APPLE 2 COMPUTER

Hardware Info

comp.sys.apple2(CSA2)Usenet newsgroup Apple II FAQs

28 May 1999

```
##########################################################################
### FILE: a2.hw
##########################################################################

Path:
news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!moe.ksu.ksu.edu!ux1.cs
o.uiuc.edu!newsrelay.iastate.edu!iscsvax.uni.edu!thompsa1597
From: thompsa1597@iscsvax.uni.edu
Newsgroups: comp.sys.apple2
Subject: Re: Language Card access -- do $C08x switches work on IIGS?
Message-ID: <1993Jun7.004328.13550@iscsvax.uni.edu>
Date: 7 Jun 93 00:43:28 -0600
References: <XHaa5B1w165w@sms.business.uwo.ca>
Organization: University of Northern Iowa
Lines: 225

FIre up your copy buffers.  This should answer your question about the
soft switches.  Four pages of goodies no Appler should be without:
```

SOFT SWITCHES

ACTION	ADDRESS	READ	WRITE?	$D0
R	$C080 / 49280	RAM	NO	2
RR	$C081 / 49281	ROM	YES	2
de R	$C082 / 49282	ROM	NO	2
RR	$C083 / 49283	RAM	YES	2
R	$C088 / 49288	RAM	NO	1
RR	$C089 / 49289	ROM	YES	1
R	$C08A / 49290	ROM	NO	1
RR	$C08B / 49291	RAM	YES	1
de W	$C008 / 49160	MAIN ZPAGE,STACK,LC		
W	$C009 / 49161	AUX. ZPAGE,STACK,LC		
R7	$C011 / 49169	$D0 BANK 2(1) OR 1(0)		
R7	$C012 / 49170	READ RAM(1) OR ROM(0)		
R7	$C016 / 49174	USE AUX(1) OR MAIN(0)		
de W	$C002 / 49154	READ FROM MAIN 48K		
W	$C003 / 49155	READ FROM AUX. 48K		
de W	$C004 / 49156	WRITE TO MAIN 48K		
W	$C005 / 49157	WRITE TO AUX. 48K		
R7	$C013 / 49171	RDG MN (0) OR AX (1)		
R7	$C014 / 49172	WRT MN (0) OR AX (1)		
de W	$C000 / 49152	RD/WR MAIN $40-5F		
W	$C001 / 49153	RD/WR AUX. $40.5F		
R	$C054 / 49236	VIEW PG 1		
R	$C055 / 49237	VIEW PG 2		
R	$C056 / 49238	VIEW TEXT & LO-RES		
R	$C057 / 49239	VIEW HI-RES		
? R7	$C018 / 49176	80STORE ON(1) OR OFF(0)		
R7	$C01C / 49180	VEIW PAGE 2(1) OR 1(0)		
W	$C07E / 49278	ENABLE DHIRES		
de W	$C07F / 49279	DISABLE DHIRES		
R/W	$C05E / 49246	DHIRES ON		
de R/W	$C05F / 49247	DHIRES OFF		

R7	$C07E / 49278	DHRS ENABLED 1=Y 0=N
R7	$C07F / 49279	DHIRES ON(1) OR OFF(0)
W	$C00C / 49164	40 COLUMN
W	$C00D / 49165	80 COLUMN
R7	$C01F / 49183	VIEWING 40(0) OR 80(1)
R7	$C068 / 49256	80/40 DOWN(1) OR UP(0)
W	$C073 / 49267	RAM BANK (0-15)

HARDWARE LOCATIONS

DEC	HEX	USE
49280	$C080	PHASE 0 OFF
49281	$C081	PHASE 0 ON
49282	$C082	PHASE 1 OFF
49283	$C083	PHASE 1 ON
49284	$C084	PHASE 2 OFF
49285	$C085	PHASE 2 ON
49286	$C086	PHASE 3 OFF
49287	$C087	PHASE 3 ON
49288	$C088	MOTOR OFF
49289	$C089	MOTOR ON
49290	$C08A	DRIVE 1
49291	$C08B	DRIVE 2
49292	$C08C	READ LATCH OR WRITE+SHIFT
49293	$C08D	WRITE+LOAD OR PROTECT CHK
49294	$C08E	READ LATCH OR PROTECT CHK
49295	$C08F	WRITE+LOAD OR WRITE+SHIFT

I/O FUNCTIONS

READ	WRITE	PROTECTED?
LDA $C08E,X	LDA $C08F,X	
...	...	
...	LDA DATA	LDA $C08D,X
LDA $C08C,X	STA $C08D,X	LDA $C08E,X
BPL -1	ORA $C08C,X	BMI PROTECT

SKEWING

```
DOS   : 0  1  2  3  4  5  6  7  8  9  A  B  C  D  E  F
PRODOS: 0A 7A 6B 6A 5B 5A 4B 4A 3B 3A 2B 2A 1B 1A 0B 7B
DISK  : 0  D  B  9  7  5  3  1  E  C  A  8  6  4  2  F
```

SIZES

PRO+VOL+TRK+SEC+CSM+EPG = 3+2+2+2+2+3 = 14 ($0E)

PRO+BYTES+CSM+EPG = 3+342+2+3 = 350 ($015E)

4 & 4 encoding = SEC, ROL 1st, AND with 2nd

 300 baud = 3.33 bks/min
1200 baud = 13.33 bks/min
2400 baud = 26.50 bks/min

DISK DRIVE ADDRESSES

ADDRESS FIELD							
	PROLOGUE			EPILOGUE			
	$D5/213	$AA/170	$96/150	$DE/222	$AA/170	$EB/235	
RD	47445	47455	47466	47505	47515	- - -	RD
	$B955	$B95F	$B96A	$B991	$B99B	- - -	
WR	48250	48255	48260	48302	48307	48312	WR
	$BC7A	$BC7F	$BC84	$BCAE	$BCB3	$BCB8	

Read checksum at $B989: D0 B7 (47497 = 208,183)

DATA FIELD							
	PROLOGUE			EPILOGUE			
	$D5/213	$AA/170	$AD/173	$DE/222	$AA/170	$EB/235	
RD	47335	47345	47356	47413	47423	- - -	RD
	$B8E7	$B8F1	$B8FC	$B935	$B93F	- - -	
WR	47187	47192	47197	47262	47267	47272	WR
	$B853	$B858	$B85D	$B89E	$B8A3	$B8A8	

Read checksum at $B92D: D0 13 (47405 = 208,19)

RWTS LOCATIONS

$B7E9 / 47081 = SLOT * 16
$B7EA / 47082 = DRIVE
$B7EB / 47083 = ZERO
$B7EC / 47084 = TRACK
$B7ED / 47085 = SECTOR
$B7F0 / 47088 = BUFFER LO
$B7F1 / 47089 = BUFFER HI
$B7F3 / 47091 = ZERO
$B7F4 / 47092 = SEEK/READ/WRITE

$03E3 / NA   = LOAD X/Y WITH PARM LIST ADDRESS
$03D9 / NA   = CALL RWTS (MUST CALL ABOVE FIRST)

$B793 / 46995 = SEEK/READ/WRITE MULTIPLE PAGES
$B7E1 / 47073 = NUMBER OF PAGES

ROM SUBROUTINES

BASCLCTX $FBC1

```
         IP Ar = vtab - 1
         OP $28.29 = base location htab 1
HOME     $FC58
CHAROUT  $FDF0
         IP Ar = a character
         OP print Ar at ($28)+$36
READKEY  $FD0C
         OP character in Ar
PRINTHEX $FDE3
         IP Ar = a number 00-0F
         OP Ar printed as a number, form $A
PRBYTE   $FDDA
         IP Ar = a number
         OP Ar printed as a number, form $AA
PRINTAX  $F941
         IP Ar & Xr = a number
         OP Ar & Xr printed as a number, form $AAXX
TEXT     $FB2F
BASCLCHI $F411
         IP Ar, Xr, Yr = hires location, form YYXX,AA
         OP ($26) = base address
CLRHIRES $F3F6
         IP $E6 = page, $1C = hcolor
         OP hires screen cleared to given color
HPLOT    $F457
         IP $E4 = hcolor, HPOSN called
         OP point plotted
PRNMZERO $FE93
NORMAL   $FE84
         OP $32: FF
WAIT     $FCA8
         IP Ar = length of pause
         OP returns after relative pause
CHKCOMMA $DEBE
         IP command line = char
         OP syntax error if not a comma
GETHIRES $F6B9
         IP command line = hires location
         OP location in form YYXX,AA, or ill. quant.
GETCHAR  $00B1
         IP command line = char or token
         OP char/token in Ar
GETSMNUM $E6F8
         IP command line = number
         OP Xr = number 00-FF
GETBGNM  $DD67 + $E752
         IP command line = number
         OP $50.51 = number 0000-FFFF
ILLQUAN  $F6E6
SNTXERR  $DEC9
PRTAREG  $FE95
         IP: number in Areg
         op: number printed
RDPADDL  $FB1E
         IP: Xreg = paddle #
         OP: xreg = pdl(x)
```

A note of care: CLRHIRES has been found to ERASE parts of ProDOS if you don't make sure to set the hires page at $E6. (found this one out the *hard way*)

END OF FILE a2.hw

```
##########################################################################
### FILE: ad.da
##########################################################################

Path: news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-
state.edu!cs.utexas.edu!geraldo.cc.utexas.edu!sleepy.cc.utexas.edu!not-for-mail
From: foegelle@sleepy.cc.utexas.edu (Michael Foegelle)
Newsgroups: comp.sys.apple2
Subject: Re: Voltage Samplers for the ][e
Date: 27 May 1994 11:12:35 -0500
Organization: The University of Texas - Austin
Lines: 35
Message-ID: <2s565j$jdm@sleepy.cc.utexas.edu>
References: <CqE5rD.LA5@cpsc.ucalgary.ca>
NNTP-Posting-Host: sleepy.cc.utexas.edu

In article <CqE5rD.LA5@cpsc.ucalgary.ca>,
Robert Fridman <fridman@cpsc.ucalgary.ca> wrote:
>
>Hello.
>
>I want to use my ][e to sample voltages from various sensors.  Does
>anyone know where I can get a/d cards.  I heards that external a/d
>boards can connect to the apple through the serial card.  Does anyone
>know anything about this?

For a relatively inexpensive alternative, contact Vernier Software at
(503) 297-1760.  They're a company that got their start making scientific
sensors and programs for the Apple for use in schools.  They still sell
Apple stuff, as well as IBM and Mac modules.  They have a voltage sensor
that connects to the game port for $45 assembled, $30 in kit form.

You might also try a similar company, PASCO, at 1-800-772-8700.

>     RF.
>
>-----------------------------------------------------------------------
>Robert Fridman               fridman@cpsc.ucalgary.ca
>Dept. of Computer Science
>University of Calgary        voice (403) 220-5104
>Calgary, Alberta       fax   (403) 284-4707
>Canada
>

Michael Foegelle

--
 Michael Foegelle  | Call Wunderland BBS! |   foegelle@ccwf.cc.utexas.edu
  University of    | (512) 472-0544  8n1  |   foegelle@utaphy.ph.utexas.edu
 Texas at Austin   | 14.4kbaud, v.32/bis  |   GEnie:   M.FOEGELLE2
Physics Department | ***  New number!  (512) 335-6753 effective 6/1/94!  ***


### END OF FILE ad.da
```

```
##############################################################################
### FILE: adb.devices
##############################################################################

Path:
news1.icaen!news.uiowa.edu!uunet!in5.uu.net!news.mathworks.com!news.mathworks.com!
www.nntp.primenet.com!globalcenter1!news.primenet.com!bpvh
From: bpvh@primenet.com (Bradley P. Von Haden)
Newsgroups: comp.sys.apple2
Subject: Apple IIgs compatible Mac ADB mice, trackballs and other devices
Date: 5 Sep 1997 17:48:00 -0700
Organization: Primenet (602)416-7000
Lines: 218
Message-ID: <5uq980$mvb@nntp02.primenet.com>
X-Posted-By: bpvh@206.165.6.202 (bpvh)



The Apple IIgs can use some Mac ADB mice, trackballs, touchpads and
miscellaneous other ADB devices (note: there is a separate list for
keyboards).  The following ADB devices work with the Apple IIgs.
'Reviews', where available, are included.  These reviews, solicited
or found in the online world, are used only with the permission of
their authors.  Additions, corrections and reviews (hint, hint -
positive, negative, different, etc) are encouraged.

Last updated: 05 Sep 1997

Some ADB mice that work on a IIgs:

     Apple ADB mice
     Interex Ergonomic
     Interex Mac-100A
     Interex Mac-180
     Jameco Mac Mouse (P/N 119327)
     LogicTech 3 button MouseMan (M/N M-AC13-4MD) - Review
     MicroTrac
     Mouse Systems Optical ADB Mouse
     Mouse Systems Optical ADB Little Mouse - Review
     NeXT ADB
     Precision Instruments - Review
     Sun Mouse

Some ADB trackballs that work:

     CH Products RollerMouse
     Identity Systems Technology Mac Compatible Trackball
     Interex Mac-200 Mac Compatible Trackball
     Kensington TurboMouse ADB (old)
     Kensington TurboMouse ADB v3.0 [note: later versions NOT IIgs
          compatible]
     Logitech Trackman Marble for Macintosh (P/N 804219-0000) -
          Review
     MicroSpeed Trackball for Mac ADB
     MicroSpeed MicroTRAC Trackball - Review
     Precision Instruments Macintosh ADB Trackball - Review

Other ADB devices that work:
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Cirque Glidepoint touchpad
Touche Technologies TouchPad - Review

Electric Crayon (Quality Computer)

Mice Reviews:

LogicTech 3 button MouseMan (M/N M-AC13-4MD) (Made in Ireland) [Tony Cianfaglione]

I use a Logitech ADB three button mouse with my GS and all three buttons function well. The left button selects the item, the middle button scrolls left or up and the right button scrolls down and right among the GS desktop items such as Finder lists or lists of items in programs such as Print Shop GS and Appleworks GS.

The two scrolling buttons also work on any GS finder list. It comes in extremely handy when scrolling through subdirectories containing hundreds of files. You can scroll a lot faster and with much more precision that you can by using the up or down scroll buttons within the window itself.

My GS is accelerated to 13.75 mhz and the scroll function is fantastic. The 3 button mouse is the way to go as far as I'm concerned.

Mouse Systems ADB Little Mouse (M/N 403323-001) [Don V. Zahniser]

An optical mouse that is slightly smaller than the standard Apple mouse. The mouse button is larger than that of the Apple mouse, covering about the front 1/3 of the mouse body. Switch action is more sensitive than the Apple mouse. Comes with a metal mousepad with an imprinted pattern that the mouse responds to. Felt strips on the bottom of the mouse make it self-cleaning. 'Faster' than the Apple mouse (less movement of the mouse for the same cursor movement) and ultra-reliable.

Precision Instruments Mouse [Ryan Suenaga]

Category 12, Topic 32
Message 62 Sat Dec 03, 1994

Shopping tip for you. . . I was at Computer City tonight and picked up a "precision instruments" brand mouse which is two buttoned (one for chording) and, not only was it cheap (29.99), not only does it work, but the documentation actually says (verbatim):

> "Your pointing device is compatible with the MACINTOSH, MACINTOSH II, MACINTOSH IICX and _APPLE II GS.-"

We do get a little respect, sometimes. . .

Trackballs:

Logitech Trackman Marble for Macintosh (P/N 804219-0000) [Don V. Zahniser]

An ergonomically-designed trackball with 3 mouse buttons that correspond to the index, middle, and third finger positions. The thumb moves the trackball (about 1.25" diameter), which is mounted on the left-hand side of the assembly. Software is provided for programming the buttons on the Macintosh, but on the GS, all three buttons act as a normal mouse button. On a ROM 01, fast mouse speed is fine for normal use, but slow is better for activities that require precision. A really nice, comfortable, easy to use trackball. Does not have a free-wheeling spinning action as on some larger trackballs. Appears to be immune to dirt build-up.

MicroSpeed MicroTRAC Trackball [Don V. Zahniser]

Category 12, Topic 32
Message 222 Tue Mar 28, 1995
D.ZAHNISER [IronTooth] at 18:39 EST

Well, there was this really cute little MicroTRAC (by Microspeed) trackball there, and it sort of followed me home. It's one of those little thingies that can be used with laptops, with a total footprint about 2/3 the size of the mouse that came with my GS. I have it attached to the side of my keyboard right now. It's a three button mouse - er, trackball. Left has standard mouse button action, right is a double-click button, and center (behind the little ball) is a click-lock button. It's got an LED that lights up when the mouse button is down (great for those 2am CoPilot sessions ;^). Action on the ball is pretty good (far better than my defective Kraft), but certainly not as smooth as the Kensington Expert Mouse that I use on my Vectra at work. I kinda like it :^)

Don V. Zahniser
Delivered by: CoPilot v2.55 & ANSITerm v2.12

Category 12, Topic 32
Message 224 Sat Apr 01, 1995
D.ZAHNISER [IronTooth] at 11:14 EST

A quick update on the MicroTRAC -

This little critter has a decided X-Y axis preference; I think it's because it doesn't have a diagonal idler bearing. This makes it harder to track from corner to corner of the screen. OTOH, it is GREAT as a 'mouse' in AppleWorks, where inadvertant diagonal movement of my mouse was driving me crazy trying to position the cursor (and yes, I did play with the mouse sensitivity settings).

The other neat thing about this micro-ball is that I have it mounted on a bracket from one of the screws holding the keyboard case together. I work the ball and switches with my fingers, and my thumb is resting right next to the

'Enter' key at the keypad. I actually need to move back and forth to the keyboard less than before when negotiating menus and dialogs. Having the Enter key so 'handy' compensates to a great extent for the X-Y preference.

Don V. Zahniser
Delivered by: CoPilot v2.55 & ANSITerm v2.12

Precision Instruments Macintosh ADB Trackball [Ryan Suenaga]

Category 12, Topic 32
Message 154 Sun Mar 12, 1995
R.SUENAGA1 [Ryan] at 23:49 EST

For those interested in a GS compatible trackball;

Precision Instruments makes one; it's labeled as a Macintosh ADB but it works just fine with my GS. Got mine for just under $40 at the local Computer City, and yes, even the lock light works. . .

Ryan
Graduate School:
What to do when you _really_ don't want to grow up!
(And delivered by Copilot and PT 3.1 :)

Other ADB devices:

Touche Technologies, Inc Touchpad (ADB version) [Don V. Zahniser]

Although this touchpad appears to work pretty well some of the time, it has one glaring flaw: It will not 'release' the button action in some instances. The effect is that the user moves the cursor to the proper position, but when attempting to 'double-click', the cursor will move (drop) even when the finger is no longer touching the pad. My suspicion is that the Touche touchpad is marginally too sensitive for the GS. The Macintosh software supplied with the touchpad supposedly allows for adjustment, but this option is not available on the GS. I have tried it on two ROM 01 systems with the same results.

Reviewers Contact Information:

Tony Cianfaglione [ab616@chebucto.ns.ca or ip-nsaug@chebucto.ns.ca]
Ryan Suenaga [A2LAMP@genie.com]
Don V. Zahniser [d.zahniser@genie.com]

**** bpvh Internet: bpvh@primenet.com GEnie: B.VONHADEN ****
**** Posted by an Apple IIgs using my own Proterm 3.1 File Macro ****

END OF FILE adb.devices

```
##########################################################################
### FILE: adb.keyboards
##########################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!newsfeed.internetmci.com!news.fibr.net!nntp.news.
primenet.com!news.primenet.com!bpvh
From: bpvh@primenet.com (Bradley P. Von Haden)
Newsgroups: comp.sys.apple2
Subject: RE: Replacement keyboard for IIgs  P/N C 658-4081
Date: 6 Jan 1996 23:11:03 -0700
Organization: Primenet (602)395-1010
Lines: 61
Sender: root@primenet.com
Message-ID: <4cno5n$kq9@nnrp1.news.primenet.com>
X-Posted-By: bpvh@usr3.primenet.com


crownmi@io.org (Myles Fudge) wrote:

>Since my stock GS keyboard has been flaky for a little while, and
>now I've got my PCT working, I'm looking for a keyboard
>replacement that resembles the extended keyboard (F-keys, etc).  I
>have purchased two 'extended' keyboards that no not work with my
>GS's ADB port.  They are both Mac keyboards.  One is "MacAlly
>Peripherals Extended Keyboard" and the other is "Micro Speed Mac
>Keyboard Deluxe.  Neither keyboard requires a driver to work with
>the Mac, and both are standard 105-key layouts.


Here is a list of ADB keyboards that I have compiled as of 96/01/06.
Additions/corrections welcome.

'+' designates changes from previous list

I have the following that work:

AppleDesign Keyboard ($85-90)
Apple Extended Keyboard II ($155-160)
Adesso 105 Extended Keyboard ($80 - Mac's Place, MacZone, Tiger SW)
Adesso 102 Extended Keyboard w/ Trackball [Trackball does NOT work]
     ($100 - Mac's Place, MacZone, Tiger Software)
Arrive Extended ($50 - MacMall)
Interex 105 Extended ($55 - MacMall, Syex Express; $34 - Computer City)
Key Tronic MacPro Plus ($130 - MacZone, APS Tech.)
OptiMac Extended Keyboard (???)
PowerUser 105E Extended Keyboard ($50 - MacWarehouse)
SIIG, Inc MacTouch Model 1905 (~$100.00)
Sun OmniMac Ultra [extended, ADB type] (???)
Suntouch ADB Extended Keyboard ($75 - Syex Express)
VividKey Extended Keyboard ($60 - MacMall)

Do not work:

Apple Adjustable Keyboard
MacALLY Peripherals Extended Keyboard
MicroSpeed Keyboard Deluxe MAC

???:
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ClubMac Extended Keyboard ($59 - ClubMac)
Datadesk MAC 101 E ($100 - MacWarehouse, MacZone)
Datadesk TrackBoard ($100 - MacWarehouse, MacZone)
Key Tronic Trak Pro Plus ($230 - APS Tech.)
Performance Soft Touch Extended Keyboard ($59 - MacZone)
Spring Sun Tech MacPride 97 ($90 - MacMall)
Spring Sun Tech MacPride 105 ($59 - MacMall)
Spring Sun Tech MacPride 110 ($80 - MacMall) [MAC/IBM switchable]
Spring Sun Tech MacPride KidBoard ($100 - MacMall)

????:

Adesso Tru-From Ergonomic extended keyboard ($90 - CDW)
Adesso Tru-Form Ergonomic ext kb w/ pointer ($116 - MacZone)

**** bpvh Internet: bpvh@primenet.com GEnie: B.VONHADEN ****
**** Posted by an Apple IIgs using my own Proterm 3.1 File Macro ****

END OF FILE adb.keyboards

```
##############################################################################
### FILE: adb.mice
##############################################################################

Path:
news1.icaen!news.uiowa.edu!news2.chicago.iagnet.net!qual.net!iagnet.net!newsreader
.digex.net!www.nntp.primenet.com!globalcenter0!news.primenet.com!bpvh
From: bpvh@primenet.com (Bradley P. Von Haden)
Newsgroups: comp.sys.apple2
Subject: Re: Apple IIGS mice -- Mac-mouse compatibility?
Date: 6 May 1998 13:13:03 -0700
Organization: CD Club Central
Lines: 26
Message-ID: <6iqg8f$hri@nntp02.primenet.com>
References: <6il20t$e1t@netaxs.com>
X-Posted-By: bpvh@206.165.6.204 (bpvh)
Xref: news1.icaen comp.sys.apple2:133454


vsp@unix3.netaxs.com (have clue--will travel) wrote:

>Are there any Mac mice known _not_ to work with the GS's ADB port,
>and are there any cheapies out there that are considered good?

While not an exhaustive list, here are some ADB mice that work on a
IIgs:

     Apple ADB mice
     Interex Ergonomic
     Interex Mac-100A
     Interex Mac-180
     Jameco Mac Mouse (P/N 119327)
     LogicTech 3 button MouseMan (M/N M-AC13-4MD)
     MicroTrac
     Mouse Systems Optical ADB Mouse
     Mouse Systems Optical ADB Little Mouse
     NeXT ADB
     Precision Instruments
     Sun Mouse


**** bpvh        Internet: bpvh@primenet.com        Delphi: bpvh ****
**** Posted by an Apple IIgs using my own Proterm 3.1 File Macro ****



### END OF FILE adb.mice
```

```
##############################################################################
### FILE: adb.problem
##############################################################################

Path:
news1.icaen!news.uiowa.edu!iagnet.net!iagnet.net!NewsNG.Chicago.Qual.Net!Qual.Net!
ais.net!nntp.giganews.com!newsgate.swbell.net!151.164.30.35.MISMATCH!cyclone.swbel
l.net!swbell!not-for-mail
From: Rubywand <rubywand@swbell.net>
Newsgroups: comp.sys.apple2
Subject: Re: help with broken GS
Date: Wed, 10 Jun 1998 05:44:16 -0500
Organization: Southwestern Bell Internet Services, Richardson, TX
Lines: 80
Message-ID: <357E6380.4E2F46C@swbell.net>
References: <357F2600.AA434F7@tridel.net>
Reply-To: rubywand@swbell.net
NNTP-Posting-Host: ppp-207-193-8-21.hstntx.swbell.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Trace: (null) 897475466 10652 (None) 207.193.8.21
X-Complaints-To: usenet@nnrp3
X-Mailer: Mozilla 4.04 [en] (Win95; I)
Xref: news1.icaen comp.sys.apple2:135111

Jon Christopher Co writes ...
>
> I was using my GS and smoke started coming out from the inside.  after
> opening it up my best guess tells me the smoke came from an 8 legged
> chip right under the power supply at the upper leftmost corner (right
> behind the composite video connector and ADB jack).  Right now the
> computer still boots up, but will not respond to any ADB device
> (keyboard).  can anybody identify what this chip is?  i also noticed
> there is a slight bump in the middle.. is this normal or is it > supposed to be
perfectly flat?



     My guess is that the chip or module you are talking about is L2
"D-15C". This is an 8-pin thing with 4 inductors (coils). Three
inductors are used. They are in series with the ADB Desktop connector.

     Evidently, one of the inductors burned out. This would explain the
loss of ADB functioning and the bump on the module.

     Repairing the burned out inductor should be fairly easy, although
it will probably be necessary to remove the motherboard. You could take
a length of thin wire-- like wirewrap wire-- make a small coil, and
connect it across the terminals of the module corresponding to the
burned-out inductor.

     The three inductors run ...

     pin 1 to  pin 8
     pin 2 to  pin 7
     pin 3 to  pin 6

You can use an Ohm meter to detect which one is open. (Example: the
```

correct reading from pin 2 to pin 7 would, probably, be less than an Ohm.)

The 'catch' in all this is ... Why did the inductor burn out?!

Since the pin2-pin7 inductor connects to +5V on the pin7 side, it appears that pin2 is, some how, shorted to ground.

Another possible candidate is the pin1-pin8 inductor. Pin8 connects to +5V through a 470 Ohm resistor. If pin1 should be shorted to ground, there _might_ be enough current to heat up and burn out the pin1-pin8 coil. However, this does not seem likely.

With the motherboard removed and KB disconnected, check Resistance from pin1 to pin8, etc.. When you find the open (high R) inductor, check R from the low-numbered side (1, 2, or 3) to Ground. (The silvery metal shield near the ADB socket should be = Ground.)

If you discover a low R (like a few Ohms) to ground on the low number side of the blown inductor, my guess is that it will be at pin2 and that the culprit is a shorted capacitor, BC91 and that your GS is a ROM-03 (since no capacitor is shown on the ROM-01 schematic). If this is the case, cut the trace to the capacitor and replace it with a compact 0.01 uF capacitor rated at 15V or better.

Another possible cause of shorting is a bent piece of shielding near the ADB connector.

If you discover no short on the low-numbered pin of the blown inductor, plug in your ADB cable without the KB and measure again. If you, now, find a short, the indication is a messed up cable.

If there is, still, no short plug in the KB. A short now would indicated a messed up connection at the KB socket.

If there is, still, no short, try the check while wiggling the cable and plugs on both ends.

If you can find no short, my suggestion is that you remove the bottom and back shields and throw them away-- they are a shorting hazard.

After repairing the blown coil with a bit of coiled wire, put everything together and see if your GS is fixed.

Rubywand

END OF FILE adb.problem

```
##########################################################################
### FILE: aeserialpro
##########################################################################

Path:
blue.weeg.uiowa.edu!news.uiowa.edu!uunet!usc!howland.reston.ans.net!agate!msuinfo!
kagunij.bch.msu.edu!user
From: carrkevi@student.msu.edu (Kevin M. Carr)
Newsgroups: comp.sys.apple2
Subject: Re: AE Serial Pro
Date: Mon, 22 Aug 1994 01:57:55 -0600
Organization: Michigan State University, Dept. of Biochemistry
Lines: 58
Message-ID: <carrkevi-2208940157550001@kagunij.bch.msu.edu>
References: <1994Aug20.124829.20517@pro-algonquin.mn.org>
NNTP-Posting-Host: kagunij.bch.msu.edu

In article <1994Aug20.124829.20517@pro-algonquin.mn.org>,
craigl@pro-algonquin.mn.org (Craig Larson) wrote:

> Could someone who has an Applied Engineering Serial Pro card please send me
> a list of the dip switch settings for the 2 banks of switches?  Thanks in
> advance!
> ----


I use an AE Serial Pro in my  //e to connect to my ImageWriter II.  All of
the DIP switches are set to OPEN (switch down).  The switch block next to
the printer interface connector is for hardware handshaking signals.
(Copied without any permission whatsoever from the AE Serial Pro User's
Manual.)

      o Switch 1, when closed, select pin 4 (Request to send) as the flow
        control handshaking line.  Some printers which use this line are:
        Data General TP2; Heath H-25; Olympia ESW102/103; QUME Sprint 5;
        and Smith-Corona TP1

      o Switch 2, when closed, selects pin 11 which is, according to RS-232-C
        specifications, undefined and is used by some serial printers as a
        printer-ready signal.  Some Centronics, Texas Instruments, and Epson
        serial printers may use this pin.

      o Switch 3, when closed, selects pin 19 (Secondary Request to Send) as
        the handshaking line.  Some of the printers that use this pin are the
        Anadex DP8000/9000, Bell TP-1000, Lear Seigler 310, NEC 3500/7700,
        and Digital Equipment (DEC) LA-series serial printers.

      o Switch 4, when closed, selects pin 20 (Data Terminal Ready) as not
        only the device-available handshaking line but also as the data-flow-
        control line.  Some Diablo, C.Itoh, Okidata, QUME, Tectronics, or
        Xerox printers may use this handshaking signal.

      o When all of the switches are open, Data Terminal Ready (DB-25 pin
        20) is the only line monitored as the hardware handshaking line
        from your printer.  This supports most popular serial printers.


The second set of DIP swithces (close to the front of the card) is for
generating Maskable (IRQ) and Non Maskable (NMI) interrupts from the 6551
```

Asynchronous Communications Interface Adaptor (ACIA) chip and the 6818 clock chip. The swithces select the type and source of interrupt request. Normally all switches are in the OPEN position.

- Switch 1: IRQ from 6551
- Switch 2: NMI from 6551
- Switch 3: IRQ from 6818
- Switch 4: NMI from 6818

Hope this information helps.

Kevin M. Carr
carrkevi@student.msu.edu

END OF FILE aeserialpro

```
##############################################################################
### FILE: amigamonitor.cable
##############################################################################

Newsgroups: comp.sys.apple2
Path: news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-
state.edu!cs.utexas.edu!swrinde!sgiblab!munnari.oz.au!newshost.anu.edu.au!csc.canb
erra.edu.au!student!u901841
From: u901841@student.canberra.edu.au (Hickey / Michael Gerard (ISE))
Subject: Re: Help! Need replacement GS monitor info
Message-ID: <1994Mar12.071700.3587@csc.canberra.edu.au>
Sender: news@csc.canberra.edu.au
Nntp-Posting-Host: student.canberra.edu.au
Organization: University of Canberra
References: <CM3p6w.BLJ@hpcvsnz.cv.hp.com> <1994Mar4.234639.11768@pro-sol.cts.com>
Date: Sat, 12 Mar 94 07:17:00 GMT
Lines: 33

In article <1994Mar4.234639.11768@pro-sol.cts.com> jamess@pro-sol.cts.com
(James Stafford) writes:


>All Tech Electronics sells RGB monitors that they specially set up for the
>Apple II for arround $150.00 I believe. These monitors were Attari monitors
>that they fixed to work on Aplle II's. All Tech's # is 1-800-995-7773.
>Also Quality Computers has monitors made by Magnavox for the Apple II. The
>price of these RGB monitors are $300.00. Quality's # is 1-800-777-3642.
>I should mention that All Tech also has used Aplle RGB monitors.

I have good information that the AMIGA 1084s monitor will work with the
Apple IIgs. I have no information on the quality of the output, I've seen
_some_ Amiga displays that look no better than your average colour TV.
Perhaps the local WAL-Mart will have a few in stock at a low price.

You will need to build your own DB9 to DB 15 cable.
1084s to    //gs
DB9         DB15
1           13
3           2
4           5
5           9
7           3

easy!
     __  |\       Michael Hickey
    /  |_| \
  ^'        \     u901841@student.canberra.edu.au
 /  Canberra \
 \      __ \. /
  \_.-'  \__/
          v


### END OF FILE amigamonitor.cable
```

```
##############################################################################
### FILE: annunciators
##############################################################################

Path: news1.icaen!news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.erols.net!feed1.news.erols.com!phase2.worldnet.att.net!uunet!in1
.uu.net!news.emi.com!usenet
From: drsmooth@relex.com (Edhel Iaur, Esq.)
Newsgroups: comp.sys.apple2
Subject: Re: Interfacing the Apple // to External devices
Date: Tue, 26 Nov 1996 01:04:07 GMT
Organization: US-A2WUG
Lines: 30
Message-ID: <57dfor$3l3@news.emi.com>
References: <3298A07A.2C7C@usfca.edu>
Reply-To: drsmooth@relex.com
NNTP-Posting-Host: slip12.relex.com
X-Newsreader: Forte Free Agent 1.0.82

Matt McDonald <mcdonaldm@usfca.edu> wrote:

>Has anone tried interfacing their Apple // to external devices, such as
>motors for robotics experiments, and such? I am interested in attempting
>this, and wondered if any others have any advice...

The first things to try is the following (use relays & external power
if 3.5V ain't enough):


Poke -16296,1  Clear game I/O AN0 output (OFF-3.5V HIGH)
Poke -16295,0  Set game I/O AN0 output (ON-.3V LOW)
Poke -16294,1  Clear game I/O AN1 output (OFF-3.5V HIGH)
Poke -16293,0  Set game I/O AN1 output (ON-.3V LOW)
Poke -16292,1  Clear game I/O AN2 output (OFF-3.5V HIGH)
Poke -16291,0  Set game I/O AN2 output (ON-.3V LOW)
Poke -16290,1  Clear game I/O AN3 output (OFF-3.5V HIGH)
Poke -16289,0  Set game I/O AN3 output (ON-.3V LOW)


These correspond to some pins on the internal 16-pin joystick socket
near the right-rear.  I forgot which ones; sorry.  If you're
interested, someone (or maybe I) can find out which pins go where.
--
| /      /         />_____________________       +==Apple // Forever==+
|___  _____  M#M#M#||_____________________---__  +-37th Wisest Wizard-+
| \ \  /     #M#M#M||_____________________---    +- Edhel Iaur, Esq. -+
| / /  \_/         \>
http://www.wco.com/~3d5d1wsw/US-A2WUG/FOUNDING.MEMBERS/HOME.PAGES/EDHEL



### END OF FILE annunciators
```

```
##############################################################################
### FILE: apple.house
##############################################################################

Path:
news1.icaen!news.uiowa.edu!news1.chicago.iagnet.net!iagnet.net!199.0.154.56!ais.ne
t!newsfeed.concentric.net!global-news-master
From: Erick Wagner <wagnere@concentric.net>
Newsgroups: comp.sys.apple2.marketplace,comp.sys.apple2
Subject: Re: Apple IIe House Control?
Date: Mon, 24 Nov 1997 00:36:41 -0600
Organization: Concentric Internet Services
Lines: 12
Message-ID: <34792079.6A96@concentric.net>
References: <narf-2111972140300001@s29.netgate.net>
Reply-To: wagnere@netcom.com
NNTP-Posting-Host: ts007d17.dal-tx.concentric.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Mailer: Mozilla 3.0 (Win95; U)
To: Matt Clark <narf@netgate.net>
Xref: news1.icaen comp.sys.apple2.marketplace:21896 comp.sys.apple2:127634

Matt Clark wrote:
>
> I seem to remember seeing a book about using an Apple IIe as a house
> controller. (IE: Lights, etc). Anyone heard of it?

You're probably thinking of a book called "The Apple House"
by John Blankenship. It was published by Prentice-Hall in
1984. The ISBN is 0-13-038711-8 (paperback) or 0-13-038729-0

You might be able to locate a copy at a local library or a
second-hand bookstore like Half-Price Books (not sure if
this is local, regional, or national).


### END OF FILE apple.house
```

```
##########################################################################
### FILE: apple2pc.joystck
##########################################################################

Path: news1.icaen!news.uiowa.edu!chi-news.cic.net!mr.net!newsfeeds.sol.net!
news.maxwell.syr.edu!cpk-news-hub1.bbnplanet.com!news.bbnplanet.com!cam-news-hub1.
bbnplanet.com!howland.erols.net!newsxfer3.itd.umich.edu!portc01.blue.aol.com!audre
y01.
news.aol.com!not-for-mail
From: rubywand@aol.com
Newsgroups: comp.sys.apple2
Subject: Re: Apple Joystick adapter for IBM port available? How to make?
Date: 5 Feb 1997 18:22:46 GMT
Organization: AOL http://www.aol.com
Lines: 222
Message-ID: <19970205182201.NAA21017@ladder01.news.aol.com>
References: <32f87b85.1846351@news.minn.net>
NNTP-Posting-Host: ladder01.news.aol.com
X-Admin: news@aol.com
X-Newsreader: AOL Offline Reader

In article <32f87b85.1846351@news.minn.net>, ttec@minn.net (Greg) writes:

>
>I have an apple //c joystick and was wondering if anyone out there has
>made a cable/adapter to use it with an IBM joystick port.
>
>

     Here is a Step-by-Step followup to the earlier info on doing the
Apple2-to-PC joystick conversion ...


Apple2-to-PC Joystick Conversion: Part 2

Step-by-Step  (2/5/97 version)
    to A2-WUG,1wsw, GS.WorldView


DOING THE CONVERSION

To convert an Apple2 joystick for PC use
you will need a cable from an old PC
stick (or a 6-wire cable and 15-pin
female connector). You can find junk
PC sticks with good cables at flea
markets and lots of other places.
You will also need two 330k resistors.


1. First, open the Apple joystick
case and mark each wire going to
the cable. The best way is to use
small self-stick labels. Label each
wire by function (e.g. "+5", "X",
"GND", etc.).

You can use an Ohm meter to, for
example, verify that the wire you
```

think is Button 0 really goes to
pin 7 on the Apple 9-pin connector
(or pin 2 on the old 16-pin IC style
connector). Pinouts for both kinds
of A2 sticks are shown below:

Apple II Joystick
(9-pin male)

[2]---- +5V
[7]---- Button 0
[5]---- X-axis
[8]---- Y-axis
[1]---- Button 1
[3]---- Ground

Apple II Joystick
(16-pin IC-style plug)

[1]---- +5V
[2]---- Button 0
[6]---- X-axis
[10]--- Y-axis
[3]---- Button 1
[8]---- Ground

The +5V wire is easy to find. It will
go to each pot and to one side of
each Button switch.

The Apple2 Ground wire goes to the
'bottom' end of each fixed resistor.
You do not need to label it; because
it will be removed.

2. Once the wires are labeled, cut
each about 1 inch from the point it
goes into the cable. Remove the cable.
(Keep the cable; it may come in handy
for some later Apple2 project.)

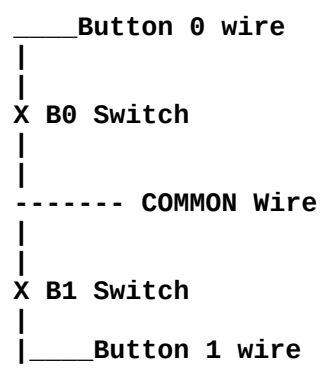
Now, is the time to rewire the
Buttons.

3. Remove (snip or unsolder) the two
fixed resistors. If the Button 0 or
Button 1 lead becomes disconnected
from its switch during removal of a
resistor, reconnect the lead.

Check to see that, now, the Button 0
wire is the only one going to one
side of the Button 0 switch. The same
goes for the Button 1 wire.

Snip off or unsolder the +5 leads going to the other side of each button switch at the non-switch end. If a wire runs from one switch to the other, leave it alone. If not, connect a wire from switch to switch. This is the "common" side of the switches.

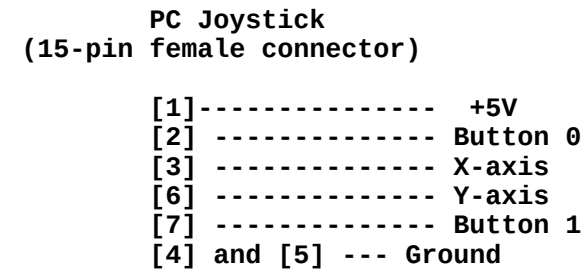
You want to end up with a single wire going to the common side of the switches and separate Button 0 and Button 1 wires going to the other side:



Label the COMMON wire as "GROUND"

4. The 330k resistors will help bring the outputs of the Apple2 X and Y 150k Ohm pots closer to the 0-100k range PC prefers. Connect a 330k resistor 'across' each pot-- i.e. from the center post to the post going to a +5 lead.

5. Label each of the leads coming from the PC cable. If it is still connected to a joystick, the following pic will help identify each lead:



If the cable is still connected, snip the the leads once they are all labeled. If both Ground ([4] and [5]) leads are present, twist them together and treat like a single Ground lead.

FINISHING UP

You have six labeled wires in the Apple2 joystick case: +5, GROUND, B0, B1, X, and Y. The same six leads are labeled on the PC cable. Splice each Apple2 wire to the corresponding PC cable wire. Use heat-shrinkable tubing to cover each connection.

Seat the new cable in the joystick case, arrange leads to avoid mounting posts, etc., and close up the case. Viola!

CHECKS

If you have an Ohm meter here are some checks you can do:

X (Horizontal) Check- check R between cable pins 1 and 3. As you move stick left to right R should go from 0 to about 100k.

Y (Vertical) Check- check R between cable pins 1 and 6. As you move stick up to down R should go from 0 to about 100k.

Button 0 Check- (Button 0 is the main, "Fire" button.) cable pins 2 and 4 or 5. It should be very high and go to 0 when Button 0 is pressed.

Button 1 Check- check R between cable pins 7 and 4 or 5. It should be very high and go to 0 when Button 1 is pressed.

TRYOUT

Plug in the stick and try it with a game.

Some games (such as Elite Plus) will claim no joystick is present if the stick is badly out of adjustment. If this happens, try the stick on a game which is less picky and includes pre-play stick adjustment.

Once adjusted, your 'new' stick should work fine with all PC wares.

R/\/\/

Rubywand

END OF FILE apple2pc.joystck

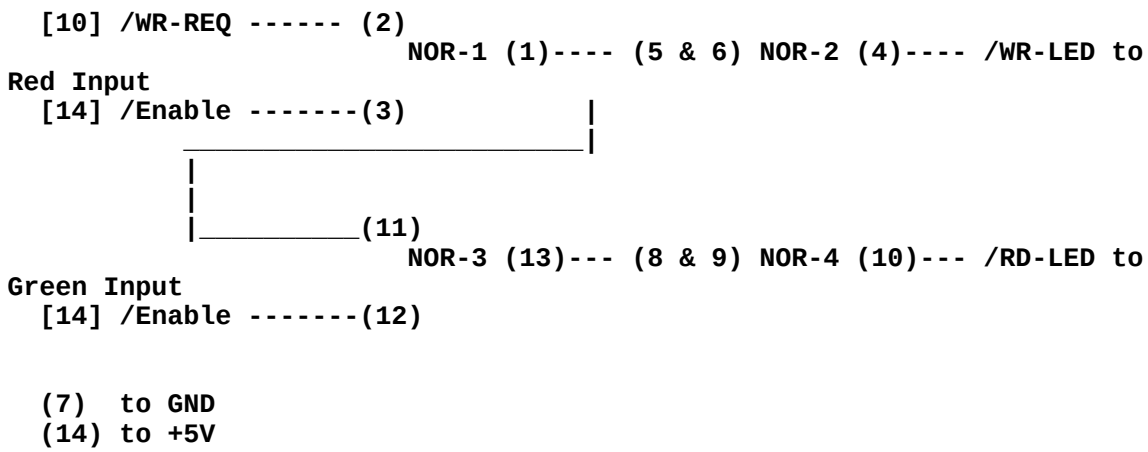
```
##########################################################################
### FILE: applemuseum.www
##########################################################################

Path: news1.icaen!news.uiowa.edu!chi-news.cic.net!feed1.news.erols.com!tezcat!
cam-news-hub1.bbnplanet.com!news.bbnplanet.com!su-news-
hub1.bbnplanet.com!newsxfer3.
itd.umich.edu!howland.erols.net!newsfeed.internetmci.com!news.hughes.net!pm-35-
169.
hughes.net!user
From: gcifu@hughes.net (Greg Cifu)
Newsgroups: comp.sys.apple2
Subject: Apple Online Museum
Date: Mon, 13 Jan 1997 18:56:15 -0800
Organization: Electronic Commerce
Lines: 36
Message-ID: <gcifu-1301971856150001@pm-35-169.hughes.net>
NNTP-Posting-Host: pm-35-141.hughes.net

I'm not normally a participant of this group. You guys are WAY over my
head when it comes to Apple II stuff. I am however a Macintosh (and Apple
in general) proponent.

I am writing to share the existence of my Unofficial, Unauthorized Apple
Online Museum. It started with a Mac 512, then a IIc, IIgs and it
snowballed from there.

<http://www.hughes.net/~gcifu/applemuseum/index.html>

I've tried to be true to each model to the best of my abilities and
research. Of particular interest is the Gantt style timeline of the
introduction of each model from 1976 through to the Macintosh (graphical
browser required). It's interesting to see which models coexisted in the
Apple lineup.

There are pages on each model. The Apple II pages are a little thin but
I'm working on them. Since rolling out the new version of the site 1/1/97
I've also purchased a IIe, and a Mac 128 (coming soon). An Apple III is in
the works.

I tried to capture the feel of each model. I have the original Apple
computer logo, scans from some of the user docs, and scans of 1982-85
Apple related magazines. I'm constantly updating the site and will
continue based on it's worth to the web community. It's what I have to
offer to the web. I hope some of you enjoy it.

Thanks for the space in your newsgroup. Flame on if you must ;-)

--
_____________________________________________________________________
Greg Cifu
<gcifu@hughes.net>

Be sure to visit my website at <http://www.hughes.net/~gcifu/>
_____________________________________________________________________


### END OF FILE applemuseum.www
```

```
##############################################################################
### FILE: bicolor.led
##############################################################################

Path: news.uiowa.edu!uunet!in2.uu.net!newsfeed.internetmci.com!206.229.87.25!news-
peer.sprintlink.net!news-backup-west.sprintlink.net!news-in-
west.sprintlink.net!news.sprintlink.net!Sprint!151.164.30.38!newsgate.swbell.net!s
wbell!not-for-mail
From: Rubywand <rubywand@swbell.net>
Newsgroups: comp.sys.apple2
Subject: Re: Bi-color red/green LEDs: Disk II read/write????
Date: Sat, 14 Mar 1998 18:36:36 -0600
Organization: Southwestern Bell Internet Services, Richardson, TX
Lines: 84
Message-ID: <350B2294.929D0294@swbell.net>
References: <6eeq9s$mhc$1@lynx.unm.edu>
Reply-To: rubywand@swbell.net
NNTP-Posting-Host: ppp-207-193-12-217.hstntx.swbell.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Trace: (null) 889922047 4837 (None) 207.193.12.217
X-Complaints-To: usenet@nnrp3
X-Mailer: Mozilla 4.04 [en] (Win95; I)
Xref: news.uiowa.edu comp.sys.apple2:133622

stephen e buggie writes ...
>
> A store is clearing out bi-color LEDs red/green.   These LEDs have three
> wires:  black (negative), red (red +), green (green +).
>
> I want to add the bi-color LED to my Disk II drives, so that it will glow
> GREEN for READ, and RED for WRITE.   I already have an AE 3.5" 800K drive
> that does this, and it looks nice.   This will be a third enhancement to
> Disk II --- "Super Bugg-Drive."
>
> First, what value of resistor should be added?  The ad says these are 2
> volt LEDs, and that 20 milliamps should flow through the LED.
>
> Will the 20 milliamps affect the read/write performance of the drive in
> any way?
>

     Since you would be sticking a 20ma load onto a 74LSxxx TTL output
in each case, the odds are pretty good that Read and Write data would be
screwed up.

     One idea is to use a couple general purpose PNP transistors. The
LED GND lead goes to GND. The Red lead goes through a 150 or so Ohm
resistor to the Collector of the "Write Transistor". The Green lead goes
through a 150 or so Ohm resistor to the Collector of the "Read
Transistor". Each transistor's Emitter goes to +5V.

     The Base of each transistor has a 1k or so Ohm resistor attached.
The resistor connected to each Base is the Input for that LED. This
should take care of driving the LEDs. When an Input goes Low (e.g. to
GND), the corresponding LED should light. If you feel brightness is too
high, increase the Base R value.
```

The rest of the circuit depends upon the conditions you choose for lighting an LED and how many of what kinds of IC's you have in your parts bin.

For example, you could use the condition: when /Enable is low and /WR-REQ is low then /WR-LED is low. /WR-LED goes to the Write LED (Red) Input. If /Enable is low and /WR-REQ is high then you assume a Read and /RD-LED goes low to turn on the Read (Green) LED.

A single quad dual input NOR IC, like a 74LS02, could handle the logic. In the circuit below, "[ ]" numbers are Disk][Analog board connector points and "( )" numbers refer to pins on a 74LS02.



In the above, when /Enable is low, one of the LED's will light. If /WR-REQ is low, the Red LED will light; if /WR-REQ is high, the Green LED will light. (Some fiddling with resistor values may be required to settle on the right ON brightness levels.) One advantage of this circuit is that you always have a 'drive ON' indicator and, so, do not need to drill a hole for another LED.

An alternative circuit could monitor actual Read [16] and Write [18] activity using /Enable [14] to enable inputs to a dual 1-Shot IC. Write transitions would fire the Write 1-Shot; Read transitions would fire the Read 1-Shot. The /Q output from a 1-shot would connect to the desired Red or Green Input. Pulse time for each 1-Shot could be something like 1/5 second in order to guarantee a stable, bright display.

Rubywand

END OF FILE bicolor.led

```
##############################################################################
### FILE: bitmouse.dips
##############################################################################

Path: news.uiowa.edu!chi-
news.cic.net!newsfeed.internetmci.com!elvis.delphi.com!news.delphi.com!usenet
From: Alberto Roffe <roffe@delphi.com>
Newsgroups: comp.sys.apple2
Subject: Re: Help with 2 cards
Date: Tue, 31 Oct 95 22:50:42 -0500
Organization: Delphi (info@delphi.com email, 800-695-4005 voice)
Lines: 26
Message-ID: <RrEkRC6.roffe@delphi.com>
References: <Pine.SUN.3.91.951031104005.16116B@owens>
NNTP-Posting-Host: bos1f.delphi.com
X-To: Cyrus Roton <croton@ridgecrest.ca.us>

Cyrus Roton <croton@ridgecrest.ca.us> writes:

>Can someone tell me the dip-switch settings for the "BITMOUSE" card by
>Sequential Systems?


The following comes from the BitMouse card manual, which I have installed
in my //e:

Switch 1- This switch controls mouse tracking sensitivity

OFF: Slow
ON:  Fast

Switch 4- CPU speed

OFF: 1 to 4 MHz
ON:  5+ MHz

Switches 2&3 currently have no function.

Hope that helps.

-Alberto Roffe
 Roffe@delphi.com



### END OF FILE bitmouse.dips
```

```
##############################################################################
### FILE: breadboard
##############################################################################

Newsgroups: comp.sys.apple2.programmer
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news.uiowa.edu!news.uiowa.edu!uunet!in1.uu.net!comp.vuw.ac.nz!actrix.gen.nz!dempso
n
From: dempson@atlantis.actrix.gen.nz (David Empson)
Subject: Re: Bare board for Apple //e
Message-ID: <DF05Lq.54u@actrix.gen.nz>
Sender: news@actrix.gen.nz (News Administrator)
Organization: Actrix - Internet Services
Date: Sat, 16 Sep 1995 14:29:50 GMT
References: <DDvzqF.71t@news.zippo.com> <42nane$rpt@maverick.tad.eds.com>
<DEwsn6.Cp1@serval.net.wsu.edu> <43e589$5pq@news.scruz.net>
X-Nntp-Posting-Host: atlantis.actrix.gen.nz
Lines: 99

In article <43e589$5pq@news.scruz.net>,
Richard Steven Walz <rstevew@armory.com> wrote:
>
> I thought the board for // and //+ and //e was the same, is it not?

Prototyping boards certainly would be (and for the IIgs).

The slots on all slotted Apple IIs are physically identical, and are
compatible with most cards.  In some cases there are firmware or CPU
compatibility problems (e.g. many new cards require an enhanced IIe or
IIgs).

There are minor differences between the slot signals on the various
machines (and even on some slots in the same machine), mostly affecting
rarely used special pins.  Here is a quick summary:

Pin 1: I/O Select ($Cn00-$CnFF, where n is the slot number).

Pins 2-17: Address bus.

Pin 18: Read/Write.

Pin 19: unused on the II and II+.  On the IIe and IIgs, this has
composite horizontal and vertical sync on slot 7, and is unused on
other slots, except for slot 1 on the IIe only, which has a diagnostic
function to disable the oscillator on the motherboard.

Pin 20: I/O Strobe ($C800-$CFFF).

Pin 21: this is the RDY input to the micro on all machines, but it
behaves a little differently in the IIgs, or in a machine with a 65802
installed.

Pin 22: this is the DMA pin on all machines.  Again, there are special
issues for doing DMA on the IIgs which can cause compatibility problems.

Pin 23: this is used for the interrupt daisy chain (out) on all slots
except 7.  In the IIe only, this pin can be connected to the GR signal
(graphics mode enabled) via a motherboard modificatoin.
```

Pin 24: DMA daisy chain out.

Pin 25: +5V.

Pin 26: Ground.

Pin 27: DMA daisy chain in.

Pin 28: Interrupt daisy chain in.

Pin 29: Non Maskable Interrupt.

Pin 30: Interrupt Request.

Pin 31: Reset.

Pin 32: this is the INHIBIT pin on all machines. This behaves differently on all three machines: the II and II+ only allow the $D000-$FFFF ROM area to be inhibited. The IIe allows RAM to be inhibited as well, but has strange interaction with main and auxiliary memory. The IIgs only allows this signal to be used if the machine is running in slow mode.

Pin 33: -12V.

Pin 34: -5V.

Pin 35: unused on the II and II+. On the IIe and IIgs, this is the colour reference signal on slot 7 only. It is unused for other slots in the IIe, except for slot 1 where it provides a poorly documented facility to disable the keyboard address decoding. On the original IIgs, slot 3 provides the M2B0 signal (Mega II Bank 0) via this pin and it is unused on other slots. The ROM 3 provides M2B0 for slots 1 to 6.

Pin 36: 7 MHz system clock.

Pin 37: Q3 - Asymmetrical 2 MHz clock.

Pin 38: Phase 1 clock (1.023 MHz).

Pin 39: something called "USER 1" on the II and II+, which can be used to disable all I/O decoding if a modification is made on the motherboard. On the IIe, this pin provides the SYNC signal from the micro, which indicates an opcode fetch. On the IIgs, this pin provides the M2SEL signal, which indicates that a valid slow memory access is in progress. This pin must be used by IIgs cards that decode the address without use of the IOSEL, IOSTRB or DEVSEL pins.

Pin 40: Phase 0 clock (1.023 MHz).

Pin 41: Device Select ($C0n0-$C0nF, where n is the slot number plus 8).

Pins 42-49: Data bus.

Pin 50: +12V.

--

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Snail mail: P.O. Box 27-103, Wellington, New Zealand

END OF FILE breadboard

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########################################################################
### FILE: BUGG-POWER- User's Manual
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Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!Qual.Net!vixen.cso.uiuc.edu!ais
.net!jamie!dca1-hub1.news.digex.net!digex!lynx.unm.edu!ben02.unm.edu!buggie
From: buggie@ben02.unm.edu (stephen e buggie)
Newsgroups: comp.sys.apple2
Subject: BUGG-POWER: User's Manual
Date: 4 Jul 1998 19:48:41 GMT
Organization: University of New Mexico, Albuquerque
Lines: 985
Message-ID: <6nm0up$14m0$1@lynx.unm.edu>
NNTP-Posting-Host: ben02.unm.edu
X-Newsreader: TIN [version 1.2 PL2]
Xref: news1.icaen comp.sys.apple2:136588


Now that I can transmit to the net from my IIgs, no longer being tied to
Gateway 2000 trash at college, I'm sending the users manual for
BUGG-POWER.  Yes, this manual is already at some FTP site somewhere, but
many users (like me) don't know how to download from FTP.

Here it is; long live the 183 units of BUGG-POWER!     Steve Buggie


22222222222222222222222222222222222222222222222222222222222222222222

Shown at KansasFest 1996 rev. Nov 1997
144 units shipped by 11-97

                                USER'S MANUAL:
                  IBM-TO-APPLE IIGS POWER SUPPLY AND CABLE ADAPTOR
                  IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII
                                    V. 1.6


Stephen Buggie OUTLINE
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                                              APPLE II AND IBM POWER
SUPPLIES
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AUTHOR'S NOTES AND ACKNOWLEDGMENTS

IBM POWER SUPPLY IIGS INSTALLATION PROCEDURE

These are the installation steps for this power supply and cable:

(a) Carefully unwrap the power supply. Use no knife or blade.

(b) With all power OFF, and after discharging any static, remove the present internal power supply -- a plastic clip at the keyboard end of the motherboard holds it in.

(c) Carefully unplug the present internal power supply from the Molex-7 connector on the motherboard.

(d) Use a DC voltmeter to CHECK THE VOLTAGES of the wires on the Molex-7 plug (+5v, +12v, -12v, and -5v) before connecting to the IIgs. [This is an important precaution!] Some units require that a load (such as an old hard drive) be attached to a Molex-4 accessory plug to get accurate readings. With minimal load, voltages will normally be lower than the target values.

(e) Place the IBM power supply on the floor under the computer table -- position it so that there is no danger of objects (paper clips, pens, etc.) falling off the table into a fan opening, nor of liquids being spilled into it.

(f) String the 6-wire cable up to the back panel of the IIgs, and into the computer.

(g) Carefully line up the Molex-7 plug with the male motherboard connector. The two black wires are towards the keyboard-front of the computer; the plug's "polarizing-ramp" faces towards the slots.

(h) Slowly push the plug onto the motherboard power connector.

(i) Put the lid on the CPU, then System Saver (if used), and the monitor.

(j) Connect the power plug of the IBM power supply to your System Saver IIgs (or to power strip). Continued use of the Kensington System Saver or AE Conserver is recommended to minimize heat that originates in the motherboard or interface cards,

(k) Enjoy 150/200 watts of clean power in your Apple IIgs; say goodbye to crashes and freeze-ups attributable to low power!

INTRODUCTION

Installing a high-powered (150-200 watt) IBM-style power supply will eliminate low-power problems suffered by Apple II users whose Apples are loaded with accessories. You will now be able: (a) to add four or more disk drives, (b) fully populate all your RAM cards, (c) fill all slots with large cards, (c) reduce overheating problems by having an external,

rather
than internal, power supply.

SWITCHING-STYLE POWER SUPPLIES

Power supplies for electronics are of two general types: (a) step-down transformers with DC rectifiers and one or more secondary windings,
and (b) switching power supplies which rectify the AC power to DC, then create the target voltages by rapidly switching the power on and off. Switching power supplies include complex regulation and protection circuits
so that power is turned down if the target voltage strays beyond the limits
of narrow acceptable ranges. Switching power supplies are more expensive but
safer; they are used in all computers including Apple II, IBM, and Macintosh.
SWitching power supplies can fail, but when failure occurs the output voltage drops rather than going berserk, as can happen with others.

APPLE II AND IBM POWER SUPPLIES: BASIC FEATURES

Apple II and IBM power supplies share similarities: Both are designed
as switching (internally protected) power supplies; both give the same DC output voltages (+5v, +12v, -12v, -5v). Both are designed originally to be
installed inside the computer.

The Apple II power supply delivers about 45-60 watts. It is fully enclosed, has no fan, and has a difficult-to-replace internal soldered fuse.
The IIe/II+ version uses a 6-pin motherboard plug (Molex red brick miniature
rectangular Matrix housing, Digi-Key part no. A14113-ND). The IIgs version
has a brushed aluminum housing with different mount, and a distinctive motherboard connector plug (Molex .156" 7-pin center-crimp terminal housing
with locking ramp; Molex no. 09-50-3071, Digi-Key part no. WM-2105-ND). The
Apple II power supply is adequate for the average user, but inadequate for "flagship" Apple IIs loaded with RAM, extra cards, or more than two disk drives. Symptoms of power overload "brownouts" include spontaneous crashes
and "freeze-ups" that require rebooting. With adequate power capacity, crashes and freeze-ups should not occur.

IBM-style power supplies are big and impressive. Even the smaller IBM-style power supplies deliver 150 watts, 2.5 times the output of the standard Apple II power supply. Newer models deliver 200-300 watts and may
be smaller in physical size than the older 150 watt models. All have cooling

fans; most have selectable dual input voltages: 110/220v AC.

Nearly all IBM power supplies run cool when used with Apples; the fan is unnecessary. Even after many hours of continuous use with the Apple, IBM power supplies generate little or no noticeable heat. Lack of overheating reduces thermal strain on electronic parts.

Output connectors on IBM power supplies appear at first glance to be a bird's nest of insulated wires and connectors. But there are only three distinct connectors:

P8: (includes blue wire -12v)
P9: (includes white wire -5v)
Molex-4: (three to five 4-pin connectors; these are for internal drives.)

Identical colors always give the same output voltage. For example, multiple red wires all give +5v DC. Identically-colored wires can be soldered together to give higher amperage at the stated voltage.

Shopping for a Used IBM Power Supply: These are widely available at thrift shops, yard sales, or on the internet itself. Prices are cheap, especially for the older larger units, because they are too large to be used with modern small CPUs. Prices are $20.00 or less for working power supplies. If building your own, shop locally for a power supply so that its operation can be verified.

When you find one, first note its odor: It should NOT have the strong pungent smell of cooked electronics. A mild electronic odor is o.k. --- the odor originates with a volatile varnish that is painted on the components. The smell of the varnish (hopefully) signals the user that the item is overheated. Next, plug it in and observe the cooling fan's movement. If the fan begins to spin quickly and maintains its speed, then the +12v line is o.k. But if the fan fails to spin, or if it quits soon after power-up, then the protection circuits have intervened to shut the power supply down. This, by itself, is sufficient reason not to buy the power supply! Shake the unit and listen for rattling sounds. If the rattle is plastic, then damage is unlikely; but if the rattle is a metal object (paper clip, pin, screw, bolt, etc.) then the power supply likely has suffered a short on the motherboard and should be avoided.

Bring a DC voltmeter when shopping for a power supply. With the 115v power on, check the DC output voltages: +12v, +5v, -12v, -5v. (NOTE: On some power supplies, the +12v line will drop to +8v or even to total shutoff when no load is attached to the power supply. This voltage drop reflects the normal operation of protection/ shutdown circuits and is not a defect. When a moderate load is attached (such as a hard drive attached to a Molex-4 connector), then the voltage of the +12v line will return to normal.

POWER SUPPLY CABLE: DESIGN FEATURES

HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH

This power supply cable is designed for durability and top performance when used with the Apple II. Note these features:

(a) Heavy-duty stranded wire (AWG-18): This is the heaviest grade of wire that will fit on the Molex and AMP connectors. Most wires are American-made.

(b) Heavy-duty insulation: Wires are wrapped with color-coded 600v heavy duty insulation. (Standard insulation is rated merely at 300v.) Heavy-duty insulation gives maximum protection against inter-wire shortages within the 6-conductor cable; it also minimizes the risk of damage by wire-chewing puppies or infants who may be nearby on the floor near the computer desk.

(c) Durable interwire connections: Soldered wire-to-wire connections are covered securely to eliminate shorts: First, the soldered connection is painted with an insulating paint; next, two layers of polyolefin shrink-tubing are added to insulate and strengthen the joint. High-current lines (+12v, +5v) are connected to multiple wires coming from the power supply. Unused wires are trimmed, insulated, and tucked in bundles. The entire six-wire cable is secured together with sections of 1/2" shrink-tubing and nylon ties.

(d) A Molex-4 connector left intact: The IBM power supply has two connectors (P8, P9) that transfer power to the motherboard, plus 3-5 Molex-4 female connectors that empower the disk drives. A Molex-4 female connector has been left intact; extras have been removed. The Molex-4 crimp pins deliver these high amperage voltages: (+12, neg, neg, +5v). The Molex-4 is useful for several reasons: (a) It can be used for testing a hard drive, which receives power via the Molex-4; (b) the +12v and +5v lines, the most important outputs, can be monitored with a DC voltmeter from the Molex-4, and (c) other appliances such as indicator lights or a hard drive can be attached to the Molex-4 connector.

(e) The finest crimp-pins ("Trifurcon," from Digi-Key) have been used in power supplies shipped since July 1996. Previously, "Jameco generic" crimp-pins were used. Trifurcon crimp-pins are superior because they surround the male pin on three sides, giving better electrical contact. This enables the transfer of maximum amperage from the power supply to the motherboard.

(f) Note that the 6 ft grounded 120v ac power cord is NOT INCLUDED with the power supply. The standard Apple II power cable works perfectly with IBM-style power supplies.

(g) A female Molex-4 connector is left intact on each power supply, mainly as a site for voltage testing. But this connector can be used as a stabilized source of DC voltage (either +5v dc or +12v dc) for small

appliances such as cassette players, radios, pencil sharpeners, etc. Most items that use 6v dc will work with 5v dc supplied by this power supply. I use a pencil sharpener at a Molex-4 plug, and its use creates no interference whatsoever with the computer. For $3 plus shipping, I can make a plug-in cable with male Molex-4 plug, 6 ft cable, and 2.1mm barrel plug> Specify whether the barrel plug center pin should have positive or negative polarity.

(h) Only six wires are used on the 7-pin Molex-7 plug; an unused space is located between a black ground wire and the orange (+5 vdc) wire. This empty space is plugged with adhesive caulk and a polarizing plug. Blocking the unused third hole on the plug is a safely feature to eliminate the electrical risk of inserting the Molex-7 plug off-center on the motherboard connector.

DETAILED INSTALLATION AND CHECKING PROCEDURE

(a) Carefully unwrap the power supply. Use no knife or blade. SHAKE the power supply gently to judge whether any movable foreign objects are rattling inside the unit.

(b) With all power OFF, and after discharging any static, remove the present internal power supply --- a plastic clip at the keyboard end of the motherboard holds it in. Pry the plastic retaining clip forward, and lift the original IIgs power supply out of the way.

(c) Carefully unplug the present internal power supply from the Molex-7 connector on the motherboard. A pliers may be used, pulling SLOWLY and CAREFULLY in an upward direction. Do not break off any of the six pins on the male motherboard connector. The spring ramp-grabbers on the right edge may need to be deflected with a knife or ruler so that the plug can be released.

(d) Use a DC voltmeter to CHECK THE VOLTAGES of the wires on the Molex-7 plug (+5v, +12v, -12v, and -5v) before connecting the IBM supply to the IIgs. [This is important!] The probes of the DC voltmeter are likely too large to fit the small openings on the Molex-7 plug. To test the voltage, clip two segments of a paper clip and insert them temporarily in the pin-windows of the Molex-7 plug, taking care to avoid short circuits. (Crimp pins in the Molex-7 plug can be damaged by thick voltmeter probes; use paper clip sections to contact the crimp pins. Touch the voltmeter probes to the paper clip segments to measure the voltage. Take care to avoid shorting the power supply.

(e) Place the IBM power supply on the floor under the computer table

-- position it so that there is no danger of objects (paper clips, pens, etc.) falling off the table into a fan opening, nor of liquids being spilled into it. This is important: paper clips could jam the fan or hit the motherboard and fry the power supply.

(f) Route the 6-wire cable up to the back panel of the IIgs, and into the computer. The cable may be routed through the rectangular hole on the back panel behind the original power supply. (I used a thin-nose pliers to break off a section of thin plastic so that the plug can be passed easier through the back panel.)

(g) Carefully line up the Molex-7 plug with the motherboard [The two black wires are positioned towards the keyboard-front of the computer; the plug's slanted "polarizing-ramp" must face towards the slots.]

(h) SLOWLY push the plug straight down onto its mating motherboard power connector. The polarizing-ramp on the plug will make a click sound when the ramp-grabbers secure it.

(i) Remount the lid onto the CPU, then System Saver (if used), and the monitor.

(j) Connect the power plug of the IBM power supply to your System Saver IIgs (or to 115v power strip).

(k) Enjoy 150/200 watts of clean power in your Apple IIgs; say goodbye to crashes and freeze-ups attributable to low power!

INSTALLATION INSTRUCTIONS: IIE/II+ VERSION

HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH

(a) All power in the computer must be OFF. Turn the CPU upside down. Remove the four screws that attach the power supply to the bottom of the CPU.

(b) Turn the CPU to its normal upright position. Lift the power supply out of the CPU.

(c) Remove any interface card from slot #1 to allow room for you to grasp the motherboard connector. Grasp the connector plug by its sides and squeeze. Lift the plug off the motherboard connector.

(d) Place the 150 watt power supply on the floor, below the computer table. String its 5 ft cable through the back panel of the computer.

(e) Position the power plug over the motherboard connector. Note that the two BLACK wires on the connector must be oriented towards the keyboard, and the GREEN and BLUE wires must be oriented towards the back panel of the CPU. Push the plug onto the motherboard connector. (Mating notches on the plug and

motherboard connector prevent the plug from being placed on the connector in anything other than the correct way; its safe and foolproof.)

(f) Return any interface cards removed to their appropriate slots. Put the CPU cover back on, and turn on the power!

WIRE INSULATION WIRE COLOR-CODES: APPLE II AND IBM

Color codes generally are consistent within brands, but variations occur! Power supplies produced for the European market may vary from the colors stated here. The placement of the voltage lines on the connector plugs are standard but colors vary. Voltages/colors must be verified with a DC voltmeter for each power supply. The output voltages are normally LESS THAN these values when measured without a full CPU load attached.

VOLTAGE	APPLE II	IBM
ground	Black	Black
+5v	Orange	Red
+12v	Yellow	Yellow (or Orange)
-12v	Green	Blue (or Brown)
-5v	Blue	White (or Yellow)

COMPATIBILITY WITH RAMFAST AND/OR SECOND SIGHT CARDS

So far (Nov 1997), I have shipped about 30 IIe/II+ power supplies and about 114 IIgs power supplies. 100% compatibility has been reported with all configurations of IIe/II+. But IIgs users are more likely to have their computers loaded with exotic interface cards. There have been reported cases of interface card / power supply incompatibilities by about 10-15% of IIgs users. No hardware has been damaged; the incompatibilities cause crashes but no damage. These incompatibilities relate to RamFast and/or Second Sight video cards. In half the cases, replacement power units have solved the problem.

Why the incompatibilities? Two hypotheses are likely: (a) maybe these cards are sensitive to the slower rise-time to the target voltage which is characteristic of large power supplies, or (b) possibly RamFast and Second Sight do not like a safety feature, the "no-load auto-off" circuit. This circuit is a desirable safety feature, which shuts the unit down if no load is detected on the output circuits. This protection circuit is common to half the IBM-power supplies --- its presence can be identified merely by checking whether the fan spins when power is on but no load is attached.

To minimize the risk of an incompatibility, IIgs users are asked to list their interface cards, and especially to mention whether their IIgs has either a RamFast or Second Sight card. Having this information will help me to ship the most compatible power supply model.

The no-load auto-off circuit is a desirable safety feature in power supplies, so I will ship this version to users who indicate that they have neither of the two fussy cards (RamFast or Second Sight).

MOLEX-4 SOCKETS FOR 5V OR 12V ACCESSORIES

Each power unit has is supplied with one or two "Molex-4" female power sockets. On IBM computers, these Molex-4 sockets run disk drives. They have four pins with these usual color codes: RED (+5v DC), BLACK (neutral), BLACK (neutral), and YELLOW (+12v DC). For Apple II applications, the Molex-4 sockets have three uses: (a) for voltmeter monitoring of the output voltages; (b) to attach a "dummy load" on units that shut-off if no load is connected (the dummy load can be a junked hard drive); (c) to operate +5v or 12v accessories.

The accessories can be connected to a Molex-4 female socket via a Molex-4 male plug. For 5v DC accessories, use two pins (red and black). For 12 DC accessories, use two other pins (yellow and black). I have Molex-4 male plugs (including crimp pins) available as an option for $0.75 each, five for $3.00. With 6 ft twin wire attached, $1.00 each, or five for $4.00. Specify whether the plug should be wired for 5v or 12v accessories.

Accessory plugs are handy and they do not interfere with the computer's operation. Most radios, etc. that use four batteries (6v DC) will work fine on the carefully regulated 5v DC output. I have attached an electric pencil sharpener, transistor radio, cassette player, radio-cassette, DC mini-drill, etc. to these power supplies. Running those appliances can be done concurrently with computer operation. There is plenty of power to spare!

COOLING FAN NOISE

Fan noise is part of IBM folklore; all of us have seen IBM PCs that sounded like reincarnated vacuum cleaners. Ball-bearing fans are quieter than sleeve fans. The IBM fan is powered from the +12v DC line. This fan differs from the AC 110v fan in Apple II System Savers. These options are available:

(a) Position the IBM power supply at a distant corner below the computer desk so that its audible sounds are unnoticed.

(b) Remove or disconnect the fan. Most IBMs run cool with Apple II because the load is only 1/3 the power supply's capacity. The fan could be disconnected or removed but this is NOT recommended.

(c) Beginning in summer 1997, a $5.00 option is offered: COOLING FAN SPEED KNOB. This is a five watt wire-wound heavy-duty potentiometer of 100-500 ohms resistance. The potentiometer is wired in series with the DC 12 volt fan, and is mounted on the casing. With this knob, fan noise can

be reduced by running the fan at a slightly slower speed. The fan should be started at FAST speed, then dialed back to a quiet slower speed. The user should ensure that the fan is spinning during use; do NOT totally shut off the fan. It is insufficient to slow the fan merely by moving the red (live) wire from +12v DC to +5v DC, because the fan will not start to spin with just 5v DC. The fan needs +12v DC to begin to spin. The user must verify that the unit operates coolly if the unit is run with slowed fan speed.

RISKS AND COMPLICATIONS

1. Follow usual precautions: All computer power OFF when connecting or disconnecting accessories; also, discharge static before going into the CPU.
Note though, that when the internal power supply is replaced, you will need
to discharge static by touching a lamp, metal file cabinet first.

2. Metal objects (paperclips, etc.) may spill into the power supply on floor,
especially through the fan openings. Put a barrier (e.g., plastic lid for tennis balls, coffee, etc.) on the power supply if a fan opening is facing upward.

3. If drinks or other liquids are occasionally spilled on the floor near your
computer desk, then it may be prudent to raise the height of the power supply
1"-3" above the floor by placing height spacers below it.

4. Puppies, babies, etc. may damage the cable or external power supply. The
heavy duty 600v insulation gives maximum protection, but keep young kids and
puppies away from the power supply!

5. When transporting your computer, remember that the MOLEX-7 PLUG and its motherboard mating socket are delicate! Either carefully remove the plug, or
secure the cable so that movement won't stress the plug.

6. Fan openings in the case expose the power supply at risk to rain damage when using the computer outdoors.

7. An Internet correspondent stated that high capacity power supplies can create problems because the underloaded power capacity makes the internal protection circuits less responsive.

8. The older RamFast SCSI cards by C.V. Technologies appear to be finicky about the 200 watt power supplies. If you have an older (Rev. B or Rev. C) RamFast card, then the you should get the 150 watt version, not the 200 watt version. Why? I suspect that the 150 watt version delivers output voltages that are more precisely on target because the load is closer to the power supply's capacity.

9. Two users (among 68 users so far) have expressed concern about radio

frequency (RF) interference emanating from the cable. Presently I am trying out a metal braid shielding option (MagnaBraid, available from auto parts supply shops), but it is premature to judge at this time whether this shielding makes any difference. Most users have reported no RF interference.

10. Do not damage the Molex-7 crimp-pins by pushing voltmeter probes into them! The standard voltmeter probes are too wide for insertion into the Molex-7 plug. Two safer options are available: (a) Clip a 1" lengths of jumbo paper clip, then insert that section into the crip-pin opening. Measure voltage by touching the voltmeter probe to the paper clip. (b) Touch the voltmeter probes on the metal strips exposed on the back side of the Molex-7 plug.

11. Some large power supplies have a slower "rise-time" to their target voltages. If the Apple crashes immediately at power-up, then allow 5-10 seconds of warm-up, followed by a PR#n "warm re-boot," where n is the slot number of your hard drive card (Typically this is PR#7 if you boot from the hard drive as most users do.)

12. The Molex-7 IIgs power plug may feel stiff because of the clear silicon caulking that surrounds the wires. The silicon adhesive strengthens the wires and crimp pins. It is flexible, so just bend the wires slowly as they are positioned in the IIgs casing.

13. Does plug insertion endanger the male pins of the motherboard IIgs connector? This is doubtful; All the power supplies are pretested prior to shipment on my two IIgs systems at home. Each motherboard power point has had MANY power supplies connected, and no pins have been broken yet.

TROUBLE-SHOOTING TIPS

HHHHHHHHHHHHHHHHHHHHH

PROBLEM	COMMENTS / WHAT TO DO
UNIT DOES NOT POWER-UP.	1. Check power switch: "|" is on, "0" is off. 2. Try a different AC power cord; internal crimps on the AC power cord's female connector may be spread too wide to make good contact with the power unit's male input prongs. 3. Shake the power supply and listen for rattling sound. Rough handling during shipment may have shaken loose the internal fuse. (Fuse is soldered to holder in half the power units, but is clamped in place in half the units.) 4. Fuse may have blown; must be inspected visually by opening the case with power cord unplugged. 5. Use caution if testing voltages with standard voltmeter probes inserted into IIgs female

		Molex-7 plug, or into IIe female AMP-6 plug. Voltmeter probes are too wide for the crimp pins, and will spread the crimps, causing poor contact on the motherboard connector. Safe way to test voltages is to insert short length of paper clip into the plug, then touch voltmeter probe to paper clip metal. Alternatively, IIgs Molex-7 plug has exposed metal strips on its back side on which voltmeter probes can be safely touched.
UNIT STARTS BUT SHUTS OFF IMMEDIATELY.	1.	Half the units have "no-load auto-off" protection circuit, which shuts off power immediately if no load is connected. If power supply has this feature, the phrase is etched near the power switch. Voltage can be tested by connecting a load (such as a hard drive) to a Molex-4 connector; fan will spin and voltages can be tested.
UNIT POWERS-UP BUT APPLE THEN CRASHES IMMEDIATELY.	1.	This is more often a problem with IIgs ROM 3 than with IIgs ROM 1 or with IIe. Some large power supplies have a slower "rise-time" to their target voltages. Solution is to do a "warm reboot." Allow 5-10 seconds for power unit to warm up; get basic prompt], then do "PR#n" with n being the slot number of your launching disk drive. Typically this is PR#7 or PR#6.
ARE INTERFACE CARDS INCOMPATIBLE WITH POWER SUPPLY UNIT?	1.	Remove all interface cards, and boot-up the computer. If boot succeeds, then add interface cards one at a time, booting up. Fussy interface card will make computer crash. This procedure identifies any problem interface card.
MEASURED VOLTAGES SEEM TOO LOW.	1.	Orange +5v, yellow +12v, green -12v, blue -5v. As a safety feature, the output voltages are normally LESS than these values when measured without full load attached. When connected to computer motherboard load, voltages will reach their expected target values.
HOLES IN BACK OF IIGS CASE ARE TOO SMALL TO THREAD CABLE TO MOTHERBOARD CONNECTOR; MOLEX-7 PLUG IS TOO BIG.	1.	Note that there are two holes at rear of CPU case behind location of internal power supply. Use thin-nose pliers to remove small amount of thin plastic around the larger (rectangular). hole. Then Molex-7 plug and cable will pass through.

CLEAR SILICON CAULK ON IIGS OR IIE CABLE PLUG SEEMS TOO STIFF TO MAKE RIGHT-ANGLE BEND TO CONNECT TO MOTHERBOARD.	1.	Clear silicon caulk was added to reduce strain on individual wires. IT IS FLEXIBLE. Slowly bend the power cable after threading it into the CPU case; it will fit successfully on the motherboard male connector.
CABLE MOLEX-7 PLUG WON'T MATE WITH MALE MOTHERBOARD CONNECTOR.	1.	Shine bright light into CPU. Be sure that Molex-7 plug is correctly centered on mother-
	.	The polarizing-key in plug's third hole prevents Molex-7 plug from being inserted off-center. Polarizing-ramp on IIgs plug must face the slots. With IIe version, the AMP-6 plug's two black wires must be positioned closest to the keyboard (front) side of the CPU.
COOLING FAN IS NOISY.	1.	This is a normal feature of IBM-style power units. Some sound like vacuum cleaners' cousins! Take advantage of the 5 ft cable to position the unit under your computer table, away from ears.
	2.	If sound suggests that an object has fallen into the unit through a fan opening, SHUT OFF the unit immediately and shake unit so object will fall out. Disconnect AC power, open unit, remove item.
	3.	Most units generate no heat when used with Apples, so the fan speed can be slowed with the $5.00 optional fan speed knob. (The IBM-style fan is designed for +12v DC and its speed is controllable with a 5 watt wire-wound potentiometer in the 100-500 ohm range. Do NOT attach a potentiometer to the System Saver 115v AC fan!)
WORRIED ABOUT SPILLED LIQUIDS OR FALLEN METAL OBJECTS (PAPER CLIPS, ETC.) ENTERING THE UNIT.	1.	Let unit rest on floor, but on raised platform (box, brick, etc.) to protect against spilled liquids on floor.
	2.	When fan-hole faces upward, place a plastic cover (coffee can lid, etc.) over fan-hole to guard against metal objects falling into unit.
	3.	If drink spills into unit, then turn off and disconnect AC power immediately. Allow 3-5 days to dry completely. Test voltages before reconnecting power unit to computer.
USER'S MANUAL: IN SOME PASSAGES, PAPER VERSION	1.	Paper and disk versions of the manual are 90% identical, but recent UPDATES are presented on

DIFFERS FROM DISK VERSION. this version supplied on disk. Read the disk version!

BIBLIOGRAPHY ON POWER SUPPLIES

Apple Computer Inc. (1987). Apple IIgs Hardware Reference. Reading MA: Addison Wesley Publishing, 192-193.

Buggie, S. E. Power-boosting the IIgs: A how-to guide for ending low-power hassles. JUICED.GS, vol. 1, no. 4, 14-15.

MONEY-BACK GUARANTEE

Each adapter cable or power supply will be thoroughly tested on my own computer (IIgs or IIe) prior to shipping. Voltages are checked repeatedly during assembly, and each cable/ power supply is tested for stability with a 4-7 day minimum duration test run on my computers. None will be shipped if there is any doubt about its safety.

If you are dissatisfied for any reason with this IIgs adaptor cable or power supply, return it to me within 90 days and I will send a refund or replacement, at your option. Buyer pays shipping both ways.

Compatibility with finicky interface cards cannot be guaranteed, but I will happily ship an exchange replacement power unit if the original is returned first. Buyer must pay all shipping.

LIMITED LIABILITY

The buyer must carefully recheck the voltages delivered at the Molex-7 power plug prior to connecting it to the computer, and should monitor its operations thereafter. Seller's liability is limited to refund of purchase price or replacement of the power supply/cable combination or cable. Responsibility is NOT ACCEPTED for any consequential damages, including but not limited to fire, explosion, or damage to motherboard, interface cards, or peripherals.

AUTHOR'S NOTES AND ACKNOWLEDGMENTS

1. This is an early version (v. 1.4) of these docs. Comments and corrections from users and other interested readers are welcome.

2. This manual was written for Apple IIgs users. Similar IBM-to-Apple power supplies and cables are available for use with the Apple IIe and II+; the only difference is that the AMP 2x3 motherboard connector is attached instead of the Molex-7 used on the IIgs. Prices are the same for IIe or IIgs.

3. Readers may buy spare motherboard connector plugs and crimp-pin sets will be sent for $2.00 per set, including postage. A spare 7th crimp-pin will be included with the set. Specify whether the motherboard plug and pins are for the IIgs or for the IIe. Send $2.00 check to Stephen Buggie, UNM-G, 200 College Rd., Gallup, NM 87301.

4. I am indebted to many who contributed advice on this project. Advisors were: Bill Bredenhoft, David Ciotti, John Daniels, Doug Durkee, Tim Gaines, Steve Jensen, Jeff Kloosterman, Hank Levinson, Jim Pittman, Mitch Spector, Samir Wahid, and David Wilson.

v.1.5
June 15, 1997

========== ==========

BUGGIE'S PRICE LIST: NOVEMBER 1997
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH

Shipping is extra on all items, but I ship cheapest available way; typically UPS-groundtrack within lower-48 states. To Canada, Hawaii, Alaska, or other countries, shipping is via post office surface mail.

Shipping must be estimated and paid in advance. For UPS within the lower 48 states, $5. is estimated for shipping a single power supply. If actual shipping is more than $2 off (either estimated too low or too high), then a follow-up check with the actual difference should be exchanged after the shipment has been completed.

Returns: Satisfaction is guaranteed and buyer can return the unit for refund or exchange if dissatisfied. Refund will be for the amount paid, less shipping costs. The buyer must pay shipping in both directions. In the event of an exchange due to incompatibility, the buyer should enclose payment for the shipment of the second unit. This will be expected in the event that the unit works well on my computer. But if the unit is actually defective, then I will pay shipping on the second unit. (So far, all returns have been due to incompatibilities, no defects).

150 WATT POWER SUPPLY: $27.00 Specify whether for IIgs plug or IIe plug.

200 WATT POWER SUPPLY: $30.00 Specify whether for IIgs plug or IIe plug.

300 WATT POWER SUPPLY $40.00 Includes Y-cable to run two Apples at the same time. Specify whether for IIgs, IIe, or both. Includes fan-speed adjuster knob.
"Godzilla"

FAN SPEED ADJUSTER KNOB: Add $5.00 (allows cooling fan noise to be reduced by dialing a slower speed) Extra cost only if for 150w or 200w types.

Y-ADAPTOR CABLE: with both styles of plug (IIgs and IIe). Add $4.00
Extra cost only if ordered for 150w or 200w types.

EXTRA CABLE LENGTH beyond 5 ft: Add $1.00 per ft length.

ACCESSORY CABLE: Supplies either 12v dc or 6 v dc to male Molex-4 plug, with 6 ft cable leading to 2.1 mm barrel plug. Specify voltage (5 v dc or 12 v dc), and also whether the barrel plug center should have positive or negative polarity. $2.00 (6 ft cable on Molex-4 without barrel plug: $1.00 each)

ACCESSORY PLUG AND FOUR CRIMP-PINS (Molex-4 male plug). Unsoldered, no wire included. You construct your own accessory cable using your own wires.
$0.75 for one set; $3.00 for five sets; $5.00 for ten sets.

"FOOT COOLER" EXTERNAL 3 1/2" FAN. Using a fan salvaged from a scrapped power supply, this fan has a two ft cord, a male Molex-4 plug, and chromed screens on both front and back sides. Power consumption: 2-4 watts. Does not interfere in any way with computer operation. It connects to a female Molex-4 accessory socket on your power supply.
$5.00

==========
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SUPER-BUGG DISK II DRIVE: (featured on covers of Summer 1996 and Fall 1996 issues of II ALIVE magazine; shown at KansasFest '96) Apple Disk II 5.25" drive with two special front panel features:
(a) 3-position write-protect switch (normal/enable/protect), and
(b) speed-control knob; allows convenient adjustment of rotational disk speed.

DISK II with standard IDE-20 flat ribbon cable: $20.00
Interface card, 20-pin cable: $10.00

DISK II with db-19 round cable (for IIc or IIgs) $25.00
Interface card, db-19 cable: $12.00

CLONE OF DISK II: Subtract $4.00 from above prices; same guarantee.

Apple IIC UPGRADE ROM CHIP, with installation instructions sheet. You swap this ROM chip (342-0033) into your original model Apple IIC, and make two minor changes on the motherboard. This upgrade will give you two advantages: (a) the "checkerboard" internal self-test, and also (b) the IIc will become able to use the 3.5" 800K Unidisk drive (white casing, model # A2M2053). $4.00 for one, or $7.50 for two, including U.S. domestic postage. Just one upgrade ROM chip is needed for each IIc.

Shipping costs are EXTRA but these costs are minimized.

Mail payment to:

Stephen Buggie **buggie@unm.edu**
Psychology
Univ. of New Mexico/ Gallup
200 College Road
Gallup NM 87301

rev. 11/1/97

-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o

Stephen Buggie **buggie@unm.edu**
200 College Rd. **November 1, 1997**
Gallup, NM 87301 **voice: (505) 863-2390 home**
863-7504 office
fax: (505) 863-7532, 863-7644

END OF FILE BUGG-POWER- User's Manual

```
##########################################################################
### FILE: buggie.pwr
##########################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.erols.net!newsfeed.internetmci.com!ncar!newshost.lanl.gov!ferrar
i.mst6.lanl.gov!tesuque.cs.sandia.gov!lynx.unm.edu!indus.unm.edu!buggie
From: buggie@indus.unm.edu (stephen e buggie)
Newsgroups: comp.sys.apple2.marketplace
Subject: 150 WATT IBM-to-IIGS (or IIE) POWER SUPPLIES
Date: 16 Sep 1996 22:44:40 GMT
Organization: University of New Mexico, Albuquerque
Lines: 35
Message-ID: <51kl8o$jng@lynx.unm.edu>
NNTP-Posting-Host: indus.unm.edu
X-Newsreader: TIN [version 1.2 PL2]

Since April, I have made/shipped 51 units.  Prices are unchanged:

150 watt IBM power supply for IIgs:   $27 plus shipping

150 watt for IIe:  $27 plus shipping

200 watt for IIgs (NOT for RamFast or Second Sight:  $30 plus shipping

200 watt for IIe (NOT for Ramfast or Second Sight)  $30 plus shipping


Cable-only version:  $14 plus $3 shipping (plugs onto your own IBM-style
      power supply)   Specify whether for IIgs or IIe.

WHEN ORDERING, please list the interface cards residing in your slots.
      RamFast, Second Sight, and high-speed accelerators (10 MHz and above)
      are most fussy about power, so for those, I will ship a power supply
      that is most compatible with those cards.

SHIPPING (within lower-48 U.S. states):  $5.00 to a UPS-deliverable address;
      but $8.00 if to a post office box (Post office shipping costs more!)


My article, POWER BOOSTING THE IIGS, will appear in the fall issue of Max
Jones' newsletter, JUICED.IIGS.   The article gives all the details
needed for do-it-yourself modification of IBM power supplies for use
with the IIgs or IIe.

Mail payment to:

Steve Buggie
Psychology
Univ of New Mexico at Gallup
200 College Rd
Gallup NM 87301


### END OF FILE buggie.pwr
```

```
##############################################################################
### FILE: bulbs
##############################################################################

Newsgroups: comp.sys.apple2.marketplace
Path: blue.weeg.uiowa.edu!news.uiowa.edu!uunet!news.sprintlink.net!crash!pro-
algonquin!craigl
From: craigl@pro-algonquin.mn.org (Craig Larson)
Subject: Apple IIe Keyboard light
Organization: The Algonquin Round Table
Date: Wed, 10 Aug 94 08:37:13 CDT
Message-ID: <1994Aug10.083713.2170@pro-algonquin.mn.org>
Lines: 9

It anyone is looking for replacement bulbs for the keyboard light on Apple
II and Apple III computers, the industry standard number for it is #7362.
They are available through Industrial Lighting in Minneapolis, Minnesota
(612) 333-4406 at $1.35 per bulb sold in packages of 10 only.  If you call
there to order some, ask for Todd.  He is familiar with this bulb.
----
craigl@pro-algonquin.mn.org --- Sysop of Electronics Shop BBS  (612) 789-2149
Chip Master @ Electronics Shop ---  Supporting Apple II line of computers



### END OF FILE bulbs
```

```
##########################################################################
### FILE: ccs7710
##########################################################################

Subject: Re: Serial card identificatio
Date: Thu,  3 Apr 97 08:04:14 CST
Message-ID: <00034CEE.fc@haaug.org>
X-FirstClass: 0x59F8 0x00000000 0x00000000 0x000F4C26 0x0000
Newsgroups: comp.sys.apple2
Path:
news1.icaen!news.uiowa.edu!uunet!in1.uu.net!207.172.3.52!feed1.news.erols.com!cpk-
news-hub1.bbnplanet.com!news.bbnplanet.com!news.sesqui.net!news.hal-
pc.org!haaug.org!CJ_Settles
From: CJ_Settles@haaug.org (CJ Settles)
To: pliethen@globaldialog.com (Peter Liethen)
Organization: Houston Area Apple Users Group
X-HoloGate: 1.1.7
Lines: 31



 >I have two serial cards and I'm trying to get some info on them,
 >so I can use them.

 >The other one is a little harder. It has 4 DIP switches in the
 >top-righthand cornner, next to the large crystal (2.4576 mHz) All
 >I know is that is is a model 7710 Asyncronous Serial interface,
 >reversion B. I'd like to know what the DIP switches should be set
 >at so that I can be used.

The "other one" is California Computer Systems (CCS) Model 7710
Asyncronous Serial Interface.  The DIP switches are for setting the baud
rate.  Here's a table for the usual baud rates.  A 1 is for On (up); the 0
is for Off (down).
     Baud  Switch
     Rate   1234
     ----   ----
     19200  0111
      9600  1110
      2400  0001 or
      2400  1100
      1200  0010

I don't know about the Apple card you describe.  Good luck.

CJ
CJ_Settles@haaug.org



### END OF FILE ccs7710
```

```
##############################################################################
### FILE: ccs7710a
##############################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!news.starnet.net!waikato!comp.vuw.ac.nz!asgard.ac
trix.gen.nz!atlantis.actrix.gen.nz!not-for-mail
From: dempson@atlantis.actrix.gen.nz (David Empson)
Newsgroups: comp.sys.apple2.comm
Subject: Re: CCS 7710 info??
Date: 17 Apr 1996 01:13:00 +1200
Organization: Actrix - Internet Services
Lines: 30
Message-ID: <4l06cs$i7f@atlantis.atlantis.actrix.gen.nz>
References: <creimanDpvv5B.HJz@netcom.com>
NNTP-Posting-Host: atlantis.actrix.gen.nz
Keywords: apple2 help serial

In article <creimanDpvv5B.HJz@netcom.com>,
Charlie Reiman <creiman@netcom.com> wrote:
> I have a CCS 7710 serial card that I purchased to hook up my brand
> spankin' used Apple IIe to my 'real' computers.

You bought a CCS 7710 (it should have an "A" on the end)?  How
recently?  It is a rather old serial card (1980 according to the
manual I have here, so it predates the Apple Super Serial Card).  It
is not supported by much software that I know about, because it is not
compatible with the Apple SSC (which is the most common type of serial
card).

> I'm only able to get serial output from my Apple2. I cannot send
> anything into the machine.

The CCS 7710A uses a Motorola 6850 ACIA chip.  This chip requires that
certain flow control signals be active in order to allow it to
transmit and/or receive.  The DCD input must be active to receive
anything.  The CCS 7710A's serial connector is wired as a DCE, so it
redirects the RTS input (pin 4) to the DCD pin of the chip.

You must therefore have RTS connected to an active flow control signal
to be able to receive anything.

(It also uses DTR, pin 20, rerouted to the CTS pin of the 6850, to
allow the card to transmit.)
--
David Empson
dempson@actrix.gen.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand


### END OF FILE ccs7710a
```

```
##############################################################################
### FILE: clocks
##############################################################################

Path: news.uiowa.edu!chi-news.cic.net!uwm.edu!lll-
winken.llnl.gov!enews.sgi.com!news.mathworks.com!newsfeed.internetmci.com!news.uor
egon.edu!cie-2.uoregon.edu!nparker
From: nparker@cie-2.uoregon.edu (Neil Parker)
Newsgroups: comp.sys.apple2
Subject: Re: Clock, BASIC, and IIgs
Date: 12 Jun 1996 07:52:02 GMT
Organization: University of Oregon Campus Information Exchange
Lines: 86
Message-ID: <4plsv2$rml@pith.uoregon.edu>
References: <4plje3$2td@news.nevada.edu>
NNTP-Posting-Host: cie-2.uoregon.edu

In article <4plje3$2td@news.nevada.edu> snit@nevada.edu (Snit) writes:
>Does anybody know how to access the clock from BASIC on a IIgs?  Is
>there a way of doing something similaron a IIe (obviosly not wth the
>real time, unless you have a clock added).  Specificly, I am trying to
>record the times of a photosensor attached to PDL (0) into a text file
>that can be imported into a spreadsheet or stats program.  Thanks...

There are no BASIC commands for accessing the clock--the only good way to
do it is to call a machine-language routine.

The most portable way to access the clock is through ProDOS.  Your BASIC
program calls this machine-language routine:

     JSR $BF00
     DF

### END OF FILE clocks
```

```
#####################################################################
### FILE: CMS.scsi
#####################################################################

Path: blue.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!agate!ucbvax!IDEANET.DOE.STATE.IN.US!jcountry
From: jcountry@IDEANET.DOE.STATE.IN.US (Jack Countryman IAC)
Newsgroups: comp.sys.apple2
Subject: Re: CMS card and write protect
Message-ID: <Pine.3.85.9407120131.A25312-0100000@ideanet.doe.state.in.us>
Date: 12 Jul 94 05:46:31 GMT
References: <2vkoda$e0r@scipio.cyberstore.ca>
Sender: daemon@ucbvax.BERKELEY.EDU
Distribution: world
Organization: The Internet
Lines: 77


On 8 Jul 1994, John Blaby wrote:

> This info is needed for a friend.
>
> She has a CMS hard drive controller and wants to configure it to run a
> 20 meg drive for a //e. She has no documentation whatsoever. Can
> anyone help out with jumper settings and any other pertinant
> information?
>
> Thanks in advance..
>                  John

According to the CMS manual, page D3, the six sets of eight pairs of jumpers
(u1....u6) are for the following purpose:

    ____________________________________________________________________
   /                                                                    |
  /     u 1          u 2            u 3            u 4          j2       |
 /                                                                      |
/                                                                       |
|                                                                       |
|                                                                       |
|                                                                       |
|                                                                       |
|                                                                       |
|    u 5     u 6                                                        |
|_______________________________________________                    j1  |
                                              |                         |
                                              |_________________________|


u 1:  Boot Scan delay....manual shows no jumpers here in default
configuration

u 2:  first (left) jumper is 'Enable I.C.P. (Yes/No)', middle 6 not used,
last (right) is 'multiple initiators (Yes/No)'...manual shows no jumpers
in default configuration

u 3:  Selection phase time out delay....I believe this sets how long the
card waits for the drive to come up to speed(?)...manual shows the
default as having 4, 5, and 7 with jumpers installed
```

u 4: Arbitration phase time out delay....manual shows default as no jumpers installed

u 5: Bus Free phase time out delay...manual shows default as jumper on number 1

u 6: Interrupt recovery delay....manual shows jumpers on 3, 4, and 5

j1 and j2 are single sets of pins....the manual says J2 is not used, but J1 is to be jumpered.

.....

The card I have here, came out of a IIGS where it was hooked to first a twenty meg CMS drive, and later a forty meg CMS drive. It has the following jumpers set:

u1: jumper on 7
u2: no jumpers
u3: jumpers on 4, 5, and 7
u4: no jumpers
u5: jumper on 1
u6: jumpers on 3, 4, and 5
j2: no jumper
j1: jumper

As I recall, this setup yeilded a rather long pause for the hard disk to come up to speed (about 40 to 45 seconds) that we found necessary at the time to avoid boot problems.

Good luck....

END OF FILE CMS.scsi

```
##########################################################################
### FILE: colorburst.iie
##########################################################################

Path: news1.icaen!news.uiowa.edu!chi-
news.cic.net!cs.utexas.edu!howland.erols.net!cam-news-hub1.bbnplanet.com!su-news-
hub1.bbnplanet.com!news.bbnplanet.com!news.pbi.net!news1.rcsntx.swbell.net!usenet
From: rubywand@swbell.net
Newsgroups: comp.sys.apple2
Subject: Re: Return fixing & Color killing?
Date: Tue, 18 Mar 1997 06:03:20 +0000
Organization: Southwestern Bell Internet Services
Lines: 53
Message-ID: <332E3028.37DA@swbell.net>
References: <3318df94.17282735@167.152.149.11> <331BBC35.4E3D@swbell.net>
<332e08c2.3032080@167.152.149.11>
NNTP-Posting-Host: ppp-207-193-8-12.hstntx.swbell.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Mailer: Mozilla 2.02E (Win16; I)

Edhel Iaur, Esq. wrote:
>
> On Tue, 04 Mar 1997 06:07:49 +0000, rubywand@swbell.net wrote:
>
> >Edhel Iaur, Esq. wrote:
>
> >> Does anybody remember the book _Enhancing Your Apple II_?  Well, I
> >> just bought a pack of resistors, and opened up my //e to do the "Color
> >> Killer Mod".  However, as the title implies, the book is apparently
> >> written for Apple // users, not Apple //e users.  The chips, etc. are
> >> in a totally different position.  Does anybody know how to do the
> >> "Color Killer Mod" on a //e?
>
> > .... I don't know about the color-killer mod you
> >mention. What is it supposed to do?
>
> FINALLY!  I Just got this article!  It's supposed to turn everything
> monochromatic (like that button on the good Apple color monitors), via
> sovtware, via one of the announciators.

     Thanks for the info. It looks like you should be able to do this kind
of full-screen color-killer on a IIe by using a general purpose NPN
transistor (2N3904, 2N2222, etc.) to shunt the Color Burst signal. The
transistor's collector would connect to the junction of R15 and R13; the
emitter lead would go to Ground. The transistor should be connected directly
to the R15-R13 junction and ground.

     The base lead would go through a 2k-3k Ohm resistor to an annunciator
output, such as An-3 at pin 12 on the 16-pin J-15 Game connector. PEEKing
the appropriate addresses should flip Color OFF and ON.

     The reason for qualifiers such as "looks like", etc. is that I have not
actually tried a mod like this on a IIe. Monitors are remarkably sensitive
to Color Burst. If the transistor does not do a good job of shunting the
signal, enough may get through to trigger Color-ON.
```

A more positve (but less easy) technique is to use a 74LS32 OR gate to control flow of the 3.58MHz signal. The IC could be tack-soldered onto U88 via its +5 and GND pins. U88 is the 74S02 which has the gate which produces Color Burst.

Pin 12 of the 'S02 would be bent up and connected to the output of an 'LS32 OR gate (e.g. pin 3). One of the OR gate's inputs (pin 2) would go to Pin 12 of the 'S02 socket. The other (pin 1) would go to an annunciator output.

Turning ON the annunciator forces the OR gate output to "1" and eliminates Color Burst. Turning OFF the annunciator lets the OR gate output follow the 3.58MHz signal and enables Color Burst.

Rubywand

END OF FILE colorburst.iie

```
##############################################################################
### FILE: cvtech.gsram
##############################################################################

Newsgroups: comp.sys.apple2
Path:
blue.weeg.uiowa.edu!news.uiowa.edu!uunet!tadpole.com!news.dell.com!swrinde!elroy.j
pl.nasa.gov!decwrl!netcomsv!netcom.com!butch
From: butch@netcom.com (Gabe Sanchez)
Subject: Re: Help with CV Tech GS-RAM's jumpers
Message-ID: <butchCvGIMv.J0I@netcom.com>
Organization: NETCOM On-line Communication Services (408 261-4700 guest)
X-Newsreader: TIN [version 1.2 PL1]
References: <33vrkn$4vv@nyx10.cs.du.edu>
Date: Thu, 1 Sep 1994 15:20:55 GMT
Lines: 41

Fan Li TAI (ftai@nyx10.cs.du.edu) wrote:

: Hiyas,
:      I need to know the jumper settings for the CV Tech GS-RAM card.  I'd
: lost my manual (sigh).  The settings I need are for 2 meg on the CV Tech
: card, and a 4 meg piggy-backed Sequential card.
:      Thank you very much in advance.

Ok here is what my manual says interms of the jumbers:

      A  B   C       A  B  C
    _______        _____
2 | o  o | o    2 |o  o| o
  |------|          -------
1 | o  o | o    1  o |o  o|
   ------             ----

1Mb on GS boar     2Mb on GS board

   A  B   C       A  B  C
      _____          ____
2   o |o   o|   2  o |o  o|
    --------          |----|
1  |o  o|  o    1  o |o  o|
    ----              ----

3 Mb on Gs board   4Mb on GSboard


"Note: these settings do not any meonry that may be piggy baced on the board"

So thats it, so as long as you are using the one with 2 Mb on the Gs memory
board, it does not matter how many ohter megs you have piggy backed (acording to
the manual)

hope this heps you!

--
  ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
  :: Mr.Butch Sysop of The Micro Exchange     :: o RamFast Speed          ::
  :: 714-992-4520  2400 - 28.8k Dual Standard :: o 15 Mhz 64 Cache Zip GS ::
  ::                                          :: o Internet               ::
```

::

END OF FILE cvtech.gsram

```
##########################################################################
### FILE: dbxx.aux
##########################################################################

Newsgroups: comp.sys.apple2
Path: news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!europa.eng.gtefsd.com!uunet!comp.vuw.ac.nz!actrix
.gen.nz!dempson
From: dempson@swell.actrix.gen.nz (David Empson)
Subject: Auxiliary types (was Re: Space Fox and System 6?)
Organization: Actrix Information Exchange
Date: Wed, 2 Feb 1994 14:05:20 GMT
Message-ID: <CKLoGx.9rJ@actrix.gen.nz>
References: <2ie9os$jli@panix.com> <CKF7Gt.4ov@well.sf.ca.us>
<CKIBFM.3vu@tsoft.net>
Sender: dempson@actrix.gen.nz (David Empson)
Lines: 43

In article <CKIBFM.3vu@tsoft.net> prisoner@tsoft.net (The Prisoner) writes:
> Uh... I think the Auxtype should be $DB02... way back when System 6 was just
> released, I contacted Dave Lyons and described the Problem and after
> I switched all the $B3 and $B5 files to a $DB02 Auxtype and they
> worked fine... something about Smoothlaunch...

For GS/OS applications and shell EXE files (types $B3 and $B5), the
last digit of the auxiliary type is defined on a bit-by-bit basis.

The high byte must be $DB, or the low byte is invalid.

Bit 0 means the application is GS/OS aware, in that it uses prefix
numbers 8 and higher, rather than the ProDOS-16 prefixes (0 through
7), and can cope with long pathnames.

Bit 1 means it is a desktop application, and is able to cope with the
super hi-res screen being active when the program starts up (or the
text screen, for that matter).

Bit 2 means it is "message aware" - it uses the pathname message
supplied by Finder when you launch an application by double-clicking a
document (or selecting the document then using the Open or Print
command).

Thus, the valid auxiliary types are:

      Message aware     Desktop app GS/OS aware
$DB00   No        No          No
$DB01   No        No          Yes
$DB02   No        Yes         No
$DB03   No        Yes         Yes
$DB04   Yes       No          No
$DB05   Yes       No          Yes
$DB06   Yes       Yes         No
$DB07   Yes       Yes         Yes


This is documented in the File Type Notes for file types $B3 and $B5.
Refer there for more information.
--
David Empson
```

dempson@swell.actrix.gen.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand

END OF FILE dbxx.aux

```
##############################################################################
### FILE: dconnectors
##############################################################################

Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!news.altair.com!news.kodak.com!
news-nysernet-16.sprintlink.net!news-east1.sprintlink.net!news-
peer1.sprintlink.net!news.sprintlink.net!howland.erols.net!sunqbc.risq.qc.ca!news.
uow.edu.au!david
From: david@uow.edu.au (David Wilson)
Newsgroups: comp.sys.apple2
Subject: Re: Unindentifiable motherboard port (II Plus clone)
Date: 2 Dec 98 01:13:15 GMT
Organization: University of Wollongong, Australia
Lines: 39
Message-ID: <david.912561195@wraith>
References: <20NOV199814103540@vax2.concordia.ca>
<365622F8.976CD19D@cyberhighway.net> <26NOV199803363783@vax2.concordia.ca>
<Pine.GSO.3.94.981127143622.3400A-100000@Ocean.CAM.ORG>
<741rec$927@login.freenet.columbus.oh.us>
NNTP-Posting-Host: wraith.cs.uow.edu.au
X-Trace: wyrm.its.uow.edu.au 912562191 20641 130.130.64.1 (2 Dec 1998 01:29:51
GMT)
X-Complaints-To: usenet@wyrm.its.uow.edu.au
NNTP-Posting-Date: 2 Dec 1998 01:29:51 GMT
X-Newsreader: NN version 6.5.0 #15 (NOV)
Xref: news1.icaen comp.sys.apple2:142464

dalloff@freenet.columbus.oh.us (Dave Althoff) writes:
>Michael Black (blackm00@CAM.ORG) wrote:
>: I have a II clone board that I found in the garbage at one point.  It was
>: missing parts, so it's scrap.  But it had two DB-9 connectors on it.  One
>: of them I took off for something else, but the remaining one is male and
>: I assume the missing one was male too.  They are both labelld (in silk
>: screening on the board) "Game I/O".  The IC's that would be in the
>: joystick circuitry are right near it.

My Multitech MPF-III (//e clone) uses DE-9M plugs for both the keyboard and
the joystick ports.

If they are both labeled Game I/O I would hazard a guess that they both have
the same signals but that AN0/1 are swapped with AN2/3 on the second port.
Probably something similar with the push buttons. The advantage of this
would be that you could plug two standard (apart from the sex of the plug)
joysticks in at the same time for two player games.

Pet Peeve time: it is not a DB-9 but a DE-9. The D is the shape of the plug,
the letter tells you the size and the number the pin count. Here are the
standard ones:

DE-9  (AT serial port, Apple //e joystick)
DA-15 (IBM PC joystick)
DB-25 (standard serial port)
DC-37 (IBM-PC external floppy)
DD-50 (some really old SCSI devices from Sun etc)

And these are the high density ones:

DE-15 (VGA monitor)
```

DA-26
DB-44
DC-62

Other than the DB-25, the DD-50 is about the only one people get right.
All the rest get lumped together as DB-xx.
--
David Wilson School of IT & CS, Uni of Wollongong, Australia david@uow.edu.au

END OF FILE dconnectors

```
##########################################################################
### FILE: digitize
##########################################################################

Path: ns-mx!hobbes.physics.uiowa.edu!news.iastate.edu!vaxe.iastate.edu!TWBV4
From: twbv4@isuvax.iastate.edu (Ian Schmidt)
Newsgroups: comp.sys.apple2
Subject: Re: Sound Digitization
Message-ID: <1991Dec17.153321.2611@news.iastate.edu>
Date: 17 Dec 91 15:33:21 GMT
References:
<1991Dec16.162532.14913@crash.cts.com>,<1991Dec17.101532.8062@nntp.uoregon.edu>
Sender: news@news.iastate.edu (USENET News System)
Reply-To: twbv4@isuvax.iastate.edu
Organization: Iowa State University, Ames, Iowa
Lines: 71

Okay, here goes, the official AudioZap Digitizing Method. :-)
Set BufPtr to a pointer to the buffer for digitizing and EndPtr to
the ADDRESS (not byte count) of the end of the buffer.
As always, its in ORCA/M ASM65816 1.2 format.

; DP Equates

BufPtr      equ 0
EndPtr      equ 4

; other equates

IRQ_Volume  equ $e100ca
SCtl        equ $c03c
SData       equ $c03d
SAdrL       equ $c03e
SAdrH       equ $c03f
Kbd         equ $c000
Strobe            equ $c010

DigitizeIt  START
            sep #$20
            longa off
                lda #0
            pha
            plb

            lda >IRQ_Volume
            and #$0f
            ora #$20
            sta SCtl
                lda #$e2
            sta SAdrL
LoopIt            lda Delay    ; digitizing rate; see why Hertz in AZ ain't
            dec a        ; gonna happen?
            bne LoopIt
                sta SData     ; write to trigger the Ensoniq
            lda SData   ; garbage, works as delay
            lda SData       ; get sample
            bne NonZ    ; zero samples are invalid on IIgs
            lda #1
NonZ        sta [BufPtr],y
```

```
            inc BufPtr
            bne CkEnd
            inc BufPtr+1
            bne CkEnd
            inc BufPtr+2
CkEnd       lda Kbd
            bmi EndIt
            lda BufPtr
            cmp EndPtr
            bne LoopIt
            lda BufPtr+1
            cmp EndPtr+1
            bne LoopIt
            lda BufPtr+2
            cmp EndPtr+2
            bne LoopIt
EndIt       sta Strobe
            phk
            plb
            rep #$20
            longa on
            rts
            END
```

Ian Schmidt twbv4@isuvax.iastate.edu irsman@iastate.edu
-> USUAL SIG IS ON VACATION TO PROTEST ISU CENSORSHIP OF USENET <-

---

Path: ns-mx!uunet!think.com!rpi!usenet.coe.montana.edu!milton!nntp.uoregon.edu!cie.uoregon.edu!nparker
From: nparker@cie.uoregon.edu (Neil Parker)
Newsgroups: comp.sys.apple2
Subject: Re: Sound Digitization
Message-ID: <1991Dec18.022207.7036@nntp.uoregon.edu>
Date: 18 Dec 91 02:22:07 GMT
References: <1991Dec16.162532.14913@crash.cts.com> <1991Dec17.101532.8062@nntp.uoregon.edu>
Sender: news@nntp.uoregon.edu
Organization: The Universal Society for the Prevention of Reality
Lines: 22

In article <1991Dec17.101532.8062@nntp.uoregon.edu> nparker@cie.uoregon.edu (Neil Parker) writes:
>[...code containing nasty typo...]

Sorry about that, folks. I posted some code that started like this:

```
>irqVolume  equ 6
>soundCtl   equ $E0C03C
>soundData  equ $E0C03D
>soundAdrL  equ $E0C03E
>soundAdrH  equ $E0C03F
>
>           pha
>           pha
>        pea irqVolume
>        _GetVector      ;Get ptr to system volume
```

That should be _GetAddr, not _GetVector. It makes a BIG difference...

```
          - Neil Parker
--
Neil Parker                 No cute ASCII art...no cute quote...no cute
nparker@cie.uoregon.edu     disclaimer...no deposit, no return...
parker@corona.uoregon.edu   (This space intentionally left blank:          )


### END OF FILE digitize
```

```
##############################################################################
### FILE: digitizer
##############################################################################

Path: ns-mx!hobbes.physics.uiowa.edu!zaphod.mps.ohio-
state.edu!mips!spool.mu.edu!agate!dog.ee.lbl.gov!nosc!crash!pnet01!pro-
hindugods.cts.com!steve
From: steve@pro-hindugods.cts.com (Steve Fenwick)
Newsgroups: comp.sys.apple2
Subject: Re: GS digitizing sounds
Message-ID: <1992May01.040028.20174@crash.cts.com>
Date: 1 May 92 04:00:28 GMT
Sender: news@crash.cts.com
Organization: Crash TimeSharing, El Cajon, CA
Lines: 28

In <1992Apr30.024719.6357@visual.spk.wa.us>
tkolstee@visual.spk.wa.us (Tony Kolstee) writes:

>I also have a question on the mod that I did.  When I hook the wires up to
>the SPEAKER port on my amplifier and put up the Oscilliscope (sp?) screen,
>the sound wave centers around the bottom.  If I blast the volume and then
>bring it back down, the wave centers in the middle, and it works okay.
>Why is this?  And how come if I connect my speakers to the amp at the same
>time the wave stays at the bottom no matter what I do?  Could this be an
>impedence problem?

I _had_ that EXACT same problem.  It is a grounding problem.  The Line and
Mic outputs of most equipment has a lower reference voltage for the audio
waveform signal.  To fix this, you need to run it through any op-amp I.C.,
and have a potentiometer going to ground from the inverting input to adjust
the waveform level.  Make sure you have a relatively large value capacitor on
the output, because I noticed that with small values, the waveform starts to
'drift' down, I don't know why, though.  I used an LM324, but any op-amp
should work.

Hope this helped!

Steve


ProLine:  steve@pro-hindugods                   |  I know
Internet: steve@pro-hindugods.cts.com           |  that you
UUCP:     pro-hindugods!steve%ttardis@nosc.mil |  know.....


### END OF FILE digitizer
```

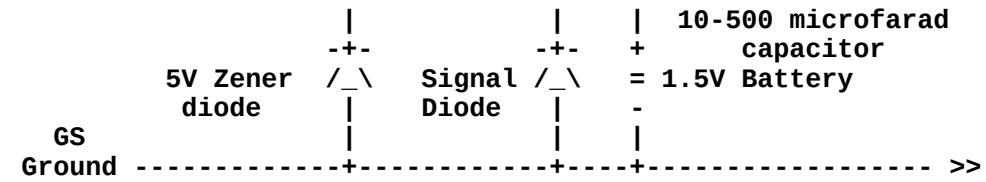
```
##########################################################################
### FILE: digitizer.circuit
##########################################################################

Path: ns-mx!hobbes.physics.uiowa.edu!zaphod.mps.ohio-
state.edu!caen!nic.umass.edu!risky.ecs.umass.edu!umaecs!wistey
From: wistey@ecs.umass.edu
Newsgroups: comp.sys.apple2
Subject: Re: Sampling Directly and chip burnout
Message-ID: <17705.2a046a02@ecs.umass.edu>
Date: 3 May 92 22:32:33 GMT
References: <1992May01.201921.4002@ecst.csuchico.edu>
Distribution: usa
Lines: 57

In article <1992May01.201921.4002@ecst.csuchico.edu>, jcrane@ecst.csuchico.edu
(John Crane) writes:
> Hello Apple II Users !!!!!!!!!
Hello !!!!!!! :-)
>
> Here is my question ..... Has anyone out there who has been successful at
> doing sampling without additional hardware tell me how you did it so that
> i dont damage my machine

"Sampling directly" is a good way to blow your Ensoniq chip.  (I know: $25
labor, $25+ chip.)  Yes, it's possible, and it works for a while, but the
chip wasn't designed for that.

If you don't mind putting together a few parts, you can build your own
adapter, though (explanation follows):

   GS
 Analog
   In ---------------+------------+----+----------||------ >>
                     |            |    |  10-500 microfarad
                   -+-          -+-   +      capacitor        To CD player,
          5V Zener  /_\   Signal /_\   = 1.5V Battery          microphone,
           diode     |    Diode   |    -                          etc.
   GS                |            |    |
 Ground -------------+------------+----+------------------ >>


I don't remember the pin connections for Analog In and Ground on the 7-pin
sound connector in the GS.  Others have probably posted them.  If not, write
back and I'll look inside mine.

The Ensoniq is designed to handle 0 to +2.5 Volts.  Most tape and CD players
produce an output from, say, -1 to +1 volts.  (Or -5 to +5 if you turn it up.)
So the battery boosts this up to within the right range for the IIgs.  The
5V Zener gives protection against brief voltage spikes, like sudden loud
noises from the microphone.  The signal diode gives protection from the other
end, when the microphone is trying to drive negative voltages (from
excessively loud noises).  To test this, use AudioZap, HyperStudio, or some
other sound utility which lets you watch the level of the digitized input.
The level should stay steady somewhere in the middle.  Turn the volume all
the way down on your CD/tape player, press Play, and turn it up until you can
clearly see the sound moving above and below the middle.

There are ways to improve this, like adding a capacitor in parallel with
```

the battery (if the battery is interfering with the sound for some odd reason) or replacing the given capacitor with a bigger one. If you're using a microphone, you don't need the capacitor, but then you would need to put the microphone in series with the battery: Ground-battery-microphone-Analog In, with the diodes still between Ground and Analog In. Other comments or questions, please write to ask...

>
> Thanks ----------->John Crane CSUC

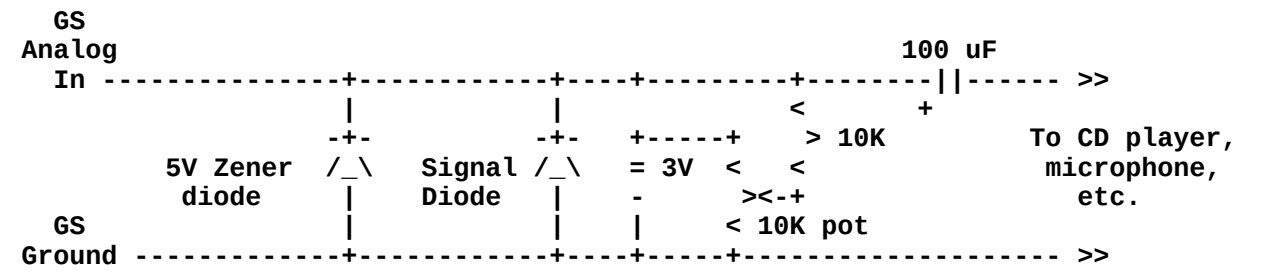
- - - -

```
##############################################################################
### FILE: digitizer.circuit2
##############################################################################

Path: news1.icaen!news.uiowa.edu!chi-news.cic.net!EU.net!news.bbnplanet.com!cpk-
news-
hub1.bbnplanet.com!feed1.news.erols.com!news.ecn.uoknor.edu!munnari.OZ.AU!metro!me
tro!cassius.ee.usyd.EDU.AU!adrianw
From: adrianw@cassius.ee.usyd.EDU.AU (Adrian Whichello)
Newsgroups: comp.sys.apple2
Subject: Sound input to the 2gs [long]
Date: 13 Jan 1997 22:53:35 GMT
Organization: Department of Electrical Engineering, Sydney University
Lines: 105
Distribution: inet
Message-ID: <5beedf$o9r@metro.ucc.su.OZ.AU>
NNTP-Posting-Host: cassius.ee.usyd.edu.au


Hi everyone,

I've been mucking around with getting sounds into the 2gs lately, and thought
I'd share the results, so far. Ages ago David Empsom wrote about using the
internal ADC (to comp.sys.apple2):

> It is the 7-pin molex connector in the lower right corner of the
> motherboard, next to the Ensoniq.  All stereo cards plug into this
> connector.
>
> Most of the pins are used for sound output and associated demultiplexing.
> Pin 1 is the sound input and pin 2 is analog ground.  (Pin 1 is the one
> closest to the back of the computer, right next to the legend "J25" on the
> ROM 1 motherboard.)

NB^^^^^^^^^^^^^^^^^^ THIS IS BACKWARDS!!! Pin 1 is closest the FRONT of the
2gs, ie close to the green power on light.

>
> The sound input expects a signal which has a maximum range of 2.5V peak to
> peak.  The input impedance is 3000 ohms.
>
> I'm not all that clear on audio impedances and voltages, so I'm not sure
> if it is safe to connect anything directly to this pin.  It may be
> necessary to use a simple amplifier circuit to handle impedance matching.
>
> Can anyone elaborate on this?

I found the following circuit on ground (in

ftp://ground.isca.uiowa.edu/apple2/MiscInfo/Hardware/digitizer.circuit

[quote]

If you don't mind putting together a few parts, you can build your own
adapter, though (explanation follows):

   GS
 Analog
   In ---------------+------------+----+----------||------ >>
```



[end quote]

but I changed it to this (a better ascii rendition of the circuit is available!):



The Ensoniq is designed to handle 0 to 2.5V input, but audio sources usually swing more or less equally +/- about zero. Therefore we need a level shifter, to put the appropriate DC bias onto the input. The 3V battery and the 10K pot are for this. To stop the low internal impedence of the battery effectively shorting the sound source (which happens with the first circuit), I've included another 10K resistor. The easy way to set this up is to use a program like AudioZap and with the CD etc. end input shorted, set the centreline of the oscilloscope display to be halfway up the screen, so the input signal will swing equally either side of this reference voltage. The zener diode is to clip the top of spikes to limit them to about 5V and the signal diode is to clip any negative going signal to -0.6V. This is protect the Ensoniq chip from overload. The capacitor keeps the DC out of the source. Pin one on the GS connector is closest to the *front* of the computer (ie with the expansion slots at the back.

The Ensoniq has a fairly low input impedence (about 3-5K), but most portable cassette or CD players should be able to handle this, since most headphones have a much lower impedence than this (usually around 50 to 100 ohms, even as low as eight for old ones). You can use a tape deck as an amplifier and "impedence buffer" for a microphone.

If you can get the file

http://cassius.ee.su.oz.au/~adrianw/gsaudioin.bsq

there's proof there that it all works (a raw sound file I made).

Adrian.

ps does anyone else hate the tabs that open the 2gs case as much as I do? I always hurt my fingers trying to push them in enough to get the lid off.

--
Dr Adrian Whichello
Imaging Science and Engineering Laboratory
Phone: +61 2 9351 4824
Fax: +61 2 9351 3847

Sydney University Electrical Engineering Email: adrianw@ee.usyd.edu.au
Australia WWW: http://www.ee.usyd.edu.au/~adrianw

"I wish to God these calculations had been executed by steam!" - C. Babbage

END OF FILE digitizer.circuit2

```
##############################################################################
### FILE: diskii.bicolorled
##############################################################################

Path:
news1.icaen!news.uiowa.edu!uunet!in4.uu.net!news1.interlink.net!sunqbc.risq.qc.ca!
howland.erols.net!news-peer.sprintlink.net!news-backup-
east.sprintlink.net!news.sprintlink.
net!151.164.30.38!newsgate.swbell.net!151.164.30.35.MISMATCH!cyclone.swbell.net!sw
bell!
not-for-mail
From: Rubywand <rubywand@swbell.net>
Newsgroups: comp.sys.apple2
Subject: Re: Bi-color red/green LEDs: Disk II read/write?-- correction & update
Date: Wed, 13 May 1998 17:53:55 -0500
Organization: Southwestern Bell Internet Services, Richardson, TX
Lines: 135
Message-ID: <355A2483.51691F77@swbell.net>
References: <6eeq9s$mhc$1@lynx.unm.edu> <351318BF.6731F16F@swbell.net>
Reply-To: rubywand@swbell.net
NNTP-Posting-Host: ppp-207-193-9-18.hstntx.swbell.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Trace: (null) 895099388 11695 (None) 207.193.9.18
X-Complaints-To: usenet@nnrp3
X-Mailer: Mozilla 4.04 [en] (Win95; I)
Xref: news1.icaen comp.sys.apple2:133705

There was a recent opportunity to do the two-color LED mod to some
Disk II drives-- i.e. A bi-color LED is swapped in for the old red "in
Use" LED. It shows Green for Reads and Red for Writes.

     Additional testing during the recent work led to an improved
circuit and the discovery of an error in my description of the earlier
circuit.

     First the correction. My earlier post says ...
.....

>          pin 11 goes to + end of mini 10uF capacitor
>          pin 12 goes to - end of the mini 10uF capacitor; and
>          pin 12 goes to a 22000 Ohm resistor
.....

There is no connection to pin 12 of the 74121. The above should have
read ...

>          pin 10 goes to + end of mini 10uF capacitor
>          pin 11 goes to - end of the mini 10uF capacitor; and
>          pin 11 goes to a 22000 Ohm resistor


     The original circuit works fairly well (if you figure out that the
directions contain an error); but, breadboard tests indicate that the
74121 can not adequately source many LEDs which might be employed.

     The new circuit uses transistors to drive the LED sections. By
getting LED power from the +12V line switched by power transistor Q1 in
```

response to /Drive Enable, the transistor used for this purpose in the old circuit is eliminated. So, the new circuit needs only two transistors-- just one more than before-- and drives the Green/Red LED at higher brightness.

As in the original design, the new circuit shows Green for Drive Enabled + no Write and Red for Drive Enabled + Write. That is, a Read is assumed if the drive is ON and no Write is occurring. The advantage of this approach is that you always have a lighted LED 'drive ON' indicator and, so, there is no need to drill a new hole in your drive panel. The new LED can use the hole occupied by the old "in Use" indicator LED.

Parts

IC- 74121 or 74LS121 1-Shot multi-vibrator
Qgreen- 2N2222A gen purpose NPN transistor
Qred- 2N2222A gen purpose NPN transistor
Rcath- 120 Ohm 5% 1/4 watt resistor
Rgreen- 3.3k 5% 1/8 watt resistor
Rred- 3.3k 5% 1/8 watt resistor
Rp- 20k 5% 1/8 watt resistor
Cp- 10uF/10v 10% "dipped tantalum" capacitor
LED- 2.2V 20ma 3-lead (common cathode) Green/Red bi-color LED

Building the Circuit

IC- locate pin-1 and mark it on bottom side with white-out.
'Dead-bug' mount the IC using epoxy in the open area near top-middle of board with pin-1 end pointing to the right.

connect Rcath to solder pad at - (minus) end of C2
connect #20 wire from IC pin-7 to solder pat at - end of C2

connect Rp from IC pin-11 to IC pin-14
connect Cp + to IC pin-10 and Cp - to IC pin-11

connect #20 wire from IC pin-14 to solder pat at + end of C4

connect a wire from IC pin-3 to end of R16 closest to 74LS125

connect Rgreen to IC pin-1 (74121 "/Q" output)
connect Rred to IC pin-6 (74121 "Q" output)

solder transistor Qred Collector to Q1 power transistor Collector (solder pad area at left front of circuit board just to left of the power transistor). Position toward left edge of pad.

solder transistor Qgreen Collector to Q1 power transistor Collector solder pad to the right of Qred.

LED- connect a 3-wire 11" cable to the LED (black to center, red to to lead with right-angle bend, green to lead with slant bend).

Old "in Use" LED- pop off the retainer ring and push through the LED. Leave the LED mount in the hole. Cut off the LED, spread cable ends and tab over with cellophane tape. (Put old LED and

ring into parts box.

Spread apart retainer 'leaves' of LED mount (at back side of panel)
to permit easier insertion of new 3-lead LED.

Run LED + cable over back of board and along bottom toward the
hole in the front panel. Push through hole. (If hole is too small,
use a Dremel tool and steel 'bulb bit' to slightly enlarge front
part of hole.)

connect LED cable black to free end of Rcath
connect LED cable green to Emitter of Qgreen (right transistor)
connect LED cable red to Emitter of Qred.

position old LED cable beneath new LED cable.

connect a wire from the free end or Rgreen (on IC pin-1) to the
Base lead of transistor Qgreen.

connect a wire from the free end or Rred (on IC pin-6) to the
Base lead of transistor Qred.

Add epoxy to the back of the LED to secure LED in place
..

How it Works

When /Enable goes low to select the Drive, the power transistor (Q1) switches ON and supplies +12V at its Collector. If there is no Write, 74121 output /Q is high, Qgreen conducts, and the LED shows Green. That is: the Green LED will light during boots and for any READs.

If the Drive is selected (/Enabled is low) and there is a Write operation and Write Protect is not ON, then, the /Write Request signal at 74LS125 pin 8 will go low. This triggers the 74121 One-Shot (at pin 3) producing an aprox. 160ms pulse at 74121 output Q. For the duration of the pulse, /Q is low and Q is high. Qred conducts, and the LED shows RED to indicate WRITE.

Rubywand

END OF FILE diskii.bicolorled

```
##############################################################################
### FILE: diskii.leds
##############################################################################

Path: news1.icaen!news.uiowa.edu!news1.chicago.iagnet.net!qual.net!iagnet.net!
newsfeed.internetmci.com!206.229.87.25!news-peer.sprintlink.net!news-backup-west.
sprintlink.net!news-in-
west.sprintlink.net!news.sprintlink.net!Sprint!151.164.30.38!
newsgate.swbell.net!swbell!not-for-mail
From: Rubywand <rubywand@swbell.net>
Newsgroups: comp.sys.apple2
Subject: Re: Bi-color red/green LEDs: Disk II read/write?-- update
Date: Fri, 20 Mar 1998 19:32:47 -0600
Organization: Southwestern Bell Internet Services, Richardson, TX
Lines: 112
Message-ID: <351318BF.6731F16F@swbell.net>
References: <6eeq9s$mhc$1@lynx.unm.edu>
Reply-To: rubywand@swbell.net
NNTP-Posting-Host: ppp-207-193-13-77.hstntx.swbell.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Trace: (null) 890443787 27099 (None) 207.193.13.77
X-Complaints-To: usenet@nnrp3
X-Mailer: Mozilla 4.04 [en] (Win95; I)
Xref: news1.icaen comp.sys.apple2:131475

stephen e buggie writes ...
>
> A store is clearing out bi-color LEDs red/green.   These LEDs have three
> wires:  black (negative), red (red +), green (green +).
>
> I want to add the bi-color LED to my Disk II drives, so that it will glow
> GREEN for READ, and RED for WRITE.   I already have an AE 3.5" 800K drive
> that does this, and it looks nice.   This will be a third enhancement to
> Disk II --- "Super Bugg-Drive."
> ....


     Since the last post, there was a chance to do some experimentation.
The circuit below seems to work well ...


NPN transistor Collector to Bi-color LED center
NPN Emitter to GND
NPN Base to two 3300 Ohm resistors
    One resistor goes to GND
    The other resistor goes ULN2003 pin 15 (connect to R2 at point
      closest to ULN2003)

LED Red (lead has right-angle at LED) to 150 Ohm resistor
    Resistor goes to pin 6 (Q output) of a 74121 One-Shot IC

LED Green (lead has slant-angle at LED) to 150 Ohm resistor
    Resistor goes to pin 1 (/Q output) of 74121 IC

74121 IC pin 7 goes to GND
         pin 14 goes to +5V
         pin 3 goes to 74LS125 pin 8 (connect to R16 at point
```

```
          farthest from ULN2003)
        (pin 1 goes to resistor to LED Green)
        (pin 6 goes to resistor to LED Red)
         pin 11 goes to + end of mini 10uF capacitor
         pin 12 goes to - end of the mini 10uF capacitor; and
         pin 12 goes to a 22000 Ohm resistor
           Resistor goes to +5V (can connect to 74121 pin 14)
```

The NPN transistor can be any general purpose NPN type (e.g. a 2N2222, etc.). It's input (Base) is driven by the /Enable after it has been inverted by a gate of the ULN2003. When /Enable goes low to select the Drive, the signal at the Base goes high. This connects the LED common lead to GND through the transistor.

If the Drive is selected (Enabled) and there is no Write operation, the Green LED will get a + voltage through its 150 Ohm resistor from the 74121 /Q output. So; the Green LED will light when the Drive is enabled (e.g. during boots and for any READs).

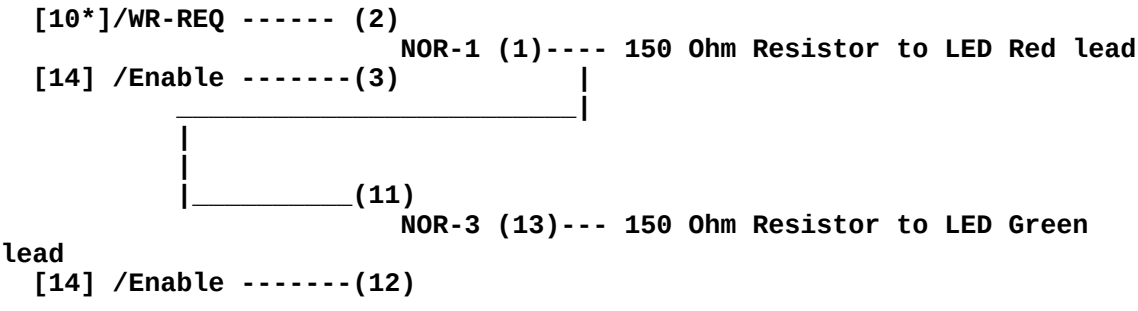
If the Drive is selected (Enabled) and there is a Write operation and Write Protect is not ON, then, the /Write Request signal at 74LS125 pin 8 will go low. This triggers the 74121 One-Shot (at pin 3) producing an aprox. 120ms pulse at output Q. For the duration of the pulse, +V goes to the Red LED through its 150 Ohm resistor. The Red LED lights. (Meanwhile, /Q has gone low so that the Green LED turns OFF.)

Probably, the first circuit posted earlier will work, too; but, I'm still not sure that Write Request is always long enough to be easily visible. This is why the One-Shot IC circuit is used. (You can make the pulse longer by using larger values for the capacitor or increasing the value of the 22000 Ohm resistor.)

Anyway, the circuit works well for showing Reads and Writes with a standard bi-color LED. It's the one I installed on our Disk][drive.

If you decide to try the NOR gates circuit posted earlier, the mod below is a simpler version which should do the same thing
....

In the circuit below, "[ ]" numbers are Disk][Analog board connector points and "( )" numbers refer to pins on a 7402 Quad dual-input NOR gate IC.



*Note: To have the Write LED remain OFF when Write Protect is ON, connect instead to 74LS125 pin 8 (connect to R16 at point farthest from ULN2003)

LED middle lead goes to GND

In both the One-Shot and the NOR gates circuit the IC is driving LEDs. This is why 74xxx instead of 74LSxxx or CMOS IC's are specified. Should you use a higher-current bi-color LED, it may be necessary to add the driver transistors included in the original circuit.

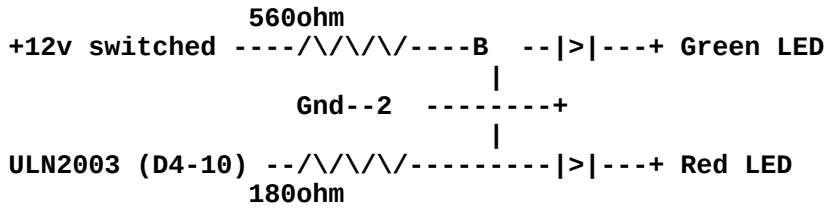
By the way, it turns out that the WR Data signal is frequently active (with pulses) even when a Write is not in progress. This pretty well makes it useless as a way to monitor Writes.

Rubywand

END OF FILE diskii.leds

```
##########################################################################
### FILE: diskkii.led
##########################################################################

Path: news1.icaen!news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!jussieu.fr!uvsq.fr!nntp-out.monmouth.com!newspeer.monmouth.com!news-
peer-
east.sprintlink.net!news.sprintlink.net!Sprint!sunqbc.risq.qc.ca!news.uow.edu.au!d
avid
From: david@uow.edu.au (David Wilson)
Newsgroups: comp.sys.apple2
Subject: Re: Bi-color red/green LEDs: Disk II read/write????
Date: 17 Mar 98 23:17:47 GMT
Organization: University of Wollongong, NSW, Australia.
Lines: 82
Message-ID: <david.890176667@wraith>
References: <6eeq9s$mhc$1@lynx.unm.edu>
NNTP-Posting-Host: wraith.cs.uow.edu.au
X-Newsreader: NN version 6.5.0 #15 (NOV)
Xref: news1.icaen comp.sys.apple2:131358

buggie@capella.unm.edu (stephen e buggie) writes:


>A store is clearing out bi-color LEDs red/green.   These LEDs have three
>wires:  black (negative), red (red +), green (green +).


>I want to add the bi-color LED to my Disk II drives, so that it will glow
>GREEN for READ, and RED for WRITE.   I already have an AE 3.5" 800K drive
>that does this, and it looks nice.   This will be a third enhancement to
>Disk II --- "Super Bugg-Drive."

>First, what value of resistor should be added?  The ad says these are 2
>volt LEDs, and that 20 milliamps should flow through the LED.

>Will the 20 milliamps affect the read/write performance of the drive in
>any way?

>Not sure where in the analog board to connect the LEDs.  Could I attach
>the black lead to a ground point, then touch various analog card points
>while the disk is reading vs. writing?

>Will other components be needed besides the bi-color LED and its padding
>resistors?

>Would it be simpler to just reconnect the red LED to a point on the analog
>board, and then to install a second separate LED to denote WRITE?

>Stephen Bugge                buggie@unm.edu

I have been looking through my copy of Apple's DOS manual with the circuit
diagram of the Disk ][ analog card and Jim Sather's Inside the Apple II and
think it can be done.

The existing LED circuit is:

                      560ohm   Red LED
      +12v switched ----/\/\/\/----B --|>|-- 2---Gnd  current =
```

As a Red/Green LED can do 3 colours (Green, Orange and Red) but we cannot do only Green or Red (as one LED will be run from the existing Enable while the 2nd will illuminate when writing is also occurring), I would recommend the following:



This way you get Green for reading and Orange for writing. This immediately tells you that the drive has been modified and the contrast between green and orange is higher than between red and orange.

I do not know if the write signal is actually long enough to see (formatting a disk should be no problem but normal writes may not keep the red LED on long enough to see). If this is the case, additional circuitry would be needed to stretch the write pulse to the LED.

Note, this has not been tried, I make no guarantee that this will work. Try it on scratch disks first.

To calculate LED currents, use the following formula:

```
Iled = (Vsupply - Vled) / R
```

so for the original circuit:

```
I = (12 - 2) / 560
  = 10/560
  = 17.86mA
```

The output of pin 10 of the ULN2003 is clamped to a maximum of 5 volts by a diode so:

```
I = (5 - 2) / 180
  = 3/180
  = 16.67mA
```

--
David Wilson School of IT & CS, Uni of Wollongong, Australia david@uow.edu.au

END OF FILE diskkii.led

```
##########################################################################
### FILE: dsk535.pinouts
##########################################################################

Path: news1.icaen!news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!cs.utexas.edu!news.maxwell.syr.edu!sunqbc.risq.qc.ca!news.uow.edu.au!dav
id
From: david@uow.edu.au (David Wilson)
Newsgroups: comp.sys.apple2
Subject: Re: db-19 drive cable compatibility: A2 vs Mac
Date: 6 May 98 02:51:43 GMT
Organization: University of Wollongong, NSW, Australia.
Lines: 53
Message-ID: <david.894423103@wraith>
References: <6ing4p$ulq$1@lynx.unm.edu>
NNTP-Posting-Host: wraith.cs.uow.edu.au
X-Newsreader: NN version 6.5.0 #15 (NOV)
Xref: news1.icaen comp.sys.apple2:133439

buggie@musca.unm.edu (stephen e buggie) writes:

>      COMPATIBILITY EXPERIMENTS OF APPLE II VS. EARLY MAC
>                    DB-19 DISK DRIVE CABLES

>     I am unable to get the Mac db-19 cables to run with Disk II.  Last
>weekend, I tediously measured PINOUTS on the A2 db-19 cable vs. the older
>Mac db-19 cables.  Here are the disturbing results:

>     First, the A2 db-19 cable uses 18 lines, while the Mac db-19 cable
>uses only 17 lines.  For A2, pins 5 and 9 are used, and pin 16 is vacant.
>The Mac db-19 cable is vacant on pin #5.

>     Is there any hope of modifying the Mac db-19 cable to make it work
>with A2?  How vital is pin #9 wire line in the A2 drive cable?  I have
>toyed with the idea that I could run a jumper in the A2 male plug from
>pin 5 to pin 16, then on the IDE-20 change the crimp pin to position 5.
>But this would do nothing about pin #9 ...


Here are the pinouts from Nathan's web page:

Much of this information comes from page 90 of Open-Apple Volume 1, number 11
(1985).

The following table lists all of the drive control signals for each type of
controller card/disk port.

signal       function              Unidisk   IIc       IIgs      Disk ][

GND      ground reference          1-4       1-4       1-3       1,3,5,7
-12V     -12 volts DC              5         5         5         9
+5V      +5 volts DC               6,16      6         6         11,12
+12V     +12 volts DC              7,8       7,8       7,8       13,15,17,19
WRPROT   write protect             10        10        10        20
PH 0-3   stepper motor phases      11-14     11-14     11-14     2,4,6,8
WREQ     write request             15        15        15        10
DRVEN    drive enable              17 (9)    17        17 (9)    14
RDDATA   read data                 18        18        18        16
WRDATA   write data                19        19        19        18
```

EXTINT	external interrupt	-	9	-	-
3.5DISK	Apple 3.5 drive enable	-	-	4	-
HDSEL	3.5" drive head select	-	-	16	-
	not connected	-	16	-	-

As you can plainly see, pin 5 supplies the -12V used by the Disk][drive.
No pin 5 => no -12V => no function. Have a look at the circuit diagram of
the Disk][(in the DOS manual) to see what the -12V is used for.

Pin 9 is the second drive select and is not needed unless you intend to
daisy chain drives.
--
David Wilson School of IT & CS, Uni of Wollongong, Australia david@uow.edu.au

END OF FILE dsk535.pinouts

```
##########################################################################
### FILE: dvorak.mod
##########################################################################

Path: blue.weeg.uiowa.edu!news.uiowa.edu!uunet!news.mathworks.com!hookup!swrinde!
howland.reston.ans.net!vixen.cso.uiuc.edu!uwm.edu!msunews!harbinger.cc.monash.edu.
au!news.cs.su.oz.au!metro!seagoon.newcastle.edu.au!wabbit.cc.uow.edu.au!wabbit.cc.
uow.edu.au!not-for-mail
From: david@wraith.cs.uow.edu.au (David E A Wilson)
Newsgroups: comp.sys.apple2
Subject: Re: Dvorak keyboard an IIe? Possible?
Date: 13 Feb 1995 10:00:14 +1100
Organization: University of Wollongong, NSW, Australia.
Lines: 25
Message-ID: <3hm3tu$mp6@wraith.cs.uow.edu.au>
References: <3hdh82$nud@cello.gina.calstate.edu>
NNTP-Posting-Host: wraith.cs.uow.edu.au

lacoss@cello.gina.calstate.edu (Greg R. Achenbach) writes:
>I've been using IIc's, IIc+'s, and IIgs's for a while and have switched
>over to the Dvorak keyboard layout.  I recently started working with a
>IIe and am getting really frustrated by the Qwerty hunt-and-peck.  Is
>there any way to switch the IIe keyboard to Dvorak?--

There are a number of ways to set the NTSC //e keyboard to Dvorak.

1)    If you have a Rev A motherboard cut X1 and join X2. This will allow
      AN2 to control the keyboard layout (default will be Dvorak).

2)    If you have a Rev B motherboard and want AN2 to control the keyboard
      layout cut X2 and solder a short wire between the back half of X2 and
      the back half of X3 (do not join X3).

3)    Obtain a 24 pin IC socket. Solder 3 fine wires to pins 12, 19 and 24.
      Solder the other ends to a SPDT switch (pin 19 to the centre/common
      terminal). Remove the keyboard ROM, insert the switch+socket and then
      insert the keyboard ROM. Cut X1 (if Rev A) or X2 (if Rev B) to isolate
      pin 19. Mount the switch somewhere convenient.

All the above was taken from "Understanding the Apple IIe" by Jim Sather.
I recommend it to you.
--
David Wilson      Dept CompSci Uni Wollongong Australia     david@cs.uow.edu.au


### END OF FILE dvorak.mod
```

```
########################################################################
### FILE: echoii.docs
########################################################################
```

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ECHO][SPEECH SYNTHESIZER

INTRODUCTION

Until recently, speech generation by a micro-computer required a fair amount of memory storage and hardware. With the advent of "Linear Predictive Coding" (a mathematical method of simulating the human vocal tract) the amount of memory needed to store speech was greatly reduced. Instead of storing the actual speech signal, only those LPC parameters needed to describe each particular speech sound are stored. This allows programs to have a large resident vocabulary without having to access a disk or tape every time an alternate response is needed. As an illustration, the sample vocabulary supplied with the ECHO][contains all of the letters of the alphabet, numbers, and over 100 other words in less than 2K of memory.

The heart of the ECHO][is Texas Instrument's TMS 5200 speech processor. This integrated circuit is an upgraded version of the one used in the Speak & Spell (TM of Texas Instruments) that has been modified for use with an eight bit processor. The ECHO][has been designed so that all of the features of the TMS 5200 may be used with the APPLE, however only RAM based speech is used with the initial operating system. Empty sockets have been provided for standard vocabulary ROMs when they become available.

The initial operating system is a RAM based phoneme system that was designed to provide flexibility and a further increase in memory efficiency over straight encoded words. By using the SPEECH EDITOR the user may create any word or phrase that he desires to have spoken from a program. This code is in a compact form and contains information on the sound, pitch, and duration of each phoneme. A second program called SPEECH GENERATOR is a binary program which interprets this code and passes the correct parameters to the ECHO][to speak the word. Only the SPEECH GENERATOR (1K bytes) and the actual vocabulary (10 to 20 bytes/word) are needed for a program to speak. The address of the word to be spoken is ìpokedî to the SPEECH GENERATOR and a call is made to initiate the speech.

The sections which follow discuss in detail how to install the card and the different components of the software system and how they are implemented. Following that is a step by step example of how to use the speech editor to create words and then a short program of how to access them from APPLESOPT basic. It is suggested that you read over the next sections first and then work through the example to become familiar with the system. You may also want to list the sample programs (RECITE and TALKING TYPEWRITER) or examine portions of the sample vocabulary with the SPEECH EDITOR as further examples.

1
ECHO][SPEECH SYNTHESIZER

INSTALLATION

Before installing the ECHO][be sure all power is disconnected from the computer. The ECHO][card may be plugged into any of slots 2 thru 5 of the APPLE][. The speaker cord should be attached to the terminals on the back of the speaker and then plugged into the jack on the back of the ECHO][card. Replace the cover and the installation is complete. There is a short subroutine located within the SPEECH GENERATOR which will determine which slot the ECHO][is located in. This should be "called" at the start of a program before any speech is attempted and will be discussed in the next section.

The SPEECH EDITOR disk is a 13 sector disk copied using DOS 3.2.1 and will not run on a DOS 3.3 system without first using the BOOT13 utility, It is suggested that a backup disk be made as soon as possible to protect its contents. If you have DOS 3.3 you may "muffin" it at this time.

SPEECH GENERATOR

The SPEECH GENERATOR is a 1K binary module that contains the actual phoneme codes, routines for processing these codes along with their variables (pitch, length, and volume), and the routine for locating the ECHO][slot. If you "catalog" the supplied disk, you will see four different versions of the SPEECH GENERATOR. Each version resident in a different portion of memory to accommodate the HIRES pages and different size systems. The locations of these routines and their associated entry points are listed in TABLE 1 at the end of the manual.

The Speak routine takes the compressed speech data beginning at the starting address (specified by the "calling" program), processes it, and then outputs it to the ECHO][for speaking. It will keep processing successive bytes of information until is comes actor's an "end" command (HEX "AC") which is tacked onto the end of each word by the SPEECH EDITOR. At that point speech is terminated and control is returned to the main program.

The SETSLT routine actually "looks" for the ECHO][card and then modifies the Speak routine accordingly. This routine should be called at the start of any speech program since different programs may be using different locations for the SPEECH GENERATOR. If your card is installed in slot 5 you don't really need to use the SETSLT routine, however if you change the location

of the ECHO][card the program will not function properly.

The SETSLT routine is also useful for determining

whether there is an ECHO][card installed in the system. That way a program where speech is an enhancement but not a necessity may still be run without the speech. To do this a "PEEK" needs to be made to the location called "SLOT" (see Table 1). If the SETSLT routine cannot find an ECHO][card it will set this location to 16 (10 Hex). An example is listed below:

```
10   LOBYTE = 16384: HYBYTE = 16385: SPEAK = 16386: NXTSPK =
16398: SLOT = 16413: SETSLT = 17313

20   ECHO = 1: CALL SETSLT: X = PEEK (SLOT): IF X = 16 THEN ECHO =
0
```

In the above listing a flag labeled "ECHO" was set to one if a speech card was present or zero if there wasn't. This may be used later in the program to bypass speech routines which could cause the program to "hang" if no card was being used.

SPEAKING FRON WITHIN AN APPLESOFT PROGRAM

In order for the SPEECH GENERATOR to say a word, it has to know the starting address of the word. Since BASIC deals with decimal numbers and the SPEECH GENERATOR deals with binary numbers, the address will have to be split into two portions and then poked to the SPEECH GENERATOR with two separate pokes. For convenience the addresses for these pokes have been labeled "HIBYTE" and "LOBYTE" and are listed in TABLE 1. A short routine to accomplish this is shown below:

```
100   AH = INT (ADD / 256) : AL = ADD . AH * 256

110   POKE HIBYTE, AH : POKE LOBYTE, AL
```

Once that has been accomplished a call to the SPEAK routine will cause the word to be spoken. From a binary program the same thing may be accomplished with two STA instructions followed by a JSR.

WORD STRUCTURE

Words may be broken up into separate and distinct sounds or phonemes. The ECHO][SPEECH EDITOR uses a set of forty-one possible phonemes along with two different types of pauses and a stop command (automatically appended at the end of words]. In general, voiced sounds (see Table 2) have variable pitch, duration, and volume. Unvoiced sounds (see Table 3) have these variables preset.

There are sixteen different pitch levels available for voiced sounds. these range from one (highest) to sixteen (lowest). Varying the pitch allows the computer to ask questions or make

exclamations. If the pitch is all one level, the speech will have a monotonic or robotic sound.

The length of each voiced sound may be specified as being from one to eight 25 millisecond "frames" long. Unvoiced sounds are preset to be anywhere from two to five frames long depending on the sound. The "PA1" is the exception. This stops speech activity 25 to 200 milliseconds specified in 25 millisecond increments. The primary use of the "PA1" is between words within a phrase or before stop plosives ("8","K","T",etc.). THE "PA" pause gives a delay of 25 milliseconds however there is still some sound occurring during this period although it is faint.

There are eight available volume levels ranging from one(softest) to eight loudest. The usual range is from five to eight for vowel sounds except when tapering off at the end of some words.

Many commonly used sounds are made up of a combination of phonemes. An example is the sound "oh". To produce this sound an "01" sound must be followed by an "02" sound. Some other examples are "eye" ("AH","I","E") and "oooh" ("U1","U2").

SPEECH EDITOR

The SPEECH EDITOR is an APPLESOFT program which allows you to construct custom words and phrases for the ECHO][. Basically, it arranges the sounds according to line numbers. These lines may be added to, deleted, modified, and inserted as necessary during word construction. When the word is finished it may be "saved" to RAM which also will assemble it into the format the SPEECH GENERATOR requires. From there it may also be "saved" to the disk for later use. The word or phrase may be spoken at any time during the process to verify it for the correct sounds. The EDITOR commands are described in detail below and are also listed in TABLE 4. Only those letters enclosed in parenthesis actually need to be typed in for the command to be recognized.

There are two modes which the EDITOR operates in. In the command mode, you will be prompted by a "#" and you may enter any of the commands listed below. In the add mode you will be expected to provide a sound or number specifying one of the variables. If you type a letter when a number is expected you will be asked to "RETYPE?". To exit the add mode and return to the command mode press the "RETURNî key When the cursor is in the "SOUND" column.

SPEECH EDITOR COMMANDS

(A)DD . This command puts you in the add mode and allows you to add sounds to the end of the current word or phrase. You will be asked for the sound for each line and also the variables if it is a voiced sound or "PA1î. To exit this mode press the "RETURN" key when the cursor is in the sound column.

(AP)PEND . You may add a word or phrase from memory to the end of the current word or phrase. Keep in mind that there is a maximum of forty lines for the current word or phrase. To construct a longer phrase see the section on phrase construction.

(C)ATALOG . This causes a DOS catalog of the current disk drive and then returns you to the command mode.

(D)ELETE . When this command is entered you will be asked which line number you wish to delete. That line will be deleted and all subsequent lines will be shifted down one line to fill its place.

(END) . This exits the SPEECH EDITOR, clears the screen, and returns you to APPLESOFT.

(I)NSERT . If you wish to add lines within a word use this command. You will be asked which line you wish to insert the new line(s) in front of. This command puts you in the add mode however all new lines are inserted within the word rather than at the end. To exit press "RETURN".

(L)IST . Re-lists the current word or phrase. If you wish to pause during the listing (useful if there is more than one screen of text) you may press the "SPACE BAR" and the listing will be halted. To resume the listing press the "SPACE BAR" again. This is similar to pressing CTRL-S when listing APPLESOFT programs.

(LO)AD . When this is entered you will be asked whether you wish to load code from the current disk drive or if you wish to load text from the memory into the current word buffer. If you are accessing the disk, you will be asked for the name of the file along with the address to load it into. If you are loading text from memory you will have to specify the starting address. It will then load up to forty lines until it encounters a stop command within the text. If there are more than forty lines you will get a beep and a '*BUFFER FULL" warning.

(M)ODIFY . This allows you to modify a line that has previously been entered. It is essentially the same as

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ECHO][SPEECH SYNTHESIZER

a "DELETE" command followed by an "INSERT" command. You will be asked which line you wish to modify. You will enter the add mode and all new lines will be inserted at that location.

(N)EW . Clears the current word buffer so you may start formation of a new word. You will be asked if it is OK to clear. Any response other than a "Y" or a "YES" will abort the command.

(PR)INT . If you wish to make a hard copy of the current word or phrase makeup use this command. You will be asked to type in the title which will be printed at the top of the listing. All output is printed to Slot #1.

(SA)VE . You may save the current text to memory or code within memory to the current disk drive. If you are saving text you will be asked for the starting address to save it to. Keep a record of this and how many bytes are saved (it tells you) for future reference. A stop command is automatically added to the end of the word as it is saved. This is included in the total number of bytes that it tells you have been saved. If you are saving code to the disk, you must specify the file name, the starting address, and

the number of bytes to be saved.

(SP)EAK . By entering this command you may hear whatever is in the current buffer. This is useful for "debugging" words during construction. Like all other commands, this command is only available when in the command mode.

(SPM)ENORY . This will speak words or phrases that have been previously stored in memory. You will be asked for the starting address at which time whatever is stored there will be spoken.

PHRASE CONSTRUCTION

There are a few different ways in which words may be strung together to form phrases. For a short phrase you will want to load or enter the first word into the SPEECH EDITOR buffer and then append each additional word. You will then want to go back and insert a "PA1" in between each word.

For longer phrases that include more than forty lines, each new word will have to be saved into memory directly following the previous one. Keep in mind that previously saved words will have a stop command tacked onto the end of them so save the new word one byte short of the actual calculated address (starting address of the previous word

plus the number of bytes saved). You will also want to start each new word with a "PA1" so that there will be a pause between the words. Do not put the "PA1" at the end of the old word because it may cause the system to "hang" when it is spoken from the SPEECH EDITOR.

One other way of producing a longer phrase is that used in the sample program "RECITE" on the disk. Unlike the method above, the stop commands are not eliminated and no "PA1" pauses are inserted. The starting address of the first word is given to the SPEECH GENERATOR and it is spoken in the normal fashion. Then for each successive word to be spoken a call is made to the "NXTSPK" routine. The SPEECH GENERATOR will already be painting to the next byte in memory after speaking the previous word so it will already have the address of the next word. To use this type of Phrase you must know how many total words are to be spoken and then do the same number of calls to the îSPEAK" and îNXTSPK" routines.

SAMPLE VOCABULARY

The sample vocabulary on the enclosed disk contains 175 words, letters, and numbers for use from within your programs or as examples on coding your own words. The file name of the code is "VOCABULARY" and should be loaded into address 17408. A complete listing of the words and their starting addresses is given in the appendix at the back of this manual. "VOCABULARY" may be loaded into other parts of memory but the starting addresses will have to be modified accordingly when accessing words from a program.

SAMPLE PROGRAMS

There are two sample programs provided on the disk. The first one, "TALKING TYPEWRITER" will say each letter and number as it is typed on the keyboard. The second one, "RECITE" will say each word of the sample vocabulary. Both of these programs are APPLESOFT programs and are run in the usual manner.

HANGUPS?

If you try to speak a phrase that begins or ends with a "PA1î or has two "PA1's" embedded in it, the entire program may "hang". It may also îhang" if you give it the starting address of some other data rather than phoneme encoded data. When this occurs the only way to regain control of the computer is to press reset. If you are using the speech editor you may return to the program with variables intact by

entering "GOTO 1000". You will have to re-list the current word or phrase and you will no longer have the headings at the top of the screen.

There is another problem that may occur anytime after the above situation occurs or if RESET is pressed when the ECHO][is talking. The next time SETSLT is called to find which slot the ECHO][is in, it probably won't find it. There are two ways to get around this without having to turn off the computer and reboot from scratch. One is to always install the ECBO][card in slot 5 and never use the SETSLT routine. The other is to POKE "255" to one of the addresses which pulls the DEVICE SELECT (PIN 41) low on the slot the ECHO][is in.

SPEECH EDITOR EXAMPLE

In this section we will use the SPEECH EDITOR to generate and save the phrase îan Apple][computer" and then write a short APPLESOFT program to say the lar9et phrase "This is an Apple][computer". Before proceeding you should install the ECHO][card according to the directions previously given.

To begin you should boot up the supplied disk and run the SPEECH EDITOR program. After it has finished loading from the disk your screen should be blank except for the headings at the top and you should be prompted with a "0". Whenever this prompt is displayed the program is waiting for a command. For clarity, in this example we will always list an entire command rather than just the first letter(s). All commands ate followed by a <CR>.

Since you will be using some of the words from the sample vocabulary, you will have to first load it from the disk into memory. To do this type in the command: LOAD. You are then given two options: to load code from the disk or to load text from memory. You want to load code from the disk so enter "1î. Next you will be asked for the file name. The sample vocabulary is saved under the name of "VOCABULARY" so type this in. When it asks for what address to load it into type in ì17408". All addresses listed in the back of this manual assume that the vocabulary has been loaded into this location.

After the file has been loaded you should be back in the control mode of the editor and the "#" should reappear. The first word of our phrase is "an". This is not one of the words in the sample vocabulary but can easily be made by modifying the word "and". Once again you will want to use the LOAD command, however this time you will want to use option "2" instead of "1". When asked for the address to

load the text from you should enter the address listed in the appendix for "and". This is "17434î so type it in now. After a brief pause your screen should appear as follows:

```
LINE# SOUND PITCH LENGTH VOLUME

1   AE      6     3     7
2   AE      8     3     7
3   AE     10     2     5
4   N       9     2     5
5   D
```

To change this to the word "anî all you have to do is delete the "D" at the end. To do this type in the command DELETE and when youíre asked for the line number enter "5". Now type the command SPEAK and you will hate the ECHO][speak it.

Both of the words "apple" and "two" are in the sample vocabulary so they can be used as they are. To add the word "apple" you will use the APPEND command. Type this in and when it asks you for the address to append from type in the address listed in the back next to "apple" (17457). After another brief pause you will get a listing of the two words strung together. Use the SPEAK command and listen to how they sound. They run together so a pause is needed between them.

You can insert a pause by using the INSERT command. When asked which line to insert before type in "5". You are now in the insert mode and the computer should be displaying a "5" with the cursor in the sound column. Since your inserting a pause type in "PA1" followed by a <CR>. The cursor will now jump to the length column since no other parameters may be specified for a "PA1" pause. You may enter any number you wish from 1 to 8, however 2 is commonly used between words. After you enter the length of the pause the cursor will move down to the next line and wait for you to input another sound. Since you only wish to insert one line at this time you may exit the insert mode and return to the command mode simply by pressing <CR>.

The pause before the word "two" may be added beforehand rather than inserting it afterwards. To do this enter the ADD command. You will be in the add mode (similar to the insert mode except new sounds are added to the end of the word) and can enter the "PA1" with a length of "2". Exiting the add mode is also accomplished by pressing <CR> when the cursor is in the sound column.

CAUTION! Do not attempt to use the SPEAK command when either the first or last line of the current buffer is a

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ECHO][SPEECH SYNTHESIZER

"PA1". This will cause the system to "hang" with pressing the "RESET" button the only alternative. This will also happen if you try to speak a word with two "PA1's" in a row. All is not lost however if this happens. Please see the section entitled "HANGUPS?" to learn how to recover with your data intact.

After the pause has been added you may append the word "two" by using the APPEND command and inputting the proper address for "two" from the appendix (19151).

The word "computer" is not included in the sample vocabulary and will have to be entered manually. To do this use the ADD command and enter the lines listed below followed by a <CR> to return to the command mode.

```
LINEO SQVND FITCH LENGTH VOLUME

17   PA1          2
18   K
19   UH           7     3     6
20    M           8     2     6
21   PA1          1
22   P
23   Y            4     1     6
24   IU           4     1     6
25   U2           4     3     6
26   PA1          1
27   T
28   ER           6     2     6
29   ER           8     2     6
30   ER     10    2     5
```

After pressing <CR> to return to the command mode the entire buffer will be re-listed on the screen. Since the screen isn't long enough to accommodate the entire buffer the first lines will no longer appear. To re-examine the first lines, enter the LIST command and while it is listing press the space bar. The listing will halt at that point and will continue only when the space bar is pressed again. A listing may be stopped and restarted in this manner as many times as desired.

Now that the phrase "an apple two computer" has been finished it needs to be saved to memory and then to the disk for future use. The SPEECH EDITOR and SPEECH GENERATOR.CODE2 use memory locations below 17408. Likewise, the sample vocabulary resides in memory locations 17408 to 19399. Therefore when you save the phrase you just constructed it should be put above these locations. To save the phrase enter the SAVE command. As with the LOAD command you will be asked whether you are saving text to memory or memory to disk. Enter a "2" for text to memory and when you are asked

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ECHO][SPEECH SYNTHESIZER

for the address to save to enter "19400". Note how many bytes were saved (56) because you will need to know that to save it to the disk.

The compressed binary code for your phrase is now in memory starting at address 19400. To save the phrase to the disk once again enter the SAVE command, but this time select the first option. For a file name you can use "AN APPLE TWO COMPUTER" and for the address to save from type in the address where it was previously saved, in this case 19400. The length of the phrase is 56 bytes as noted above.

At this point the entire vocabulary to say the phrase "this is an apple two computer" is stored either within the sample vocabulary or within the file that you just created. The entire phrase could have been constructed and placed within a single file but in order to more effectively demonstrate how to access speech from within a program you will be accessing a combination of single words and a phrase.

The program listed on the next pa9e will say the sample phrase every time a <CR> is pressed. The "REM" statements pretty well explain its operation and what portion of the program does what.

```
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ECHO ][ SPEECH SYNTHESIZER

10 HIMEM: 7167
15 REM SETS HIMEM BELOW THE LOCATION OF THE SPEECH ROUTINES.
20 D$ = CHRS (4)
25 REIUI SETS D$ UP AS A CONTROL.D FOR DOS COMMANDS.
30 PRINT D$;"BLOAD SPEECH GENERATOR.CODE0"
35 REM LOADS IN THE SPEECH GENERATOR.CODE0 INTO $1C00 TO $1CFF.
40 PRINT D$;"BLOAD VOCABULARY"
45 REM LOADS THE SAMPLE VOCABULARY INTO LOCATION 17408.
50 PRINT D$;"BLOAD AN APPLE TWO COMPUTER"
55 REM LOADS THE PHRASE INTO LOCATION 19400.
60 LOBYTE = 7168:HIBYTE = 7169:SPEAK = 7170:NXTSPK = 7182:SLOT =
7197:SETSLT = 8097
65 REM SETS UP THE VARIOUS ADDRESSES USED WITH SPEECH
GENERATOR.CODEO.
70 CALL SETSLT:A = PEEK (SLOT): IF A = 16 THEN HOME : PRINT
"PLEASE INSERT AN ECHO II CARD": END
75 REM DETERMINES WHICH SLOT THE ECHO II CARD IS IN. IF NO CARD IS
INSTALLED IT WARNS THE USER AND ENDS THE PROGRAM.
80 HOME : INPUT "PRESS THE <CR> FOR A DEMOSTRATION ";X$
85 REM CLEARS THE SCREEN AND WAITS FOR A COMMAND TO START.
90 ADD = 19070: GOSUB 200
95 REM SETS UP THE ADDRESS FOR THE WORD "THISî AND THEN JIMPS TO
THE ROUTINE THAT WILL OUTPUT THE ADDRESS AND SPEAK IT.
100 FOR A = 1 TO 100: NEXT
105 REM CAUSES A PAUSE BETWEEN THE WORDS "THIS" AND "IS".
110 ADD = 18184: GOSUB 200
115 REM SETS UP THE ADDRESS FOR THE WORD "IS" AND THEN JUMPS TO
THE ROUTINE THAT WILL OUTPUT THIS ADDRESS AND SPEAK IT.
120 FOR A = 1 TO 100: NEXT
125 REM CAUSES A PAUSE BETWEEN THE WORD "IS" AND THE FOLLOWING
PHRASE.
130 ADD = 19400: GOSUB 200
135 REM SETS UP THE ADDRESS FOR THE PHRASE "AN APPLE TWO COMPUTER"
AND THEN JUMPS TO THE ROUTINE THAT WILL OUTPUT THE ADDRESS AND
THEN SPEAK IT.
140 GOTO 80
```

```
200 AH = INT (ADD/256):AL = ADD -AH * 256
205 REMI SPLITS THE ADDRESS UP INTO HIGH AND LOW ADDRESSES LESS
THAN 256 AND THAT CAN BE POKED INTO A BINARY ROUTINE.
210 POKE HIBYTE,AH: POKE LOBYTE,AL
215 REM POKES THE ADDRESSES DETERMINED ABOVE INTO THE LOCATIONS
USED BY THE SPEECH GENERATOR.CODE.
220 CALL SPEAK
225 REM THIS CALLS THE ROUTINE THAT SPEAKS THE WORD OR PHRASE
STARTING AT THE ADDRESS POKED ABOVE.
230 RETURN
```

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ECHO][SPEECH SYNTHESIZER

TABLE 1 -SPEECH GENERATOR ADDRESSES

SPEECH GENERATOR.CODE0 . $1COO TO S1FFF
SPEECH GENERATOR.CODE1 . $3COO TO $3FFF
SPEECH GENERATOR.CODE2 . S4000 TO $43FF
SPEECH GENERATOR.CODE3 . $6000 TO $63FF

VERSION	LOBYTE	HIBYTE	SPEAK	NXTSPK	SLOT	SETSLT
0	7168	7169	7170	7182	7197	B097
	$1C00	$1C01	$1C02	$1COE	$1C1D	$1FA1
1	15360	15361	15362	15374	15389	16289
	$3C00	$3C01	$3C02	$3COE	$3C1D	$3FA1
2	16384	16385	16386	16398	16413	17313
	$4000	$4001	$4002	$400E	$401D	$43A1
3	24576	24577	24578	24590	24605	25505
	$6000	$6001	$6002	$600E	$601D	$63A1

TABLE 2 . SOUNDS WITH SELECTABLE VARIABLES

Al . late	E . speak	M . many	OO2 . book
A2 . late	EH . letter	N . nice	U1 . tune
AE . dad	ER . hurry	NG . long	U2 . tune
AH . bother	I . finger	O1 . oh	UH . fun
AW . call	IU . you	O2 . oh	Y . you
L . like	OO1 . book	PA1 . pause	

TABLE 3 . SOUNDS WITH PRESET VARIABLES

B . baby	G . get	R . red	TH1 . then
CH . choose	H . hello	S . see	V . very
D . dog	J . jet	SH . shoe	W . will
DT . butter	K . kick	T . too	Z . zero
F . if	P . print	TH . think	PA . pause

TABLE 4 . SPEECH EDITOR COMMANDS

(A)DD	(END)	(N)EW
(AP)PEND	(I)NSERT	(PR)INT
(C)ATALOG	(L)IST	(SA)VE
(D)ELETE	(LO)AD	(SP)EAK
(M)ODIFY	(SPM)EMORY	

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ECHO][SPEECH SYNTHESIZER
APPENDIX . SAMPLE VOCABULARY

```
A..........17408    ADDED.......17425    ANSWER......17444
ADD........17417    AND.........17434    APPLE.......17457

B..........17469    BLUE........17490    BYTE........17510
BLACK.......17477   BY..........17502

C..........17521    CLOSE.......17551    CONTROL.....17595
CATALOG.....17532   COLOR.......17570    CORRECT.....17610
CENTS.......17548   COMMA.......17583

D..........17624    DISK........17670    DO..........17724
DATE........17632   DIVIDE......17680    DOLLARS.....17732
DECIMAL.....17641   DIVIDED.....17695    DON'T.......17747
DELETE......17656   DRIVE.......17713

E..........17758    ELEVEN......17800    ERROR.......17B51
EIGHT.......17765   END.........17815    ESCAPE......17862
EIGHTEEN....17775   ENTER.......17825    EXCLAMATION.17B74
EIGHTY......17789   EQUALS......17838

F..........17899    FIRST.......17942    FORTY.......17975
FALSE.......17905   FILE........17953    FOUR........17987
FIFTEEN.....17916   FIVE........17965    FOURTEEN....17997
FIFTY.......17930

G..........18012    GOOD........18028    GUESS.......1B048
GAME........180ZO   GREEN.......18039

H..........18057    HELP........1S075    HUNDRED.....18098
HELLO.......18065   HIGH........18088

I..........18112    INCORRECT...18134    IS..........18184
IF..........18121   INPUT.......18153    IT..........18190
IN..........18127   INSERT......18168

J..........18198

K..........18206    KEY.........18214    KEYBOARD....1B222

L..........18236    LIST........18256    LOW.........18279
LEFT........18245   LOAD........18267

M..........1B290    MILLION.....18328    MULTIPLY....18355
MANY........18301   MINUS ......18341    MULTIPLIED..18376
MEMORY......18314

N..........18398    NINE........18431    N0..........18480
NAME........18409   NINETEEN....18442    NOW.........18489
NEXT........18418   NINETY......18462    NUMBER......18497
```


ECHO][SPEECH SYNTHESIZER
APPENDIX . SAMPLE VOCABULARY

```
0..........18510    ONE.........18534    OR..........18555
OFF.........18519   OPEN........18542    OUT.........18564
ON..........18525
```

```
P..........18573    PERIOD......18614    PRESS.......1B648
PARENTHESIS.18583   PLUS........18627    PRINT.......18658
PERCENT.....18600   POUND.......18638    PROGRAM.....18670

Q..........186S5    QUESTION....18697

R..........18711    REMOVE......18729    RETURN......18759
RED.........18720   REPEAT......18743    RIGHT.......18774

S..........18785    SEVENTY.....18864    SPELL.........18933
SAVE........18792   SIX.........18878    START.......18942
SECOND......18801   SIXTEEN.....18888    STOP........18953
SEMICOLON...18814   SIXTY.......18903    SUBTRACT....18964
SEVEN.......18835   SORRY.......18915    SUBTRACTED..18979
SEVENTEEN...18845   SPACE.......18925

T..........18997    THIRTEEN....19047    TRY.........19109
TAPE........19007   THIRTY......19060    TRUE........19119
THAT........19016   THIS........19070    TWELVE......19128
TEN.........19025   THOUSAND....19077    TWENTY......19140
THE.........19033   THREE.......19089    TWO.........19151
THE1........19041   TIME........19098    TYPE........19159

U..........19170    UH OH.......191B1    UNDERSTAND..19190

V..........19207    VALUE.......19217

W..........19231    WHERE.......19277    WILL........19303
WAS.........19249   WHITE.......19285    WITH........19311
WHAT........19258   WHO.........19295    WRONG.......19318
WHEN........19269

X..........19326

Y..........19335    YES.........19358    YOUR........19366
YELLOW......19345

Z..........19377    ZERO........19387    END OF FILE.19399
```

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ECHO][SPEECH SYNTHESIZER
WARRANTY

LIMITED WARRANTY

Every product manufactured by Street Electronics Corporation is fully tested and quality checked before shipment and is warranted to be free from defects in materials and workmanship for a period of 90 days from date of purchase. During that time period, Street Electronics Corporation will, at no charge, repair or replace any defective unit returned to its Service Department.

Street Electronics Corporation disclaims any liability to users of its products for consequential damages of any kind arising from at connected with the use of its products.

This warranty is void in cases of misuse, abuse, abnormal conditions of operation or attempts to alter or modify the function of a part or assembly.

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In case of problems with a Street Electronics Corporation product, please notify us of the model, serial number, date of purchase, and particular details. Do not return the unit to Street Electronics Corporation until you have received authorization to do so.

When returning equipment, ship in the original carton or securely packed in a cardboard carton with at least two inches of cushioned packing material on all sides. Mark the package "FRAGILE" and ship via UPS, Parcel Post, or Air Freight, insured and prepaid. (Collect shipments will be refused and returned.) Enclose a clear description of the problems experienced, proof of purchase date, return address, and preferred shipping method.

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###

END OF FILE echoii.docs

```
##########################################################################
### FILE: encoding35
##########################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!nntp.coast.net!news.kei.com!newsfeed.internetmci.
com!in2.uu.net!news.u.washington.edu!news.uoregon.edu!cie-2.uoregon.edu!nparker
From: nparker@cie-2.uoregon.edu (Neil Parker)
Newsgroups: comp.sys.apple2.programmer
Subject: Re: Q: 3.5" encoding scheme
Date: 24 Jun 1996 09:50:51 GMT
Organization: University of Oregon Campus Information Exchange
Lines: 98
Distribution: world
Message-ID: <4qlodr$mad@pith.uoregon.edu>
References: <4qjdnj$t5a@elna.ethz.ch>
NNTP-Posting-Host: cie-2.uoregon.edu

In article <4qjdnj$t5a@elna.ethz.ch> GUDATH@EZINFO.VMSMAIL.ETHZ.CH (Henrik
'Ratte' Gudat) writes:
>[...snip...]
>- as with 5.25" disks, address fields are encoded 4&4, the data chunk 6&2,
>right?

Wrong.  The address fields of a 3.5-inch disk are encoded 6&2 (sort of).
The address field looks like this:

     $D5, $AA, $96, track, sector, sides, format, checksum, $DE, $AA

Each datum in the address field is a 6-bit number.  Their meanings are as
follows:

     track     The low-order six bits of the track number
     sector    The sector number
     sides     Bit 0 is the high-order bit of the track number
               Bit 5 is the side number (0 for side 1, 1 for side 2)
               All other bits are zero (i.e. the number looks like "s0000t")
     format    The low four bits are the interleave (usually 2, unless the
               disk was formatted on a Unidisk 3.5)
               The high bit is the number of sides (0=single, 1=double)
               Bit 4 is always 0 (the number looks like "s0iiii")
     checksum  A checksum of the previous four values (I'm not sure, but
               I think it's computed by EORing)

Each of these numbers is translated to a valid disk byte by looking it up in
the 6&2 translation table (so that 0 becomes $96, 1 becomes $97, 2 becomes
$9A, etc.).

>- the two bits that are rolled out of each byte (6&2 scheme) are put into a
>secondary buffer. Where will this buffer be written?  After the main buffer
>(with bits 2-8 of each byte)? or will it also be divided by some magic figure
>(for example, 6 chunks of 86 bytes from main buffer and 27 bytes from secondary
>each)?

It's a bit more complicated than that.

There are, in effect, four buffers.  They get filled something like this:

     1st byte --> 6 bits to byte 1 of buffer 1, 2 bits to byte 1 of buffer 4
```

2nd byte --> 6 bits to byte 1 of buffer 2, 2 bits to byte 1 of buffer 4
3rd byte --> 6 bits to byte 1 of buffer 3, 2 bits to byte 1 of buffer 4
4th byte --> 6 bits to byte 2 of buffer 1, 2 bits to byte 2 of buffer 4
5th byte --> 6 bits to byte 2 of buffer 2, 2 bits to byte 2 of buffer 4
and so forth.

All the while a three-byte checksum is being computed, in a very hard-to-understand way. Watch out! The checksum computation modifies the data, just like it does on the 5.25-inch drive.

Once the buffers are filled, they're written:

1st byte of buffer 1
1st byte of buffer 2
1st byte of buffer 3
1st byte of buffer 4
2nd byte of buffer 1
2nd byte of buffer 2
etc.

So the byte containing the extra two bits from three other bytes is written immediately following those three bytes. The three-byte checksum expands to four bytes in exactly the same fashion.

The data field looks like this:

$D5, $AA, $AD, track, 699 data bytes, 4 checksum bytes, $DE, $AA

The "track" number is identical to the "track" number from the address field.

Remember that the original data is 524 bytes, not 512.

>- is the book "Beneath Apple ProDOS" still available? :-))))

I think Byteworks still sells it. But it was written before the 3.5-inch drive was available for the Apple II, so its contents are only relevent in a very general sort of way.

- Neil Parker

P.S. I recommend having a look at the 3.5-inch drive I/O routines in the IIGS ROM. You can find them by looking in the SetHook/GetHook table, which is at $E10F6F in ROM 1 (note that there are two identical JMP instructions for each vector). It's best to do this without booting GS/OS, because GS/OS patches the vectors. See the file on undocumented Smartport info on my home page, http://cie-2.uoregon.edu/~nparker.

P.P.S. Are you aware that something keeps adding control-P's to the subject lines of your postings? I've seen it in at least three unrelated posts from you.
--
Neil Parker | No cute quote, no cute ASCII art, no cute
nparker@cie-2.uoregon.edu | disclaimer, no deposit, no return....
nparker@cie.uoregon.edu | (This space intentionally left blank:
http://cie-2.uoregon.edu/~nparker |)

END OF FILE encoding35

```
##############################################################################
### FILE: eprom.convert
##############################################################################

Path: news1.icaen!news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.
erols.net!newspeer.monmouth.com!intgwpad.nntp.telstra.net!news1.optus.net.au!optus
!
news.usyd.edu.au!news.uow.edu.au!david
From: david@uow.edu.au (David Wilson)
Newsgroups: comp.sys.apple2
Subject: Re: II+ vs IIe Char Gen PROMs and Shift-key mods-- LC $F8 PROM mod
Date: 9 Apr 99 02:54:01 GMT
Organization: University of Wollongong, Australia
Lines: 38
Message-ID: <david.923626441@wraith>
References: <7cosa7$rgl$1@nnrp1.dejanews.com> <36F01E44.8DB3CAE4@swbell.net>
<1doxxsz.
5zmnapzv7ggaN@dempson.actrix.gen.nz> <3701FF21.C4F327BD@swbell.net> <37020A8B.
46585F3E@iolinc.net> <37023162.11165D84@swbell.net> <37041CA0.6C13D2DE@iolinc.net>
<3704A7A3.72AE153F@swbell.net> <3704B626.DF28564C@iolinc.net> <370C3F1C.
8D3C3DA3@swbell.net> <david.923554356@wraith> <370CB616.B63AD078@swbell.net>
NNTP-Posting-Host: wraith.cs.uow.edu.au
X-Trace: wyrm.its.uow.edu.au 923627584 5827 130.130.64.1 (9 Apr 1999 03:13:04 GMT)
X-Complaints-To: usenet@wyrm.its.uow.edu.au
NNTP-Posting-Date: 9 Apr 1999 03:13:04 GMT
X-Newsreader: NN version 6.5.0 #15 (NOV)
Xref: news1.icaen comp.sys.apple2:146701

Rubywand <rubywand@swbell.net> writes:
>David Wilson writes ...
>>The only problem with this change is that the ROMs in a ][ or ][+ are not
>>pin-compatible with EPROMs of the same size. Thus, to make this change you
>>would need to wire an adapter between the EPROM and the ROM socket to sort out
>>the chip select polarities.

> True. The 2516 and 2716 2k x 8 PROMs come close.

> One problem is that the ROMs have three enable/select pins; the PROM has two.

> Fortunately, the Apple II uses only two select lines; so, the main thing you
>need to add to an adaptor is an inverter-- like a 74LS04 or any other inverting
>gate.

Acording to Jim Sather, the inverter can be dispensed with:

Pin # ROM socket        2716 (except TMS2716 - use TMS2516 instead)
18    CS2 (active high) /CE (active low)
20    CS1' (active low) /G (active low)
21    CS3' (active low) Vpp (25v prog, 5v read)

So if pin 18 (ROM) goes to pin 21 (EPROM) and pin 20 (ROM) goes to both
pin 20 and 18 (EPROM) it should work.

Looking at the 2716 data sheets I have this is not valid as Vpp is only
defined at 5v and 25v, not at 0v. If you do not have any cards which drive
the INHIBIT' line then this will not be a problem.

>Probably, a II+ will have the Language Card plugged into Slot 0. With the LC
```

>plugged in the $F8 ROM used is going to be the one on the LC; so, this is
>where you would swap in the adaptor with the PROM.

If you have a Language Card, it already has two solder points to convert it
to 2716 polarity. A third point marked F8 should be left open unless you want
the motherboard F8 PROM used when the motherboard BASIC is selected.
--
David Wilson School of IT & CS, Uni of Wollongong, Australia david@uow.edu.au

END OF FILE eprom.convert

```
##########################################################################
### FILE: falsereads.6502
##########################################################################

Path: news.uiowa.edu!chi-
news.cic.net!simtel!harbinger.cc.monash.edu.au!news.cs.su.oz.au!metro!news.ci.com.
au!wabbit.cc.uow.edu.au!wabbit.cc.uow.edu.au!not-for-mail
From: david@wraith.cc.uow.edu.au (David E A Wilson)
Newsgroups: comp.emulators.apple2,comp.sys.apple2,comp.sys.apple2.programmer
Subject: Re: 6502 false references?
Date: 22 Oct 1995 12:04:19 +1000
Organization: University of Wollongong, NSW, Australia.
Lines: 69
Message-ID: <46c8r3$ijr@wraith.cc.uow.edu.au>
References: <45ulkp$ppd@post.gsfc.nasa.gov> <462ah4$as_001@news.usa.net>
NNTP-Posting-Host: wraith.cs.uow.edu.au
Xref: news.uiowa.edu comp.emulators.apple2:4091 comp.sys.apple2:94056
comp.sys.apple2.programmer:5613

>In article <45ulkp$ppd@post.gsfc.nasa.gov>,
>   klipsch@ssvs.gsfc.nasa.gov (Colin Klipsch) wrote:
>>My question is: which 6502 instructions generate double references?  More
>>specifically, which instructions will hit the speaker twice instead of
>>once, when applied to the speaker I/O addresses?  I've looked in
>>Leventhal's and Zak's 6502 books, but didn't find this information.

From MOS Microcomputers Hardware Manual (publication number 6500-10A) Jan 1976:

ASL,CLC,CLD,CLI,CLV,DEX,DEY,INX,INY,LSR,NOP,ROL,SEC,SED,SEI,
TAX,TAY,TSX,TXA,TXS,TYA
single byte instruction
      false read of following opcode

ADC,AND,BIT,CMP,CPX,CPY,EOR,LDA,LDX,LDY,ORA,SBC
indirect,x
      false read of 00nn before x is added to nn
absolute,x or absolute,y
      false read if page crossing occurs
zp,x or zp,y
      false read of 00nn before x/y is added to nn
indirect,y
      false read if page crossing occurs

STA,STX,STY
indirect,x
      false read of 00nn before x is added to nn
absolute,x or absolute,y
      false read
zp,x or zp,y
      false read of 00nn before x/y is added to nn
indirect,y
      false read

ASL,DEC,INC,LSR,ROL,ROR
zp or absolute
      false write of old data
zp,x or abs,x
      false read of 00nn before x is added to nn
      false write of old data
```

```
PHP,PHA
      false read of following opcode

PLP,PLA
      false read of following opcode
      false read of stack (before stkptr incremented)

JSR
      false read of stack

BRK
      false read of following opcode

RTI
      false read of following opcode
      false read of stack

RTS
      false read of following opcode
      false read of stack
      false read of byte before next instruction to execute

Bxx
      false read of PC+2+offset (no carry) if page crossed

Hope this helps. Let me know if you need the full cycle by cycle details.
--
David Wilson      Dept CompSci Uni Wollongong Australia     david@cs.uow.edu.au


### END OF FILE falsereads.6502
```

```
##############################################################################
### FILE: fastpath4
##############################################################################

Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!vixen.cso.uiuc.edu!howland.erol
s.net!newsfeed.berkeley.edu!xmission!nntp.csuchico.edu!orion.whowhere.com!namche.S
un.COM!sunnews1.Eng.Sun.COM!engnews1.eng.sun.com!not-for-mail
From: Charles Stephens <devnull@dobbs.eng.sun.com>
Newsgroups: comp.sys.apple2
Subject: Re: Fastpath 4 Information
Date: 06 Nov 1998 10:34:20 -0800
Organization: Sun Microsystems, Inc.
Lines: 30
Message-ID: <afkvhkshdqr.fsf@dobbs.eng.sun.com>
References: <Pine.SGI.3.91r.981106101731.16431B-100000@tcfreenet.org>
NNTP-Posting-Host: brak.eng.sun.com
X-Face:
(xx[.&.0Swozm=m{+3EKI~Wiz/bZn}xO&',E2Q)s!4BVkO"5Warsdm>3E}5uY'wkp%(zm{p1>A<S%/$]{g
!)W|4T9mRlK}V[]yOV*O[eUz4<7P,HtN{]_;0kU;09+:yL2T7Oo^mrp{DYlcWZc-kRGaJhn+qlU
X-Newsreader: Gnus v5.5/XEmacs 20.4 - "Emerald"
Xref: news1.icaen comp.sys.apple2:141422

>>>>> "GB" == Greg J Buchner <buchner@tcfreenet.org> writes:

 GB> So, someone out there in CSA2 must have some info on the
 GB> Kinetics (Shiva) Fastpath 4 router I got.  I have downloaded
 GB> the v9.1.2 software from Shiva's website, but the Fastpath
 GB> needs to be reset.  It has the v5.1 ROMs and on the Shiva
 GB> website it says to call Tech Support.  But I figure I
 GB> probably have a better chance of getting an answer through
 GB> here than from Shiva these days.

 GB> So, any information on the Fastpath 4 would be greatly
 GB> appreciated.

Open the unit and on the motherboard there should be 3 pairs of jumper
blocks and two jumpers.  Make a record of which posts the jumpers are
on and remove them.  Wait about 30 minutes and replace the jumpers.
Then power the unit and run the utility program.

Also be sure to read the release notes to make sure you are running
the correct FP utility.  There are two and one of them is for the FP5
only.

cfs
--
Charles F. Stephens               = cfs  AT  eng.sun.com
Software Psychic and Illuminary   =
Solaris Network Sustaining        = "We know what you buy, we know where you
Solaris Software                  =  live." -- Wesayso Corp.
Sun Microsystems, Inc.            =
Menlo Park, California, USA       =
Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!nyd.news.ans.net!newsfeeds.ans.
net!news.idt.net!dca1-
hub1.news.digex.net!digex!news2.randori.com!tcfreenet.org!buchner
Newsgroups: comp.sys.apple2
From: "Greg J. Buchner" <buchner@tcfreenet.org>
```

```
Subject: Re: Fastpath 4 Information
In-Reply-To: <afkvhkshdqr.fsf@dobbs.eng.sun.com>
Message-ID: <Pine.SGI.3.91r.981106175841.10363B-100000@tcfreenet.org>
References: <Pine.SGI.3.91r.981106101731.16431B-100000@tcfreenet.org>
<afkvhkshdqr.fsf@dobbs.eng.sun.com>
MIME-Version: 1.0
Content-Type: TEXT/PLAIN; charset=US-ASCII
Lines: 25
Date: Fri, 6 Nov 1998 18:00:53 -0600
NNTP-Posting-Host: 206.8.96.2
X-Trace: news2.randori.com 910396958 206.8.96.2 (Fri, 06 Nov 1998 16:02:38 PDT)
NNTP-Posting-Date: Fri, 06 Nov 1998 16:02:38 PDT
Xref: news1.icaen comp.sys.apple2:141430

On 6 Nov 1998, Charles Stephens wrote:

> >>>>> "GB" == Greg J Buchner <buchner@tcfreenet.org> writes:
>
>  GB> So, someone out there in CSA2 must have some info on the
>  GB> Kinetics (Shiva) Fastpath 4 router I got.  I have downloaded
>
> Open the unit and on the motherboard there should be 3 pairs of jumper
> blocks and two jumpers.  Make a record of which posts the jumpers are
> on and remove them.  Wait about 30 minutes and replace the jumpers.
> Then power the unit and run the utility program.

But, on the Shiva website it says not to do that if you have the
v5.1 ROM's, which I do have.

It says to contact Shiva Tech Support...and I don't really feel
like calling their normal number and trying to talk with someone.
If they had e-mail tech support it'd be a bit better.

Greg B.

+-------------------------------------------+
| buchner@tcfreenet.org -or- gjb@wavetech.net |
+-------------------------------------------+



### END OF FILE fastpath4
```

```
##########################################################################
### FILE: fasttwgs
##########################################################################

Path: news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!zaphod.mps.ohio-
state.edu!howland.reston.ans.net!agate!spool.mu.edu!uwm.edu!caen!destroyer!cs.ubc.
ca!unixg.ubc.ca!kakwa.ucs.ualberta.ca!ersys!herbertf
From: herbertf@ersys.edmonton.ab.ca (Herbert Fung)
Newsgroups: comp.sys.apple2
Subject: Transwarp GS upgrade article
Message-ID: <aFZBZB2w165w@ersys.edmonton.ab.ca>
Date: Sun, 21 Feb 93 09:53:09 MST
Organization: Edmonton Remote Systems #1, Edmonton, AB, Canada
Lines: 266

The following is a post I found a few months ago. This should answer most
questions about the TransWarp GS upgrade that people have been asking me,
and whether or not you need the GAL chip upgrade. Of course the
information about the availability of the GAL chips is outdated.

[begin repost]

From: posty@socs.uts.edu.au (Andrew Roughan)
Newsgroups: comp.sys.apple2
Subject: Transwarp GS upgrade article
Date: 22 Oct 92 07:18:34 GMT
Organization: Computing Sciences, Uni of Technology, Sydney.
Lines: 237


This is an article I wrote for my local user group magazine. Information
was sourced heavily from fellow Internet users and GNO-L users.

I am placing it here as a summary, and because people are again starting
to ask questions about topics contained herein.

Regards
Andrew

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Please keep author and source intact.

---cut here---
Breaking the 10Mhz barrier
By Andrew Roughan
Source Apple Users' Group, Sydney Australia

Hot news travels fast these days, and seemingly none travels faster than
the news of "14Mhz" 65C816 chips. The undercurrent at Kansasfest always
brimmed with comments about Tim Meekins running his Transwarp GS
accelerator (TWGS) at 13.75Mhz or Steven Chiang running at 14Mhz. For
those of us without accelerators, running at 2.8Mhz, this is mind
bogglingly fast! The chips in question originated from Sanyo who
re-engineered the 65C816 to boost its performance. The Sanyo chips run at
higher speeds without needing higher voltages or cooling systems.
Western Design Center (WDC - the company behind development of the 65xxx
series) purchased a large batch of these chips directly from Sanyo and
have made them available to people wishing to upgrade their TWGS boards.
WDC have always been able to provide limited quantities of 'engineering
```

parts' which performed better than 7Mhz, but the Sanyo batch has brought the average performance to greater than 12Mhz.
So with a faster processor available, are manufacturers offering faster accelerators? Zip Technology offered an upgrade for a short time and now list a 14Mhz Zip GSX card. Applied Engineering do not offer anything for TWGS owners, but fortunately it is easy enough to do it yourself.
The procedure for upgrading a Zip GSX board involves cutting traces and replacing logic array circutry, as well as purchasing a faster processor and oscillator. At this stage the process is not well documented and owners are advised to purchase the upgrade throught Zip Technology directly.

Available Documentation
Until now, for most of us at with 7Mhz Transwarps, the quest for speed has been a little daunting. Getting accurate upgrade information and finding parts suppliers has been difficult.
The article by Andrew Hall, prepared for Western Design Center and published in September 1991 Applecations, outlines four steps for getting the best possible speed out of the TWGS.
The National AppleWorks Users Group (NAUG) publication 'AppleWorks Forum' has three articles containing very detailed, accurate and informative information written by John Link. The issues are March, April and May 1991. These three issues are considered 'must read' material and are supplied by WDC to any prospective TWGS upgrader. When you contact WDC to purchase a 65C816 chip, they will insist on sending this document (by fax or mail) before processing your order.
The aim of this article is to give additional information not generally available. The upgrading steps are still the same, but now the faster parts available make it easier to get a faster speed which may tempt more Transwarp GS owners to break the 10Mhz barrier.

Prerequisites
The TWGS needs ROM version 1.5 (or greater) to work at speeds greater than 7Mhz. The current ROM can be obtained directly from Applied Engineering for US$20. The NAUG document describes how to replace the ROM. It is recommended that the TWGS have the 32k Cache upgrade. This will give you the latest ROM, faster cache memory and complimentary performance improvements. The 32k Cache upgrade can be purchased locally from Two Series Software for $99.
The other speed dependent parts on the TWGS are the GAL chips which are seated together on the right hand side of the card. The minimum versions that are known to work are TWGS1A1, TWGS2B1, TWGS3E1, TWGS4B1, TWGS5A1, TWGS6A1, TWGS7A1, TWGS8B1. A fast GAL chip set is available from LRO Computer Sales for $79 + shipping. Applied Engineering's code for the set is 10MHZPALKIT.

Obtaining the Microprocessor
Replacement 65C816 chips are obtained directly from WDC. The processors cost US$95. Shipping by airmail is an extra US$5. NAUG members can obtain 65C816 chips for US$71.25. I really shouldn't point out that if a group got together to purchase 65C816s in one shipment, that it would be worthwhile for one person to join NAUG - membership is US$31.

Obtaining the Crystal oscillator
The WDC supplied document explains why the oscillator must be four times the speed that you wish to run your system at. The shmoo plot supplied with the processor will enable you to identify what speed the processor can run at.
You then must obtain the appropriate oscillator.
Oscillators are available on this side of the Pacific Ocean from Clarke &

Severn Electronics. Different speed oscillators have different prices ranging up to $12. Contact them for information as to pricing and availability. Non "off the shelf" speed oscillators can also be ordered at a cost of $21 each. The TWGS uses a 1/2 TTL oscillator. The oscillators supplied by Clarke & Severn are standard size TTL oscillators. This means you will need to modify the oscillator to fit the TWGS. The WDC supplied document describes one method of doing this. Another is to obtain a 16 pin DIP socket from Dick Smith Electronics for 40 cents. Cut 8 pins off of one end, and solder a jumper wire between the 8th pin (cut off) and the 4th pin (not cut off) on each side. This method has the added advantage of making oscillator swapping an effortless task whereas the NAUG method involves modifying the actual oscillator.
As an alternative to Clarke & Severn, you may like to try Digi-Key in the USA. Digi-Key have the following 1/2 TTL oscillators which fit into the TWGS with no modifications:

Mhz	Part	Price (US$)
32	SE1101	3.60
33.33	SE1102	3.60
36	SE1103	3.60
40	SE1104	3.60
42	SE1105	3.60
46	SE1106	3.60
48	SE1107	3.60
50	SE1108	3.60
55	SE1109	3.60
60	SE1110	3.75

If you wish to look for other alternatives, make sure that you get TTL or CMOS oscillators. Sizes are 1/2 or standard. They come in metal and plastic bodies. The plastic ones work just fine and are possibly cheaper.

Obtaining faster cache memory
The standard TWGS 8k cache memory is 45 nanoseconds (ns). The 32k cache memory is 35ns. 35ns is supposedly fast enough for 14Mhz so you may not need faster SRAMs than this. Experimentation is still continuing in this area. SRAMs used by the TWGS and Zip GS are 32768x8 general purpose SRAMs. Try and get chips needing the lowest power requirements.
Sony make a very low power 25ns chip, CXK58258B-25LL, and a 15ns chip CXK58258A-15. VLSI Tech make 25ns, 20ns and 15ns chips: VT62832UHL-25, VT62832UHL-20, VT62832UHL-15. Other 25ns chips are Mosel, MS62256-25, and Paradigm, PDM41256L-25.
All the chips mentioned are available in 28 pin DIPS, with tri-state outputs.
Some may only be available in .3 inch or .6 inch widebody packages. My TWGS 32k Cache upgrade takes the .3 inch packages but you should check yours to make sure you get the correct size, otherwise some messy soldering could be involved.

Increasing the Power Supply

Increasing the power supply increases the performance of the processor, oscillator and GAL chip components thereby giving improved system performance. There are two methods of increasing the power supply to the TWGS. The first is to increase the voltage level output from the power supply which affects the whole system. Adjusting the power supply output is not a user servicable operation. Applied Engineering sell a 5.25 volt supply to NAUG members. The second is to use the 12 volt supply line on the TWGS edge connector, see Andrew Hall's article for this procedure.

Running your 65C816 higher than 5.5 volts is asking for trouble. The buffer chips in the TWGS and the IIgs are TTL and the design tolerances on those don't guarantee they will survive anything above 5.5 volts. There's going to be some drop, so feeding the 65C816 5.6 volts would probably work since the rest of the machine will still see 5.5 volts, but it is not recommended to go above 5.6 volts under any circumstances.

System testing
You should allow a significant period of running time to make sure that your system is reliable. Your system may work well when cool but crash unmercilessly when warm.

Success Stories
Steven Chiang (DreamWorld Software) 14Mhz
Tim Meekins (Procyon) 13.75Mhz
Chris Deschu (Internet user) 13.75Mhz
Chris Nelligan (AUG Vice-president) 12.5Mhz
Cameron Brawn (AUG Apple // sysop) 11.5Mhz

I am currently running my ROM 3 system at 12.5Mhz. I purchased a ROM 1.8S Transwarp GS with the 32k cache upgrade directly from Two Series Software.
The GAL versions are TWGS1A1, TWGS2B1, TWGS3E1, TWGS4B1, TWGS5A1, TWGS6A1, TWGS7A1, TWGS8B1. I bought a WDC engineering part 65C816 for $180 (including UPS freight and duty), a 50Mhz oscillator (to run my system at 12.5Mhz) from Clarke & Severn for $7.50. I have not purchased faster SRAMs or modified the power supply.

PARTS SUPPLIERS

High speed 65C816 processors are available from:
The Western Design Center Inc. (WDC)
2166 East Brown Road
Mesa, AZ. 85213
(602) 962-4545 (voice)
(602) 835-6442 (fax)
Talk to Deborah Lamoree when you call.

Oscillators are available from:
Clarke & Severn Electronics
PO Box 1
Hornsby NSW 2077
(02) 482-1944 (voice)
(02) 482-1309 (fax)

Digi-Key
701 Brooks Ave S
PO BOX 677
Theif River Falls, MN 56701-0677
(218) 681-6674
US$5 handling charge on orders under US$25.

Fast GAL chip sets are available from:
LRO Computer Sales
(815) 338-8658 (voice)
(815) 338-4332 (fax)
It is recommended to make sure that the item is in stock before offering payment details.

Transwarp GS ROMs are available from:
Applied Engineering
3210 Beltline
Dallas, Texas 75234
(214) 241-6060 (voice)
(214) 484-1365 (fax)

Transwarp GS 32k cache upgrades are available from:
Two Series Software
PO Box 1
West Hoxton NSW 2171
(02) 606-9343 (voice/fax)

Fast SRAMs are available from:
Sony (714) 220-9100 or VLSI Tech (408) 434-3100

National AppleWorks Users Group
Box 87453
Canton, MI 48187
(313) 454-1115

14Mhz Zip GSX cards are available from:
Zip Technology
5601 West Slauson Ave
Suite 264
Culver City CA 90230
(310) 337-1313 (voice)
---cut here---

[end repost]

--
 * Apple IIGS Forever * Kimaguire Orange Road * Battle of The Planets *
* Star Trek * Star Trek The Next Generation * Star Trek Deep Space Nine *
   * Darkstars * Death:The High Cost of Living * Quantum Leap * Enya *
    * Booster Gold * Green Lantern * Robin * Legion of Super Heroes *
  * Transformers * 92.9 K.I.S.M. * Out of This World GS * ProTERM 3.0*
   * Rastan GS * Record of Lodoss Wars * Ranma 1/2 * Gundam 0083 *
                              * DuelTris! *

--
Herbert Fung   herbertf@ersys.edmonton.ab.ca

END OF FILE fasttwgs

```
##########################################################################
### FILE: fdc10
##########################################################################

Newsgroups: comp.sys.apple2
Path:
news.weeg.uiowa.edu!news.uiowa.edu!uunet!orca!javelin.sim.es.com!javelin!kpopple
From: kpopple@imp.sim.es.com (Ken Poppleton)
Subject: Re: VGA card on an Apple II?
Message-ID: <1992Oct19.145430.12472@javelin.sim.es.com>
Sender: news@javelin.sim.es.com
Nntp-Posting-Host: imp.sim.es.com
Reply-To: kpopple@imp.sim.es.com (Ken Poppleton)
Organization: Evans & Sutherland Computer Corp., Salt Lake City, UT
References: <92287.154203JJMCWILL@MTUS5.BITNET> <behrenss.719055899@hphalle6>
<1992Oct15.225650.11922@fawlty.towers.oz.au> <1992Oct17.005632.6095@utstat.uucp>
Date: Mon, 19 Oct 1992 14:54:30 GMT
Lines: 23

In article <1992Oct17.005632.6095@utstat.uucp>, philip@utstat.uucp (Philip
McDunnough) writes:
> In article <1992Oct15.225650.11922@fawlty.towers.oz.au>
johnmac@fawlty.towers.oz.au (John MacLean) writes:
> More than anything the GS needs
>
> (1) Inexpensive 3.5" drives.
>  ...


This is currently avaible in the form of 800k IBM-PC compatable drives through
the use of the FDC-10 from CTI.

        Conversion Technology  (CTI)
        in the care of
        Patrick L. McLaughlin
      516 12th Ave
        Salt Lake City, Utah 84103

At least the card works well for Apple II's running ProDos.

--------------------------------------------------------------------------
Ken Poppleton
kpopple@imp.sim.es.com
--------------------------------------------------------------------------


### END OF FILE fdc10
```

```
##########################################################################
### FILE: fix.cap
##########################################################################

Path: news1.icaen!news.uiowa.edu!news.physics.uiowa.edu!nntp.ksu.edu!news.cis.
okstate.edu!news.ecn.uoknor.edu!munnari.OZ.AU!spool.mu.edu!uwm.edu!cs.utexas.
edu!news.sprintlink.net!news-peer.sprintlink.net!news-peer.gsl.net!news.gsl.net
!portc01.blue.aol.com!audrey01.news.aol.com!not-for-mail
From: rubywand@aol.com
Newsgroups: comp.sys.apple2
Subject: Re: IIGS Monitor problem...Help, Please
Date: 18 Nov 1996 04:26:45 GMT
Organization: America Online, Inc. (1-800-827-6364) (1.10)
Lines: 54
Sender: news@aol.com
Message-ID: <19961118042900.XAA21384@ladder01.news.aol.com>
References: <h1JVYDW.tdon@delphi.com>
NNTP-Posting-Host: ladder01.news.aol.com
X-Newsreader: AOL Offline Reader

In article <h1JVYDW.tdon@delphi.com>, Tom O'Neill <tdon@delphi.com>
writes:

>
>While tickling the keys two nights ago and dling my e-mail from Delphi
>using Spectrum, there was a slight "poof" sound.  Immediately, the screnn
>went from text to a checkerboard pattern, multicolored...red, green, and
>blue, I think...and it began flipping about once or twice a
>second...scrolling
>upwards, that is.
>....
>

     Since you still have power for the drives, the "POOF" sounds like a
blowing electrolytic capacitor. (Sometimes, they explode; sometimes, they
poof.)

    The main suspect is one of the caps in your power supply; but, it
won't hurt to look and sniff around your Slot cards and the motherboard.
If you do not find anything, pull your Slot cards, replace the 65C816 uP,
and turn ON the computer.

    Check the +5V line voltage. (You can find +5V on Pin 25 of any Slot
socket.)  If the voltage is at or close to 5V (4.8V-5.1V), there is a
decent chance the 5V line is okay. Also check the other voltages (+12V at
Pin 50, -12V at Pin 33, -5V at Pin 34).

    If your system can boot ProDOS 8 from diskette and the display looks
normal, then, suspicion falls on one of the cards you've pulled. Carefully
examine each. You are looking for a capacitor with scum at its base; but,
if you see a burned resistor, blown diode, ..., this could be your
problem. (Diodes, however, seldom poof; resistors usually either pop or
fry. Globars can poof; but, then, you would be getting no power at all.)
Coils can poof; but, this is fairly rare.

   Use your nose, too. Lots of times it can zero-in on the problem area. A
blown electrolytic cap smells a bit like burned bakelite.

    If your +5V line is reading low, the power supply should be pulled and
```

checked. One test is to clip a 10 Watt 10 Ohm resistor between +5V and Gnd and measure each of the voltages from the output to Gnd. If any voltages are low, then open the supply and look/sniff around. You should find one or more caps with scum at the base and a distinctive scent and/or a charred choke coil or a cracked rectifier diode..

If the power supply seems okay, you can try increasing the load on the +5V line by adding another 10 Watt 10 Ohm resistor in parallel with the first. If it's still okay, suspicion shifts to some kind of short on the motherboard, probably on the +5V line.

Replace any bad components.

Rubywand

END OF FILE fix.cap

```
##############################################################################
### FILE: flash.eeprom
##############################################################################

Path:
news1.icaen!news.uiowa.edu!uunet!in5.uu.net!news1.interlink.net!news1.interlink.ne
t!sunqbc.risq.qc.ca!news.uow.edu.au!david
From: david@uow.edu.au (David Wilson)
Newsgroups: comp.sys.apple2
Subject: Re: Hardware Project
Date: 14 Nov 98 03:15:42 GMT
Organization: University of Wollongong, Australia
Lines: 43
Message-ID: <david.911013342@wraith>
References: <364919f0.0@news.cgocable.net> <364A6F6E.46D6C5B6@thegrid.net>
<david.910851756@wraith> <Pine.GSO.3.96.981112082457.18971F-100000@ordinateur>
<1digo03.118jc48dwt1g5N@dempson.actrix.gen.nz>
NNTP-Posting-Host: wraith.cs.uow.edu.au
X-Trace: wyrm.its.uow.edu.au 911014648 9909 130.130.64.1 (14 Nov 1998 03:37:28
GMT)
X-Complaints-To: usenet@wyrm.its.uow.edu.au
NNTP-Posting-Date: 14 Nov 1998 03:37:28 GMT
X-Newsreader: NN version 6.5.0 #15 (NOV)
Xref: news1.icaen comp.sys.apple2:141759

dempson@actrix.gen.nz (David Empson) writes:
>Yet another variant is Flash ROM.  I've never been entirely clear on the
>difference between Flash ROM and EEPROM, as they seem to overlap in
>features.  Flash is generally characterised by being able to be erased
>and reprogrammed in sectors, while EEPROM is more often bulk erased and
>reprogrammed one byte at a time.

I had the same query re the difference between Flash and EEPROM.

Here is one explanation from http://webopedia.internet.com/TERM/E/EEPROM.html:

      EEPROM is similar to flash memory
      (sometimes called flash EEPROM).
      The principal difference is that
      EEPROM requires data to be written
      or erased one byte at a time whereas
      flash memory allows data to be
      written or erased in blocks. This
      makes flash memory faster.

I find this explanation unconvincing but reading a few data sheets gives some
credence to it. For example, the MC68HC912B32 has both EEPROM and Flash EEPROM
and is described as follows:

      The chip is the first microcontroller to include both byte-erasable
      EEPROM and Flash EEPROM on the same device.

The Flash chips I have been using lately in another project are 4Mb (512KByte)
and can be erased in 64KB blocks and are rewritten one byte at a time needing
only 5v supply (the 1Mb parts we had before this needed 12v to program).

The MC68HC12A4 has internal 16 bit wide EEPROM which can be erased either by
the byte, aligned word, aligned row (32 bytes) or bulk (4KB) but can only
be written by the byte or aligned word.
```

Based on that, Flash seems less flexible than EEPROM. Having to erase 64KB
to rewrite a sector would prevent its use as a standard disk but would still
be useful for a read mostly disk.

EEPROM is typically good for 10,000 erase/write cycles while flash is 100,000
erase/write cycles (based on a sample of two datasheets).
--
David Wilson School of IT & CS, Uni of Wollongong, Australia david@uow.edu.au

END OF FILE flash.eeprom

```
##############################################################################
### FILE: flyback
##############################################################################

Xref: news.weeg.uiowa.edu comp.sys.apple2:63949 comp.sys.misc:2753
Path: news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!gatech!prism!gt1666b
From: gt1666b@prism.gatech.EDU (SHELL,MICHAEL DAVID)
Newsgroups: comp.sys.apple2,comp.sys.misc
Subject: Re: look for monitor flyback
Message-ID: <116546@hydra.gatech.EDU>
Date: 13 Oct 93 02:21:56 GMT
References: <CELCxy.1JJ@chemelex.com>
Followup-To: comp.sys.apple2
Distribution: ba,usa
Organization: Georgia Institute of Technology
Lines: 49

In article <CELCxy.1JJ@chemelex.com> fms@chemelex.com writes:
>Hi, My wife's school Apple II GS, with many happy years as a
>classroom computer has died. Actually, the monitor gave it up
>with a small puff of smoke. The TV repairman in town says we
>need a
>
>     Mitisbushi (sp?) manufacturers part number
>           CP334P00901
>
>     which is a high voltage transformer (I think) or a
>flyback.
>
>Our repairman is unable to locate this part. Anyone have one or
>know how or where to get one? I'm located in the San Francisco
>Bay Area.
>
>Thanks,
>---
>Fred Schenkelberg
>fms@chemelex.com
>--
>Fred Schenkelberg

Try this:

Mitsubishi Electric Sales America, Inc.
Service Dept. Consumer Prod.
5757 Plaza Dr.
P.O. Box 6007
Cypress,CA 90630-007
(714)-220-2500
(800)-888-6773

or

MCM Electronics
650 Congress Park Dr.
Centerville, Ohio 45459-4072
(800) 543-4330

They carry a good selection of aftermarket replacement flyback transformers.
```

(at least they did the last time I ordered from them)

Both places should be happy to do a mail order.
Hope this helps! Good luck!

--
Mike Shell
gt1666b@prism.gatech.edu

END OF FILE flyback

```
##############################################################################
### FILE: gameio.pinouts
##############################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!newsfeed.internetmci.com!news.kei.com!nntp.coast.
net!lll-winken.llnl.gov!fnnews.fnal.gov!nntp-server.caltech.edu!nathan
From: nathan@cco.caltech.edu (Nathan Mates)
Newsgroups: comp.sys.apple2.programmer
Subject: Re: TTL
Date: 31 May 1996 07:44:49 GMT
Organization: California Institute of Technology, Pasadena
Lines: 53
Message-ID: <4om81h$ap6@gap.cco.caltech.edu>
References: <Pine.A32.3.93.960531001302.14571B-100000@freenet4.afn.org>
NNTP-Posting-Host: accord.cco.caltech.edu

In article <Pine.A32.3.93.960531001302.14571B-100000@freenet4.afn.org>,
Donald 'X-caiver' Pattee Jr  <afn45687@afn.org> wrote:
>I was trying to use my gamepot (In my GS) to drive some little relays...I
>know I have my program correct and I know I am using the correct addresses
>because the inputs are working). To test I tried to just drive an LED with
>the outputs (which according to teh manual, should work). I know which pins
>the annunciator outputs are in, but where is 'ground' or whatever I should
>clip the other end of my LED too, at?

Shameless plug: the following is a cut & paste job off my Apple II
Resources WWW pages, specifially the 'general questions' page at
http://www.ugcs.caltech.edu/~nathan/a2stuff/generalques.html

Apple 16-pin DIP socket (on the motherboard):

     ====================
     |                  |
 8   |  *             *  |  9
 7   |  *             *  |  10
 6   |  *          === *  |  11
 5   |  *        |    *  |  12    <--  Notch on socket
 4   |  *        |    *  |  13
 3   |  *          === *  |  14
 2   |  *             *  |  15
 1   |  *             *  |  16
     |                  |
     ====================

Pin 1 - +5V Power
Pin 2 - Pushbutton 0
Pin 3 - Pushbutton 1
Pin 4 - Pushbutton 2
Pin 5 - Strobe
Pin 6 - Game Control 0
Pin 7 - Game Control 2
Pin 8 - Ground
Pin 9 - No Connection
Pin 10 - Game Control 1
Pin 11 - Game Control 3
Pin 12 - Annunciator 3
Pin 13 - Annunciator 2
Pin 14 - Annunciator 1
```

```
Pin 15 - Annunciator 0
Pin 16 - No Connection

   Use pin 8 for the ground.

Nathan Mates
--
<*> Nathan Mates http://www.ugcs.caltech.edu/~nathan/      <*>
# And he said to them, "To you has been given the secret of the
# Kingdom of God, but for those outside, everything comes in
# parables" Mark 4:11, NRSV


### END OF FILE gameio.pinouts
```

```
##############################################################################
### FILE: gameio.pins
##############################################################################

Path:
news.uiowa.edu!uunet!salliemae!europa.chnt.gtegsc.com!cantaloupe.srv.cs.cmu.edu!da
s-news2.harvard.edu!news2.near.net!howland.reston.ans.net!usc!nic-
nac.CSU.net!cello.gina.calstate.edu!cello.gina.calstate.edu!not-for-mail
From: jkenner@cello.gina.calstate.edu (Jason Kennerly)
Newsgroups: comp.sys.apple2.programmer
Subject: Re: Game port pin #'s
Date: 1 Apr 1995 19:27:14 -0800
Organization: GINA and CORE+ Services of The California State University
Lines: 16
Message-ID: <3ll5ii$jd@cello.gina.calstate.edu>
References: <kjTQg2a00WBO0392sk@andrew.cmu.edu>
NNTP-Posting-Host: cello.gina.calstate.edu

Description:      Internal pin#:    External pin #:
+5 Power Supply       1                 2
Switches [buttons]    2,3,4             7,1,6
Strobe                5                 -
Paddle 0-3            6,10,7,11         5,8,4,9
Ground                8                 3
Annunciators          15,14,13,12       -
Nothing               9,16              -


hope this helps...

I have the //e technical reference [and an apple 2, 2+, and 2c, but no
2e... gotta love the irony] so just ask if ya have ?'s
--
Remember what the doormouse said - feed your head!
Path:
news.uiowa.edu!hobbes.physics.uiowa.edu!news.ksu.ksu.edu!vixen.cso.uiuc.edu!howlan
d.reston.ans.net!news.sprintlink.net!malgudi.oar.net!infinet!vleonard
From: vleonard@infinet.com (Victor Leonard)
Newsgroups: comp.sys.apple2.programmer
Subject: Re: Game port pin #'s
Date: 2 Apr 1995 04:18:01 GMT
Organization: InfiNet
Lines: 46
Message-ID: <3ll8hp$bqr@horus.infinet.com>
References: <kjTQg2a00WBO0392sk@andrew.cmu.edu>
NNTP-Posting-Host: rigel.infinet.com
X-Newsreader: TIN [version 1.2 PL2]

Ido Ben-Shachar (grasshopper+@CMU.EDU) wrote:
:   Does anyone know the pins on the internal game port?  (ie, where you
: plug in joystick stuff)

: This is the 16 pin connector, by the way.


From apple //e technical reference manual (combined from about 4 pages
all of which got VERY well used when I used to connect apples together
using game port for fun and games (that I wrote))
```

```
      9     8     GND
PDL1  10    7     PDL2
PDL3  11    6     PDL0
AN3   12    5     STB
AN2   13    4     SW2
AN1   14    3     SW1/CAPL (OPTION)
AN0   15    2     SW0/OAPL
      16    1     +5C
```

1 +5C +5 volts (not to exceed 100mA
2 PB0 (button 0 or switch 0) (read $c061)
3 PB1 (read $c062)
4 PB2 (read $c063)
5 STROBE' also 'Analog input reset' Strobe output. line goes low
      during 0O of a read or write instruction to $c040
6 PDL0 (read $c064) goes low after read or write to $c040 until capacitors
     recharge (connect +5v to PDLn with resistance. amount of resistance
     determines how long til $c064 goes high
7 PDL2
8 GND system ground
9 n.c. not connected
10 PDL1
11 PDL3
12 AN3 Annunciators. These are standard 74LS TTL outputs and must be
     buffered to drive other than TTL inputs (on = rw $c05f, off $c05e)
13 AN2 (on $c05d, off $c05c
14 AN1 ($c05b, $c05a)
15 AN0 ($c059, $c058)
15 n.c.

jim
vleonard@infinet.com
Path:
news.uiowa.edu!hobbes.physics.uiowa.edu!newsrelay.iastate.edu!vixen.cso.uiuc.edu!h
owland.reston.ans.net!newsjunkie.ans.net!newstf01.news.aol.com!newsbf02.news.aol.c
om!not-for-mail
From: wagnere@aol.com (WagnerE)
Newsgroups: comp.sys.apple2.programmer
Subject: Re: Game port pin #'s
Date: 3 Apr 1995 02:41:35 -0400
Organization: America Online, Inc. (1-800-827-6364)
Lines: 6
Sender: root@newsbf02.news.aol.com
Message-ID: <3lo5b0$8ig@newsbf02.news.aol.com>
References: <3lltfj$gl@paris.ics.uci.edu>
Reply-To: wagnere@aol.com (WagnerE)
NNTP-Posting-Host: newsbf02.mail.aol.com

Be aware that Apple made some slight changes to the 16-pin gameport on the
Apple IIgs.

A fourth push button switch was added (SW3 or PB3) at pin 9
And the STROBE' output signal at pin 5 was replaced with a +5-volt pull-up

END OF FILE gameio.pins

```
##########################################################################
### FILE: gameport
##########################################################################

Newsgroups: comp.sys.apple2
Path: blue.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!news.starnet.net!wupost!waikato!comp.vuw.ac.nz!ac
trix.gen.nz!dempson
From: dempson@atlantis.actrix.gen.nz (David Empson)
Subject: Re: Pinout for Joystick Port on Apple IIe ?
Message-ID: <D32E26.KL2@actrix.gen.nz>
Sender: news@actrix.gen.nz (News Administrator)
Organization: Actrix - New Zealand Internet Service Providers
Date: Fri, 27 Jan 1995 12:44:29 GMT
References: <3g9akt$r8t@crl7.crl.com>
X-Nntp-Posting-Host: atlantis.actrix.gen.nz
Lines: 127

In article <3g9akt$r8t@crl7.crl.com>, Derek Wong <derekw@crl.com> wrote:
>
>  Could someone please post the pinouts for the joystick port on an AppleIIe?

There are two of them (the DB-9 on the back, and the internal 16-pin
socket).

The internal one is the original game connector, which is identical on
the Apple ][, ][+ and all versions of the IIe.  The IIgs's game
connector is identical except for two signals (see below).

The external one is provided on the IIe, IIc and IIgs.  The IIc
version also supports a mouse.

Here are the pinouts for all the variations.

DB-9  16-pin  Function         Notes

2      1      +5 Volts
7      2      Button 0         IIe, IIc, IIgs: Open Apple (Apple)
1      3      Button 1         IIe, IIc, IIgs: Closed Apple (Option)
6      4      Button 2         ][, ][+, IIe: used with shift-key mod
                                IIc: no connection
-      5      Strobe Output    IIgs: not supported
5      6      Paddle 0         IIc: also used for Mouse X move
4      7      Paddle 2         IIc: Mouse X direction
3      8      Ground
-      9      No connection    IIgs: Button 3
8     10      Paddle 1         IIc: also used for Mouse Y direction
9     11      Paddle 3         IIc: Mouse Y move
-     12      Annunciator 3
-     13      Annunciator 2
-     14      Annunciator 1
-     15      Annunciator 0
-     16      No connection

Hardware Notes
==============

A joystick should be wired to use Paddle 0 for the X direction and
Paddle 1 for the Y direction.
```

The paddle inputs are intended to be used with a 150 Kohm variable resistor between the paddle input and +5V. Low resistance returns a low reading and high resistance returns a high reading.

The button inputs should be driven by momentary contact pushbuttons, connecting the appropriate input line to +5V while pressed. There should be no connection to the button input while the button is released.

The shift-key mod (switch 2) operates by connecting the shift key to the button input pin. The shift key reads in the opposite state to a button - the bit is clear while the button is down.

Note that with the standard shift-key mod (a simple wire), the power supply will be shorted out if the shift key is pressed at the same time as pushbutton 2. This can be avoided by using a low value resistor in series with the wire.

(There is no problem with pressing button 0 or 1 at the same time as the Apple or Option key.)

The annunciators generate a TTL-level output, which can be set high or low under software control.

The strobe output is a TTL-level signal that is normally high, and goes low for half a microsecond when the strobe location is accessed. On the IIgs, this output is permanently high.

Software Notes

The paddle timing circuits are triggered by reading $C070. Locations $C064 to $C067 can then be monitored to see when the high order bit goes to zero. The time this takes is proportional to the resistance setting of the paddle.

There is a standard routine provided in the ROM to read one paddle (PREAD at $FB1E: load X with the paddle number from 0 to 3, and the value is returned in Y). Applesoft BASIC provides the PDL(n) function.

With both these routines, false readings may occur unless the software waits long enough between calls to read different paddles. If the paddle is still counting down from the previous reading, it will not be retriggered. (All paddles are triggered at the same time.)

Most programs deal with this by separating the reading of the X and Y axis of the joystick, or by using a custom routine to read both paddles at the same time.

The button inputs can be sensed in locations $C061-$C063. Bit 7 goes high if the button is pressed. On the IIgs, button 3 can be accessed at $C060 (this is the cassette input on the II+ and IIe).

With the shift-key mod installed, the shift key can be sensed by testing for bit 7 of $C062 (button 2) being low.

On the IIe, IIc and IIgs, the Apple and Option keys cause bit 7 of $C061 (Apple) or $C062 (Option) to be set. On the IIe and IIc, it is not possible to distinguish a paddle or joystick button from these keys. On the IIgs, the modifier keys can be read from another location, so a press of the button can be identified as long as the corresponding key is not being pressed.

A pulse is generated on the strobe output by reading location $C040. This location is unused on the IIgs.

The annunciators are controlled by pairs of locations in $C058-$C05F. Reading or writing the lower of the two addresses sets the output off (low). Reading or writing The higher of the two addresses sets the output on (high).

I won't go into the IIc mouse support - it is far too complicated. The mouse interface is designed to be able to detect whether a mouse is connected, and this does not interfere with a standard joystick plugged into the game port.

--

David Empson
dempson@actrix.gen.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand

END OF FILE gameport

```
##############################################################################
### FILE: genericio.specs
##############################################################################

From: "ntt" <ntt@dove.mtx.net.au>
Newsgroups: comp.sys.apple2
References: <364919f0.0@news.cgocable.net> <Pine.SOL.3.96.981114110324.27535A-
100000@
moose> <david.911171291@wraith>
Subject: Re: Hardware Project
Date: Tue, 17 Nov 1998 08:08:37 +1030
Lines: 76
X-Newsreader: Microsoft Outlook Express 4.72.3110.1
X-MimeOLE: Produced By Microsoft MimeOLE V4.72.3110.3
NNTP-Posting-Host: pppk56a-77.mtx.net.au
Message-ID: <36509add.0@news.mtx.net.au>
X-Trace: 17 Nov 1998 08:06:29 -1050, pppk56a-77.mtx.net.au
Path: news1.icaen!news.uiowa.edu!news.physics.uiowa.edu!math.ohio-state.edu!news.
cis.ohio-state.edu!news.maxwell.syr.edu!newspeer.monmouth.com!intgwpad.nntp.
telstra.net!news1.optus.net.au!optus!yorrell.saard.net!duster.adelaide.on.net
!news.saix.saia.asn.au!news.mtx.net.au!pppk56a-77.mtx.net.au
Xref: news1.icaen comp.sys.apple2:141876


David Wilson wrote in message ...

>Most any card you design with on-board ROM needs to decode all three
selects
>(DEVSEL, IOSEL and IOSTB) and generate chip selects for ROM, devices and
the
>data bus buffer. This tends to take quite a few LSTTL chips. My idea is to
>replace these with a single PAL/GAL (plus an 8 input NAND gate) to take
care
>of all this (including the CFFF disable function). It will also allow for
the
>use of RAM instead of ROM as this makes code development much easier.
>
>Any thoughts on this would be appreciated.


It is hard to imagine any significant project being undertaken which would
really benefit from this. It is almost impossible to get hold of devices (eg
EPROM) that would fit into the memory space (and those you do get, you
probably wouldn't want to use). Using larger devices would be a waste
without making available the rest of the memory which means using some form
of bank switching.

How generic is the PAL/GAL to be (since you're also adding a TTL device as
well)?

PLDs are becoming inexpensive and readily available. It would be easy enough
to produce a trivial PLD design which would decode everything (get rid of
the NAND gate), provide /CS lines and addressing for modern memory devices
(eg 128Kx8 --> 512Kx8) making the entire space available through the 2K
C800:CFFF window using an arbitrary location (eg C0[n+8]0) for the bank
switching. Decoding the slot ROM (Cnxx) could force a certain bank (such as
bank zero which would presumably always be there). The PLD could also
convert the R/W line to /OE and /WE lines for memory.
```

You don't need to use all this space, but at least make it available...

Lets see...

To make all of this happen, you need /IOSEL, /IOSTRB & /DEVSEL for the 3 memory spaces
   you need the 8 data bus lines to latch a bank number
       (if you wanna make it simple make this read only)
   A7:0 can go straight through to the memory chips...
   A10:8 need to be latched (and driven) if you want to
       force Cnxx accesses to a certain bank
   you need to produce the high 8 address lines
       (latched from the data bus/forced by /IOSEL)
   you need to produce at least one /CS line
   you need to convert R/W into /OE and /WE

adding that up you get 3 + 8 + 0 + (3 + 3) + 8 + 1 + (1 + 2) = 29 available I/Os

This will fit comfortably in a 44-pin PLCC (socketable) package for under $10 and will address all locations ('cept for the 256 CFFF locations (one in each bank)) of a 512Kx8 FLASH (non-volatile memory) or SRAM. Smaller parts will just 'wrap around in the available banks.

There are still outputs available in the same package for decoding other locations in the C0[n+8]x range for other devices or purposes.

If you want to get fancy you could use the 7M clock to generate /CAS and /RAS signals for DRAMs but this would require a larger package.

Going to a 68-pin PLCC package (or 84-pin PLCC) would give you enough I/Os to decode almost anything.

If you were to produce some generic 'application-specific' logic parts you might as well do it properly...

cheers
ntt@dove

Path: news1.icaen!news.uiowa.edu!news.physics.uiowa.edu!math.ohio-state.edu!howland.erols.net!sunqbc.risq.qc.ca!news.uow.edu.au!david
From: david@uow.edu.au (David Wilson)
Newsgroups: comp.sys.apple2
Subject: Re: Hardware Project
Date: 16 Nov 98 22:03:27 GMT
Organization: University of Wollongong, Australia
Lines: 58
Message-ID: <david.911253807@wraith>
References: <364919f0.0@news.cgocable.net> <Pine.SOL.3.96.981114110324.27535A-100000@moose> <david.911171291@wraith> <36509add.0@news.mtx.net.au>
NNTP-Posting-Host: wraith.cs.uow.edu.au
X-Trace: wyrm.its.uow.edu.au 911255509 207 130.130.64.1 (16 Nov 1998 22:31:49 GMT)
X-Complaints-To: usenet@wyrm.its.uow.edu.au
NNTP-Posting-Date: 16 Nov 1998 22:31:49 GMT
X-Newsreader: NN version 6.5.0 #15 (NOV)
Xref: news1.icaen comp.sys.apple2:141879

"ntt" <ntt@dove.mtx.net.au> writes:
>It is hard to imagine any significant project being undertaken which would

>really benefit from this. It is almost impossible to get hold of devices (eg
>EPROM) that would fit into the memory space (and those you do get, you
>probably wouldn't want to use). Using larger devices would be a waste
>without making available the rest of the memory which means using some form
>of bank switching.

I had already discarded 2716/2732 and reached 2764/6264 sized chips. Bank selection is included (1/4 is used for the slot space, the remainder is banked 3 ways into the C800-CFFF space).

>How generic is the PAL/GAL to be (since you're also adding a TTL device as
>well)?

Just a standard 20V10 or similar.

>PLDs are becoming inexpensive and readily available. It would be easy enough
>to produce a trivial PLD design which would decode everything (get rid of
>the NAND gate), provide /CS lines and addressing for modern memory devices
>(eg 128Kx8 --> 512Kx8) making the entire space available through the 2K
>C800:CFFF window using an arbitrary location (eg C0[n+8]0) for the bank
>switching. Decoding the slot ROM (Cnxx) could force a certain bank (such as
>bank zero which would presumably always be there). The PLD could also
>convert the R/W line to /OE and /WE lines for memory.

Very similar to my GAL design. Rather than using up the limited C0[8+n]X space I am using CFFC-E to select banks 0..2 while bank 3 is forced when IOSEL is asserted.

The reason for a GAL is that it is relatively small and I have access to a GAL burner.

>To make all of this happen, you need /IOSEL, /IOSTRB & /DEVSEL for the 3
>memory spaces
Got them.
>   you need the 8 data bus lines to latch a bank number
>   (if you wanna make it simple make this read only)
No need as I use A0-A2 instead.
>   A7:0 can go straight through to the memory chips...
>   A10:8 need to be latched (and driven) if you want to
>   force Cnxx accesses to a certain bank
I feed A10:8 straight to the EPROM - this uses 8x256 bytes for the slot ROM but does allow slot dependant code rather than having to write PIC.
>   you need to produce the high 8 address lines
>   (latched from the data bus/forced by /IOSEL)
I am producing A11 & 12.
>   you need to produce at least one /CS line
Yep.
>   you need to convert R/W into /OE and /WE
Currently /WE = R/W* and the GAL inverts R/W* to form /OE.

>If you were to produce some generic 'application-specific' logic parts you
>might as well do it properly...

Very interesting ideas. Thanks for the input.
--
David Wilson School of IT & CS, Uni of Wollongong, Australia david@uow.edu.au

END OF FILE genericio.specs

```
##########################################################################
### FILE: graphics.tablet
##########################################################################

Path: news.uiowa.edu!chi-
news.cic.net!hookup!news.mathworks.com!tank.news.pipex.net!pipex!blackbush.xlink.n
et!ka.sub.net!news
From: Oliver.Schmidt@powerframe.de (Oliver Schmidt)
Newsgroups: comp.sys.apple2
Subject: Re: Apple Graphics Tablet
Date: Wed, 12 Jun 1996 08:25:43 GMT
Organization: powerframe Datensysteme GmbH
Lines: 77
Message-ID: <4pluvs$mh8@ka.sub.net>
References: <255967003.15208359@adbbs.antioch.edu>
NNTP-Posting-Host: pcos.pf.sub.de
Mime-Version: 1.0
Content-Type: text/plain; charset=iso-8859-1
Content-Transfer-Encoding: 8bit
X-Newsreader: Forte Free Agent 1.0.82

John_L._Graham@adbbs.antioch.edu (John L. Graham) wrote:

>I had a similar question. I recently was given an Apple Graphics Tablet in
>_mint_ condition. Interface card and everything, but no software. Does anyone
>know how to write programs which can use it? I looked in our library of Apple
>tech notes but came up empty.

Hi,

first, let's make sure we're talking about the same thing: the Apple
Graphics Tablet I know of is rather large and heavy; its pen is
attached to it with a (too short) cable; it makes funny sounds that
change when the pen is moved in/out the reach of of the tablet.

A long time ago I patched a few programs to make use of this tablet.
To make it clear in the first place - I don't have theese patched
versions available anymore :-(. But I found a listing from which I can
tell You this:

To detect to interface card, I looped over all slots to check in its
firmware for

$B0 at location $Cx01 and

$20 at location $Cx09

beeing x the slot number. I never found this 'signature' in any other
firmware.

To check for the pen position one has to poll the tablet (again beeing
x the slot number):

LDA $CFFF ; switch off all extension ROMS

LDA $Cx00 ; switch on the extension ROM of the tablet

LDA #$Cx
STA $07F8 ; initialize some hidden text screen data area for the
```

tablet firmware

JSR $CBB9 ; call well known location ;-) in tablet firmware

When the pen is in reach of the tablet (up or down) this routine will return immediatly. Else it will block - fortunatly the routine checks the keyboard strobe ($C010) too and will also return if a key is pressed, even if the pen remains out of tablets reach.

After the routine has returned one can get the information:

$0280 contains the state of the pen (up or down), I don't know excatly any more wich bit it is nor if one can distiguish between 'pen up' and 'pen out of reach but key pressed'

$0281, $0282 contains the absolute X position of the pen

$0283, $0284 contains the absolute Y position of the pen

As far as I can remember the values have about 12 bit resolution (!). Usually I needed screen coordinates (280 x 192), so I dropped the 4 least significant bits and did some additional adjustment. Unfortunatly I can't remember either what coordinates will be there in the 'out of reach but key pressed' case.

Hope this helps a little - if somebody has success using this method, please give me some feedback.

BTW: I'm working on an Apple][+ emulator, but suffer from a total lack of infos about the Apple][mouse (I think it goes into slot 4 and uses some interrupt stuff ???) due to the fact that I have never even seen such a mouse. Any way I'd like to build support for it into my emulator. So what ports - what firmware - ... thanks for help in advance.

Oliver

EOF

END OF FILE graphics.tablet

```
##########################################################################
### FILE: grappler-phasor.dips
##########################################################################

Newsgroups: comp.sys.apple2
Path:
blue.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!newsrelay.iastate.edu!
newsxfer.itd.umich.edu!gatech!rutgers!utcsri!newsflash.concordia.ca!vax2.concordia
.ca!spector
From: spector@vax2.concordia.ca (Mitchell Spector)
Subject: Re: Need info re: Phazor, SeriALL, Grappler + (Buffered)
Message-ID: <12AUG199418444616@vax2.concordia.ca>
News-Software: VAX/VMS VNEWS 1.41
Sender: usenet@newsflash.concordia.ca (USENET News System)
Nntp-Posting-Host: vax2.concordia.ca
Organization: Concordia University
References: <brianf.2zt3@sempco.uucp>
Date: Fri, 12 Aug 1994 23:44:00 GMT
Lines: 107

In article brianf@sempco.uucp (Brian Flanagan) writes...
>
>I recently picked up some old Apple cards, but didn't get any technical
>documentation on them.  Could someone please tell me...

Sure.. :)

>re: Buffered Grappler +:  What are the 4 DIP switches used for?  What is the
>pinout on the cable (I don't have a cable for it.)?

      I have two standard Grappler+ cards, as well the the 64k Buffered
Grappler+ version. The DIP switches are used to configure your card for a series
of different printers out there (I'll list those settings below). You may also
want to test the RAM memory on your Buffered Grappler+, so do the following
to invoke it's built-in self test. Making sure the card is installed in slot
#1, with the cable attached to the printer and the printer online with paper
in it, turn on your Apple II with the RESET key hold down, then release it
after 2-3 seconds. If you've done this correctly, a message will be printed
saying the test is in progress. After 45 seconds the status of your RAM chips
will be printed, numbered 1 to 8. If an "X" appears, this indicates the absence
of a RAM chip or a _bad_ chip. If you see a "1", this means a DRAM chip has been
found at the location and tests good. The cable you need is very common, and
all my other Apple II printer cards use it. It's a 26-pin female, to a 25-pin
centronics ribbon cable.

G+ Pin assignments:     DIP switch settings:
~~~~~~~~~~~~~~~~~~      ~~~~~~~~~~~~~~~~~~
STB   1           DIP SWITCH POSITIONS            1    2    3    4
D0    3
D1    5                 Epson Series and Star Gemini      OFF  ON   ON   ON
D2    7           NEC 8023/C, Itoh 8510/DMP 85      OFF  ON   ON   OFF
D3    9           Centronics 739-1                  OFF  ON   OFF  ON
D4    11          Anadex Printers                   OFF  ON   OFF  OFF
D5    13          Okidata 82A, 83A, 92, 93, 84      OFF  OFF  ON   ON
D6    15          Okidata 84 w/o Step II Graphics   OFF  OFF  OFF  ON
D7    17                Apple Dot Matrix                 OFF  OFF  ON   OFF
ACK   19                IDS Printers                     (Any position)
BUSY  21
P.E.  23                Notes: "+" side, or set to right, the switch is set to
```

```
SLCT  25                the ON position. Switch 1 controls MSB, the 8th bit.
N/C   -                 Setting switch 1 to 'ON' makes MSB _not_ transmitted...
GND   all others
```

[ps - Anyone know if a Grappler+ (or Buffered Grappler+) will function in an Apple IIgs to drive a centronics printer? (ie - DeskJet 560, etc). I haven't tried, but I suspect a ROM update may be necessary. Is it?]

>re: Phasor (Applied Engineering) What are the 4 DIP switches used for? What >are the 2 POTs used for? Where can I get programming information for this >soundcard? Is Applied Engineering still in business? (I hope so, they're my >favorite Apple hardware company!) I've tried contacting them recently, but >couldn't find a current phone number.

The Phasor is a great sound card. Offers you 12 sound channels (using all sorts of wave-form patterns and effects, simular to FM-synthesis in IBMs), 4 white noise generators (synthesized drums, etc) and a 1-voice synthesized speech channel, expandable to 2 speech channels. Has a 4 watt amplifier that can drive stereo speakers (left & right). It's compatible with most older sound cards, like the Mockingboard, ALF, SMS and Echo+. Few programs ever supported it, let alone many programs out there that supported the older cards. It did, however, come with some decent software that showed off the card's features and let you experiment with it a bit.

The four DIP switches control emulation modes and standard Apple][internal speaker sound-level (only if you disconnect internal speaker and have old speaker toggling sent to Phasor). Switches #1 and #2 are for emulations. Switches #3 and #4 control your old internal speaker sounds, again, *if* you have speaker disconnected and that pin location on motherboard connected to Phasor. You can set Low, Medium and High volume with three different DIP positions. This doesn't affect Phasor music/sound however. To do that, you must turn those two pots you asked about. Each controls either the left or right stereo channel. Turning them clock-wise increases volume, and you probably don't want this too high up, or sound gets distorted! Put both on an equal setting, unless you want one channel louder/softer than the other.

Phasor DIP switch emulation modes:
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

```
Native Phasor mode:   1: closed, 2: closed
Mockingboard  mode:   1: opened, 2: closed
Echo+         mode:   1: opened, 2: opened  (Never got this mode to work!)
```

As for Applied Engineering, you won't be able to contact them. They went out of business back around March 1994. Not just the Apple II division, but the entire company as a whole (Mac, Apple, Amiga divisions -- gone!). You may be able to contact former AE employees on GEnie, there was a rumour of someone taking over their repair/support for II users.

>re: SeriALL (Practical Peripherals) Same questions... What are the cable >pinouts? What are all the switches used for?

I have a Practical Peripherals MicroBuffer II card. Mine seems to be the parallel version of what you have. If the same, it may use the same non-standard 20-pin connector.

>If anybody has any technical information on any of these cards, (or knows where >I can get some) please e-mail me a note.
>
>Thanks!
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

```
>
>Brian Flanagan,  please address E-Mail as follows,
>from INTERNET: sempco!brianf@wupost.wustl.edu
>         UUCP: wupost.wustl.edu!sempco!brianf

Mitchell Spector
sb_spec@pavo.concordia.ca / spector@vax2.concordia.ca



### END OF FILE grappler-phasor.dips
```

```
##########################################################################
### FILE: grappler.dips
##########################################################################

Newsgroups: comp.sys.apple2
Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!usc!newshub.cts.com!crash!pro-palmtree!rder
From: rder@pro-palmtree.cts.com (Richard Der)
Subject: Re: Dip switch setting on Z-80 Card and Grappler+ Printer card
Organization: The Palmtree BBS - 310/453-8726 - Santa Monica, CA
Date: Wed, 10 Jul 96 00:39:32 PDT
Message-ID: <ga02410@pro-palmtree.cts.com>
Lines: 50


>Does any one know what the dip switches on the above mentioned
>card are used for?
>
>The printer card is a Grappler+ Printer interface made by
>Orange Micro Inc,  On it there is a bank of 4 dip switches.


Grappler+ DIP switch settings:

DIP switch positions            1*      2       3       4
-------------------------------------------------------------
Anadex Printers                 off     on      off     off
Apple DMP                       off     off     on      off
C. Itoh 8510 EP                 off     on      on      on
Epson Dot Matrix Printers       off     on      on      on
Hewlett Packard Think-Jet       off     on      on      on
NEC 8023, C.Itoh 8510/ProWriter off     on      on      off
Okidaata 82A,83A,84,182,183,92,
         93,192,193             off     off     on      on
Okidata 84 w/o Step II Graphics off     off     off     on
Panasonic KXP-1090              off     on      on      on
Smith-Corona D-100/200/300      off     on      on      on
Star Micronics Series           off     on      off     on

**Transparent Mode              off     off     off     off


* Switch 1 controls the MSB (Most Significant Bit=8th bit of data).
When this switch is on, the MSB is not transmitted to the printer.
When this switch is off, the MSB is under software control. The
printer must be set to 7 data bits, no line feed to use the settings
in the table.

** If your printer is not listed, then the card should be set to
"transparent" mode (turn all switches to off). This will disable
the special screen dump features, which are only useful under
BASIC anyway.

The screen dump commands are: Control-I G (press control-I, followed
by the letter G) for a hi-res page 1 dump, Control-I G2 for a page
2 dump, Control-I Ge for a double-hi-res dump, Control-I S for
a 40 column text screen dump and Control-I 8S for an 80 column
screen dump.
```

```
-----
The Palmtree BBS  310-453-8726 v.32
Inet: rder@pro-palmtree.cts.com


### END OF FILE grappler.dips
```

```
##########################################################################
### FILE: gsfans
##########################################################################

Path:
news1.icaen!news.uiowa.edu!uunet!in5.uu.net!newsflash.concordia.ca!newsflash.conco
rdia.ca!not-for-mail
From: spec@vax2.concordia.ca (Mitchell Spector)
Newsgroups: comp.sys.apple2
Subject: Re: IIgs internal fan hookup question...
Date: 18 Sep 1997 03:03 -0500
Organization: Concordia University
Lines: 30
Distribution: world
Message-ID: <18SEP199703035333@vax2.concordia.ca>
References: <pdueck-1709971532440001@dial24.pli.mb.ca>
NNTP-Posting-Host: vax2.concordia.ca
NNTP-Posting-User: SPEC
News-Software: VAX/VMS VNEWS 1.50AXP

In article pdueck@pli.mb.ca (Perry Dueck) writes...

>If one were to install an internal fan in an Apple IIgs, what is the
>proper Amps level that the fan should be rated at, in order to connect it
>to the two pin fan connector at the rear of the IIgs motherboard?

    The pinout for the "Fan" connector is +12V and Ground. The +12 is
the pin closest to the powersupply, or the pin on the left if you are
facing the GS motherboard from the front end. Most fan wires are color
coded, so the red wire goes to power and black to ground.

>I pulled a perfectly good working fan out of a non-functioning 386sx power
>supply. This fan I have is an  NMB "FLOW MAX", and it is rated:
>DC +12V   0.14 Amps.  Is this the proper amperage level, or is it too low
>or too high?

    The voltage rating is fine, the amerage level should be fine as well
as long as it's not too high where it overloads the powersupply (I doubt
that in this case). I've connected all sorts of fans to the "Fan" pins,
back when I was trying to cool down my accelerator board. I had a 486
CPU mini-cooling fan in there (0.9W) as well as a full-sized fan pulled
from an IBM powersupply, which had a higher power consumption rating.
They were all DC +12V in case your wondering, it was just the wattage/
amperage levels that differed.

    You just need to slice the wires and stick them in a two-pin molex
connector, I found one on a dead 80 columns card. :)

Mitchell Spector
spec@vax2.concordia.ca


### END OF FILE gsfans
```

```
##########################################################################
### FILE: gssauce.dips
##########################################################################

Path:
news1.icaen!news.uiowa.edu!news1.chicago.iagnet.net!streamer1.cleveland.iagnet.net
!iagnet.net!newsfeed.internetmci.com!206.165.113.230!www.nntp.primenet.com!globalc
enter0!news.primenet.com!bpvh
From: bpvh@primenet.com (Bradley P. Von Haden)
Newsgroups: comp.sys.apple2
Subject: GS Sauce dip settings
Date: 4 Dec 1997 20:10:01 -0700
Organization: Primenet (602)416-7000
Lines: 75
Message-ID: <667ra9$ccn@nntp02.primenet.com>
X-Posted-By: bpvh@206.165.6.208 (bpvh)


Matthew Hudson <mhudson@home.com> wrote:

>Anyone know what the dip switch settings for this card are?

Here are a couple of responses I have in my archives.  Hope this
helps:

Newsgroups: comp.sys.apple2
From: edward@pro-ren.cts.com (Edward Floden)
Subject: Re: Harris Tech. RAM Card
Date: Fri Nov  4 06:26:57 1994

256K SIMMS
                Switch
           1   2   3   4
256K       O   O   O   O
512K       O   C   O   O
  1M       C   C   O   O


1M SIMMS
               Switch
           1   2   3   4
  1M       O   O   C   O
  2M       O   C   C   O
  4M       C   C   C   O

....and, *never* set both switches 3 and 4 to closed. You'll fry
something. :(


From: bedwards@arthur.st.nepean.uws.edu.au (Brett Edwards)
Newsgroups: comp.sys.apple2
Subject: Re: Harris Tech. RAM Card
Date: Fri Nov  4 22:29:15 1994

Here are the complete dip switch settings for the gs Sauce card

Dip switch settings for GS Sauce Memory Card.

256Kb Simm     s1   s2   s3   s4
```

```
--------------------------------

256Kb          off  off  off  off

512Kb          off  on   off  off

1024Kb         on   on   off  off


1Mb Simm       s1   s2   s3   s4

--------------------------------

1Mb            off  off  on   off

2Mb            off  on   on   off

4Mb            on   on   on   off


One Note: ensure that switches 3 and 4 are never on (closed
positions) at the same time, mentions something about endangering
powersupply.

Kryten

****               Maintainer of the CD CLUB FAQ                ****
****            http://www.primenet.com/~bpvh/cdclubs           ****
****       ftp://ftp.primenet.com/users/b/bpvh/cdclubfq.txt     ****
**** bpvh        Internet: bpvh@primenet.com        Delphi: bpvh ****
**** Posted by an Apple IIgs using my own Proterm 3.1 File Macro ****


### END OF FILE gssauce.dips
```

```
##############################################################################
### FILE: gsslots.bad
##############################################################################

Path: news1.icaen!news.uiowa.edu!news1.chicago.iagnet.net!qual.net!iagnet.net!
howland.erols.net!news-peer.sprintlink.net!news-backup-east.sprintlink.net!news-
in-east.sprintlink.net!news.sprintlink.net!Sprint!151.164.30.38!newsgate.swbell.
net!swbell!not-for-mail
From: Rubywand <rubywand@swbell.net>
Newsgroups: comp.sys.apple2
Subject: Re: Slots not working
Date: Fri, 20 Feb 1998 04:01:57 -0600
Organization: Southwestern Bell Internet Services, Richardson, TX
Lines: 39
Message-ID: <34ED5495.D940E49B@swbell.net>
References: <19980220051700.AAA25108@ladder03.news.aol.com>
Reply-To: rubywand@swbell.net
NNTP-Posting-Host: ppp-207-193-8-177.hstntx.swbell.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Trace: (null) 887968850 19553 (None) 207.193.8.177
X-Complaints-To: usenet@nnrp3
X-Mailer: Mozilla 4.04 [en] (Win95; I)
Xref: news1.icaen comp.sys.apple2:130451

Supertimer writes ...
>
> I had a ROM 1 GS motherboard which worked fine except the slots
> did not work.  When a card was plugged in and the control panel was
> set to YOUR CARD, the slots were still seen by the GS as empty.
> ALL the slots had this problem EXCEPT the memory expansion slots.
> What was wrong with this motherboard?


    If you are saying that, whatever the card and whatever the Slot, the
cards plugged into the GS's Slots did not work, then, there are a few
halfway decent suspects on a GS that, otherwise, seems to work okay:

 1. A break in the trace which is supposed to supply +5V to each Slot
card would shut down nearly any Slot card.

 2. Most Slot cards need to receive and/or send information over the
Slot Data bus. A defective 74HCT245 (IC UF2) or one with a loose/broken
pin connection would be likely to kill Slot Data bus transfers.

 3. A defective Slotmaker chip (IC UE11) or one with a broken trace on
any of several inputs would render most Slot cards non-functional.

 4. A break in any of several traces supplying signals to the Slots
would disable many Slot cards.

 5. Many Slot cards would not work should any of several Slot traces be
shorted to another trace or to ground. (Sources of shorting include bent
case shielding below or behind the motherboard, a Slot socket into which
a shard of metal, solder, or bit of wire has fallen, a shorted bypass
capacitor, and, possibly a Coke, etc. spill leaving conductive residue
beneath several Slot sockets.)
```

6. If a defective Slot card is plugged into one Slot while other Slots are being tried with other cards, the defective card could short or corrupt critical bus lines and render other cards non-functional.

Rubywand

END OF FILE gsslots.bad

```
##########################################################################
### FILE: hardware.projects
##########################################################################

Newsgroups: comp.sys.apple2
Path: news.weeg.uiowa.edu!news.uiowa.edu!uunet!spool.mu.edu!bloom-
beacon.mit.edu!mcrcim.mcgill.edu!sifon!CC.UMontreal.CA!IRO.UMontreal.CA!guertinp
From: guertinp@IRO.UMontreal.CA (Paul Guertin)
Subject: Re: Apple IIe project
Message-ID: <CFD9Es.5MA@IRO.UMontreal.CA>
Sender: news@IRO.UMontreal.CA
Organization: Universite de Montreal, Canada
References: <50.6196.2096.0N003110@freddy.ersys.edmonton.ab.ca>
Date: Sat, 23 Oct 1993 20:11:15 GMT
Lines: 19

In article <50.6196.2096.0N003110@freddy.ersys.edmonton.ab.ca>
phil.ware@freddy.ersys.edmonton.ab.ca (Phil Ware) writes:
>Could anyone suggest a good project book for the Apple IIe.
>I'm interested in using an old box for tracking the
>temperature in a water bath.
>
Vernier software publishes a book called "How to Build a Better Mousetrap"
which contains 14 hardware projects for the Apple II. Project #6 is a
temperature probe connected to PDL0.

ISBN for the book is 0-918731-16-X.
Vernier Software
2920 S.W. 89th Street
Portland, Oregon  97225 USA
(503) 297-5317

Paul
guertinp@iro.umontreal.ca


Path:
news.weeg.uiowa.edu!news.uiowa.edu!uunet!europa.eng.gtefsd.com!howland.reston.ans.
net!gatech!prism!gt2011a
From: gt2011a@prism.gatech.EDU (gt2011a Sheldon Simms)
Newsgroups: comp.sys.apple2
Subject: Re: Apple IIe project
Message-ID: <118842@hydra.gatech.EDU>
Date: 24 Oct 93 00:15:46 GMT
References: <50.6196.2096.0N003110@freddy.ersys.edmonton.ab.ca>
Organization: Georgia Institute of Technology
Lines: 17

In article <50.6196.2096.0N003110@freddy.ersys.edmonton.ab.ca>
phil.ware@freddy.ersys.edmonton.ab.ca (Phil Ware) writes:
>Could anyone suggest a good project book for the Apple IIe.
>I'm interested in using an old box for tracking the
>temperature in a water bath.

A good book is _Inside The Apple IIe_ by Gary B. Little. It isn't
a project book, but it does have a good chapter on using the Game I/O
connector for "electronics experiments."

-Sheldon
```

--

W. Sheldon Simms |
gt2011a@prism.gatech.edu | Newt Gingrich for minority leader!
-------------------------+---

END OF FILE hardware.projects

```
##############################################################################
### FILE: hsscsi.id
##############################################################################

Path:
blue.weeg.uiowa.edu!news.uiowa.edu!uunet!spool.mu.edu!uwm.edu!cs.utexas.edu!bcm!pe
ndragon!fullfeed!fullfeed!not-for-mail
From: bpvh@msn.fullfeed.com (Bradley VonHaden)
Newsgroups: comp.sys.apple2
Subject: RE: Bernoulli on a //gs? (Please Read)
Date: 26 Oct 1994 05:47:10 -0500
Organization: FullFeed Communications (Internet +1.608.246.2701 info)
Lines: 43
Message-ID: <38lc3e$k07@fullfeed.fullfeed.com>
NNTP-Posting-Host: fullfeed.fullfeed.com


gardnern@ucsu.Colorado.EDU (RKE) wrote:

>I am trying to attach a 90mb Bernoulli drive to my GS.
>My system is as follows:
>
>ROM 1 Apple //gs
>4mb AE RAM card
>8mhz ZIP GS
>Apple High-Speed SCSI card
>90 mb Bernoulli hard drive
>System 6.0.1

Three things I can think of to check:

One possibility is DMA compatibility.  If your memory card is not DMA
compatible, then switch 1 on the Apple HS SCSI card should be open
(up).

Another possibility I guess is a SCSI ID conflict.  The Apple HS SCSI
card's ID at the factory is set to 7.  Here are the Apple HS SCSI
card switch combinations:

   note: Switch 1 controls DMA; open (up) turns DMA off
   note: Switches 2-4 control SCSI card ID
   note: 'U' means open (up), 'D' means closed (down)

     SWITCH:     1234  1234  1234  1234  1234  1234  1234  1234
     SETTING:    .UUU  .UUD  .UDU  .UDD  .DUU  .DUD  .DDU  .DDD
     CARD ID:      0     1     2     3     4     5     6     7

Third, the scsi chain needs termination power to work properly.  This
is different from termination.  Both are required for a properly
functioning scsi chain.  It is possible that neither the Bernoulli
drive nor the Apple HS SCSI card is supplying termination power.  If
this is the case, and there is no other device on the scsi chain to
supply said power, it probably won't work.  There is a modification
(requires soldering skills) to the Apple HS SCSI card to make it
supply termination power.

****bpvh     Internet: bpvh@fullfeed.com      GEnie: B.VONHADEN****
****Posted by an Apple IIGS using my own Proterm 3.1 File Macro****
```

END OF FILE hsscsi.id

```
##########################################################################
### FILE: ii+keyboards
##########################################################################

Path: news1.icaen!news.uiowa.edu!chi-news.cic.net!howland.erols.net!news-
peer.sprintlink.net!news-sea-19.sprintlink.net!news-in-
west.sprintlink.net!news.sprintlink.net!Sprint!205.185.79.4!zdc!super.zippo.com!ne
ws1.rcsntx.swbell.net!usenet
From: Rubywand <rubywand@swbell.net>
Newsgroups: comp.sys.apple2
Subject: Re: ][ + control key locked
Date: Sat, 12 Jul 1997 07:26:10 +0000
Organization: Southwestern Bell Internet Services
Lines: 54
Message-ID: <33C73192.3DFC@swbell.net>
References: <33c6d63e.0@news1.ibm.net>
NNTP-Posting-Host: ppp-207-193-8-157.hstntx.swbell.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Mailer: Mozilla 2.02E (Win16; I)

wshek@ibm.net writes ...
>
> Anyone have any experience with keyboard encoder chips and such?
>
> I have a ][+ with a keyboard symptomatic of control key always pressed when
> it isn't. ie. press the single key 'g' get beep....press 'm' get cr etc.
> Keyboard appears to be functioning properly by process of elimination but I
> don't have another encoder chip to try.
> Has anyone purchased parts for a ][+ recently? Would like as near original as
> possible.

     Are you sure that your CTRL key is not stuck? (Try diddling the key.)

     Another possible source of the problem is a KB Controller IC pin making
poor contact with the line coming from the CTRL key circuit. (Try removing and
re-socketing the KB IC.)

     U1, a 7400 quad nand gate IC, could have gone bad or be making poor
contact at some pins. This could result in an 'always-pressed CTRL key' signal
at pin 11.

     When the CTRL key is not pressed, pins 12 and 13 of U1 (connected to the
CTRL key switch) should be at nearly 5V and pin 11 (which goes to pin 19 of the
KB Controller IC) should be at logic "0" (roughly 0V - 0.25V).

     If U1 pins 12 and 13 are at 0V (or very close) when the CTRL key is not
pressed, your CTRL key switch is, probably, stuck.

     If U1 pins 12 and 13 are at/near 5V and pin 11 is not near 0V, U1 is
probably bad or making poor contact at some pins.

     If U1 pin 11 is near 0V and pin 19 of the KB Controller IC is not, then,
there is either a break in the line connecting the pins or one or both IC's are
making poor socket contact.

     If pin 19 of the KB Controller IC is near 0V when the CTRL key is not
pressed and near 4-5V when the CTRL key is pressed, then, if you still have
```

'stuck CTRL key' symptoms, there is a good chance that the KB Controller IC is messed up.

Note: all of this assumes that your KB is like the one diagrammed in the Apple][Reference Manual on page 101.

The keyboard is known to be a weak point in][+ design. Probably, Apple did not expect the machines to be in service at the turn of the century!

After a plague of KB problems, we ended up yanking the entire thing, enlarging the KB opening, and installing a home-brew KB. It uses the key matrix from a surplus reed-switch KB and a decoder circuit designed around the SMC KR2376-ST KB Controller IC.

Rubywand

END OF FILE ii+keyboards

```
##############################################################################
### FILE: ii.power
##############################################################################

Newsgroups: comp.sys.apple2
Path:
news.weeg.uiowa.edu!news.uiowa.edu!uunet!noc.near.net!howland.reston.ans.net!math.
ohio-state.edu!cs.utexas.edu!sdd.hp.com!crash!pro-sol!tomk
From: tomk@pro-sol.cts.com (Tom Kelly)
Subject: Re: Power Supplies
Organization: ProLine [pro-sol], Rancho San Diego, CA
Date: Sun, 13 Jun 93 21:01:36 PDT
Message-ID: <fd80651@pro-sol.cts.com>
In-Reply-To: tomk@pro-sol.cts.com (Tom Kelly)
References: <fc48797@pro-sol.cts.com>
Lines: 34

 The following is the connections for the power
 supply ON THE MOTHERBOARD for the Apple ][, ][+, ][e.
 It was derived from the Apple ][ Reference Manual
 and examining a Apple ][.
 It is to be used as a reference and should NOT be accepted
 as GOSPEL untill you have verified it yourself.
 It is most useful when splicing a "OLD IBM POWER SUPPLY"
 on the cable of a Apple ][ supply when they go bad.
 The IBM supply will NOT fit inside the Apple ][ case.
 I don't have the connection diagram for the IBM connectors.


        ___
       /5 6\
       |3 4|
       |1 2|
       -----


 PIN    NAME    COLOR
 1,2    GROUND  BLACK
 3      +5V     ORANGE
 4      +12V    YELLOW
 5      -12V    GREEN
 6      -5V     BLUE


 Please feel FREE to correct and provide anything I have left out.
 It will be for the GOOD of the Apple "world".

ProLine:  tomk@pro-sol
Internet: tomk@pro-sol.cts.com
UUCP:     crash!pro-sol!tomk


### END OF FILE ii.power
```

```
#####################################################################
### FILE: iie2gspwr.guide
#####################################################################

Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!207.24.245.130!nyd.news.ans.net
!news.idt.net!logbridge.uoregon.edu!news.nero.net!newshub.tc.umn.edu!lynx.unm.edu!
ben16.unm.edu!buggie
From: buggie@ben16.unm.edu (stephen e buggie)
Newsgroups: comp.sys.apple2
Subject: How-to-Do-It: Transplant p.s. innards IIe-IIgs
Date: 23 Jan 1999 22:17:37 GMT
Organization: University of New Mexico, Albuquerque
Lines: 132
Message-ID: <78dhq1$ieu$2@lynx.unm.edu>
NNTP-Posting-Host: ben16.unm.edu
X-Newsreader: TIN [version 1.2 PL2]
Xref: news1.icaen comp.sys.apple2:144424

buggie@unm.edu                                  January 23, 1999

         APPLE II INTERNAL POWER SUPPLIES:
    HOW TO TRANSPLANT THE IIE P.S. CIRCUITRY
              INTO THE IIGS CASING

          by  Steve "Power Man" Buggie

       Working IIe internal power supplies are abundant and cheap,
while IIgs power supplies are getting scarcer and scarcer.  I sell
_external_ 150 watt "bugg-power" units for $27 plus $5 shipping;
201 of these units have been shipped since April 1996!

       The IIe and IIgs internal power supplies use exactly the same
output voltages and color codes:  BLACK = negative (two wires);
ORANGE = +5v DC;  YELLOW = +12v DC,  GREEN = -12vDC,  BLUE = -5v DC.
The IIe unit is rated by Apple at about 35 watts and the IIgs unit is
rated by Apple at about 45 watts.  The IIe units were made by Astec,
while the IIgs units were made either by Astec (heavy, steel casing),
or by DynaComp (lightweight brushed alumnum casing.  The Dynacomp
IIgs p.s. is more prone to failure.

       Still, for portability, the internal power supply remains
useful.  I can do the work described below for you at nominal cost:
$12 plus $4 shipping for an outright sale.   $6 plus shipping if you
mail me your dead IIgs power supply.  $2.00 plus shipping if you send
me a GOOD IIE p.s. in addition to the dead IIgs p.s.

       The transplant is easy enough that the ordinary "solder-slinging"
user can do this himself  Here are step-by-step instructions.  These
instructions apply to dead DYNACOMP IIgs power supplies --- I have
done the transplant successfully on two of these units.  The ASTEC
IIgs p.s. has a different mounting arrangement for the circuit board.
I've looked at it, but have not yet done the transplant on the Astec
IIgs version.

TOOLS & MATERIALS NEEDED:  Soldering iron and rosin-core solder;
       wire cutter and wire-stripping tool, philips-head screwdriver;
       electric drill; brown corregated cardboard, adhesive glue (e.g,
       "Liquid Nails" or equivalent non-conductive adhesive), heat-
```

shrink insulation for AWG-18 wire: 3/16" diameter prior to shrinkage, DC voltmeter.

1. TEST both power supplies to verify that the IIE unit is GOOD and that the IIgs unit is BAD.

2. With power cord disconnected, remove the case=screws and open the two units.

3. Inspect the FUSE in the IIgs unit. It is soldered to the board :-(If fuse is blown, replace with a fuse of the same amperage. Apply power and check voltages at the Molex-7 nylon plug. If unit works, then close up the box --- you're done! If fuse blows again, then proceed to step 4.

4. Cut the colored output wires: For IIgs unit, cut them NEAR the board; for IIe unit, cut them near the plug. This will allow wires of the finished unit to remain relatively long. AC plug to be DETACHED from the unit in this and in the remaining steps.

5. IIgs unit: near the AC switch/socket end, notice where the brown (live) wire and blue (neutral) wire are soldered to the board. But both wires close to the board. Detach the green wire (ground) from its bolt on the inside casing.

6. IIe unit: Find the brown (live) and blue (neutral) AC wires; cut those wires, leaving the wires that attach to the circuit board as LONG as possible. These wires are located near the switch/socket end of the unit.

7. IIgs unit: remove the philips-head small screws that hold the circuit board to the casing, and lift the circuit board out.

8. IIe unit: remove philips-head small screws; lift the circuit board out.

9. Hold the two circuit boards side by side. Notice that the IIgs version is LONGER than the IIe version. Notice and compare the locations of the holes for the mounting screws on the two boards. Near the "switch-socket" end, both boards have two holes. Midway down the length, on the "starboard"
(right side), the mounting holes are slightly misplaced. Using a 3/16" drill, drill a hole on the IIe circuit board slightly "forward" of the present hole, so that the bolt will be positioned correctly with its barrel-nut on the IIgs inside casing. (The drilled hole will pass through a non-critical portion of the board.) Clean away any drill filings.

10. The IIe circuit board will be attached wiith only three bolts inside the IIgs casing. Check that it will fit correctly by sliding the board into the IIgs casing. Redrill the midway-positioned hole if necessary, removing the board from the casing while doing the drilling.

11. With the circuit board removed, cut to size a piece of brown corregated cardboard to fit in the "forward" 2/3 length of the casing. Attach the cardboard to the inside of the casing with "liquid nails" adhesive --- or other non-conductive adhesive. The cardboard provides physical support for the circuit board, and also insulates the underside contacts against possible short circuits! Secure the three mounting screws
through the circuit board: two screws at the "switch-socket" end, and one

screw through the drilled "midway hole.

12. Connect the AC wires: BLUE to BLUE, and BROWN to BROWN. Solder them, clean the solder flux from the solder joiunt, and insulate with heat-shrink
tubing. Three layers of heat-shrink tubing are recommended.

13. At the "bow" (forward end), connect/solder all six output wires, matching color-codes exactly: BLACK to BLACK, ORANGE to ORANGE, YELLOW to YELLOW, GREEN to GREEN, BLUE to BLUE. Clean the rosin from the solder joints, insulated with triple layers of heat-shrink tubing.

14. String the output wires through the side-opening, passing them through the black plastic strain-relief.

14. (Optional step) Before sealing the unit, non-conductive adhesive caulking could be smeared on circuit board edges to secure the board from vibration or movement. I use 100% silicone caulking in the big tubes: either "GE SOLICONE II" or "ACE HARDWARE 50-YEAR 100% SILICONE."

15. Blow out any dust or shavings. Reattach the cover with its small bolts. Before connecting to the computer, attach the AC cord and TEST THE VOLTAGE OUTPUTS at the Molex-7 plug. If these are normal, then the unit can be attached to the IIgs.

16. Salvage reusable parts left over: The switch/ AC socket from the IIe casing; fuse, resistors, capacitors, etc. from the dead IIgs DynaComp board. That's it! Steve "Power Man: Buggie

END OF FILE iie2gspwr.guide

```
##############################################################################
### FILE: iiepower
##############################################################################

Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!nyd.news.ans.net!newsfeeds.ans.
net!news.idt.net!newsfeed.berkeley.edu!cyclone.swbell.net!typhoon01.swbell.net.POS
TED!not-for-mail
Message-ID: <363E94A6.887BB984@swbell.net>
From: Rubywand <rubywand@swbell.net>
Reply-To: rubywand@swbell.net
X-Mailer: Mozilla 4.06 [en] (Win95; I)
MIME-Version: 1.0
Newsgroups: comp.sys.apple2
Subject: Re: Apple //e Power Supply
References: <363dd01e.0@195.226.32.5>
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
Lines: 23
Date: Mon, 02 Nov 1998 23:29:10 -0600
NNTP-Posting-Host: 209.184.93.158
X-Complaints-To: abuse@swbell.net
X-Trace: typhoon01.swbell.net 910070960 209.184.93.158 (Mon, 02 Nov 1998 21:29:20
PDT)
NNTP-Posting-Date: Mon, 02 Nov 1998 21:29:20 PDT
Organization: SBC Internet Services
Xref: news1.icaen comp.sys.apple2:141285

Tim Anderson writes ...
>
> I have recently aquired a //e, green screen monitor and two disc drive for 5
> pounds, only problem is that the computer doesn't have a power supply. What
> voltages does the //e require.


     Here is some info on the IIe power supply:


 II+/IIe Power Supply Socket      Power Supply Output Ratings

        _________
       /         \                +5V @ 2.50 Amps (continuous)
  -12V |  5   6  |   -5V          -5V @ 0.25 Amps (continuous)
       |         |               +12V @ 1.50 Amps (continuous)
   +5V |  3   4  |  +12V         -12V @ 0.25 Amps (continuous)
       |         |
   GND |  1   2  |   GND
       |_________|


Rubywand


### END OF FILE iiepower
```

```
##########################################################################
### FILE: iigsram
##########################################################################

Path: news1.icaen!news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.erols.net!cam-news-hub1.bbnplanet.com!news.bbnplanet.com!cpk-
news-
hub1.bbnplanet.com!newsfeed.internetmci.com!status.gen.nz!news.express.co.nz!actri
x.gen.nz!dempson
From: dempson@actrix.gen.nz (David Empson)
Newsgroups: comp.sys.apple2
Subject: Re: Hacking GS memory card?
Date: Fri, 7 Feb 1997 20:57:58 +1300
Organization: Empsoft
Lines: 34
Message-ID: <19970207205758321397@dempson.actrix.gen.nz>
References: <5ddo00$81f@balsam.unca.edu>
NNTP-Posting-Host: dempson.actrix.gen.nz
X-Newsreader: MacSOUP 2.2b6

Rhonda K. Faircloth <RKFAIRCLOTH@unca.edu> wrote:

> I've been poking around Apple's 1meg memory board for the //gs, trying
> to increase it's memory capacity... hopefully to 4meg. Anybody have
> any experience/knowledge in gs memory handling?

Yep.  I have the IIgs hardware reference, and I'm quite familiar with
how standard memory cards are implemented (the more oddball ones are
somewhat of a mystery).

> I desolered the eight dram chips already on the board and ran some wires
> to a socketed 256k SIMM on a proto-board. This tested ok. I then tacked a
> wire to the unused FRA9 (pin3) line, ran that through the same type of
> inverter/resistor (as the other address lines are handled) and brought it
> to A9 of a 1meg simm. It would only give me 768k.d

You have missed an important step.  There is a pin on the memory slot
which tells the motherboard what size of RAM is installed on the card.
The Apple IIgs Memory Expansion Card is set for 256KB rows, so the
motherboard doesn't use FRA9, and the row address lines decode into
multiples of 256KB.

If the appropriate pin is set for 1MB RAM then FRA9 contains the next
multiplexed address bit, and the row address lines decode into multiples
of 1MB.

The pin in question is called MSIZE.  It is pin 27 on the slot
connector.  It is unconnected for a card with 256KB rows, connected to
ground for a card with 1MB rows.

--
David Empson
dempson@actrix.gen.nz
Snail Mail: P.O. Box 27-103, Wellington, New Zealand


### END OF FILE iigsram
```

```
##############################################################################
### FILE: interfacing
##############################################################################

Newsgroups: comp.sys.apple2
Path: news.uiowa.edu!chi-
news.cic.net!newsfeed.internetmci.com!news.msfc.nasa.gov!elroy.jpl.nasa.gov!usc!ne
ws.cerf.net!nntp-server.caltech.edu!news.ridgecrest.ca.us!owens!croton
From: Cyrus Roton <croton@ridgecrest.ca.us>
Subject: versatile interface
X-Sender: croton@owens
X-Nntp-Posting-Host: owens
Content-Type: TEXT/PLAIN; charset=US-ASCII
Message-ID: <Pine.SUN.3.91.951025104138.7395A-100000@owens>
Sender: usenet@ridgecrest.ca.us (Ridgenet Usenet admin)
Organization: RidgeNet - SLIP/PPP Internet, Ridgecrest, CA. (619) 371-3501
Mime-Version: 1.0
Date: Wed, 25 Oct 1995 17:44:56 GMT
Lines: 71

GAME PORT, VERSATILE INTERFACE

A multitude of interface cards exist for the Apple II But, few
people realize that the Apple II game port can be a very
versatile interface.

A "paddle" input is internally connected to a trigger chip and
a .022 MFD capacitor. The paddle is a variable resistor and a
voltage source. In use, the capacitor is discharged, a timer
(counter) is reset, and then the capacitor is allowed to charge
by current passing through the external resistor while the
counter is incrementing. When the charge on the capacitor reaches
3.2 volts, the trigger circuit stops the counter. The number
stored in the counter at that time gives an indication of the
time required for the capacitor to charge up to the trigger
voltage, and that time relates the value of the external resistor
(paddle) as follows;

V = (input voltage)*(1-EXP(-t/R*C))

From experiment, we find that with a 5 volt input and a 120K
resistor, the counter will reach a value of 250. From this
fact, and using the above formula, we can plot the count as
a function of resistance

Knowing all of this, we can design interface circuits. Such
devices as photocells, photo resistors, thermisters, and other
things could be connected to the game port. With appropriate
software, we could use the Apple to monitor a variety of
real-world events, and to display the results.

For example, a local chemistry lab wanted to measure the "time
of solution" when a chemical was dropped into a test tube
containing a solvent. The solvent was clear, but changed color
when the chemical dissolved into it. A light was passed through
the test tube to strike a photo resistor. A TYPE 7 photo resistor,
which has peak sensitivity with orange light, varies its
resistance as a function of light intensity, with the formula
```

R = (443)*(I^(-0.6692))

where R is in Kilohms and I is in foot-candles. Futhermore, the minimum sensitivity of the photo resistor is with violet light, which happens to be the color when thiothymolyne is dissolved in water.

When the photo resistor is connected to the paddle input with 33 volt source, the resistance in Megohm is calculated by the approximation;

R = (count)/209.9

The point of all this was an attempt to refute the results obtained by Prof. Azimov, as reported in April 1948. The Prof. had reported that thiothymolyne displays a negative "time of solution" when dropped into water. Prof. Azimov may have been correct. Unfortunately, meaningful results could not be obtained from the above experiment because the Apple II is too slow to measure negative time. Perhaps one of the new optical computers, which operates at the speed of light, could be fitted with an accelerator to operate faster than light, and thus be used to measure negative time.

Of course, some of this is in jest. But such interfaces are practical, within the limitations of the Apple II game port.

Cyrus Roton croton@ridgecrest.ca.us
Ridgecrest Apple User Group

END OF FILE interfacing

```
##########################################################################
### FILE: io16.serial
##########################################################################

Newsgroups: comp.sys.apple2.comm
Path: news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-
state.edu!sol.ctr.columbia.edu!newsxfer.itd.umich.edu!nntp.cs.ubc.ca!uw-
beaver!netnews.nwnet.net!news.clark.edu!lclark!NewsWatcher!user
From: drucker@lclark.edu (Ivan Drucker)
Subject: plans for simple serial i/o (game port) part 1
Message-ID: <drucker-270294181337@149.175.6.233>
Followup-To: comp.sys.apple2.comm
Sender: usenet@lclark.edu (News Poster)
Nntp-Posting-Host: 149.175.6.233
Organization: Lewis and Clark College, Portland OR
Date: Sun, 27 Feb 1994 18:13:36 +0000
Lines: 138

By previous demand from a long time ago, I'm going to reproduce the plans
for a simple serial output from the ][/][+/][e 16-pin game port.  These
originally appeared in the January 1978 Apple ][ Reference manual that was
included with the computer back when they gave useful informatin as part of
the package.

A SIMPLE SERIAL OUTPUT

   The Apple II is equipped with a 16 pin DIP socket most frequently used
to connect potentiometers, switches, etc. to the computer for paddle
control and other game applicatins.  This socket, located at J-14, has
outputs available as well.  With an appropriate machine language program,
these output lines may be used to serialize data in a format suitable for a
teletype.  A suitable interface circuit must be built since the outputs are
merely LSTTL and won't run a teletype without help.  Several interface
circuits are discussed below and the user may pick the one best suited to
his needs.

The ASR-33 Teletype
   The ASR-33 Teletype of recent vintage has a transistor circuit to drive
its solenoids.  This circuit is quite easy to interface to, since it is
provided with its own power supply.  (Figure 1a)  It can be set up for a
20mA current loop and interfaced as follows (whether or not the teletype is
strapped for full duplex or half duplex operation):
   a) The yellow wire and purple wire should both go to terminal 9 of
Terminal Strip X.  If the purple wire is going to terminal 8, then remove
it and relocate it at terminal 9.  This is necessary to change from the
60mA current loop to the 20mA current loop.
        b) Above Terminal Strip X is a connector output socket identified as
"2".  Pin 8 is the input line + or high;  Pin 7 is the input line - or low.
 This connector mates with a Molex receptacle model 1375 #03-09-2151 or
#03-09-2153.  Recommended terminals are Molex #02-09-2136.  An alternate
connection method is via spade lugs to Terminal Strip X, terminal 7 (the +
input line) and 6 (the - input line).
   c) The following circuit can be built on a 16 pin DIP component carrier
and then plugged into the Apple 16 pin socket found at J-14:  (The junction
of the 3.3k resistor and the transistor base lead is floating).  Pins 16
and 9 are used as tie points as they are unconnected on the Apple board.
(Figure 1a).

The "RS-232 Interface"
```

For this interface to be legitimate, it is necessary to twice invert the signal appearing at J-14 pin 15 and have it swing more than 5 volts both above and below ground. The following circuit does that but requires that both +12 and -12 supplies be used. (Figure 2) Snipping off pins on the DIP-component carrier will allow the spare terminals to be used for other tie points. The output ground connects to pin 7 of the DB-25 connector. The signal output connects to pin 3 of the DB-25 connector. The "protective" ground wire normally found on pin 1 of the DB-25 connector may be connected to the Apple's base plate if desired. Placing a #4 lug under one of the four power supply mounting screws is perhaps the simplest method. The +12 volt supply is easily found on the auxiliary Video connector (see Figure S-11 or Figure 7 of the manual). The -12 volt supply may be found at pin 33 of the peripheral connectors (see Figure 4) or at the poer supply connector (see Figure 5 of the manual).

A Serial Out Machine Center Language Program

Once the appropriate circuit has been selected and constructed a machine language program is needed to drive the circuit. Figure 3 lists such a teletype output machine language routine. It can be used in conjunction with an Integer BASIC program that doesn't require page $300 hex of memory. This program resides in memory from $370 to $3E9. Columns three and four of the listing show the op-code used. To enter this program into the Apple II the following procedure is followed:

Entering Machine Language Program

1. Power up Apple II
2. Depress and release the "RESET" key. [Note: This is for Rev. 0 Apple]['s!] An asterick and flashing cursor should appear on the left hand side of the screen below the random text matrix.
3. Now type in the data from columns one, two and three for each line from $370 to 03E9. For example, type in "370: A9 82" and then depress and release the "RETURN" key. Then repeat ths procedure for the data at $372 and on until you cokmplete entering the program.

Executing this Program

1. From BASIC a CALL 880 ($370) will start the execution of this program. It will use the teletype or suitable 80 column printer as the primary output device.
2. PR#0 will inactivate the printer transferring control back to the Video monitor as the primary output device.
3. In Monitor mode $370G activates the printer and hitting the "RESET" key exits the program.

[Note: I know you don't need to know this, I'm entering it for completion's sake and 'cause I find it amusing...]

Saving the Machine Language Program

After the machine language program has been entered and checked for accuracy it should, for convenience, be saved on tape - that is unless you prefer to enter it from the keyboard every time you want to use it.

The way it is saved is as follows:

1. Insert a blank program cassette into the tape recorder and rewind it.
2. Hit the "RESET" key. The system should move into Monitor mode. An asterick "*" and flashing cursor should appear on the left-hand side of the screen.
3. Type in "370.03E9W 370.03E9W". [Teaching you to back up even then.]
4. Start the tape recorder in record mode and depress the "RETURN" key.
5. When the program has been written to tape, the asterick and flashing cursor will reappear.

The Program

After entering, checking and saving the program perform the following procedure to get a feeling of how the program is used:

1. Bc (control B) into BASIC
2. Turn the teletype (printer on)
3. Type in the following

```
10 CALL 880
15 PRINT "ABCD...XYZ0l123456789"
20 PR#0
25 END
```

4. Type in RUN and hit the "RETURN" key. The text in line 15 should be printed on the teletype and control is returned to the keyboard and Video monitor.

Line 10 activates the teletype machine routine and all "PRINT" statements following it will be printed to the teletype until a PR#0 statement is encountered. Then the text in line 15 will appear on the teletype's output. Line 20 deactivates the printer and the program ends on line 25.

Conclusion

With the circuits and machine language program described in this paper the user may develop a relatively simple serial output interface to an ASR-33 or RS-232 compatible printers. This circuit can be activated through BASIC or monitor levels. And it is a valuable addition to any users program library.

Ok. That's all of the text -- all that's left to reproduce is the machine code and the two schematics. I'm debating whether or not to reproduce the whole source with comments, or whether to just do a hex dump -- it'll depend upon how ambitious I'm feeling. I'm not so slick with schematics so we'll see how this turns out with only ASCII to work with. It'll be in the next post.

Ivan Drucker
drucker@lclark.edu
Lewis & Clark College, Portland OR

END OF FILE io16.serial

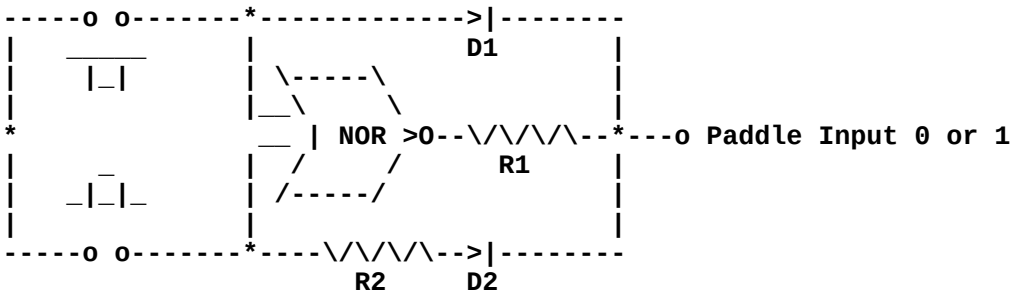
```
##########################################################################
### FILE: io32
##########################################################################

Path: news.uiowa.edu!chi-
news.cic.net!nntp.coast.net!news2.acs.oakland.edu!newshub.gmr.com!hobbes.tad.eds.c
om!maverick.tad.eds.com!news-admin@tad.eds.com
From: Erick Wagner <wagnere@netcom.com>
Newsgroups: comp.sys.apple2.programmer
Subject: Re: Q: I/O 32 card from Applied Engineering
Date: 5 Dec 1995 15:53:02 GMT
Organization: PRC
Lines: 96
Message-ID: <4a1psu$o2u@maverick.tad.eds.com>
References: <49dv74$ccm@trib.apple.com> <49iui9$fgr@nnrp1.news.primenet.com>
NNTP-Posting-Host: 148.94.8.235
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Mailer: Mozilla 1.22 (Windows; I; 16bit)

Recently Dave Lyons and John Bowling asked about the AE I/O 32 card.

I sent Dave some info via email but thought I should post so others
could benefit from it too.

>I suspect that the AE card used a couple of 6522's

Good guess but wrong :)  AE used a pair of Motorola 6821 chips.
MicroDimensions also used the 6821 chip in at least one of their
I/O boards and the John Bell Engineering board uses the 6522.  If you
have a choice over which I/O to use, I'd lean towards the 6522.  It
seems to be a little more straightforward in terms of setting it up
for I/O and it has some wonderful built-in timers that can prevent
you from writing some fairly complex code.

Well, here's the info I sent to Dave:

====================================
Applied Engineering I/O 32 Information
====================================

If a bit in the Data Direction Register is 1, the
corresponding bit of the Port is an output;  otherwise,
it is an input.

The procedure for writing to an output is:
  (1) Write a 0 to bit 2 of the Control Register
  (2) Write 1's to the Data Direction Register of each
      output bit
  (3) Write a 1 to bit 2 of the Control Register
  (4) Write data to the Port

The procedure for reading to an input is:
  (1) Write a 0 to bit 2 of the Control Register
  (2) Write 0's to the Data Direction Register of each
      input bit
  (3) Write a 1 to bit 2 of the Control Register
  (4) Read data from the Port
```

```
Control Register A $C085+s0
Control Register B $C087+s0
Control Register C $C089+s0
Control Register D $C08B+s0

Examples:

  Reading all 8 bits from Port A

    LDA $C085+s0    ;Read Control Register A
    AND #%11111011  ;Turn off bit 2
    STA $C085+s0    ;Set CRA for Data Direction
    LDX #$00        ;All bits are inputs
    STX $C084+s0    ;Set Data Direction for all inputs
    ORA #%00000100  ;Turn on bit 2
    STA $C085+s0    ;Set CRA for Port A data
    LDA $C084+s0    ;Read Port A data

  Reading bits 0, 1, 2 from Port B

    LDA $C087+s0    ;Read Control Register B
    AND #%11111011  ;Turn off bit 2
    STA $C087+s0    ;Set CRB for Data Direction
    LDX #%11111000  ;Bits 0, 1, 2 are inputs
    STX $C086+s0    ;Set Data Direction
    ORA #%00000100  ;Turn on bit 2
    STA $C087+s0    ;Set CRB for Port B data
    LDA $C086+s0    ;Read Port B data

  Writing bits 4, 5, 6, 7 to Port C

    LDA $C089+s0    ;Read Control Register C
    AND #%11111011  ;Turn off bit 2
    STA $C089+s0    ;Set CRC for Data Direction
    LDX #%11110000  ;Bits 4, 5, 6, 7 are outputs
    STX $C088+s0    ;Set Data Direction
    ORA #%00000100  ;Turn on bit 2
    STA $C089+s0    ;Set CRC for Port C data
    LDA #$A0        ;Data to write
    STA $C088+s0    ;Write Port C data

  Writing all 8 bits to Port D

    LDA $C08B+s0    ;Read Control Register D
    AND #%11111011  ;Turn off bit 2
    STA $C08B+s0    ;Set CRD for Data Direction
    LDX #$FF        ;All bits are outputs
    STX $C08A+s0    ;Set Data Direction for all outputs
    ORA #%00000100  ;Turn on bit 2
    STA $C08B+s0    ;Set CRD for Port D data
    LDA #$AE        ;Data to write
    STA $C08A+s0    ;Write Port D data

[end of document]
```

```
### END OF FILE io32
```

```
##############################################################################
### FILE: j25.pinout
##############################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!news-
e2a.gnn.com!newstf01.news.aol.com!newsbf02.news.aol.com!not-for-mail
From: rubywand@aol.com (RUBYWAND)
Newsgroups: comp.sys.apple2
Subject: Re: Sonic Blaster HELP!
Date: 1 May 1996 04:52:54 -0400
Organization: America Online, Inc. (1-800-827-6364)
Lines: 34
Sender: root@newsbf02.news.aol.com
Message-ID: <4m78p6$96d@newsbf02.news.aol.com>
References: <4m6d8r$cji@nyx10.cs.du.edu>
NNTP-Posting-Host: newsbf02.mail.aol.com
X-Newsreader: AOL Offline Reader

In article <4m6d8r$cji@nyx10.cs.du.edu>, wbaguhn@nyx10.cs.du.edu (Will
Baguhn) writes:

>
>AIGH!   I've recently gotten a Sonic Blaster (AE), and not the sound
output
>cable that goes with it.  the output (?) on the card is a Molex-6, i
believe.
>
>I really would like stereo output, so a pinout would be appreciated.
THANKS!
>

    Here is the pinout for J-25. I'm pretty sure Pin [1] is closest to the
front of the computer.


[1] A/D Converter Input (3000 Ohms)

[2] Analog GND

[3] Analog Output  (-5 to +5  P-P, 10,000 Ohms minimum)

[4] Channel ADDR 0

[5] Channel ADDR 1

[6] Channel Strobe (goes Low when ADDR valid)

[7] Channel ADDR 2



Rubywand


### END OF FILE j25.pinout
```

```
######################################################################
### FILE: joyst.ibm2aii
######################################################################

Path:
news.weeg.uiowa.edu!news.uiowa.edu!uunet!think.com!sdd.hp.com!zaphod.mps.ohio-
state.edu!cs.utexas.edu!gateway
From: C1891@slvaxa.umsl.edu
Newsgroups: comp.sys.apple2
Subject: Apple II digital joystick interface
Date: 22 Nov 1992 12:54:42 -0600
Organization: UTexas Mail-to-News Gateway
Lines: 70
Sender: daemon@cs.utexas.edu
Message-ID: <01GRGBHATRO08WW0UZ@slvaxa.umsl.edu>
NNTP-Posting-Host: cs.utexas.edu

This is the schematic for using a digital joystick on an Apple II game port.
Use one copy of this circuit for each joystick axis (i.e. you need two of
these).
```




```
R1 = about 71K
R2 = 150K
D1 & D2 are switching diodes


I don't know if this company is still around, but they used to sell factory
seconds of comercial quality digital joystick elements (the type used in
comercial arcade games).  The company is Newport Machine Design, PO Box 418,
Bishop, CA, 93514 (phone: 619-873-5677).

The suggeseted pin-out for this is the Coleco Adam, which is the same as the
Atari, but has a second push button.

     joystick         socket #
     position         on plug
     ========         ========
     UP               1
     DOWN             2
     LEFT             3
     RIGHT            4
     FIRE 2           5
     FIRE 1           6
     ----             7
     Common Ground    8       (connect to +5V for the Apple interface)
     ----             9

By using this pin-out, your joystick can also be used on Commodore 64 and
```

Atari (computer or game) systems.

For Apple II and II+ owners:

The logic for the push-buttons is not positive logic. You will need to use a 5V coil relay or a transistor circuit to convert the +5V, normally open switch logic for FIRE 1 & 2 to the open-collector logic (normally closed switch connected to ground) used by the game port.

** disclaimer time **
I have used the above circuit on my Apple II+ for 9 years without any problem. However, I am not responsible or liable for your ability with a soldering iron. Use this circuit at your own risk. Someday I will probably redesign this to work better (I know a lot more about electronics now than I did 9 years ago), but it works and so improving the design has been a very low priority. When the day comes that I do redesign this interface, I will certainly post it for the Apple II community to share and enjoy.

Shade and sweet water,

Curt

Curt Schroeder | McDonnell Douglas Aerospace - East | c1891@slvaxa.umsl.edu |
---|curts@tmpcu.mdc.com |
These opinions are mine, mine, mine! |---|
I am not an instantiation of Std_Employee! | - Apple II Forever - |

END OF FILE joyst.ibm2aii

```
##########################################################################
### FILE: joystck.read
##########################################################################

Newsgroups: comp.sys.apple2
Path: news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!zaphod.mps.ohio-
state.edu!cs.utexas.edu!sun-barr!ames!agate!dog.ee.lbl.gov!news!nosc!crash!pro-
nbs!pro-harold!pro-cajun!pro-gumbo!tgeer
      (Smail3.1.28.1 #7) id m0nEz5Z-0000l2C; Thu, 21 Jan 93 02: 24 PST
From: tgeer@pro-gumbo.cts.com (System Administrator)
Subject: Re: Attention assembly programmers...
Organization: Apple Gumbo BBS
Date: Tue, 19 Jan 93 20:29:30 CST
Message-ID: <aj74842@pro-gumbo.cts.com>
In-Reply-To: andrep@balboa.eng.uci.edu (Andre Prellwitz)
References: <2B59CDAB.12197@news.service.uci.edu>
Lines: 59

In <2B59CDAB.12197@news.service.uci.edu>
andrep@balboa.eng.uci.edu (Andre Prellwitz) writes:

>A while ago someone posted about how to read the joystick on a //gs in native
>mode.  They said that it was possible to read both paddles at once and there-
>fore get much more accurate readings.  I don't recall exactly how to do this,
>but I've been trying the following: strobe the analog paddle reset ($c070)
>and then read locations $c064 and $c065 and wait until both return to zero.
                                                ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^

Only the high bit of these locations is valid.  When the high bit of either
location becomes 0 then the corresponding analog input has timed out.  You
will actually get more accurate results by reading them one after the other
with the accumulator set to 8 bits wide and the index registers used to hold
the counts (16 bits wide).  This allows for a much faster loop, giving better
resolution.  Assuming that this routine is called from full native mode, the
following code will do the trick:

strobe   equ   $C070       ; analog input timing reset
pdl0     equ   $C064       ; analog input 0
pdl1     equ   $C065       ; analog input 1

start    php               ; save processor status register
         phb               ; and data bank register
         sep   #%100000    ; make accumulator 8 bits wide
         lda   #0          ; make data bank = 0
         pha
         plb
         ldx   #0          ; initialize the counters
         txy
         lda   strobe      ; strobe the timing reset
loop1    inx               ; increment pdl0 count
         lda   pdl0        ; is high bit = 0?
         bmi   loop1       ; no, keep checking
         lda   strobe      ; yes, strobe the timing reset again
loop2    iny               ; increment pdl1 counter
         lda   pdl1        ; is high bit = 0?
         bmi   loop2       ; no, keep checking
         plb               ; yes, restore data bank
         plp               ; and processor status register
         rts               ; return to caller (could be RTL)
```

Notice that the actual counting loops are only 9 cycles long. This gives the best possible resolution. You will need your counters to be 16 bits wide as the results will easily overflow the capacity of an 8 bit counter. Using memory locations as counters will only serve to slow the counting loop down. If X and Y contain valid data before entry, you will need to save them off to the stack and pull them back in after interpreting the joystick results.
I have used this exact method to read the analog inputs on my Science Toolkit box which connects to the joystick port. The results have been extremely accurate (much more than would be needed for a game which reads the joystick).

ProLine: tgeer@pro-gumbo Internet: tgeer@pro-gumbo.cts.com
UUCP: crash!pro-gumbo!tgeer Fidonet: tom.geer@f20.n380.z1.fidonet.org

---

"My wife is a bargain hunter - I just carry the ammunition."

END OF FILE joystck.read

```
##########################################################################
### FILE: joystick.asm
##########################################################################

Path:
blue.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!newsfeed.ksu.ksu.edu!m
oe.ksu.ksu.edu!vixen.cso.uiuc.edu!uwm.edu!cs.utexas.edu!usc!nic-
nac.CSU.net!csulb.edu!paris.ics.uci.edu!clyde.ics.uci.edu!jlee
From: jlee@ics.uci.edu (Orion Pax)
Newsgroups: comp.sys.apple2.programmer
Subject: Re: Joystick Code... Help Please!
Date: 26 Nov 1994 06:32:24 GMT
Organization: Creative 'Ware @ University of California, Irvine
Lines: 59
Message-ID: <3b6kpo$oos@paris.ics.uci.edu>
References: <3b37bu$8ag@condor.ic.net>
NNTP-Posting-Host: clyde.ics.uci.edu
X-Newsreader: TIN [version 1.2 PL2]

Shawn Platkus (platkus@ic.net) wrote:
: I'm in need of some code to read the joystick values from 65816 assembly.

Here's the code I copied from Out of This World and used in Star Command GS:

readJoystick      START
*
*  Reads the values for the joystick paddles && returns values in the x/y regs
*  7/93 version 4.0.2
*
*  Code from Out of This World by Bill Heineman
*
       php                  ; save states of cpu
       phd
       pea $100             ; put maxReadBound on stack (values max at $FF)
       tsc                  ; point dp to maxReadBound
       tcd
       sei                  ; interrupts off
       lda >$C070           ; reset joystick i/o timer
       ldx #0               ; zero counters
       txy
readLup anop
       lda >$C064           ; read x/y axises
       and #$8080
       beq quit             ; if neither valid, quit
checkY anop
       asl a
       bcc ySpinWheels      ; if invalid y, do dummy code for dummy cycle time
       iny                  ; else increment y counter
       bra checkX
ySpinWheels anop            ; dummy code of similiar cycle time
       nop
       nop
       nop
checkX anop
       asl a
       beq xSpinWheels      ; if invalidx, do dummy code for dummy cycle time
       inx
       bra maxDec
xSpinWheels anop            ; dummy code of similiar cycle time
```

```
       nop
       nop
       nop
maxDec anop
       dec <1               ; this makes sure values are <= 255
       bne readLup
quit anop
       pla
       pld                  ; restore cpu state
       plp
       rtl
       END
```

Joseph
--
jlee@clyde.ics.uci.edu | Have you watched your Koko wa GreenWood, Yotoden,
-------------------------+ Gundam 0083, Bubble Gum Crisis/Crash!, Video Girl
II(> Creative 'Ware <)II | Ai, Tenchi Miyou, Ah! My Goddess, Maison Ikkoku,
 Cal-Animage Epsilon VP | PatLabor, Ranma 1/2, and Five Star Stories today?

END OF FILE joystick.asm

```
##############################################################################
### FILE: joystick.convertor
##############################################################################

Path: news1.icaen!news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.erols.net!newsfeed.berkeley.edu!cyclone.swbell.net!typhoon01.swb
ell.net.POSTED!not-for-mail
Message-ID: <36C54EDC.81B6B38@swbell.net>
From: Rubywand <rubywand@swbell.net>
Reply-To: rubywand@swbell.net
X-Mailer: Mozilla 4.5 [en] (Win95; U)
X-Accept-Language: en
MIME-Version: 1.0
Newsgroups: comp.sys.apple2
Subject: Re: Joystick Pin-Out
References: <rB7x2.616$_B2.11382@newsfeed.slurp.net>
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
Lines: 88
Date: Sat, 13 Feb 1999 04:07:24 -0600
NNTP-Posting-Host: 207.193.8.30
X-Complaints-To: abuse@swbell.net
X-Trace: typhoon01.swbell.net 918900432 207.193.8.30 (Sat, 13 Feb 1999 02:07:12
PDT)
NNTP-Posting-Date: Sat, 13 Feb 1999 02:07:12 PDT
Organization: SBC Internet Services
Xref: news1.icaen comp.sys.apple2:145074

"Charles J. Sarchet" writes ...
>
> Could someone please post the pin out for the 9-pin joystick connection and
> the 16-pin connection on the motherboard of the GS.  I would like to convert
> my Wingman Extreme to a GS capatible joystick.



     Converting a PC stick is probably the best way to get a high
quality stick for your IIgs. Here are directions for making a converter:


  To PC Stick               To Apple II        Or to 16-pin IC plug
  15-pin Dsub               9-pin Dsub         ribbon cable to
  female connector          male connector     internal Game socket

      [1] [4] and [5] ----------[2]  +5V           [ 1]
      [2] ----------------------[7]  Button 0      [ 2]
      [3] ----------------------[5]  X-axis        [ 6]
      [6] ----------------------[8]  Y-axis        [10]
      [7] ----------------------[1]  Button 1      [ 3]
                                [3]  Ground        [ 8]


On the Apple II side ...           9-Pin          16-Pin

  add 680 Ohm resistor between   [7] & [3]      [ 2] & [ 8]

  add 680 Ohm resistor between   [1] & [3]      [ 3] & [ 8]

  add .01 uF cap* between        [5] & [3]      [ 6] & [ 8]
```

```
    optional: for fine-tuning,
    add 50K-100K trim pot
    in series with the cap

  add .01 uF cap* between        [8] & [3]      [10] & [ 8]
    optional: for fine-tuning,
    add 50K-100K trim pot
    in series with the cap

*Note: The Capacitors compensate for smaller R range of PC
 sticks.The C values are approximate. For standard 100K Ohm
 PC sticks, .01 uF pretty well guarantees you will be able to
 cover the full Apple II X and Y range (0-255).

 Values of .01 uf  (X-axis)  and .005 uF (Y-axis)  worked
 well for a PC "FlightStick" when plugged into our Apple II+.
```

For checking and adjusting stick performance on your Apple II, use a program which continuously reads and displays X and Y stick values. The program below does this and displays "B0" when Button 0 is pushed and "B1" when Button 1 is pushed. Do a CTRL-C to exit.

```
20 PRINT "X= "; PDL(0); TAB(15); "Y= ";PDL(1); TAB(30);
30 IF PEEK(49249)>127 THEN PRINT "  B0";
40 IF PEEK(49250)>127 THEN PRINT "  B1";
50 PRINT: GOTO 20
```

Note: If your Apple II uses an accelerator chip or board, make sure that it "slows down" for joystick accesses or just set Speed to "Normal" (1MHz).

Most likely, you will find that the a stick tops-out too early in the X-max and/or Y-max direction. For best control precision, what you want is for extreme values to occur near the extremes of stick movement:

```
X (horizontal)  Left= 0   Right= 255
Y (vertical)      Up= 0    Down= 255
```

This way, you have lots of active swing which makes graphics work and playing most games much easier.

If you included the trim pots in your converter, adjusting for maximum active swing will be easy. If your converter does not include the trim pots, experiment with swapping in capacitance values between ..002 uF and .01 uF to get the best control 'spread'.

The converter I built fit inside heat-shrink tubing. Putting it in a small plastic box may be better. You could mount the trim pots (and/or switches with fixed "trim resistors") and select between settings for a 'Fast', short swing, 'hot' Game Stick and a 'Normal', full swing, 'cool' Game/Graphics Stick.

Rubywand

END OF FILE joystick.convertor

```
##############################################################################
### FILE: joystick.ibm2aii
##############################################################################

Path: news.weeg.uiowa.edu!news.uiowa.edu!uunet!wupost!zaphod.mps.ohio-
state.edu!menudo.uh.edu!elroy.uh.edu!st1dr
From: st1dr@elroy.uh.edu (Frankfort, David C.)
Newsgroups: comp.sys.apple2
Subject: Joystick IBM->Apple2
Date: 15 Nov 1992 23:51 CST
Organization: University of Houston
Lines: 47
Distribution: world
Message-ID: <15NOV199223511033@elroy.uh.edu>
NNTP-Posting-Host: elroy.uh.edu
News-Software: VAX/VMS VNEWS 1.41

This is the requested conversion from an IBM joystick to an Apple joystick.
The materials required to do it is a shielded 6 wire cable to any length
desired.  Also include a 15 pin sub d male and a 9 pin sub d male.  Of course
you'll need a soldering iron and solder or else get the crimping kind of pins
for the sub d connectors.

Pin assignments - looking into the d
--------------------------------          ------------------------
 \    o  o  o  o  o  o  o  o  /           \  o  o  o  o  o    /
  \   1  2  3  4  5  6  7  8 /             \ 1  2  3  4  5   /
   \                        /               \               /
    \  o  o  o  o  o  o  o /                 \ o  o  o  o  /
     \ 9 10 11 12 13 14 15/                   \6  7  8  9 /
       ------------------                       ----------

Now with the knowledge of the pin assignments the actual dirty work can begin
  The layout is with respect to the 15 pin IBM connector.  Pins not
mentioned on the 9 pin connector are not used.  Note the jumper between pin 1
and pin 4 on the 15 pin sub d.

     15 pin connector          9 pin connector
   +--->1------------------------>2 +5V
   |    2------------------------>7 Fire Button 1
   |    3------------------------>3 X Control
   +--->4                         +5V
        5------------------------>5 GND Used for sheilding and nothing alse
        6------------------------>8 Y Control
        7------------------------>1 Fire Button 2
        8
        9
        10
        11
        12
        13
        14
        15

        Once all the connections are put together put the screws to hold it
all together.  A suggestion is to put a nut with a one piece screw and nut
like the one used on the Super Serial Card for the 15 pin sub d.  This will
allow for the screws on the IBM joystick.  BTW I will not held responsble for
any subsequent faults or failure due to the above information.  To send
```

```
comments or suggestions please mail to st1dr@jetson.uh.edu.

*******************************************************************************
*David F.                      No silly quote.                        *
*******************************************************************************


### END OF FILE joystick.ibm2aii
```

```
##############################################################################
### FILE: joystick.orca
##############################################################################

Newsgroups: comp.sys.apple2.programmer
Path:
news.uiowa.edu!uunet!usc!elroy.jpl.nasa.gov!decwrl!waikato!comp.vuw.ac.nz!actrix.g
en.nz!dempson
From: dempson@atlantis.actrix.gen.nz (David Empson)
Subject: Re: Joystick and stuff
Message-ID: <D5JGFJ.Bp7@actrix.gen.nz>
Sender: news@actrix.gen.nz (News Administrator)
Organization: Actrix Information Exchange
Date: Thu, 16 Mar 1995 15:02:06 GMT
References: <pU26uow.sjc@delphi.com>
X-Nntp-Posting-Host: atlantis.actrix.gen.nz
Lines: 138

In article <pU26uow.sjc@delphi.com>, Stephen Carpenter  <sjc@delphi.com> wrote:
> I am on a GS and was wondering how I can read the Joystick
> I am using Orca/c (if that helps any)

It certainly affects how you will go about reading the joystick.

There is no firmware or toolbox support provided for reading the
joystick from GS/OS.  Apart from writing your own assembly language
code to read it, the easiest way is to use the FWEntry tool call in
the Miscellaneous toolset to call the old PREAD routine in the
monitor.  This will allow one axis of the joystick to be read.  You
can then call it again with different parameters to read the other
axis.

Note: you have to ensure each axis has timed out before trying to read
it.  If you try to read the X and Y values immediately after each
other, you will probably get a false reading on the second one.  A
delay of at least three milliseconds is recommended.  One commonly
used solution is to separate the reading of the X and Y values and do
several other operations between them.

Reading the buttons is easier: it is just a matter of reading the
appropriate I/O locations directly.


Now for the details:

First, a very major warning: the FWEntry toolbox call has been
implemented incorrectly in all versions of ORCA/C: its parameters are
in a different order than they are listed in the toolbox reference.
Even worse, the parameter order varies depending on which compiler
version you have (all of them are wrong).

The official definition of FWEntry is:

   regs = FWEntry(aReg, xReg, yReg, entryPt);

With ORCA/C 1.0 to 2.0.0, you must reverse the parameters:

   regs = FWEntry(entryPt, yReg, xReg, aReg);
```

With ORCA/C 2.0.1 to 2.0.3, you must swap the first and last parameters:

```
   regs = FWEntry(entryPt, xReg, yReg, aReg);
```

This will probably be fixed in a future version of the compiler (it is actually a bug in the library code), so the correct parameter order will be used (a, x, y, entryPt). [Yes, Mike does know about this one.]

If you change compiler versions, make sure you check your FWEntry calls are correct for the new version.

Having got that out of the way, here is the code required to read either axis of the joystick from ORCA/C. I've used inline assembly language to read I/O ports directly, to avoid possible hickups with ORCA/C reading the following byte as well.

```
#include <misctool.h>

/* Set the FWENTRY_BUG macro according to the compiler version you are using:

   1   ORCA/C 1.x, or ORCA/C 2.0.0
   2   ORCA/C 2.0.1 through 2.0.3, or future versions that still have
       the same bug.
   0   Future versions of ORCA/C that have the bug fixed.
*/

#define     FWENTRY_BUG 2       /* I'm assuming ORCA/C 2.0.1 to 2.0.3 */

#define     PRead 0xFB1E          /* Paddle read routine entry point */

Word read_paddle(Word n) {
    /* Get the current reading from a paddle.  Paddle 0 is the
       joystick X axis, paddle 1 is the joystick Y axis.  If a second
       joystick is connected, it corresponds to paddles 2 (X) and 3 (Y). */
    FWRec regs;
#if FWENTRY_BUG == 2
    regs = FWEntry(PRead, n, 0, 0);
#elif FWENTRY_BUG == 1
    regs = FWEntry(PRead, 0, n, 0);
#else
    regs = FWEntry(0, n, 0, PRead);
#endif
    return regs.yRegExit & 0xFF;
}

Boolean test_paddle(Word n) {
    /* Test if a paddle has timed out since the last read.  This routine
       can be used to check whether it is safe to call read_paddle again.
       The return value is TRUE if the specified paddle has timed out
       and can be read again, FALSE if it is still timing out (this may
       indicate that the paddle/joystick has not been connected if it
       continues long enough). */
    Byte paddle_flag;
    asm {
        sep #0x30
        lda n
        and #0x03
```

```
        tax
        lda 0xE0C064,x
        and #0x80
        sta paddle_flag
        rep #0x30
    }
    return (paddle_flag != 0);
}

Boolean read_button(Word n) {
    /* Read the state of the specified paddle/joystick button.  The return
       value will be TRUE if the button is on, FALSE if the button
       is off.  This routine supports buttons 0, 1, 2, and 3.  Button
       3 is only available on the IIgs, and only on the internal 16-pin
       game port.
       Note: holding down the Apple key will make button 0 appear to
       be on; similarly, the Option key will make button 1 appear to
       be on. */
    Byte button_state;
    asm {
        sep #0x30
        lda n
        inc a
        and #0x03
        tax
        lda 0xE0C060,x
        and #0x80
        sta button_state
        rep #0x30
    }
    return (button_state != 0);
}

--
David Empson
dempson@actrix.gen.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand


### END OF FILE joystick.orca
```

```
######################################################################
### FILE: joystick.pcmod
######################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!newsfeed.internetmci.com!in1.uu.net!newstf01.news
.aol.com!newsbf02.news.aol.com!not-for-mail
From: rubywand@aol.com (RUBYWAND)
Newsgroups: comp.sys.apple2
Subject: Re: Joysticks for Newbie? IIc and IIe.
Date: 6 Jan 1996 07:27:15 -0500
Organization: America Online, Inc. (1-800-827-6364)
Lines: 46
Sender: root@newsbf02.news.aol.com
Message-ID: <4clpr3$m1r@newsbf02.news.aol.com>
References: <4cj35n$jjs@newsbf02.news.aol.com>
NNTP-Posting-Host: newsbf02.mail.aol.com
X-Newsreader: AOL Offline Reader


Re question: What joystick can I use on a IIc and where can I buy one?
Same for a IIe. ...


    When John Dobbins emailed a question about stick wiring, it suddenly
dawned upon me that I've never seen a modern, pure PC stick converted for
use on an Apple II or a "PC-to-Apple converter cable". It seemed like a
good idea to actually try building a converter cable.

    My PC stick is a standard CH Products "FlightStick". A resistance
measurement produced a disconcerting revelation: the X and Y pots top-out
around 100K Ohms-- 50K less than a standard Apple II stick! Fortunately,
you can compensate for the difference just fine by adding a bit of
capacitance. The finished converter is shown below:


         To PC Stick                          To Apple II
(15-pin female connector)             (9-pin male connector)

         [1]  and  [4] ------------------------------ [2]  +5V
         [2] -----------------------------------------[7]  Button 1
         [3] -----------------------------------------[5]  X-axis
         [6] -----------------------------------------[8]  Y-axis
         [7] -----------------------------------------[1]  Button 2
                                                      [3]  Ground
                              add 680 Ohm resistor between [7] & [3]
                              add 680 Ohm resistor between [1] & [3]
                              add .01 uF cap between [5] & [3]*
                              add .01 uF cap between [8] & [3]*

*NOTE: These C values are approximate. For standard 100K Ohm PC sticks,
..01 uF pretty well guarantees you will be able to cover the full Apple II
X and Y range (0-255).

However, you may find that the stick tops-out too early in the X and/or Y
max direction. For best control precision, what you want is for extreme
values to occur near the extremes of stick movement.

Use a program which continuously reads and displays X and Y stick values
```

and experiment with capacitance values between .002 uF and .01 uF to get the best 'spread'.

Values of .01 uf (H-axis) and .005 uF (Y-axis) worked well on the PC "FlightStick" when plugged into our Apple II+.

END OF FILE joystick.pcmod

```
##########################################################################
### FILE: joystick.read
##########################################################################

Path: blue.weeg.uiowa.edu!news.uiowa.edu!uunet!usc!elroy.jpl.nasa.gov!netline-
fddi.jpl.nasa.gov!nntp-server.caltech.edu!nathan
From: nathan@cco.caltech.edu (Nathan Mates)
Newsgroups: comp.sys.apple2.programmer
Subject: Re: Joystick Code... Help Please!
Date: 25 Nov 1994 06:39:52 GMT
Organization: California Institute of Technology, Pasadena
Lines: 82
Message-ID: <3b40ro$ief@gap.cco.caltech.edu>
References: <3b37bu$8ag@condor.ic.net>
NNTP-Posting-Host: accord.cco.caltech.edu

In article <3b37bu$8ag@condor.ic.net>, Shawn Platkus <platkus@ic.net> wrote:
>I'm in need of some code to read the joystick values from 65816 assembly.

   This was sent to me a while back.

Nathan


--- Begin included file
From afcdyajim@aol.com Sat Mar 27 21:47:15 1993
From: afcdyajim@aol.com
X-Mailer: America Online Mailer
To: nathan@cco.caltech.edu
Subject: joystick routine

Path: Assembly (6502/65816)/Asm65816 Code Wanted...

Subj:  My code...                          92-10-21 22:48:08 EST
>From:  AFL GaryJ
Posted on: America Online

Here's the code I used.  There are a few things to keep in mind with this
code:  Because I'm using wide registers, the X and Y values of the joystick
may come back with values greater than $FF.  The size of the number returned
depends (in part) upon the speed of the machine that the code is running on.
Accellerated IIGS's will return greater values than stock 2.8 MHz machines.
Having the user do a joystick calibration at the start of the program would
be one way of solving this problem.

Also, because the maximum joystick value returned is not "clipped off" (i.e.
maxed out at $FF), the X and Y maximum returned values may differ, depending
on the model and wear of your joystick.

And one last thing: The timing cycles of my routine are greater than the sum
of the cycles required to execute the standard paddle reading routine built
into the II+  ROM.  But, since my routine will execute at speeds greater than
1 MHz, the net difference results in a faster joystick read.  That, coupled
with the fact that both paddles are read at the same time, makes this routine
much faster than the standard ROM call.

I haven't looked at this code for a long time, and I'm sure there are ways to
improve it.  Anyone, feel free to post possible enhancements!
;
```

```
;  Read the joystick controls:
PRead    anop
         php
         sei
         lda   >$00C070  ; trigger paddles           (6)
         ldy   #0        ;                           (3)
         ldx   #3        ;                           (3)
PRtime   dex             ;                           (2)
         bne   PRtime    ; timing loop for 1st count (2,3)
PRead2   lda   >$00C064  ; check paddle 0,1 status   (6)
         and   #$8080    ; check high bits of each   (3)
         beq   PRXit     ; exit if both are done     (2)
         cmp   #$0080    ; see if X only is active   (3)
         bmi   PRBoth    ; > no, do both             (2,3)
         beq   PRXOnly   ; > X axis only             (2,3)
PRYonly  iny             ;                           (2)
         bpl   PRYmore   ; (just for timing)         (3)
         bmi   PRXit     ; (prevent endless loop)
PRYmore  bra   PRead2    ; go back for more          (3)
PRXOnly  inx             ;                           (2)
         bmi   PRXit     ; (prevent endless loop)    (2)
         bra   PRead2    ; go back for more          (3)
PRBoth   inx             ;                           (2)
         iny             ;                           (2)
         nop             ; match timing of others    (2)
         bpl   PRead2    ;                           (3)
PRXit    plp
         rts             ; x = pdl(0), y = pdl(1)

;------------------------------

Gary


--
* Nathan Mates   http://www.ugcs.caltech.edu/~nathan/                *
* Ftp humor archiver: ftp to cco.caltech.edu, look in pub/humor      *
* "Always listen to experts. They'll tell what can't be done, and   *
*  why. Then do it."  -- Robert A. Heinlein, Lazarus Long            *


### END OF FILE joystick.read
```

```
########################################################################
### FILE: keybd.repair
########################################################################

Newsgroups: comp.sys.apple2
Path:
news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!newsfeed.ksu.ksu.edu!m
oe.ksu.ksu.edu!vixen.cso.uiuc.edu!howland.reston.ans.net!agate!darkstar.UCSC.EDU!n
ews.hal.COM!olivea!decwrl!pa.dec.com!acme.freenet.columbus.oh.us!dalloff
From: dalloff@freenet.columbus.oh.us (Dave Althoff)
Subject: Dave's Guide to ][e Keyboard Repair
Message-ID: <Pine.3.07.9406062340.A16870-b100000@acme.freenet.columbus.oh.us>
Date: Mon, 6 Jun 1994 23:13:40 -0400 (EDT)
X-Received: by usenet.pa.dec.com; id AA03764; Mon, 6 Jun 94 20:35:30 -0700
X-Received: by pobox1.pa.dec.com; id AA03304; Mon, 6 Jun 94 20:35:27 -0700
X-Received: from acme.freenet.columbus.oh.us by inet-gw-3.pa.dec.com
(5.65/27May94)
      id AA16069; Mon, 6 Jun 94 20:31:52 -0700
X-Received: by acme.freenet.columbus.oh.us (8.6.7/5.901231)
      id XAA17652; Mon, 6 Jun 1994 23:30:22 -0400
X-To: hbcsc003@huey.csun.edu
X-Cc: comp.sys.apple2.usenet@decwrl.dec.com
X-Mime-Version: 1.0
X-Content-Type: TEXT/PLAIN; charset=US-ASCII
Lines: 47


Most Apple ][e's use all-mechanical Alps keyswitches in the keyboards.
Some use a short-stem switch, some use a short-stem switch with an
extender, and some use a long-stem switch.  In most cases, the switches
are not repairable.

Fortunately, replacement  is fairly easy.

1.  Remove the screws from the bottom of the ][e case, and remove the top
half of the case.

2.  Scribe the position of the keyboard on the keyboard support brackets,
to facilitate reinstallation.

3.  Remove the keycaps of the blown key and the surrounding keys.

4.  Remove the four keyboard mounting  screws, and unplug the ribbon
connector from the keyboard.  At this point, I generally find it
convenient to mount the keyboard PCB-side-up on the mounting brackets.

5.  Locate the two solder pads under the blown key.  Heat these pads and,
using a vacuum bulb, remove all of the solder from the pins.  Grasp the
exposed pins with a small plier and wiggle a bit to make sure they are
free of the board.

6.  To remove the keyswitch, you must fully depress the tabs on either
side of the key stem, and lift the entire switch upward.  This is the
tricky part.

7.  To install the new keyswitch, simply press the switch into the hole in
the keyboard until it snaps  into position.  Carefully solder the pins to
the pads  on the PC board, then reinstall the keyboard  in the reverse of
removal.
```

8. When reinstalling the keyboard, line the edges up with the scribe marks on the brackets. If you get it malpositioned, you may find that certain keys (most notably the "`") will stick by jamming against the system cover.

If you need more information, I am...

--Dave Althoff, Jr.
(dalloff@freenet.columbus.oh.us)
(long-time Apple][user)

Newsgroups: comp.sys.apple2
Path:
news.weeg.uiowa.edu!news.uiowa.edu!uunet!newsflash.concordia.ca!vax2.concordia.ca!spector
From: spector@vax2.concordia.ca (Mitchell Spector)
Subject: Re: Keyboard repair
Message-ID: <7JUN199411052817@vax2.concordia.ca>
Summary: 3 key doesn't work; help!
News-Software: VAX/VMS VNEWS 1.41
Sender: usenet@newsflash.concordia.ca (USENET News System)
Nntp-Posting-Host: vax2.concordia.ca
Organization: Concordia University
References: <2st9n7$9nc@nic-nac.CSU.net>
Date: Tue, 7 Jun 1994 16:05:00 GMT
Lines: 35

In article hbcsc003@huey.csun.edu (will irace) writes...
>
>I've just picked up a //e enhanced, and it's great except for the fact
>that the "3" key is stone cold dead. ("Aaigh! no PR#6!") I've taken it
>apart only to find that the keyboard is apparently RIVETED together! Is
>there no way for me to repair this? How about some sort of workaround
>(i.e., figuring out which pins I should short together to get a "3" out)?

I had a simular problem happen to me recently. Some months ago, my friend found an Apple //e in the trash and gave it to me the night of Oct.31st last year (hey, talk about your "enchanted" //e! ;-), but the keyboard was damaged and it was missing a screen. I soon discovered it would be much cheaper to just buy another second-hand //e, than pay for a replacement keyboard and monitor. So, a few weeks ago that's just what I did! When I brought it home it was fairly dirty, so I took it apart and cleaned everything including the brand-new _working_ keyboard. Unfortunately, once I put everything back together, I found many of the keys were acting totally dead. Well, I was on verge of giving up until I tried this....

Remove the plastic-keycap on your "3" key. Do you see little plastic tabs on either side on the the keyswitch? Poke something in between these tabs (ie - toothpick, long metal-pin) and very gently pry them away from the keyswitch. If that doesn't work, push them in closer. Try depressing the keyswitch (without keycap back on yet) until you get a response on screen from the "3" key again. You might have to play around until it's fully functioning again. In my case, I think there was a contact-pad or something simular that wasn't making a connection. While this solution may not sound so orthodox, it may just save you from having to do any messy soldering.

>Will Irace

>wirace@csun.edu

Mitchell Spector
sb_spec@pavo.concordia.ca / spector@vax2.concordia.ca

END OF FILE keybd.repair

```
##############################################################################
### FILE: keycaps.fix
##############################################################################

Path: ns-mx!hobbes.physics.uiowa.edu!zaphod.mps.ohio-
state.edu!sol.ctr.columbia.edu!spool.mu.edu!agate!dog.ee.lbl.gov!ucbvax!cxr_rs6000
.med.ge.com!marc
From: marc@cxr_rs6000.med.ge.com (Marc Wolfgram)
Newsgroups: comp.sys.apple2
Subject: Re:  Keys which break!
Message-ID: <9205011742.AA09578@cxr_rs6000>
Date: 1 May 92 17:42:27 GMT
Sender: daemon@ucbvax.BERKELEY.EDU
Organization: The Internet
Lines: 5

On reparing keycaps: take a paperclip and bend a tight hook in one end to pull
the broken part of the cap out of the switch itself... then cut up the papercli
and bend a short u-shaped piece to be used inside the broken part _and_ tha cap
as a "splint"... put the parts to gether, push in the wire, add superglue, and
wait a bit for the glue to dry before putting the fixed keycap back in the switch.


### END OF FILE keycaps.fix
```

```
##############################################################################
### FILE: keyfix
##############################################################################

Path: ns-mx!uunet!zephyr.ens.tek.com!tektronix!reed!nobody
From: reeder@reed.edu (Doug Reeder)
Newsgroups: comp.sys.apple2
Subject: Re: Apple 2e key(board) trouble
Keywords: apple 2e, spam, lust, keycaps, keyswitches
Message-ID: <m0kHuNa-0003DZC@romulus.reed.edu>
Date: 4 Sep 91 10:22:44 GMT
References: <1304@ucsbcsl.ucsb.edu>
Sender: nobody@reed.edu (anonymous NFS user)
Distribution: comp
Organization: Tether Propulsion Division, Institute of Knowledge, Jinx
Lines: 64

In article <1304@ucsbcsl.ucsb.edu> 6600faze@ucsbuxa.ucsb.edu (Jennifer Mosley)
 writes:
-I don't know the details, but my father is complaining that the
-a-key on his Apple 2e "doesn't work."

The simple soulution is to clean the keyswitch, as detailed in another article.
If this does not fix the problem, you must replace the keyswitch, a very
simple repair.
1) pull the keycap (the part with the letter on it) straight up. There exists
at tool that does this nicely, but one can get by without it.
2) remove the keyboard from the machine.
  a) unscrew the screws on the bottom of the case
  b) lift the top casing off the bottom casing
  c) unplug the keyboard from the motherboard
  d) unscrew the screws that connect the keyboard with whichever casing it's
     connected to
3) unsolder the keyswitch from the keyboard. There are two leads on the
   bottom of the keyboard for each keyswitch.
4) squeze the plastic tabs on the side of the keyswitch toward the center,
   while pulling up on the stem of the keyswitch.  This usually requires two
   pairs of needle-nose pliers and lots of patience.
5) get a replacement keyswitch from your Apple dealer (or elsewhere).  Bring
   in the old old keyswitch, because there are five different kinds used on
   the IIe, and you want an exact match.  You'll need a "straight adapter" as
   well, if all the other keys on your keyboard have them.  Short stem
   keyswitches need adapters, and a long-stem is not quite the same length as
   the short+adapters.
6) push the new keyswitch straight into the hole, making sure the leads
   go through the holes in the printed circuit board, until the plastic tabs
   click in place.
7) solder the two leads to the circuit board.
8) put the computer back together
9) replace the keycap

-BTW, when we bought my apple, one of the keys was broken and the
-'tile' (the cover with the letter on it) was missing.

Check with another dealer.  I can't speak for all dealers, but we kept enough
keycaps on hand to match anything.

If you've broken the stem of a keyswitch, you'll need to replace the keyswitch
as detailed above.  Don't bother trying to glue a keyswitch stem.  Save the
```

keycap, as it can be used again, once you get the fragment of stem out. A piece of wire (e.g. a bent out paperclip) and a flame (e.g. a match) to heat the wire will almost always get keyswitch stem fragments out of keycaps.

P.S. If anyone's keeping a FAQ list, this article might be a good thing to append, even if it was written late at night.

Doug Reeder USENET: ...!tektronix!reed!reeder
Internet: reeder@reed.EDU BITNET: reeder@reed.BITNET
I'm looking for a grad school or a job as a research assistant where I can work on tethers for space propulsion or robotics, in particular, walking machines, or even some more contract programming work.

--
Doug Reeder USENET: ...!tektronix!reed!reeder
Internet: reeder@reed.EDU BITNET: reeder@reed.BITNET
I'm looking for a grad school or a job as a research assistant where I can work on tethers for space propulsion or robotics, in particular, walking machines.

END OF FILE keyfix

```
##############################################################################
### FILE: keyfix.2
##############################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-state.edu!pacific.mps.ohio-
state.edu!freenet.columbus.oh.us!not-for-mail
From: dalloff@freenet.columbus.oh.us (Dave Althoff)
Newsgroups: comp.sys.apple2
Subject: Re: Problem with IIe keyboard
Date: 4 Sep 1996 23:19:50 -0400
Organization: The Greater Columbus FreeNet
Lines: 123
Message-ID: <50lgsm$qql@login.freenet.columbus.oh.us>
References: <Pine.SOL.3.94.960827203857.8368A-100000@apollo>
<Dx3xG2.95B.0.queen@torfree.net> <Pine.SOL.3.95.960902103418.26501D-100000@owens>
NNTP-Posting-Host: login.freenet.columbus.oh.us
X-Newsreader: TIN [version 1.2 PL2]

I promised to post this...

If you can't get a solvent to clean your bad keyswitch, here are detailed
instructions for replacing the faulty switch...

A Guide to Replacing Apple ][e Keyswitches
------------------------------------------

By Dave Althoff, ][.  (dalthoff@capital.edu)

NOTE:  This document details the methods I have used to replace Apple
][e keyswitches.  The procedure is fairly straightforward, but it
does involve completely disassembling your computer, desoldering the
old keyswitch, and resoldering the new switch.  If you mess it up,
damage your computer, hurt yourself, or experience other
difficulties, I cannot assume any responsibility.  As with any repair
or modification, proceed at your own risk.

Various comp.sys.apple2 correspondents have reported success with
cleaning Apple ][e keyswitches.  I have not had much luck with this
myself, but I have replaced a bunch of the switches in one of my
][e's.  The procedure is fairly straightforward.  I have been able to
get replacement keyswitches from Micro Center (Columbus, Ohio) for
$10/each (Yikes!) for the Alps long-stem switch...which is also used
in the Macintosh Plus keyboard.  Some ][e's use the Alps short-stem
key switch with an extension.  If anyone knows a cheaper source for
these parts, PLEASE let me know!

1.  Turn the computer off, ground yourself to the chassis, then
    pull the plug on the machine.

2.  Invert the computer and remove the Phillips head screws from
    the perimeter.  There are supposed to be three under the front
    edge, and three more along each side edge.  Some may be
    missing (mine had only four).  Do NOT remove the four smaller
    screws which secure the power supply.  With the screws removed,
    turn the computer right-side up.  Hold it together when you
    do so!

3.  Remove the top of the case.  NOTE:  There are two styles!!
3a.  IF THE KEYBOARD IS NOT ATTACHED TO THE UPPER CASE:
```

i. Set the case lid aside.
ii. The keyboard is attached to two supports attached to the computer's base pan. Mark the supports at the edge of the keyboard assembly.
iii. Note the orientation of the ribbon connector either at the edge of the keyboard, or on the motherboard, and unplug the ribbon cable.
iv. Remove the four screws which secure the keyboard to the supports, and remove the keyboard assembly. Proceed to step 4.

3b. IF THE KEYBOARD IS ATTACHED TO THE UPPER CASE:
i. Note the orientation of the ribbon cable either at the edge of the keyboard or on the motherboard, and unplug the ribbon cable. Set the motherboard assembly aside.
ii. Remove the four screws which secure the keyboard to the upper case and remove the keyboard assembly. Proceed to step 4.

4. Locate the bad keyswitch, and remove the keycap by pulling straight up. Also remove the keycaps from the surrounding keys.

5. On the bottom of the keyboard, there are two solder points beneath each keyswitch. Locate the solder points for the bad keyswitch and COMPLETELY desolder the terminals using some kind of vacuum desoldering tool. I use a squeeze bulb, but the spring-loaded desoldering tools sometimes work better. Be careful not to damage the printed circuit trace...do not overheat the joint!

6. Now for the tough part. Squeeze together the tabs on either side of the keyswitch post, and lift the keyswitch straight up out of the keyboard assembly. If it won't come, then you probably don't have all of the solder off of the connection posts. Or you aren't squeezing the tabs enough.

7. Align the posts on the bottom of the new keyswitch with the holes in the circuit board. It will only fit one way. Press the keyswitch into the keyboard assembly until it snaps into place.

8. Carefully solder the pins on the keyswitch to the circuit board. Replace the keycaps.

9a. IF THE KEYBOARD WAS ATTACHED TO THE UPPER CASE:
i. Attach the keyboard to the upper case using the four screws.
ii. Connect the ribbon cable between the keyboard and the motherboard
iii. Proceed to step 10.

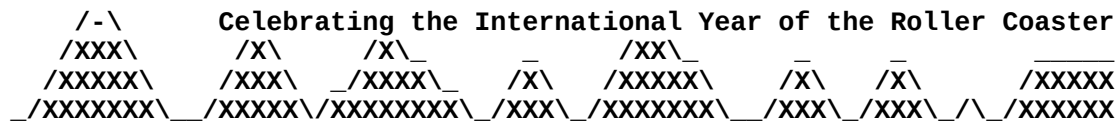
9b. IF THE KEYBOARD WAS ATTACHED TO SUPPORTS ATTACHED TO THE BASE PLATE:
i. Align the edge of the keyboard with the mark you made on the support in step 3a(ii).
ii. Attach the keyboard to the keyboard support bracket using the four screws. Alignment is very important!
iii. Reconect the ribbon cable between the keyboard and the motherboard.
iv. Proceed to step 10.

10. Drop the upper case onto the computer base plate, invert the unit, and reinstall the screws from the bottom of the case.

11. Reconnect the computer and test the keyboard. Make sure that all of the keys work, in particular the key that you replaced. Also, check all of the keys around the edge of the keyboard, particularly the open-apple and tilde, to make sure that none of the keys are jamming against the edge of the case.

12. Go enjoy a beverage of your choice, as you have successfully repaired your keyboard. The whole operation should take about a half-hour.

--Dave Althoff,][.
--



END OF FILE keyfix.2

```
##########################################################################
### FILE: keypresses
##########################################################################

Newsgroups: comp.sys.apple2.programmer
Path: news.uiowa.edu!chi-
news.cic.net!newsfeed.internetmci.com!news.msfc.nasa.gov!pendragon!ames!waikato!co
mp.vuw.ac.nz!actrix.gen.nz!dempson
From: dempson@atlantis.actrix.gen.nz (David Empson)
Subject: Re: Control key
Message-ID: <DMps0s.B8r@actrix.gen.nz>
Sender: news@actrix.gen.nz (News Administrator)
Organization: Actrix - Internet Services
Date: Tue, 13 Feb 1996 12:29:15 GMT
References: <4fb59l$4kc@lastactionhero.rs.itd.umich.edu>
<4fcats$hvt@tuba.cit.cornell.edu> <4fk52s$l8q@lastactionhero.rs.itd.umich.edu>
<4fmt3p$nu9@nnrp1.news.primenet.com>
X-Nntp-Posting-Host: atlantis.actrix.gen.nz
Lines: 82

In article <4fmt3p$nu9@nnrp1.news.primenet.com>,
John Bowling <johnlb@primenet.com> wrote:
> >In article <4fcats$hvt@tuba.cit.cornell.edu>,
> >Jay Krell <jmk3@crux4.cit.cornell.edu> wrote:
> >>mcafee@umich.edu (Sean McAfee) writes:
> >>>How is it that the Event Manager is able to determine that the Control key
> >>>was being pressed during the last keydown event?
> >
> >>C025 (don't use it) is well documented to hold the status of
> >       ^^^^^^^^^^^^
> >>control, shift, apple, option, keypad, etc., though with slight
> >>inaccuracies wrt control and the arrows.

I don't understand this comment about control/arrow inaccuracies.  It
has always worked fine for me - the arrow keys by themselves do not
indicate that the control key is down, so they can be detected
(because the ASCII code was a control character).  If Control-Arrow is
pressed, it cannot be distinguished from Control and the corresponding
letter.

(This could be avoided by bypassing the standard keyboard handling
provided by the keyboard microcontroller, and processing key up/down
sequences directly, using the ADB service request mechanism - you then
get scan codes for the keys, so every key can be identified correctly.)

> I've used it in a few programs that need to get around the C crap of
> requiring a <return> key on every entry, and I've never had a problem
> with it.
>
> So, why not?

Compatibility.

If you access the hardware directly, you will reduce the number of
situations in which your program will work properly.  In particular,
it will NOT work properly in the background under GNO or another
multitasking system.

It also might not work reliably if something else has enabled the
```

Event Manager - keys might be swallowed behind your back as the Event Manager's interrupt handler picks them up.

If you get keys using the Event Manager, then it will always work.

In shell programs, another option is to use the new calls provided by ORCA/Shell 2.0.1 and later, and recent versions of GNO. The ORCA/Shell implementation of the calls "KeyPress" and "ReadKey" will use the Event Manager if it is active, or access the hardware directly.

The GNO implementation also copes with programs that have been switched into the background, not providing them with any keypresses.

I wrote my own keyboard read routines that do the following:

1. Try the ORCA/Shell call.

2. If an error occured (older version of the shell, or no shell present), and the Event Manager is active, then use it.

3. If all else fails, access the hardware directly.

This should work in any 16-bit environment (GNO, ORCA/Shell 2.0.1 or later, older shell versions, a standalone application, CDA, etc.)

Note that if you do choose to access the hardware directly, make sure you use $C025, $C000 and $C010 correctly. The proper sequence for detecting a keypress and reading the modifiers is:

- Check for a keypress by looking at bit 7 of location $C000.
- If a key is available, read the modifiers from $C025, with the associated key value from $C000.
- Reset the keyboard strobe by accessing $C010.

Note that if keyboard buffering is enabled, the modifiers will be stable until the associated key is cleared. If keyboard buffering is disabled, the modifiers can change on the fly (this is also the case when buffering is enabled and no non-modifier has been pressed yet).
--
David Empson
dempson@actrix.gen.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand

END OF FILE keypresses

```
######################################################################
### FILE: keyswitch.fix
######################################################################

Path: news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-state.edu!magnus.acs.ohio-
state.edu!freenet.columbus.oh.us!not-for-mail
From: dalloff@freenet.columbus.oh.us (Dave Althoff)
Newsgroups: comp.sys.apple2
Subject: Re: partially dead //e keyboard
Date: 2 Mar 1995 00:48:29 -0500
Organization: The Greater Columbus Freenet
Lines: 74
Message-ID: <3j3m7d$cq@acme.freenet.columbus.oh.us>
References: <3j349a$9md@lastactionhero.rs.itd.umich.edu>
NNTP-Posting-Host: acme.freenet.columbus.oh.us
X-Newsreader: TIN [version 1.2 PL2]

What you've got is a dead keyswitch.

I like the ][e keyboard; it has a great feel to it, especially compared to
my GS keyboard.  The trouble is that with discrete keys, you've got some
63 little switches to fail.

They're not hard to replace; I've probably bought enough keyswitches for
Mom's ][e to buy two or three new keyboards (anyone know where to get one
for, say, $70?  "Genuine" type ][e keyboard? Jameco dropped them from the
catalog right when I was about to order one!)

Anyway, the last time I checked, keyswitches were about $10 each retail
for the Alps Long-Stem switch.  That's the same switch as used in the Mac
Plus keyboard, so they are still available.

To replace the keyswitch:
Remove the screws from the bottom of the ][e case.  Remove the case.  If
you have a classic ][e (beige), the keyboard will be supported on two
triangular supports attached to the base plate.  On the "platinum" ][e,
the keyboard is attached to the upper case.

On the beige ][e, save yourself a lot of grief before going any further.
Get a marker and scribe the supports at the edge of the keyboard assembly.
This will allow you to get the horizontal alignment right when you put it
all back together; this keeps you from getting hung with stuck keys later.

Remove the four screws holding the keyboard, and disconnect it from the
motherboard.  I suggest unplugging the ribbon connector from the end of
the keyboard so it will be out of your way.

Remove the keycaps from the bad key and from the surrounding keys by
pulling them straight off.  Examine the keyboard, and locate the two
solder connections on the back directly below the bad key.

At this point, I usually mount the keyboard upside-down on the support in
the computer, since it provides a handy support which also protects the
keycaps by suspending them, but, as they say, YMMV.

Using a low-wattage soldering iron and a desoldering bulb, carefully
remove all the solder from the two connections under the bad key.  When
you have done so, the pins sticking through the holes should be completely
free of the board tracings.  Be careful; if you use too much heat, you can
```

lift the copper trace off the board. You do NOT want to do that!

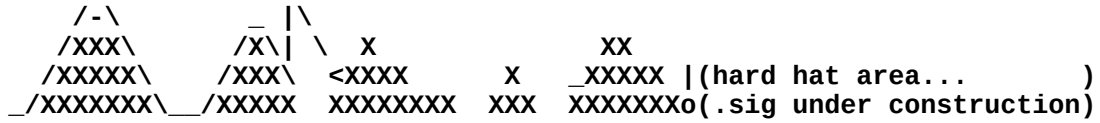
Turn the keyboard up-side-up. There is a squeeze-tab on either side of the keyswitch. With the solder completely removed from the bottom, you should be able to squeeze these tabs together and lift the switch straight out. Sorry, no tips here...I have trouble doing it myself. Two tiny flat-head screwdrivers usually work; sometimes I can get a pair of needle-nose pliers to do the trick.

To install the new switch, make sure it is oriented the same way as the old one, and snap it into the hole. If you did it right (and it's REALLY hard to screw this part up!), the contacts should be sticking through the holes in the bottom of the circuit board. Heat up the pins and apply solder to connect the new switch to the board. Reconnect the keyboard to the computer, power it all up, and make sure the new key works.

Reinstall the key caps, and reattach the keyboard. On the beige][e's, line up the edge of the keyboard with the mark you made earlier. Put the case back together, and it's all good as new.

Usual cost:
$10 (keyswitch)
about an inch of solder
about fifteen minutes-half an hour.

--Dave Althoff, Jr.
(sometimes I think I should buy keyswitches by the dozen 8-( )
--



END OF FILE keyswitch.fix

```
##########################################################################
### FILE: keyswitch.fix2
##########################################################################

Path: icaen!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-
state.edu!magnus.acs.ohio-state.edu!freenet.columbus.oh.us!not-for-mail
From: dalloff@freenet.columbus.oh.us (Dave Althoff)
Newsgroups: comp.sys.apple2
Subject: Re: partially dead //e keyboard
Date: 2 Mar 1995 00:48:29 -0500
Organization: The Greater Columbus Freenet
Lines: 74
Message-ID: <3j3m7d$cq@acme.freenet.columbus.oh.us>
References: <3j349a$9md@lastactionhero.rs.itd.umich.edu>
NNTP-Posting-Host: acme.freenet.columbus.oh.us
X-Newsreader: TIN [version 1.2 PL2]

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you have a classic ][e (beige), the keyboard will be supported on two
triangular supports attached to the base plate.  On the "platinum" ][e,
the keyboard is attached to the upper case.

On the beige ][e, save yourself a lot of grief before going any further.
Get a marker and scribe the supports at the edge of the keyboard assembly.
This will allow you to get the horizontal alignment right when you put it
all back together; this keeps you from getting hung with stuck keys later.

Remove the four screws holding the keyboard, and disconnect it from the
motherboard.  I suggest unplugging the ribbon connector from the end of
the keyboard so it will be out of your way.

Remove the keycaps from the bad key and from the surrounding keys by
pulling them straight off.  Examine the keyboard, and locate the two
solder connections on the back directly below the bad key.

At this point, I usually mount the keyboard upside-down on the support in
the computer, since it provides a handy support which also protects the
keycaps by suspending them, but, as they say, YMMV.

Using a low-wattage soldering iron and a desoldering bulb, carefully
remove all the solder from the two connections under the bad key.  When
you have done so, the pins sticking through the holes should be completely
free of the board tracings.  Be careful; if you use too much heat, you can
```

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Reinstall the key caps, and reattach the keyboard. On the beige][e's, line up the edge of the keyboard with the mark you made earlier. Put the case back together, and it's all good as new.

Usual cost:
$10 (keyswitch)
about an inch of solder
about fifteen minutes-half an hour.

--Dave Althoff, Jr.
(sometimes I think I should buy keyswitches by the dozen 8-( )
--

```
    /-\        _ |\
   /XXX\      /X\| \  X              XX
  /XXXXX\    /XXX\  <XXXX      X   _XXXXX |(hard hat area...       )
_/XXXXXXX\__/XXXXX  XXXXXXXX  XXX  XXXXXXXo(.sig under construction)
```

END OF FILE keyswitch.fix2

```
##############################################################################
### FILE: koalapad.c64
##############################################################################

Path:
news1.icaen!news.uiowa.edu!news1.chicago.cic.net!iagnet.net!howland.erols.net!news
2.digex.net!swbell!not-for-mail
From: Rubywand <rubywand@swbell.net>
Newsgroups: comp.sys.apple2
Subject: C-64 to A2 Koala Pad Converter? (was Re: Koala Pad)
Date: Thu, 28 Aug 1997 12:30:51 +0000
Organization: Southwestern Bell Internet Services, Richardson, TX
Lines: 67
Message-ID: <34056F7B.352F@swbell.net>
References: <3401193C.4D74@itis.com> <34013A26.7CB7@swbell.net>
<34028079.125890516@news.interlog.com> <340390C6.3BCF@itis.com>
NNTP-Posting-Host: ppp-207-193-9-18.hstntx.swbell.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Mailer: Mozilla 2.02E (Win16; I)

Ray writes ...

> ....  This Koala Pad has a 9 pin male connector the same
> as the male joystick port on my apple IIe.  I thought I may be able to
> get a gender changer and connect there but it doesn't sound that way.
> Is there a practical way to use this with any AppleII product?
>                                                Ray

     It appears that there is some confusion about male/female. The
standard Apple II 9-pin Game/Joystick port has a female connector or
socket. Standard Apple II joysticks with 9-pin DIN plugs have male
connectors.

     Since the standard Commodore-64 9-pin DIN port is male, it looks
like your Koala Pad (with a female plug) is intended to work on a C-64,
VIC-20, etc. machine.

     As to whether or not the C-64 Koala Pad can be used on an Apple
II, it looks like, probably, it can, if you can find or build an
adaptor. This is, really, a guess. It is based upon the capabilities of
the C-64 Game port, time constant capacitor values used in the C-64,
and the probability that Koala Pad's makers would not wish to make
major design changes between Apple and C-64 models.

     Although C-64 joysticks are of the simple "switcher" type which
connect to Game port switch inputs, the C-64 Game port also includes X
and Y analog "paddle" inputs. These are at pin 9 (X) and pin 5 (Y). The
C-64 manual does not ever seem to specify an optimal max R value for
the pots connected to these inputs; but, the capacitor part of the
expected R/C circuit is 1000 pF in each case and the caps go to ground.

     In short, the C-64 "paddle" inputs look very much like the Apple
II joystick inputs. A _try_ at an adaptor would look something like the
following ...

To C-64 Koala Pad    To Apple II Game Port
 (9-pin male DIN)      (9-pin male DIN)
```

```
1 ?
2 ?   2nd Button -> 1
3 ?
4 ?
5 <-  PDL1 (Y)   -> 8
6 <- main button -> 7
7 <-  +5V line   -> 2
8 <-    GND      -> 3
9 <-  PDL0 (X)   -> 5
```

The above assumes that the C-64 Koala Pad will use C-64's "Fire Button" input for its main button. The second button would, then, connect to one of the four joystick switch inputs. (Actually, since all of the switch inputs, including the Fire Button, are just inputs to a port IC, any two may be the ones used to handle Koala Pad's buttons.)

It should be possible to detect the button lines on the Koala Pad connector using an Ohm meter (on R x 100 range) with one lead connected to the GND pin (pin 8) and using the other lead to check pins 1, 2, 3, 4, and 6. A button lead similar to one on an Apple II should show up as a 500-700 Ohm resistance.

Again, we are dealing with guesses. If you decide to try making a converter, be sure to post what you discover. Good luck!

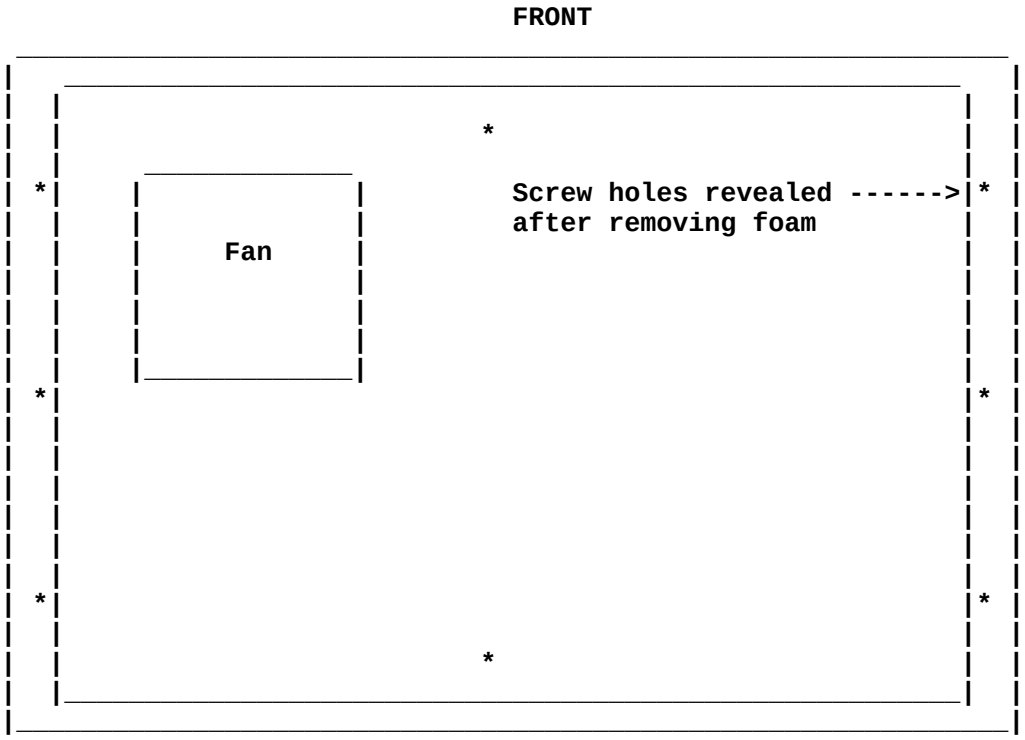
Rubywand

END OF FILE koalapad.c64

```
##########################################################################
### FILE: kssfan.fix
##########################################################################

Path: news1.icaen!news.uiowa.edu!chi-news.cic.net!howland.erols.net!news-
peer.sprintlink.net!news-pull.sprintlink.net!news-in-
east.sprintlink.net!news.sprintlink.net!Sprint!164.67.241.200!myriad!mail
From: nobody@REPLAY.COM (Anonymous)
Newsgroups: comp.sys.apple2
Subject: Re: WTB: System Saver GS or Equiv
Date: 18 Jul 1997 13:00:10 -0700
Organization: Replay and Company UnLimited
Lines: 107
Message-ID: <199707181948.VAA17856@basement.replay.com>
To: comp.sys.apple2@myriad.alias.net
X-001: Replay may or may not approve of the content of this posting
X-002: Report misuse of this automated service to <abuse@replay.com>
X-URL: http://www.replay.com/remailer/


darsys@pro-entropy.cts.com (Eric A. Seiden) wrote:
>Am looking for one of these babies to help keep my Proline BBS site up and
>running. Current one is dying and system will overheat without it. Email me
>directly with offers or inquiries.
>
>        Thanks
>        Eric

Eric, here's a repost of my System Saver GS repair article:



Hacker's Corner

Replacing the System Saver IIGS Fan

Does your Kensington System Saver IIGS sound like a broken record?  It may
be that the fan inside the unit is showing wear.  The good news is that
replacing the fan is an easy and rewarding task.

I knew my fan was starting to die when it sounded like it was wheezing
during spin-up.  The fan, a Sprite model SU2C7, uses sleave bearings,
whose lifespan is determined by the lubricating oil supply in the
bearings.  When enough of the oil evaporates, metal will grind against
metal resulting in heat and resistance that cause the fan to quickly
lock-up.  Better quality fans use ball-bearings, but Kensington
apparently used the cheapest component available.  Even among the models
with sleave bearings, the SU2C7 is the least capable.  It can only move
15 cubic feet of air a minute (half what a typical PC fan moves) and has
a 55,000 hour rating.

In looking for a replacement for my dying fan, I chose to use a better
model.  The Sprite model SU2B1 has the same dimensions as the SU2C7 used
in the System Saver and is readily available from Digi-Key corporation.
It uses ball bearings for long life (the fan is rated for 73,000 hours)
and can move 28 cubic feet of air a minute.  The higher quality is
readily apparent: the replacement is currently noticeably quieter than
the original even though it is moving more air per minute.
```

Make sure the System Saver is unplugged before opening the case.

Opening the System Saver case involves removing eight screws. You must remove the foam weatherstriping along the periphery of the case to expose the screws. Once the weatherstripping is removed, you should be able to see the screw access holes. They are arranged as shown in the following diagram (bottom view of the System Saver):



Once inside, the fan can be removed by unplugging the power cord that connects it to the circuit board. A grounding wire that is attached by a screw must also be removed. The fan itself is held to the case by two screws. Once you remove the SU2C7, you can replace it with the SU2B1. Now mount everything back together again with the screws. Apply new foam weatherstripping to the periphery of the bottom of the system saver.

The refurbished System Saver is now better than a factory new model! Notice the difference in sound: a quiet hum rather than a load rumble. If you have a lot of cards, you will notice that the inside of the IIGS is a lot cooler too. An upgraded System Saver is a great way to counteract accelerator instability caused by heat.

Sources and parts needed:

1) Part: Sprite model SU2B1 (Digi-Key Part No. CR103-ND)
   Source: Digi-Key Corp. (1-800-344-4536/www.digikey.com)

2) Part: Foam weatherstripping tape (3/8th inch width, 3/16th inch thick)
   Source: Home Depot (or a comparable hardware store)

-Scott G.

END OF FILE kssfan.fix

```
##############################################################################
### FILE: laser128.info
##############################################################################

Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!nyd.news.ans.net!newsfeeds.ans.
net!news.idt.net!newsfeed.internetmci.com!152.163.199.19!portc03.blue.aol.com!audr
ey03.news.aol.com!not-for-mail
From: supertimer@aol.com (Supertimer)
Newsgroups: comp.sys.apple2
Subject: Re: Laser 128 info needed
Lines: 150
Message-ID: <1998080608463001.EAA25852@ladder03.news.aol.com>
NNTP-Posting-Host: ladder03.news.aol.com
X-Admin: news@aol.com
Date: 6 Aug 1998 08:46:30 GMT
Organization: AOL http://www.aol.com
References: <35c709b2.2781016@news.coil.com>
Xref: news1.icaen comp.sys.apple2:137711

1. Make and Model:
     Video Technology Laser 128EX/2 (refined and extremely
     popular Apple IIc Plus clone)

2. Released:
     1988

3. Follows:
     Video Technology Laser 3000

4. Followed by:
     N/A

5. CPU:
     Western Design Center (not to be confused with Western
     Digital, the hard drive maker) 65C02 running at 3.6Mhz

6. ROM:
     64K -- This includes the only legal Apple compatible
     ROM by 1988 (Apple lost a lawsuit challenging it) and
     Microsoft BASIC (the Applesoft compatible version)
     licensed from Microsoft.

7. RAM:
     128K standard with built in sockets for expansion to
     1MB using 41256 chips of 120ns or faster (the motherboard
     is designed to do bank switching, like the IIc Plus).
     Memory support is controlled by a custom Memory
     Management Unit (MMU) array...memory size is
     automatically detected when new chips are put in.

8. Case:
     Attractive light beige ABS impact resistant plastic.
     Case has handle that doubles as a prop to raise the
     rear of the computer for easy typing.

9. Keyboard:
     Full layout keyboard with numeric keypad and function
     keys.  The copyrighted Open Apple and Closed Apple
```

have been replaced with Open Laser and Closed Laser symbols. The keys have rollover and full travel and a very nice feel.

10. Display:
The Laser 128EX/2 has all the graphics modes found on the Apple IIc, with an extra character set for RGB.
--Text mode: 40x24 and 80x24. Characters are formed by a 7x8 pixel matrix ON THE COMPOSITE OUTPUT. The 128EX/2's Video Display Generator chip also provided both analog RGB video (for connecting an Apple IIGS, Amiga, or Atari ST monitor) and digital RGB video (for connecting a CGA monitor). In RGB mode, the Video Display Generator (VDG) chip generates a text character set identical to an IBM PC (with the addition of the Open and Closed Triangle characters and MouseText). Text mode is monochrome.
--Low Resolution: 40x48 pixels in 16 colors.
--Double Low Resolution: 80x48 pixels in 16 colors.
--High Resolution: 280x192 pixels in 6 colors
--Double High Resolution: 560x192 pixels in 16 colors.
--Combinations/Variations: 4 lines of text mode can be mixed with a truncated Low Resolution or High Resolution mode graphic. The text in mixed mode can be either 40 column or 80 column.

11. Audio:
Simple beeper driven by the CPU. Because the Laser's motherboard operates at 3.6Mhz (notice that it requires 120ns or faster RAM), sound in programs designed for earlier Apple IIs is often distorted.

12. Media:
The Laser 128EX/2 has a built in 3.5" double-sided, double-density floppy drive with a storage space of 800K. The drive and the external daisy-chain floppy "SmartPort" is driven by Video Technology's custom "Universal Disk Controller" (UDC) disk array chip. The SmartPort supports Apple IIe/IIc UniDisks (3.5" and 5.25" models), Macintosh 3.5" drives (the ones without the buttons), Apple IIGS daisy-chain 3.5" drives and Apple 5.25" drives. It is also designed to support the Chinook CT-series 20MB to 100MB SmartPort hard drives.

The SmartPort can support two 800K 3.5" drives, two 140K 5.25" drives, and one 100MB CT100 hard drive simultaneously daisy-chained to each other.

The Laser 128EX/2 has one Apple bus compatible expansion slot on the side opposite the 3.5" disk drive. This bus can hold an Apple High Speed (DMA) SCSI controller for running additional SCSI based storage devices.

13. Input/Output:
Two RS-232C ports
One MIDI port (setting Port 2 to MIDI deactivates one serial port)
One Centronics parallel port (setting Port 1 to parallel deactivates one serial port)
Composite display output (NTSC or PAL depending on the

country)
LCD output (for flat panel display)
RGB monitor output (both analog and digital monitors supported by the Video Display Generator chip with its 64K of VRAM)
External Drive "SmartPort" (supports Mac, IIGS, or UniDisks 3.5" drives, Apple 5.25" drives, and CT-series 20MB to 100MB hard drives)
Joystick/Mouse port (connecting one precludes connecting the other...mouse is the same mouse used in original Mac to Mac Plus)
Headphone connector
Speaker volume control
One Apple bus (same as Apple IIe) expansion slot

14. Trivia:
This unit was so good that Apple Computers was prompted to upgrade the IIc to counter it. The result was the Apple IIc Plus, also released in 1988. The IIc Plus had a 4Mhz Western Design Center 65C02 processor, an 800K 3.5" drive built-in, and an External Drive "SmartPort" capable of the same tricks as the Laser's. Although the two units were similarly matched, Video Technology actively advertised the Laser 128EX/2 while Apple had moved on to advocating Macintosh. The Laser became the most successful Apple II clone ever and this model was 99.8% IIc Plus compatible. The only two software the Apple magazines reported incompatible were The New Print Shop (Borderbund) and HomeWord (Sierra).

In North America, the Laser was aggressively marketed in Sears department stores, where it erroded its niche rival's sales, the Commodore 128.

This Laser unit's case was also used to make a Turbo XT PC clone. The PC clone and the Laser 128EX/2 shared the same case. They looked identical except for the label. Instead of "Laser 128EX/2," the XT had "Laser XT10"

15. Emphasis:
Small business, Home, Education, Gaming, Programming

16. Net Resources:
http://ground.ecn.uiowa.edu/ (1.7GB A2 knowledge and software repository)
http://www.sequential.con/ (Video cards and storage)
http://www.allelec.com/ (Various hardware and software)

17. Picture (see http://ground.ecn.uiowa.edu/ the ground ftp server)

END OF FILE laser128.info

```
##########################################################################
### FILE: laser128.ports
##########################################################################

Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!nyd.news.ans.net!newsfeeds.ans.
net!newspump.monmouth.com!newspeer.monmouth.com!newsfeed.cwix.com!208.140.2.17!reg
gie.win.bright.net!not-for-mail
From: Brent <bharrisnospam2391@vax2.winona.msus.edu>
Newsgroups: comp.sys.apple2
Subject: Re: Laser 128 (Again)
Date: Mon, 16 Nov 1998 19:14:40 -0600
Organization: none
Lines: 72
Message-ID: <72qj09$2jv$1@reggie.win.bright.net>
References: <19981115183830.02820.00001641@ng71.aol.com>
<19981116051452.14142.00001983@ng40.aol.com>
Reply-To: bharrisnospam2391@vax2.winona.msus.edu
NNTP-Posting-Host: gal-usr1-cs-24.win.bright.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Mailer: Mozilla 3.04 (Win95; U)
Xref: news1.icaen comp.sys.apple2:141887

Supertimer wrote:
>
> jacc7621@aol.com (JACC7621) wrote:
>
> >thanks for the info, but does anyone know the pinoust for all the ports? I
> >don't have any manuals, and most of the ports are non-standard. Also, does
> >anyone know what is in slot 5? the prodos users disk says it is "used", and
> >slotscan just crashes. Thanks again.
>
> Well, the two serial ports accept IIc serial cables.  If you want
> parallel, dunno (the parallel cable plugs into the serial ports
> and you flip a switch).
>
> Similarly, the drive port uses Apple II smartport cables, same
> as the IIc, IIGS, Macintosh, IIe, etc.
>
> The video port takes a standard IIGS monitor cable or it can
> take an LCD panel designed for the IIc (it can act as both
> a true RGB port like the IIGS or a dumb video port like the
> IIc).
>
> So basically, just use the Apple II (mainly IIc) cables.
Actually, the parallel port is seperate from the serial port.  It is a
"nonstandard" 12 pin port.  It looks like this:
 ___________________________________________
/                                           \
 \   .8   .7   .6   .5   .4   .3   .2   .1   /
  \                                         /
   \    .15  .14  .13  .12  .11  .10  .9    /
    \_____________________________________/

1. printer data bus   9. BUSY - from printer
2. printer data bus   10. PTRSTB - printer data strobe (active low)
3. printer data bus
```

4. printer data bus
5. printer data bus
6. printer data bus
7. printer data bus
8. printer data bus

Both the serial printer port and the parallel printer port share slot1. You can select which one you wish to use with a switch that's on top of the compter, next to the keyboard.

The Laser 128EX has a built in Memory expansion card, mapped to slot 5. While the Laser 128 doesn't come with this card, it could (at one time) be purchased seperately. This card is Laster 128 specific, it's an internal card, and can hold up to 1 meg of ram.

The slots are mapped out as follows:
Slot 0: 40-column display interface
Slot 1: Parallel or Serial printer interface
Slot 2: Serial communication interface
Slot 3: 80-column display interface
Slot 4: Mouse/Joystick port
Slot 5: Memory Expansion interface / or external expansion box
(depends on which way you set the jumper)
Slot 6: 5.25" drive interface
Slot 7: 3.5" drive interface / or external expansion box
(I don't believe the Laser 128 supports 3.5 drives without an extra card)
Note: The jumpers are located underneath the rom door on the bottom of your computer

The 50 pin port on the left side of you machine is an expansion port. You can hook up an expansion box to this, and plug in up two two standard apple II cards into this expansion box. If you don't have the expansion box, you can still plug any standard Apple II card into this port.

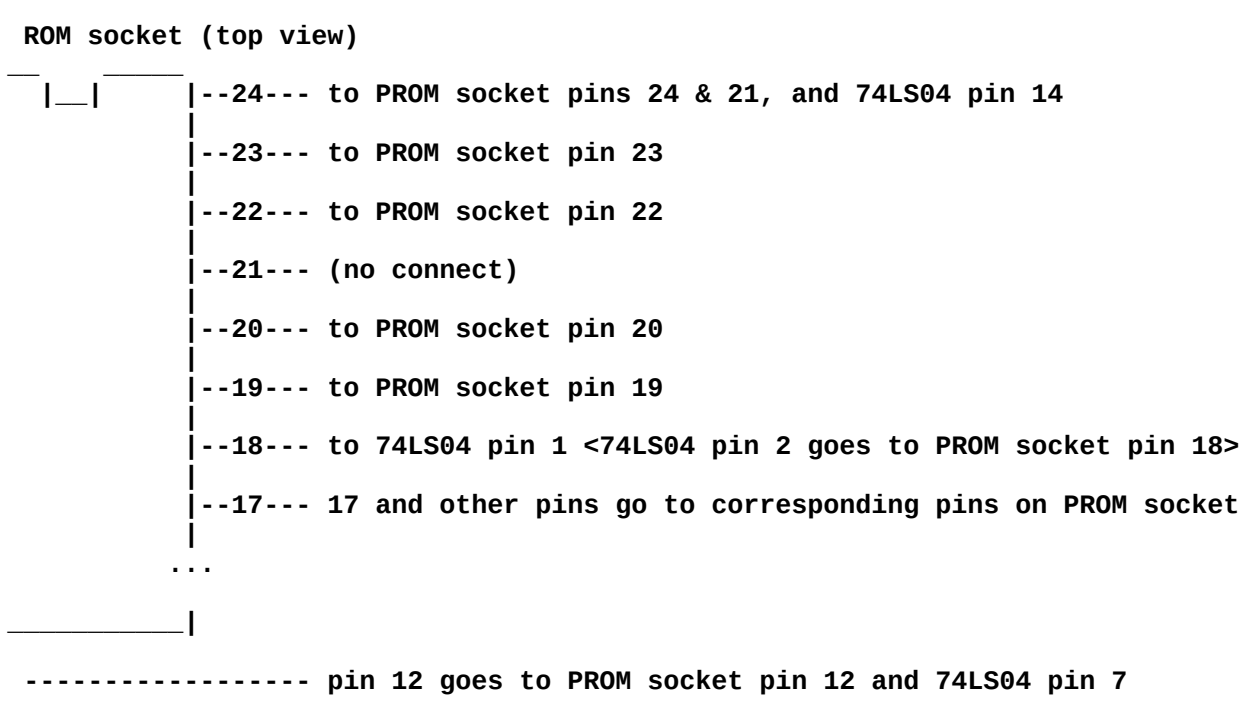
Hope this helps.

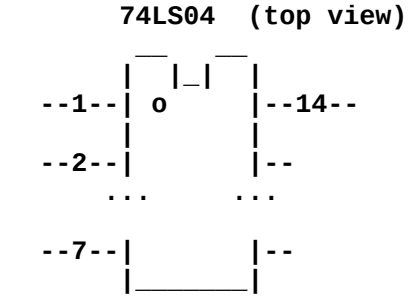
END OF FILE laser128.ports

```
##########################################################################
### FILE: lcase.promadapt
##########################################################################

Path: news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!207.24.245.130!
nyd.news.ans.net!news.idt.net!newsfeed.berkeley.edu!cyclone.swbell.net!
typhoon01.swbell.net.POSTED!not-for-mail
Message-ID: <370CB616.B63AD078@swbell.net>
From: Rubywand <rubywand@swbell.net>
Reply-To: rubywand@swbell.net
X-Mailer: Mozilla 4.51 [en] (Win95; U)
X-Accept-Language: en
MIME-Version: 1.0
Newsgroups: comp.sys.apple2
Subject: Re: II+ vs IIe Char Gen PROMs and Shift-key mods-- LC $F8 PROM mod
References: <7cosa7$rgl$1@nnrp1.dejanews.com> <36F01E44.8DB3CAE4@swbell.net>
<1doxxsz.5zmnapzv7ggaN@dempson.actrix.gen.nz> <3701FF21.C4F327BD@swbell.net>
<37020A8B.46585F3E@iolinc.net> <37023162.11165D84@swbell.net> <37041CA0.
6C13D2DE@iolinc.net> <3704A7A3.72AE153F@swbell.net> <3704B626.DF28564C@iolinc.
net> <370C3F1C.8D3C3DA3@swbell.net> <david.923554356@wraith>
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
Lines: 124
Date: Thu, 08 Apr 1999 08:58:46 -0500
NNTP-Posting-Host: 207.193.10.85
X-Complaints-To: abuse@swbell.net
X-Trace: typhoon01.swbell.net 923579785 207.193.10.85 (Thu, 08 Apr 1999 06:56:25
PDT)
NNTP-Posting-Date: Thu, 08 Apr 1999 06:56:25 PDT
Organization: SBC Internet Services
Xref: news1.icaen comp.sys.apple2:146682

David Wilson writes ...
>
> Rubywand <rubywand@swbell.net> writes:
> >Not as far as I know. What you do is $EA out the code which does the checking.
> >The code starts at address $FD7E in both the old and Autostart Apple II+'s
> >(which should be address $57E in a 2K $F8 PROM) ...
>
> >FD7E- C9 E0  compare the byte to the lowest ASCII value for a lower case char
> >FD80- 90 02  if the byte is less (not lower case) hop over the next two inst
bytes
> >FD82- 29 DF  if the byte is lower case AND it with #$DF to force upper case
>
> The only problem with this change is that the ROMs in a ][ or ][+ are not
> pin-compatible with EPROMs of the same size. Thus, to make this change you
> would need to wire an adapter between the EPROM and the ROM socket to sort out
> the chip select polarities.
 ....

    True. The 2516 and 2716 2k x 8 PROMs come close.

    One problem is that the ROMs have three enable/select pins; the PROM has two.

    Another problem is that one of the enables (pin 18) is Select= Hi. Both of the
PROM enables are Select= Lo.

    Fortunately, the Apple II uses only two select lines; so, the main thing you
need to add to an adaptor is an inverter-- like a 74LS04 or any other inverting
```

gate.

Something like this should work ...





Probably, a II+ will have the Language Card plugged into Slot 0. With the LC plugged in the $F8 ROM used is going to be the one on the LC; so, this is where you
would swap in the adaptor with the PROM.

An alternative to an adaptor would be to mod the ROM socket connections on the
LC:

o- a 74LS04 IC would be dead-bug mounted to the LC
near the ROM socket using epoxy.

o- 74LS04 pin 14 goes to ROM socket pin 24

o- 74LS04 pin 7 goes to ROM socket pin 12

o- any trace to ROM socket pin 21 would be cut and
   ROM socket pin 21 would be jumpered to ROM socket pin 24

o- any trace to ROM socket pin 18 would be cut and
   ROM socket pin 18 would be connected to 74LS04 pin 2

o- pin 1 of the 74LS04 goes to the trace which used to go to ROM socket pin 18

After these mods, the PROM would be swapped in for the ROM.

Let me know if you see any screw-ups in the above.

Our setup is different because we did several mods early (before getting a Language Card) and ended up with the PROM on the main board with an option to switch
to the ROM on the LC.

The reason for being able to swap in the regular ROM is that we made many changes to the $F8 ROM code and wanted to get around ROM checks which a few old copy
protected programs do upon booting. (I don't know if the minor mod to enable lower case input will get past all such ROM checks-- it certainly would not pass a check sum test.) Anyway, the checks are fairly rare.

Hmmm-- what about this code substituttion instead of just NOPing everything:

```
FD7E- C9 C0
FD80- 90 02
FD82- 29 FF
```

It diddles things around so that the checksum is right and the AND #$FF leaves
the input alone whatever the branch at $FD80 decides. (According to the ROM code listing, there are no branches which go into the middle of this code and flags status doesn't matter because the code quickly does another compare operation after
saving the input.)

Rubywand

END OF FILE lcase.promadapt

```
##########################################################################
### FILE: lego.kits
##########################################################################

Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!news2.ais.net!jamie!ais.net!new
s.maxwell.syr.edu!intgwpad.nntp.telstra.net!nsw.nntp.telstra.net!ozemail!ozemail.c
om.au!hmag
From: hmag@ozemail.com.au (Terry Allen)
Newsgroups: comp.sys.apple2
Subject: Lego Card Info.
Date: Sat, 22 Aug 1998 17:05:42 +1000
Organization: hEARd Magazine
Lines: 97
Message-ID: <hmag-ya02408000R2208981705420001@news.ozemail.com.au>
NNTP-Posting-Host: slgos2p56.ozemail.com.au
Mime-Version: 1.0
Content-Type: text/plain; charset=ISO-8859-1
Content-Transfer-Encoding: 8bit
X-Newsreader: Yet Another NewsWatcher 2.4.0
Xref: news1.icaen comp.sys.apple2:138410

Kind reader of rec.toys.lego emailed me the following, which may spur
someone elses memory or a bit more info.

Date: Fri, 21 Aug 1998 23:33:23 -0400
From: "William 'Mr. K' Kenlon" <jwk@eaglenet.com>
Organization: None
MIME-Version: 1.0
To: Terry Allen <hmag@ozemail.com.au>
Subject: Re: Lego Controller Card for Apple II

Terry Allen wrote:
>
> Recently got hold of an Apple IIGS & have been attracting various
> equipment from friends who have old cards & things hanging around. One of
> these cards is a Lego Controller card. Apparently, it was used for
> controlling Lego motors.
>    If anyone has any information or knows where to find software to use it,
> could they please email me & post the info to the newsgroup comp.sys.apple2
>    Many thanks for any info.
>

Terry,

Thought you might like to know about a brochure I have (copyright
date 1987), the cover of which reads "NO LIMITS -- LEGO(R) TC logo",
with an Apple IIe and a LEGO Technic merry-go-round on the cover.

On the back of the brochure: "The LEGO Interface A connects to a
special slot card that fits the Apple IIe and Apple IIgs computers.
A power supply transformer is included in the set.  The interface
and computer are fully protected against wrong connections of motors
and sensors.  The interface has a stop button which cuts off power
to all output sockets.  It also withstands normal wear and tear from
fingers and dust."

Also in the booklet...
```

Various illustrations and explanations of the TC Logo's objective, and a short philosophical introduction to the system by a bearded, middle-aged man by the name of Seymour Papert (Prof. of Math and Education, MIT).

Toward the end of the book is a product list, which has the following items:

9700 Technic Control-0 -- $142.00
Contains over 450 elements and a strong molded storage box. Special elements include 2-4.5 volt motors, 1 optosensor and 1 counting disk, 2 touch sensors, 4 light bricks and 7 sets of building instructions for different models.

9750 Technic Control Interface and Transformer -- $150.00
Specially designed in conjunction with out research team at MIT. This box has 6 outputs from which students can send signals to LEGO motors and 2 input sensors which receive information from the LEGO touch and optic sensors.

950051 Starter Pack -- $450.00
1 TC-0 Set
Interface and Transformer
Reference Guide
1 Master disk and 1 Backup disk
Quick Reference Guide
Apple IIe and Apple IIgs slot card and cable
[various teachers' & students' guides]

Also, the following contact information is given, but beware -- the brochure is eleven years, old and this contact information could be very dated. (And it may not be good in Australia, either.)

Sarah McDonald
Education Dept.
LEGO Systems, Inc.
555 Taylor Road
Enfield, CT 06082

203/749-2291
800/243-4870 (ex. AK, CT, HI)

I don't know for sure if any of this is relevant, but I thought it might be of some importance, as it mentions a LEGO motor and IIgs card and all.

Leg godt,
William Kenlon (whose news server doesn't carry <news:comp.sys.apple2>)

--
Bye For Now, Terry Allen

hEARd - Non-profit Promotion For new music.
WWW - http://www.ozemail.com.au/~hmag
Email - hmag@ozemail.com.au

END OF FILE lego.kits

```
##########################################################################
### FILE: logic.chart
##########################################################################

Path: news.uiowa.edu!chi-
news.cic.net!ddsw1!news.mcs.net!www.nntp.primenet.com!nntp.primenet.com!howland.er
ols.net!EU.net!newsfeed.internetmci.com!in1.uu.net!news.mc.net!usenet
From: "anomaly3@mc.net" <anomaly3@mc.net>
Newsgroups: comp.sys.apple2
Subject: Apple IIe Manual Fault Dictionary
Date: Sun, 15 Sep 1996 21:10:05 -0500
Organization: McHenryCom
Lines: 87
Message-ID: <323CB6FD.4ABF@mc.net>
Reply-To: anomaly3@mc.net
NNTP-Posting-Host: d3001.mc.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Mailer: Mozilla 2.01 (Macintosh; I; 68K)

Apple //e Manual Fault Dictionary:

How to use this chart:

Switch on your Apple //e with no disk in any drives. Get out your logic
probe, and test the pins on each chip and note their reading. Then check
your list with the list below and compare them. Any inconsistencies
could signal a faulty chip and should be tested and/or replaced.

       PIN #         1         2         3         4
CHIP        12345678901234567890123456789012345678901
-------------------------------------------------
LS125       PPPLPPLHPHPPLH

PLA         PPPPPPHPHLLPPPPPPPPH

FF          HHLPHPPLPPHPPPHH

Buffer      LPPPPPPPPLPPPPPPPPLH

LS245       LPPPPPPPPLPPPPPPPPH

LS374       PPPPPPPPPLPPPPPPPPH

LS244       LPPPPPPLPLPPPPLPLPLH

Vid ROM     PPPPPLPPLPPH

MMU         LPPPPPPPPPPPPPHHHPHPPLPPHPPPPPPPPPPPPPPP

Processor   LHPHOHPHPPPPPPPPPPLLLLPPPPPPPPPPPOOPHPH

ShRegistr   PPPPPPPLHPPPPPPH

IOU         LLPPPHLLPLLHHPHOPPPPPPPPPPPHPPLLPPPPHPPP

LS10        PPPHHPLHLHHHPH
```

```
Dec/Demux   PPPPPPHLHHHHHHPH

All RAMs    HPPPPPPHPPPPPPPL

CD ROM      HPPPPPPPPPPPPLPPPPPLPPPPPHHL

S202        LHLPPLLPPPHPLH

EF ROM      HPPPPPPPPPPPPLPPPPPLPHPPPHHH

LS154       PHHHHHHHHHHLHHHHHPPPPPPH

Keybd ROM   LLLHLLHHPPPLPPPPHLLPHLHH
            --------             --

LS251       OLLHPOHLPPPHHHHH

RC741       PLLPPPHO

NE558       HOHHHHOHHOHLHHOH

Decoder     PPPLLLLHLLLHHHLLLLLLLLLLLLLHHHLPPPPPPPPP
                 ---------
```

P = Pulse
H = High
L = Low
O = No Light

Pins 1-8 & 22 & 23 on the Keyboard ROM as well as pins 6-14 on the Decoder are readings made after "space bar" pressed.

+ These readings are taken under normal stand-by conditions.

That's all there is to it! Please do not ask what the chips themselves do - refer to the Apple //e Technical Reference Manual, in the Hardware Implementation section.

- Tony :-)

** This list was obtained from p.232 of "Troubleshooting and Repairing Personal Computers 2nd Edition" by Art Margolis published by Windcrest/McGraw Hill. ISBN 0-8306-2187-3. **

<<<<< DISCLAIMER: This post is for reference only - I will not be held responsible for any damages or personal injury as the result of the use, misuse, or otherwise of the information contained herein. The above procedures should only be performed by a qualified technician, or Apple authorized representative. >>>>>

END OF FILE logic.chart

```
##########################################################################
### FILE: logictest
##########################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.erols.net!news.sprintlink.net!news-
peer.sprintlink.net!newsfeed.internetmci.com!in2.uu.net!news.mc.net!usenet
From: "anomaly3@mc.net" <anomaly3@mc.net>
Newsgroups: comp.sys.apple2
Subject: Apple //e Manual Fault Dict.
Date: Wed, 18 Sep 1996 21:21:06 -0500
Organization: McHenryCom
Lines: 87
Message-ID: <3240AE12.3937@mc.net>
Reply-To: anomaly3@mc.net
NNTP-Posting-Host: d3043.mc.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Mailer: Mozilla 2.01 (Macintosh; I; 68K)

Apple //e Manual Fault Dictionary:

How to use this chart:

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probe, and test the pins on each chip and note their reading. Then check
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could signal a faulty chip and should be tested and/or replaced.

       PIN #         1         2         3         4
CHIP        12345678901234567890123456789012345678901
-------------------------------------------------
LS125       PPPLPPLHPHPPLH

PLA         PPPPPPHPHLLPPPPPPPPH

FF          HHLPHPPLPPHPPPHH

Buffer      LPPPPPPPPLPPPPPPPPLH

LS245       LPPPPPPPPLPPPPPPPPH

LS374       PPPPPPPPPLPPPPPPPPH

LS244       LPPPPPPLPLPPPPLPLPLH

Vid ROM     PPPPPLPPLPPH

MMU         LPPPPPPPPPPPPPHHHPHPPLPPHPPPPPPPPPPPPPPP

Processor   LHPHOHPHPPPPPPPPPPLLLLPPPPPPPPPPPOOPHPH

ShRegistr   PPPPPPPLHPPPPPPH

IOU         LLPPPHLLPLLHHPHOPPPPPPPPPPPHPPLLPPPPHPPP

LS10        PPPHHPLHLHHHPH
```

```
Dec/Demux   PPPPPPHLHHHHHHPH

All RAMs    HPPPPPPHPPPPPPPL

CD ROM      HPPPPPPPPPPPPLPPPPPLPPPPPHHL

S202        LHLPPLLPPPHPLH

EF ROM      HPPPPPPPPPPPPLPPPPPLPHPPPHHH

LS154       PHHHHHHHHHHLHHHHHPPPPPPH

Keybd ROM   LLLHLLHHPPPLPPPPHLLPHLHH
            --------             --

LS251       OLLHPOHLPPPHHHHH

RC741       PLLPPPHO

NE558       HOHHHHOHHOHLHHOH

Decoder     PPPLLLLHLLLHHHLLLLLLLLLLLLLHHHLPPPPPPPPP
                 ---------
```

P = Pulse
H = High
L = Low
O = No Light

Pins 1-8 & 22 & 23 on the Keyboard ROM as well as pins 6-14 on the Decoder are readings made after "space bar" pressed.

+ These readings are taken under normal stand-by conditions.

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- Tony :-)

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<<<<< DISCLAIMER: This post is for reference only - I will not be held responsible for any damages or personal injury as the result of the use, misuse, or otherwise of the information contained herein. The above procedures should only be performed by a qualified technician, or Apple authorized representative. >>>>>

END OF FILE logictest

```
##########################################################################
### FILE: lowcase.iiplus
##########################################################################

Path: news.weeg.uiowa.edu!news.uiowa.edu!uunet!zaphod.mps.ohio-
state.edu!sdd.hp.com!sgiblab!adagio.panasonic.com!nntp-server.caltech.edu!toddpw
From: toddpw@cco.caltech.edu (Todd P. Whitesel)
Newsgroups: comp.sys.apple2
Subject: Re: Lowercase characters for Apple][ +
Date: 7 Jan 1993 11:25:55 GMT
Organization: California Institute of Technology, Pasadena
Lines: 19
Message-ID: <1ih403INNak5@gap.caltech.edu>
References: <1993Jan6.055154.7450@nuscc.nus.sg>
NNTP-Posting-Host: punisher.caltech.edu

scip2060@nusunix1.nus.sg (SARDJONO INSANI) writes:

>Anyone knows how to modify the Apple ][ + keyboard to produce lowercase?

Which model have you got? The earlier ones couldn't do it without software
support. The later ones had six solder pads and a couple jumpers you could
change to add a DPDT switch that served as a CAPS LOCK switch. If you have
the "two-piece" keyboard (there's a little PC board hanging off of the main
keyboard) then you are in luck. If you look at the little PC board then look
near the CONTROL/RESET switch and see if you can find a 2x3 pattern of holes
with exposed metal around them and two "bow ties" nearby. You may have to
partially disassemble the keyboard to find them, and you will definitely
need to do that to add the Caps Lock switch and cut the bow ties (the bow
ties are connections that make the board think there is a switch connected
but locked in one position, and you cut them with an exacto knife when you
install the real switch).

Todd Whitesel
toddpw @ cco.caltech.edu


### END OF FILE lowcase.iiplus
```

```
##############################################################################
### FILE: maciie
##############################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!cs.utexas.edu!news.sprintlink.net!news-
peer.sprintlink.net!howland.erols.net!newsfeed.internetmci.com!news.ix.net!s002.ci
n.ix.net!user
From: jnichol@tso.cin.ix.net (Jim Nichol)
Newsgroups: comp.sys.apple2
Subject: Re: <no subject>
Date: Sat, 28 Sep 1996 13:09:28 -0400
Organization: IX Network
Lines: 25
Message-ID: <jnichol-2809961309280001@s002.cin.ix.net>
References: <324A6EFC.369B@wctc.net> <ggonter-2609962101570001@port-56-max-btv-
01.ramp.together.net>
NNTP-Posting-Host: s002.cin.ix.net

In article
<ggonter-2609962101570001@port-56-max-btv-01.ramp.together.net>,
ggonter@together.net (Geof Gonter) wrote:

> In article <324A6EFC.369B@wctc.net>, jfriess@wctc.net wrote:
>
>
> >But, Nate, isn't there an Apple II card for the Mac, won't it fit in a
> >Performa 630CD, and won't it run Bank Street Writer and other ProDos
> >programs?  (Ulrich, I see you've posted to the Mac groups too--maybe
> >they've mentioned this or other possible solutions).
>
> The Apple II card fits LC series Macs only, or should I say any Mac with a
> LC PDS slot. Yes it'll run ProDos and DOS 3.3 applications.

Yes and no.  The 630 Macs _do_ have LC-style PDS slots.  However, the
630's cannot use a IIe Card because you cannot turn off 32-bit addressing
in a 630.  The IIe Card _will_ work in all other Macs with an LC-style PDS
slot, including:

Mac LC, LCII, LCIII, Quadra 605, LC475, Performa 475, Performa 550,
Performa 575-8, Color Classic, LC520 (I think), and several other
Performas that are the equivalents of the LC's above.

Jim Nichol


### END OF FILE maciie
```

```
##########################################################################
### FILE: mackybds
##########################################################################

Path: news.uiowa.edu!chi-
news.cic.net!newspump.sol.net!www.nntp.primenet.com!nntp.primenet.com!news.primene
t.com!bpvh
From: bpvh@primenet.com (Bradley P. Von Haden)
Newsgroups: comp.sys.apple2
Subject: Re: IIgs and Mac ADB ports
Date: 17 Sep 1996 10:58:02 -0700
Organization: Primenet (602)416-7000
Lines: 83
Message-ID: <51mora$hql@nnrp1.news.primenet.com>
X-Posted-By: bpvh@206.165.5.110 (bpvh)


nathan@visi.com (Nathan Mates) wrote:

>J. Morris Prosser <jmprosser@redshift.com> wrote:

>>Since IIgs keyboards are so hard to come by, I ordered a Mac
>>keyboard (MacALLY) from Mac Connection to replace the IIgs
>>keyboard.  Only problem is that it doesn't work!

>Probably a software issue.

I believe it is a hardware issue.

>Roughly a week ago, I added some information to the
>comp.sys.apple2 FAQ detailing which ADB keyboards have been tested
>and do work, and which ones don't. Your 'MacALLY' is not listed in
>either category.

If it is my list of ADB keyboards, the MacAlly has been in the "Do
not work" category since at least January 1996 (I do not keep older
versions lying around).  Someone put my list up on a ftp site without
attribution and has not kept it up to date.  I have posted the list
of keyboards infrequently to comp.sys.apple2 and
comp.sys.apple2.marketplace.

Here is a list of ADB keyboards that I have compiled as of 17
September 1996.  Additions/corrections welcome.

'+' designates changes from previous list

I have the following that work:

Apple ADB Keyboards I and II
AppleDesign Keyboard ($85 - MacMall(66s), Mac Zone(47b))
+Apple Extended Keyboard (original)
Apple Extended Keyboard II ($155 - MacMall(66s), Mac Zone(47b))
Adesso 105 Extended Keyboard ($80 - Mac's Place, Mac Zone, Tiger SW)
Adesso 102 Wxtended Keyboard w/ Trackball [Trackball does NOT work]
     ($100 - Mac's Place, Mac Zone, Tiger Software)
Arriva Extended ($40 - MacMall(66s))
Interex 105 Extended ($55 - MacMall, Syex Express; $34 - Computer
     City)
Key Tronic MacPro Plus ($130 - Mac Zone, APS Tech.)
```

OptiMac Extended Keyboard (???)
PowerUser 105E Extended Keyboard ($50 - MacWarehouse(59))
SIIG, Inc MacTouch Model 1905 (~$100.00)
Sun OmniMac Ultra [extended, ADB type] (???)
Suntouch ADB Extended Keyboard ($75 - Syex Express)
VividKey Extended Keyboard ($60 - MacMall)

Do not work:

Apple Adjustable Keyboard
MacALLY Peripherals Extended Keyboard
MicroSpeed Keyboard Deluxe MAC

???:

+Adesso Easy Touch ext kb ($44 - Mac Zone(47b))
+Adesso ProPoint ext kb w/ thinkpad ($60 - MacMall(66s))
+Alps GlidePoint kb ($110 - Mac Zone(47b))
ClubMac Extended Keyboard ($39 - ClubMac(13))
Datadesk MAC 101 E ($100 - MacWarehouse, Mac Zone)
Datadesk TrackBoard ($100 - MacWarehouse, Mac Zone)
Key Tronic Trak Pro Plus ($230 - APS Tech.)
Performance Soft Touch Extended Keyboard ($49 - Mac Zone(47b))
Spring Sun Tech MacPride 97 ($90 - MacMall)
Spring Sun Tech MacPride 105 ($59 - MacMall)
Spring Sun Tech MacPride 110 ($80 - MacMall) [MAC/IBM switchable]
Spring Sun Tech MacPride KidBoard ($100 - MacMall)

????:

+Adesso NUForm Ergonomic ext kb ($60 - MacMall(66s))
+Adesso NUForm Ergomomic ext kb w/ pointer ($70 - MacMall (66s))
+Adesso NUForm Ergonomic ext kb w/ touch pad ($90 - MacMall (66s),
     Mac Zone (47B))
Adesso Tru-From Ergonomic ext kb ($79 - Mac Zone(47b))
Adesso Tru-Form Ergonomic ext kb w/ pointer ($90 - MacMall(66s))

**** bpvh   Internet: bpvh@primenet.com   GEnie: B.VONHADEN ****
**** Posted by an Apple IIgs using my own Proterm 3.1 File Macro ****

END OF FILE mackybds

```
##############################################################################
### FILE: magnvx.cable
##############################################################################

Path: ns-mx!hobbes.physics.uiowa.edu!zaphod.mps.ohio-
state.edu!think.com!wupost!uunet!blkcat!Uucp
From: White.Wolf@f438.n109.z1.FidoNet.Org (White Wolf)
Newsgroups: comp.sys.apple2
Subject: Maganox to GS monitor he
Message-ID: <697093251.18@blkcat.FidoNet>
Date: 1 Feb 92 07:01:28 GMT
Lines: 34


                            [Message Deleted]

SDP|this is what they look like
SDP|                      _____________________
SDP|Apple's RGB          \ o o o . o o . . /
SDP|                       \ o o . . o . . /
SDP|                         -------------
SDP|                         _____________
SDP|and Maganox's RGB       \ o o o o o /
SDP|                         \ o . o o /
SDP|                           --------

SDP|I would appreciate any help.  Drop me E-mail direct please!

 Magnavox | Apple IIgs |  Discription
___-----------------------------------------
     1    |      1     |    GND
     2    |      1     |    GND
     3    |      2     |    Red
     4    |      5     |    Green
     5    |      9     |    Blue
     7    |      3     |    Composite Sync.

  5 4 3 2 1   8 7 6 5 4 3 2 1       Female
   9 8 7 6     e d c b a 0 9      Connectors

Quality Computers (I think that's the name), in A+/Incider has a cable
for about $25-$30.


___
 X SLMR 2.1 X White Wolf --> Tae Song

 * Origin: Europa BBS (301) 718-4690 HST/DS 14.4k (1:109/438)


### END OF FILE magnvx.cable
```

```
##########################################################################
### FILE: mcmultifunc
##########################################################################

Path: news.uiowa.edu!chi-
news.cic.net!uwm.edu!msunews!harbinger.cc.monash.edu.au!news.cs.su.oz.au!metro!wab
bit.cc.uow.edu.au!wabbit.cc.uow.edu.au!not-for-mail
From: david@wraith.cc.uow.edu.au (David E A Wilson)
Newsgroups: comp.sys.apple2
Subject: Re: want help with Mountain multifunction card
Date: 12 Nov 1995 12:58:20 +1100
Organization: University of Wollongong, NSW, Australia.
Lines: 26
Message-ID: <483kbs$rfk@wraith.cc.uow.edu.au>
References: <8B424E2.0221001119.uuout@digitec.co.za>
NNTP-Posting-Host: wraith.cs.uow.edu.au
X-Newsreader: NN version 6.5.0 #5

> RJ> From: bob_jensen@jhuapl.edu (Robert Jensen)
>   > Subject: want help with Mountain multifunction card
>   > Date: Sun, 15 Oct 95 03:40:33 GMT

> RJ> I would like to get help with using a Mountain Computer
>   > multifunction card. If anyone has experience, or better
>   > yet documentation, please let me know. I can't puzzle out
>   > how to address the serial port, the parallel port, or the
>   > clock. Thanks for any help.

The memory map is as follows:

Cn00-CnEF   8x 240 byte ROM banks
CnF0-CnF7   32x 8 byte battery backed up RAM banks
CnF7        I/O select default (Bank 0 only) (I7..I1, bit 0 unused)
CnF8        RAM/ROM select (RAS4,RAS2,RAS1,RAS0,RAS8,ROS2,ROS1,ROS0)??
CnF9        Clock Data I/O Para SP Status
            (Spare,+OBE,-,-,+CD4,+CD2,+CD1,+CD0)??
CnFA/B            Serial chip (INS2651)
CnFC        I/O Select Mapper (+I07..+IO1,-)
CnFD        Parallel Data Out
CnFE        Clock Address & Control (MSM5832), Serial Control
            (+SCR,+CH,+CW,+CR,+CA4,+CA2,+CA1,+CA0)??
CnFF        not used
--
David Wilson      Dept CompSci Uni Wollongong Australia     david@cs.uow.edu.au


### END OF FILE mcmultifunc
```

```
##########################################################################
### FILE: mctspeeddemon
##########################################################################

Path:
news.uiowa.edu!hobbes.physics.uiowa.edu!newsrelay.iastate.edu!vixen.cso.uiuc.edu!h
owland.reston.ans.net!news-
e1a.megaweb.com!newstf01.news.aol.com!newsbf02.news.aol.com!not-for-mail
From: rubywand@aol.com (RUBYWAND)
Newsgroups: comp.sys.apple2
Subject: Re: Help I.D.ing cards.
Date: 19 Nov 1995 15:01:31 -0500
Organization: America Online, Inc. (1-800-827-6364)
Lines: 50
Sender: root@newsbf02.news.aol.com
Message-ID: <48o2er$36n@newsbf02.news.aol.com>
References: <48gsv1$1o2@lynx.unm.edu>
NNTP-Posting-Host: newsbf02.mail.aol.com
X-Newsreader: AOL Offline Reader


james keim (jkeim@unlinfo.unl.edu) wrote:


> One is an accelerator card--an "M-c-T SpeedDemon"
> It is dated 1984.  Does anyone know what speed this thing
> runs?  I _think_ I am seeing four 16k 90milisecond cache ram
> chips on it.  There also seems to be a little place for
> jumper block on the top of the card, near the keyboard end.
> Any ideas what it might be for?  Any ideas if there is a way
> to control this thing through software/hardware?  Oh, I did
> notice that the card draws a little Apple on the graphics
> screen before the Autostart ROM kicks in and the "Apple ]["
> appears.
>
    The RAMs on our Speedemon are 100ns 2048x8  9128's (for a total 8K of
pretty speedy cache).  I once asked McT about the jumper block you
mention, they said the jumper is set at the factory to adjust on-card
timing and to Leave It Alone. (On our card, the jumper block has 5 pairs.
The pair 2nd from the top is jumpered.)

    There is also a jumper pair near the bottom middle of the card. This
is the Speed Jumper. Jumper it if you want 'demon to slow down for I/O
accesses to Slots 4 & 5. (The 'demon always slows for Slot 6 I/O ($C0E0 -
$C0EF.)

    According to the "Manual" (a folded card),  pressing PDL-1
(Closed-Apple on a IIe) upon power-up will engage a self-test. Pressing
ESC at power-up will turn OFF the card and allow running at normal speed.
To turn OFF the card later on, do a POKE (49152+256*S) where S= Slot # of
the slot the card is in; then, press RESET.

    You can put the 'demon into any Slot; but, if you put it in Slot 0
(Slot 3 in a IIe), the card will not respond to any KB shut-off commands.

    Your card may be a slightly later model. (I've never noticed ours draw
a hires apple on the screen-- darn it!)  Possibly, McT came out with a
revision aimed at 128K IIe's.
```

Indeed, the 'demon is a power gobbler-- roughly 1.5A as I recall-- and some of the IC's run hot. We finally cut out a square section on the back of the II+ and added a mini-fan, just to blow air across the 'demon board.

In terms of raw performance (once you arrange for cooling), Speedemon may be the best of the 4MHz accelerators for early II's. I've never noticed any compatibility problems and the approx. X3.5 speed increase puts real 'snap' into your machine's response. (Besides, it's great for games like Elite!)

END OF FILE mctspeeddemon

```
##########################################################################
### FILE: memswitches
##########################################################################

Path: news.uiowa.edu!chi-news.cic.net!news.uoregon.edu!cie-2.uoregon.edu!nparker
From: nparker@cie-2.uoregon.edu (Neil Parker)
Newsgroups: comp.sys.apple2
Subject: Re: memory switches
Date: 8 Nov 1995 09:20:23 GMT
Organization: University of Oregon Campus Information Exchange
Lines: 87
Message-ID: <47pson$c1a@pith.uoregon.edu>
References: <1995Nov7.155913.3304@freenet.victoria.bc.ca>
NNTP-Posting-Host: cie-2.uoregon.edu

In article <1995Nov7.155913.3304@freenet.victoria.bc.ca>
ur448@freenet.Victoria.BC.CA (John Edward Flanders) writes:
>Could anyone please explain the locations and functions of the memory bank
>switches on an Apple //e with 128k memory?

Have patience...this gets rather complicated.

The bank-switching controls are as follows:

$C002: Select main memory for reading in $0200...$BFFF
$C003: Select aux memory for reading in $0200...$BFFF
$C004: Select main memory for writing in $0200...$BFFF
$C005: Select aux memory for reading in $0200...$BFFF
$C008: Select main memory for reading & writing in $0000...$01FF & $D000...$FFFF
$C009: Select aux memory for reading & writing in $0000...$01FF & $D000...$FFFF

To activate any switch, write a value at the I/O location.  It doesn't matter
what you write; the act of writing is what triggers the switch.  (You *must*
access the switch by writing--reading a switch just gets you the ASCII code
of the most recent keypress, and doesn't do any bank switching.)

Don't ever try to POKE these switches from BASIC--you'll bank-switch yourself
out of existence.

Note that these switches divide memory into four ranges:

     $0000...$01FF:  Switched by $C008, $C009.
     $0200...$BFFF:  Switched by $C002...$C005.
     $C000...$CFFF:  Not switchable.
     $D000...$FFFF:  Switched by $C008, $C009.  This is the "language card"
                     area...the switch only controls which of the two
                     "language cards" (main or aux) is active...if you
                     have ROM mapped into this area, it never switches (i.e.
                     there's only one ROM, and it shows up in both the main
                     and aux banks).

Note that for memory in $0200...$BFFF, reading and writing are separately
selectable...you can read from main memory and write to aux memory, for
example.  However, for memory in $0000...$01FF and $D000...$FFFF, reading
and writing are not separately selectable...you either read and write in
the main bank, or you read and write in the aux bank.

Looks simple enough, doesn't it?  Well, here comes the complicated part.
There is another switch that affects bank switching:
```

$C000: Turn off 80-column bank switching
$C001: Turn on 80-column bank switching

(As above, these switches must be accessed by writing.)

If 80-column bank switching is off, bank switching works exactly as described above. But if 80-column bank switching is on, the text screen ($0400...$07FF) becomes immune to the normal bank-switching controls. In this mode, the text screen is bank-switched by the following controls instead:

$C054: Map the main text page into $0400...$07FF
$C055: Map the aux text page into $0400...$07FF

(These switches can be triggered by ANY access, not just a write.)

Note that this is the PAGE1/PAGE2 switch. When 80-colunn bank switching is on, text page 2 (and graphics page 2) cannot be displayed.

As if that weren't confusing enough, turning on the HIRES switch (by accessing $C057) causes hires page 1 ($2000...$3FFF) to behave just like the text screen--it too becomes immune to the normal bank-switching controls, and is switched instead by $C054, $C055.

Actually, I lied when I wrote above that the I/O area ($C000...$CFFF) doesn't bank-switch. The following switches control portions of this memory area:

$C006: Map slot card ROMs into $C100...$CFFF
$C007: Map internal ROM into $C100...$CFFF
$C00A: Map built-in 80-column firmware into $C300...$C3FF
$C00B: Map slot card ROM into $C300...$C3FF

(These are write-only switches.)

- Neil Parker
--
Neil Parker, nparker@{cie-2,cie}.uoregon.edu, http://cie-2.uoregon.edu/~nparker

"Bad move, Neil!" -- The Tick

Newsgroups: comp.sys.apple2
Path: news.uiowa.edu!chi-news.cic.net!news.uoregon.edu!waikato!comp.vuw.ac.nz!actrix.gen.nz!dempson
From: dempson@atlantis.actrix.gen.nz (David Empson)
Subject: Re: memory switches
Message-ID: <DHqCuJ.ALA@actrix.gen.nz>
Sender: news@actrix.gen.nz (News Administrator)
Organization: Actrix - Internet Services
Date: Wed, 8 Nov 1995 15:11:06 GMT
References: <1995Nov7.155913.3304@freenet.victoria.bc.ca>
X-Nntp-Posting-Host: atlantis.actrix.gen.nz
Lines: 256

In article <1995Nov7.155913.3304@freenet.victoria.bc.ca>,
John Edward Flanders <ur448@freenet.Victoria.BC.CA> wrote:
>
> Could anyone please explain the locations and functions of the memory bank

> switches on an Apple //e with 128k memory?

I assume you are referring to the IIe-specific bank switches relating to the 64K auxiliary memory, and not the $D000-$FFFF soft-switches, which are the same as the][/][+ with a language card installed. (I have described these anyway.)

Before mentioning the soft-switches, I should first cover the firmware routines that are normally used to access auxiliary memory. These routines are generally easier to use than trying to control the soft-switches directly, as it avoids the problem of your memory switching out from underneath you while you are trying to execute code!

Two special routines are provided in the IIe firmware. They are dependent on the built-in 80-column firmware, so they might not be available if a card with firmware on it is installed in slot 3.

AUXMOVE ($C311) is used to copy data either way between main and auxiliary memory (in the $0200-$BFFF area).

Before calling AUXMOVE, the following zero page locations must be set up:

$3C - $3D Source starting address (low byte, high byte)
$3E - $3F Source ending address (low byte, high byte)
$42 - $43 Destination startion address (low byte, high byte)

In addition, the carry flag must be set to indicate the direction of the move: C=1 to move from main to auxiliary memory, C=0 to move from auxiliary to main memory.

XFER ($C314) is used to transfer execution between code running in main and auxiliary memory.

Locations $03ED and $03EE must be set to the address of the destination routine in the other bank. The carry and overflow flags must be set as follows: C=1 to transfer execution from main to auxiliary memory, C=0 for auxiliary to main memory; V=1 to use auxiliary zero page, stack and language card, V=0 to use main zero page, stack and language card.

When using this routine, it is also necessary to save and restore the main and auxiliary stack pointers, which are stored at locations $0100 and $0101 respectively (both in auxiliary memory).

Since these routines execute from the I/O space, they are able to access both banks without causing problems. For code executing from main memory, it is possible to write to auxiliary memory, but reading from auxiliary memory is not directly possible (your code is switched out).

Auxiliary Memory Soft-switches

The IIe-specific soft switches all use three I/O locations. A pair of locations set the soft switch to the "on" and "off" states by writing to the location (value is irrelevant). The third location allows software to read the current state of the switch, by examining bit 7

of the returned value (the switch is "on" if bit 7 is set).

The softswitches related to auxiliary memory bank switching are as follows:

Name	OFF location	ON location	READ location
RAMRD	$C002 (write)	$C003 (write)	$C013 (read bit 7)
RAMWR	$C004 (write)	$C005 (write)	$C014 (read bit 7)
ALTZP	$C008 (write)	$C009 (write)	$C016 (read bit 7)
80STORE	$C000 (write)	$C001 (write)	$C018 (read bit 7)
PAGE2	$C054 (r/w)	$C055 (r/w)	$C01C (read bit 7)
AN3	$C05E (r/w)	$C05F (r/w)	not available

The RAMRD switch determines which bank is accessed for READ operations in the address range $0200 to $BFFF. If this switch is OFF, main memory is read. If this switch is ON, auxiliary memory is read.

The RAMWR switch determines which bank is accessed for WRITE operations in the address range $0200 to $BFFF. If this switch is OFF, main memory is written. If this switch is ON, auxiliary memory is written.

The ALTZP switch determines which bank is accessed for both READ and WRITE operations in the address ranges $0000 to $01FF (zero page and stack memory) and $D000 to $FFFF ("language card"). If this switch is OFF, main memory is accessed. If this switch is ON, auxiliary memory is accessed.

In addition to these three switches, there are special facilities to simplify access to the 80-column text buffer (half of which is in auxiliary memory at $0400-$07FF) and first page of the double hi-res graphics buffer (half of which is in auxiliary memory at $2000-$3FFF).

These facilities are controlled by the 80STORE switch. If 80STORE is OFF, then auxiliary memory switching is controlled only by the RAMWR and RAMWR switches.

If 80STORE is ON, then the PAGE2 switch controls the bank accessed in the $0400-$07FF area. If PAGE2 is OFF, main memory is accessed. If PAGE2 is ON, auxiliary memory is accessed. This overrides the current setting of RAMRD and RAMWR.

Note: PAGE2 normally selects the displayed text or graphics page (1 or 2). This function is disabled while 80STORE is active, and only page 1 can be displayed.

Note also that the 80STORE bank switching function is independent of the display of 80-column text and double hi-res graphics mode, which involves the 80COL soft switch ($C00C write = OFF, $C00D write = ON, $C01F = read).

The AN3 switch is involved in the use of double hi-res graphics mode. If AN3 is OFF ($C05E), double hi-res graphics is ENABLED. Double hi-res graphics will also be displayed if 80COL is ON and HIRES ($C057) is ON.

If AN3 is ON ($C05F), double hi-res graphics is DISABLED. Standard Hi-res graphics will be displayed, even if 80COL is ON.

If AN3 is OFF and 80STORE is ON, then PAGE2 controls whether main or auxiliary memory is accessed in the $2000-$3FFF area (as with the 80-column text buffer).

If AN3 is OFF and 80STORE is also OFF, then PAGE2 selects which text/graphics page is displayed, as normal. This combination allows double hi-res graphics page 2 to be displayed. This page ($4000-$5FFF in both banks) does not have a special bank switch mechanism, so other methods must be used to access the two halves of its address space. (The same applies to 80-column text page 2, at $0800-$0BFF in both banks.)

In AN3 is ON (double hi-res graphics disabled), then 80STORE has no effect on memory mapping in the $2000-$3FFF area.

Note that the AN3 switch also controls the state of annunciator output number 3 on the internal 16-pin game connector.

$C100-$CFFF ROM bank switching

The IIe has internal ROM in the $C100-$CFFF area. Locations $C300-$C3FF and $C800-$CFFF contain the 80-column firmware. The other areas ($C100-$C2FF and $C400-$C7FF) contain monitor extensions and self-test routines.

This memory area is normally occupied by the ROM on cards in I/O slots. The IIe has two soft-switches that control what appears in these areas.

Name	OFF location	ON location	READ location
SLOTCXROM	$C006 (write)	$C007 (write)	$C015 (read bit 7)
SLOTC3ROM	$C00A (write)	$C00B (write)	$C017 (read bit 7)

The SLOTCXROM switch controls locations $C100-$C2FF and $C400-$C7FF (slots 1, 2, 4, 5, 6 and 7). If this switch is OFF, the normal slot address space applies. If this switch is ON, the internal ROM is enabled for these areas.

The SLOTC3ROM switch controls locations $C300-$C3FF (slot 3). If this switch is OFF, the internal 80-column firmware is enabled in slot 3. If this switch is ON, the slot 3 firmware is enabled.

The $C800-$CFFF area is bank switched between slots in the standard way - it is enabled for slot n when $Cn00-$CnFF is accessed (if this area is implemented for the slot in question) and is disabled for all slots when $CFFF is accessed (it is necessary to do this first, to ensure that the bank-swtich area is not enabled for multiple slots). The internal 80-column firmware will be enabled in this area if slot 3 is set to "internal" mode, and $C300-$C3FF is accessed.

Language Card Bank Switching

The IIe has built-in emulation of the "language card" that is used in an Apple][or][+ to increase the total memory to 64K.

The language card provides 16K of additional RAM that is bank-switched into the $D000-$FFFF area, which is normally occupied by the firmware (Applesoft BASIC and the monitor firmware). This is only 12K of address space: the extra 4K is provided via a second bank at $D000-$DFFF.

In a 128K IIe, the language card structure is repeated in both main and auxiliary memory, and the same soft switches control both banks. The active bank is controlled by the ALTZP soft switch (described earlier).

The language card soft-switches are as follows. Note that they are the same for a][or][+ with a language card in slot 0, except that the "read" locations are not available. An Applesoft/Integer BASIC ROM card uses a subset of these locations (it only supports $C080/$C081).

All of these soft switches may be controlled with a read or write access. They control which areas are accessed for subsequent read and write operations in the $D000-$FFFF. "bank 1" and "bank 2" refer to the two alternative 4K RAM banks at $D000-$DFFF. $E000-$FFFF accesses the same memory area no matter which bank is selected.

Name	Location	Read	Write
LC2RD	$C080	RAM, bank 2	-
LC2WR	$C081	ROM	RAM, bank 2 (see below)
ROMONLY2	$C082	ROM	-
LC2RW	$C083	RAM, bank 2	RAM, bank 2 (see below)
LC1RD	$C088	RAM, bank 1	-
LC1WR	$C089	ROM	RAM, bank 1 (see below)
ROMONLY1	$C08A	ROM	-
LC1RW	$C08B	RAM, bank 1	RAM, bank 1 (see below)

In summary:

$C082 or $C08A totally disables the language card RAM. The ROM is enabled for read, and the RAM is completely disabled. The two locations are identical in function.

$C080 or $C088 enables the language card RAM in "write protected" mode (acting as a ROM). This is used by DOS 3.3 when Integer BASIC is loaded into the language card. The two locations select different 4K RAM banks in the $D000-$DFFF area.

$C081 or $C089 enables the language card RAM in "write only" mode, with the ROM enabled for read operations. This is used when executing code in ROM, but allowing data to be copied into the language card (e.g. when copying parts of the ROM into the language card). The two locations select different RAM banks in the $D000-$DFFF area.

$C083 or $C08B enables the language card RAM in "read/write" mode, with the ROM completely disabled. This is used when exeucting an operating system (e.g. ProDOS or Pascal) from the language card space, where part of the RAM is used as buffering memory, for example. The two locations select different RAM banks in the $D000-$DFFF area.

The "write enable" locations ($C081, $C083, $C089 and $C08B) require a special sequence to enable write access. Two or more consecutive READ accesses to the location are required to enable writes (e.g. two LDA instructions).

The current state of these soft-switches can be detected on the IIe by
reading bit 7 of the following locations:

$C011   Read bank 2 select state (set for bank 2, clear for bank 1)
$C012   Read RAM read enable state (set for RAM read, clear for ROM read)

It is not possible to read the write-enable state of the language card RAM.
--
David Empson
dempson@actrix.gen.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand

END OF FILE memswitches

```
##########################################################################
### FILE: microtek.cards
##########################################################################

Path: news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!nyd.news.ans.net!news-
w.ans.net!newsfeeds.ans.net!news.lava.net!news.Hawaii.Edu!gkomatsu
From: gkomatsu@Hawaii.Edu (Galen Tatsuo Komatsu)
Newsgroups: comp.sys.apple2
Subject: Re: Yet another Mystery board
Date: 6 Nov 1998 06:33:41 GMT
Organization: University of Hawaii
Lines: 37
Message-ID: <71u585$nk2@news.Hawaii.Edu>
References: <labelas-0511982218590001@1cust1.tnt23.atl2.da.uu.net>
NNTP-Posting-Host: uhunix3.its.hawaii.edu
Xref: news1.icaen comp.sys.apple2:141394

In article <labelas-0511982218590001@1cust1.tnt23.atl2.da.uu.net>,
Labelas Enoreth <labelas@hotmail.com> wrote:
>Well, this one may not be a mystery if I am right, but I may not be.
>Microtek 'SLOTWARE'
>4 SN74xxxxx chips and a socketed chip with a label over it
>has a 26-pin connector directly on the card, like the old disk ][
>contollers were. I'm thinking it may be a parallel interface, since I
>think I may have gotten some huge daisy-wheel printer with it at the time
>and I think that this would have been the only way it could have been
>attached, but, unfortunately, since there is no adapter to go between the
>card and the back of the computer, I guess I am SOL.

      Any other identifying codes on the card?  I have a cardless
manual for a Microtek Dumpling-GX Parallel Interface.  ("Slotware"
is apparently the name for their line of cards.)

      The Manual is dated September 1, 1983 and lists these cards
that Microtek makes.  Any of the codes printed on your card?

RV-611C       7/8 BIT Parallel Interface Slotware(TM)
DUMPLING-GX   Hi-Res Graphics printer Interface Slotware(TM)
DUMPLING-64   64K Spooler Buffer Slotware(TM) for all major printers
DUMPLING-S    Programmable Serial I/O Slotware(TM) with 4 Personalities
BAM-16MM      16K Memory Expansion Slotware(TM) with Memory Management
BAM-128       64K or 128K Memory Expansion Slotware(TM)
Q-DISC        128K Disc Emulation Slotware(TM) for DOS 3.3
MAGNUM-80     80 Column Video Slotware(TM)
MAGNUM-80Me   80 Column Video Slotware(TM) with 64K Memory For Apple IIe
RAINBO-256    RGB Analog Slotware(TM) providing 256 colors
SV-622        Serial Interface Slotware(TM)


--- These people owe me stuff ---
Josh Smith (aka "itsme")   :  $17.00 + various specified videogame items
     (http://www2.hawaii.edu/~gkomatsu/JSmith/js.html)
Ben Cureton ("tragic")     :  $85.00



### END OF FILE microtek.cards
```

```
##########################################################################
### FILE: mockingboard
##########################################################################

Path: news.uiowa.edu!chi-news.cic.net!nntp.coast.net!howland.reston.ans.net!news-
e1a.megaweb.com!newstf01.news.aol.com!newsbf02.news.aol.com!not-for-mail
From: rubywand@aol.com (RUBYWAND)
Newsgroups: comp.sys.apple2.programmer
Subject: Re: Mockingboard programming
Date: 14 Feb 1996 10:06:34 -0500
Organization: America Online, Inc. (1-800-827-6364)
Lines: 52
Sender: root@newsbf02.news.aol.com
Message-ID: <4fstpq$om@newsbf02.news.aol.com>
References: <victort-1302961551230001@ts-h08-15-54.ucc.su.oz.au>
NNTP-Posting-Host: newsbf02.mail.aol.com
X-Newsreader: AOL Offline Reader

In article <victort-1302961551230001@ts-h08-15-54.ucc.su.oz.au>,
victort@extro.ucc.su.oz.au (Victor Tan) writes:

>can anyone supply information about how to make a mockingboard produce
>sound/music? I don't have any technical info about this so as much info
as
>you can supply would be greatly appeciated. Specifically, how to use it
>from 6502 assembly.
>
>Also, does anyone have any info about the different mockingboards? I see
>that some Apple II programs ask which type the user has: but what's the
>difference between them?

MockingBoard Mini-manual (Part 1)

    The Sweet Micro Systems MockingBoard comes in four 'flavors':

A. Sound I--    produces music tones and a variety of sound effects (1
channel output)
B. Speech I--  produces speech and limited sound effects (1 channel
output)
C. Sound II--   2 x Sound I on a single board (2 channels output)
D. Sound/
     Speech I-- Sound I + Speech I on a single board (2 channels output)

    MockingBoards work on Apple II's with at least 48K RAM. MB can go into
any Slot. Most programs expect it to be in Slot 4; however, it is fairly
common for a program which supports MB to ask you to enter the Slot #.
Most for-MB products use the board for music & sound effects and will work
with boards A, C, or D. Products that use MB include Ultima III, Sky Fox,
Wiley Byte', Under Fire, Guitar Master, and Music Star.

    MB's 0.5 Watt output(s) can directly drive an 8 Ohm speaker. You can
also run the output(s) to a hi-fi amplifier.

    MB "Sound" version boards use the General Instruments AY-3-8910
Programmable Sound Generator IC. The PSG has 3 on-chip tone oscillators
(via channels A, B ,C) and a Noise Generator (NG). So, for example, the
Sound II can play up to 6 notes with 2 noises at once.

    MB "Speech" version boards use the Votrax SC-01 Speech Synthesizer IC.
```

The SC-01 uses 64 phoneme sounds to produce speech. MB software lets you adjust duration of each phoneme in 4 steps, create "rules" for custom sounds, and speak sentences from text in BASIC programs.

All MB versions use the 6522 Versatile Interface IC to handle board I/O. Except for the Sound I board, there are circuit board points to which you can add cables to utilize I/O ports not needed for Sound or Speech.

Rubywand
Path: news.uiowa.edu!chi-news.cic.net!nntp.coast.net!news.kei.com!newsfeed.internetmci.com!howland.reston.ans.net!news-e1a.megaweb.com!newstf01.news.aol.com!newsbf02.news.aol.com!not-for-mail
From: rubywand@aol.com (RUBYWAND)
Newsgroups: comp.sys.apple2.programmer
Subject: Re: Mockingboard programming
Date: 14 Feb 1996 10:06:40 -0500
Organization: America Online, Inc. (1-800-827-6364)
Lines: 110
Sender: root@newsbf02.news.aol.com
Message-ID: <4fstq0$oo@newsbf02.news.aol.com>
References: <victort-1302961551230001@ts-h08-15-54.ucc.su.oz.au>
NNTP-Posting-Host: newsbf02.mail.aol.com
X-Newsreader: AOL Offline Reader

victort@extro.ucc.su.oz.au (Victor Tan) writes:
>.... supply information about how to make a mockingboard produc
sound/music? ....

MockingBoard Mini-manual (Part 2): Sound Programming

The user can set Tone Frequency (12 bits, 4 coarse & 8 fine)* and Amplitude (4 bits) for each channel individually. A fifth Amplitude bit lets
you decide if a channel's Level will be "fixed" (use the Level value) or "variable" (i.e. follow the current Envelope pattern). You can set NG Frequency (4 bits)* but not level.

*Tone Freq = A2 Clock Freq/ [(4096 x Coarse) + (16 x Fine)]
Noise Freq = A2 Clock Freq/ (16 x NG value)

The Envelope of the combined outputs of enabled sources can be controlled
for Period (16 bits, 8 coarse & 8 fine)** and, roughly, for Shape (4 bits).

**Env Freq = A2 Clock Freq/ [(65536 x Coarse) + (256 x Fine)]

The registers of the PSG are described briefly below:

Reg.	Function & Bit(s) used
00	A Freq. fine (0-7)
01	A Freq. coarse (0-3)
02	B Freq. fine (0-7)
03	B Freq. coarse (0-3)
04	C Freq. fine (0-7)
05	C Freq. coarse (0-3)

```
06       NG Freq. (0-4)
07       Enable =0/ Disable =1

  NG on A (5)  on B (4)  on C (3)
  Tone on A (2)  on B (1)  on C (0)
  Ex: Writing $F0 to Reg 07 plays tones A, B, C plus noise on C

08      A Level (0-3) and
     Envelope Control (4):  1 = Use Env;  0 = Use Level value

09      B Level (0-3) and ...
0A     C Level (0-3) and ...
0B     Envelope Period Fine (0-7)
0C     Envelope Period Coarse (0-7)
0D     Envelope Shape (four bits)

  Continue (3)  0= do 1 cycle and set Level to zero
  Attack (2) 1= count up  0= count down
  Alternate (1)  1= reverse count direction each cycle
  Hold (0)  1= do 1 cycle and hold count
```

To program the MB you write to the board's 6522 I/O chip(s). All addresses reference here are for a MB Sound II (2 Output channels) in Slot 4.

```
$C400  ORB1  function to perform, OUT 1
$C480  ORB2  function to perform, OUT 2
$C401  ORA1  data, OUT 1
$C481  ORA2  data, OUT 2
$C402  DDRB1 data direction, OUT 1
$C482  DDRB2 data direction, OUT 2
$C403  DDRA1 data direction, OUT 1
$C483  DDRA2 data direction, OUT 2
```

Before sending music, etc. data to the MB you must Initialize the board's I/O. To Initialize the 6522's: Store $FF at $C402 and the other three DDRxx addresses. This needs to be done by your program just once.

Your program gets access to a PSG via the 6522 by using a few basic Function codes which set the PSG's I/O control lines:

```
  Set Inactive = $04  Set PSG Reg# = $07   Write Data = $06   Reset = $00
```

To Write to a PSG register: Tell the PSG which Register you wish to access (i.e. Set the "current register" #) and Write the data. This is easiest to do with subroutines to handle the basic Functions.

Example Subroutines (for Output Channel 1):

```
Set Reg #     1000:  A9 07   8D 00 C4   A9 04   8D 00 C4   60
Write Data    100B:  A9 06   8D 00 C4   A9 04   8D 00 C4   60
```

Notice that each Function sub ends by setting the PSG control lines to Inactive.
Similarly, to do a Reset (set all PSG regs to zero) ...

```
Reset           1016:  A9 00   8D 00 C4   A9 04   8D 00 C4   60
```

To put the value $55 in PSG Register 02 (Channel B Freq. fine) ....

```
1080: A9 02         put Reg#  in A
1082: 8D 01 C4    store A at the Data address ORA1
1085: 20 00 10     JSR to Set Reg#  (sets "current register" to Register
2)
1088: A9 55         put the value $55 in A
108A: 8D 01 C4    store A at the Data address ORA1
108D: 20 0B 10    JSR to Write Data  ($55 goes into PSG Register 2)
1090: 60             Exit from subroutine
```

Good luck!

Rubywand

END OF FILE mockingboard

```
##########################################################################
### FILE: model.nums
##########################################################################

Newsgroups: comp.sys.apple2
Path:
news1.icaen!news.uiowa.edu!uunet!in2.uu.net!205.252.116.190!feed1.news.erols.com!h
owland.erols.net!math.ohio-state.edu!usc!newshub.cts.com!crash!pro-aplbytrs!nancyc
From: nancyc@pro-aplbytrs.pro-nsdapple.cts.com (Nancy Crawford)
Subject: Model #s; Originally Re: Printer questions
Organization: ProLine [pro-aplbytrs] -- Davenport, IA
Date: Sun, 5 Jan 97 14:30:34 CST
Message-ID: <a552366@pro-aplbytrs.pro-nsdapple.cts.com>
Lines: 65


nathan@visi.com (Nathan Mates) replied to <kristelli@mail.earthlink.net>
about printer questions:

 > You noted what model number it is, but didn't note the manufacturer.
 > If it's by Apple, it probably will work. Other ones,
 > depends on whether it's compatible with the software you're using--
 > serial dot matrix printers will probably be the most compatible.

 > Quoting from the comp.sys.apple2 Frequently Asked Questions (FAQ)
 > at http://www.visi.com/~nathan/a2/faq/csa2.html, sections 2.4 and
 > 4.4:

Nathan Mates,

A reference of Apple model numbers should be in a FAQ, IMO. Here's a
few for a start:

Model number:        Equipment:          Comment:
-------------------------------------------------------------------

PRINTER
        A9M0303          Image Writer I    (beige)
        A9M0310          Image Writer II   (white w/ power connect on
                                            right rear leg)

MOUSE
        A2M4015          Mouse             (beige  original //c mouse)
        A2M2070          Apple Mouse IIe   (platinum  came w/ IIe card)


DRIVE
        A2M2053          Unidisk 3.5       (white)


CPU
        A2S2064          Enhanced //e      (beige case)
        A2S4000          Original //c      (white -- This particular CPU
was an early "print peek (64447) 0" //c. The model# label is a printed
stick-on  label, in an inset. Same model# (A2S4000) case on a later model
has the label facts molded into the case with only the serial # a stick-on
label.)
```

```
MONITOR
       A2M2010           Green Phosphor     (two-tone beige; crt case
                         Monitor II         and controls are darker.)

       A2M6020           AppleColor         (platinum and heavy! plugs )
                         Composite monitor   into //c, //e w/RCA connect
                                             coax; same as Monitor II.)

       A2M6014           IIgs AppleColor    (platinum)
                         RGB Monitor


Anyone care to add, correct, and post...?

-- nancy


ProLine:  pro-aplbytrs!nancyc@pro-nsdapple
Internet: pro-aplbytrs!nancyc@pro-nsdapple.cts.com
UUCP:     crash!pro-nsdapple!pro-aplbytrs!nancyc


### END OF FILE model.nums
```

```
##############################################################################
### FILE: monitor.repair
##############################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!news-
e2a.gnn.com!newstf01.news.aol.com!newsbf02.news.aol.com!not-for-mail
From: rubywand@aol.com (RUBYWAND)
Newsgroups: comp.sys.apple2
Subject: Re: Repair Apple IIGS RGB, info wanted
Date: 21 Mar 1996 14:56:34 -0500
Organization: America Online, Inc. (1-800-827-6364)
Lines: 80
Sender: root@newsbf02.news.aol.com
Message-ID: <4isc9i$5ia@newsbf02.news.aol.com>
References: <4ip4pc$buj@madeline.INS.CWRU.Edu>
NNTP-Posting-Host: newsbf02.mail.aol.com
X-Newsreader: AOL Offline Reader

Monitor Repair Mini-Manual (mostly from stuff in COMPUTIST)

    First, be safe. (See safety stuff at end.)  Mainly, unplug the monitor
and let sit for a day, wear goggles, work on non-conductive table surface,
do not stress CRT neck.

    Whatever it is you plan to fix, if you remove the monitor case, you
will probably need to unplug the cable running from the circuit board to
the Controls/Switch Module on the side of the case. Use 'whiteout',  nail
polish, etc. to mark the position of the plug.

     If  the monitor exhibits major flickering, periodic collapse of the
display to a line, etc., then it may help to know that a common source of
such problems is one or more bad connections where the High Voltage module
is joined to the main circuit board. (This module is the black thing with
a HV lead running to the CRT-- it's near the left, back. The slotted nub
controls in its case set Focus and base Intensity.)  Often these
connections look okay because it is hard to see the small fractures in the
solder surrounding the pins.

    The cure is to resolder all of the pins coming from the module (on the
under-side of the circuit board).  Before doing the soldering, clip a wire
to the metal chassis and touch the other end to each HV module pin and
other points in the area. While soldering, avoid touching anything
conductive on the monitor with anything but the iron and solder.

    All-blue, all-red, etc. screen? You probably have a blown choke on the
little chroma board mounted to the back of the CRT. The choke will be
connected to one of the larger, R/G/B output transistors. Use an Ohmmeter
to find the open choke. Replace the bad choke with 'one like it' or brew
your own: wind about 25-30 turns of #30 wire on a small ferrite core.

    For all soldering use a good quality pencil-style iron rated at 25-40
watts with a holder. Use high quality (60/40 or better) rosin core solder
(e.g. Kester "44" 20 gauge).

    Arcing from the metal brace to the HV module can cause the display to
momentarily shrink and flick out of focus. The cure is to bend the brace
up enough to increase the arc path and clean the surfaces involved. Apply
HV dope to the brace and module where distances are small.
```

If the case interior seems pretty clogged with dust and gunk, it's a good idea to remove the side-mounted Controls/Switch Module and give the case a good washing. (Be very sure it is well dried before replacing.) You should also clean the two controls on the C/S Module with spray-in control cleaner.

Before putting the case back, this is a good time to adjust base Intensity and Focus (the two nub controls on the HV module). Position the monitor so that screen is easy to see and the nub controls are accessible. Plug in the the C/S Module. Adjust the C/S Module controls to center positions. Plug in the monitor to the computer. Get a Desktop display with some text and icons. Use an insulated tool to adjust the nub Intensity and Focus controls for maximum sharpness at 'normal' viewing intensity. A magnifying glass is helpful to obtain max pixel sharpness.

_____

Safety

Unplugging the monitor and letting it sit for a few hours reduces the danger of shock from stored charges; it does not eliminate it. The usual warning for this kind of work is AVOID touching two different circuit points at the same time. Like, don't touch the metal chassis and the conductive surface of the CRT at the same time. It's a good idea to clip a wire to the chassis and touch the other end to the conductive surface of the CRT a few times before doing any work.

WEAR protective GOGGLES. If you should, somehow, bump or stress the CRT neck-- as in jumping when you get shocked-- it may break. The result may be a peaceful THOOP! or the CRT may implode in a spray of glass.

Work on a wooden or plastic-topped table with plenty of space. Try to position yourself, tools, and the monitor so that when you get 'stung', the chances of breaking something are reduced.

Rubywand

END OF FILE monitor.repair

```
##########################################################################
### FILE: monitorgs.fix
##########################################################################

Path:
blue.weeg.uiowa.edu!news.uiowa.edu!uunet!news.mathworks.com!udel!gatech!howland.re
ston.ans.net!news.sprintlink.net!news.infi.net!larry!dynasor
From: dynasor@infi.net (Dennis McClain-Furmanski)
Newsgroups: comp.sys.apple2
Subject: Monitor Repair: Dark, Blurry
Date: 7 Feb 1995 00:48:01 GMT
Organization: InfiNet
Lines: 192
Message-ID: <3h6g01$cke@lucy.infi.net>
NNTP-Posting-Host: larry.infi.net
X-Newsreader: TIN [version 1.2 PL2]

Got a request to post this, so enjoy. E-mail me if you
have questions. And be careful in there!
=====

Disclaimer: I have almost 30 years experience working on
this type of device. I know how to be careful when doing
these things. You probably don't have this much experience.
I will do my best to explain this clearly and in enough
detail that you can do it yourself. However, I make no
promises, and I certainly do not take any responsibility
for the results. If this is a problem, the course is
simple: don't do it. This instruction set is offered to
the public domain and may be passed around or reprinted
anywhere, so that others may benefit. I only ask that you
leave my name on it. Dennis McClain-Furmanski,
dynasor@infi.net.

GS MONITOR REPAIR -- HIGH VOLTAGE PROBLEMS

This is a set of instructions for repairing the GS monitor.
This is not hard, but it is not without difficulties or
danger. Please pay very close attention to both instructions
and caution warnings. Read it all at least twice before
trying to do anything. Make sure all power is off before
connecting or disconnecting anything to the computer.

The GS monitor, just like all other high voltage driven CRT
devices deteriorates in function with age. This is
unavoidable wear-and-tear, and is accounted for in the
design. The problem is deterioration in the high voltage
circuitry and/or those portions on the monitor which
are operated by it.

SYMPTOMS: Increasing loss of brightness, contrast and/or
focus. The picture may 'bloom', that is get larger when
you turn up the brightness, and shrink when you turn it
down.

Associated side-effects: flashing and/or inconsistent
brightness fluctuation while trying to adjust the external
brightness and contrast controls.
```

PROBLEM: Primarily in the high voltage transformer. This 'fires' the electron guns, which produce the raster. This is adjustable up to a point. The side-effects are dirty controls; they can be cleaned.

THE FIX: The easy one first -- even if it's not necessary, you might as well do it while you're in there. Clean the brightness and contrast controls.

DISCONNECT THE MONITOR FROM THE COMPUTER AND FROM THE WALL. For safety's sake, I suggest doing this a day or two before working on it.

Open the GS monitor by removing the four screws, two on the back of the top 'flange' around the screen, two on the bottom facing the front, in the long 'channels'. Slide the back off of the monitor slowly, until the edge of the back is even with the back edge of the motherboard, the circuit board on the bottom of the monitor. Feed the power cord through the hole in the back as you slide it off. The wires leading to the controls on the side of the monitor might hang up. If so, simply loosen them and continue. Once the back is free of the chassis, slowly slide the back towards the right side (as you face the front) of the monitor. This is so you don't put strain on the wires going to the controls on the side.

Look inside the back, at the controls. The power switch, brightness and contrast controls are all mounted on the inside of the back. You can clean the brightness and contrast controls, to alleviate the flashing or inconsistent response. Using a pencil, mark the controls and the case so that you can set the controls back where they were before you started messing with them.

Get a spray can of NON-ABRASIVE contact cleaner. (This is probably al you'll find; the abrasive type was mostly for the old mechanical channel changer-tuners, but make sure). Make sure it won't hurt plastic. It will say so on the can. Try to get a can with a straw that fits into the spray cap. Spray some into one of the two controls, and turn it up and down repeatedly. Do this a few times. Then do the other control. Allow these to dry completely before you try to fire up the CRT. If this doesn't fix this problem, it's likely these will need to be replaced. The parts look to be fairly common. Sorry, I don't have details on them, so you'll have to get help with this.

Now to attack the main problem.

Look at the body of the CRT (picture tube). There's a big fat red (usually) wire coming out of it to the right of the long 'neck' of the tube (looking from the rear now). This is the high voltage wire. In fact, it's the VERY high voltage wire. There's enough juice in this thing when operating to knock you down and possibly kill you. Even when turned off, enough can be stored in this area to really bite you. This is why I suggest waiting a day or two before messing with this. It gives the power time to drain off.

This big wire goes into the top of a plastic device which is partially covered with a metal cage. This is the high voltage transformer. Facing the rear, you will see two small adjustment stems, one above the other. The upper one is marked FOCUS, the lower one SCREEN. This is on the collar around the stem.

If your problem is increasing darkness, the SCREEN control is the one you'll want to work with mostly. If your display is out of focus, obviously you'll work with the focus control. In either case, you may have to adjust both of them somewhat. Before you do anything else, MARK THEM. Use a pencil, and mark the control and the body of the transformer so you can set things back the way they were in case you get too messed up.

Now stop and think. The rest requires adjusting the high voltage controls (THOUSANDS of volts) with the set turned on. This is DANGEROUS. If this bother you, reassemble it now and do not go any farther. Take it to a tech. They should be able to do the rest of this for a minimum labor charge. Want to continue? OK, let's go.

Set up the monitor with the back still off and slid to the side, and connect both the power and the signal cable from the computer. Set it up so that you can work with plenty of room to move around the back. Set up a mirror in front of the screen, so you can see what's going on with the picture while you make adjustments without having to crane around to look at the screen. This would cause you to be in a position where you are not able to see your hands while working, and this is the best way to get bit. DO NOT, under ANY CIRCUMSTANCES try to work on anything without being able to see your hands.

Now, fire it up, and give yourself a familiar screen such as Finder, ProSel menu, whatever. Adjust the mirror so you can see the screen clearly from behind the monitor.

Make sure your brightness and contrast controls are set back where they were before you cleaned them. Now, using a plastic handled, if not *entirely* plastic, screwdriver, slowly adjust the control on the back of the transformer. KEEP AN EYE ON YOUR HANDS. Do not come into contact with anything other than the tool handle. Watch the mirror for changes in the picture. Adjust SCREEN first if the problem is mostly brightness. Adjust FOCUS if the picture is fuzzy. Adjust them both as necessary to obtain the best picture.

You may want to adjust the brightness and contrast controls down while doing this, because you may have over time moved them up to compensate for deterioration. Try to get them in the middle of their range, with the picture at your preferred viewing brightness.

If you can get things set the way you like it, great. Now try testing it while it's still operating. Adjust the brightness control on the side up and down. If you still get 'blooming', the transformer is going bad and will need to be replaced. It will probably cost more than the monitor is

worth. Ask a tech how much to change your Hi-V transformer, and decide. If no matter what you do with the FOCUS, you still get a fuzzy picture, your CRT is probably 'gassy', that is losing vacuum. This is definitely more costly to replace than to get a new one, unless you can get a tube from another monitor and replace it yourself.

Once you have things where you want them, turn it all off, disconnect everything, and reassemble the monitor. Your repair job is done. If it worked, you just saved yourself somewhere between $50 and $150.

If the brightness still does not come up enough, there's one more thing that can be tried. The electron guns can be 'burned off', that is hooked up to a tube tester which can put a great deal of voltage through the guns and burn off any oxides on the gun filaments. This must be done by someone with this device, in other words a tech. This is at best a temporary fix, and is equivalent to the "picture tube brighteners" you can purchase. If this needs to be done, you're working with a limited lifetime on the tube as is, and doing this may well shorten that lifetime.

Any questions, or anything not clear about these instructions, write me and I'll clarify.

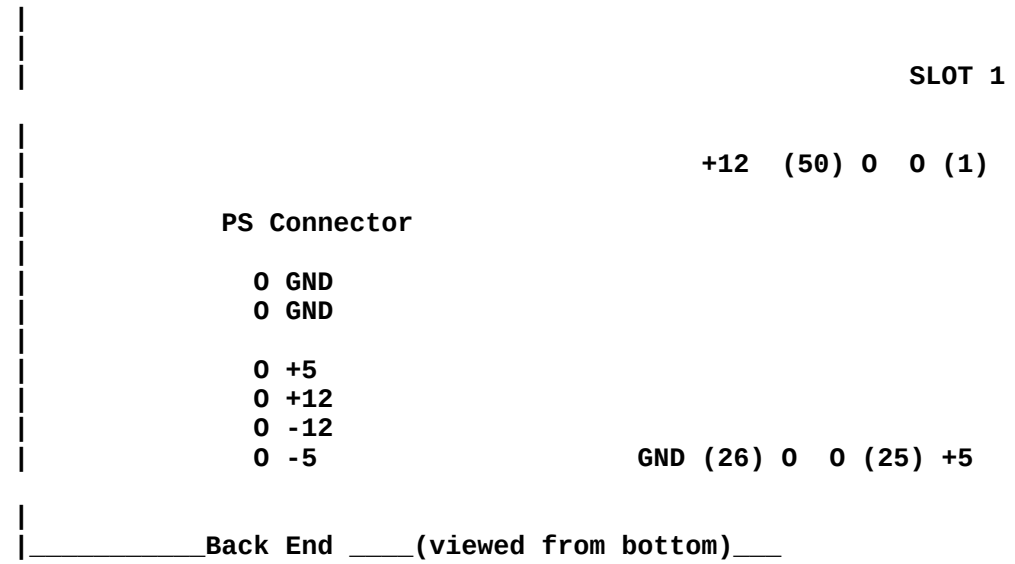
--
dynasor@infi.net The Doctor is on.

END OF FILE monitorgs.fix

```
##########################################################################
### FILE: motherboard.power
##########################################################################

Path: news.uiowa.edu!chi-news.cic.net!newspump.sol.net!uwm.edu!math.ohio-
state.edu!howland.erols.net!agate!newsxfer2.itd.umich.edu!portc01.blue.aol.com!new
stf01.news.aol.com!newsbf02.news.aol.com!not-for-mail
From: rubywand@aol.com (RUBYWAND)
Newsgroups: comp.sys.apple2
Subject: Re: SecondSight boot stability
Date: 24 Aug 1996 09:48:44 -0400
Organization: America Online, Inc. (1-800-827-6364)
Lines: 125
Sender: root@newsbf02.news.aol.com
Message-ID: <4vn17s$rtq@newsbf02.news.aol.com>
References: <4vfkun$m5s@nnrp1.news.primenet.com>
NNTP-Posting-Host: newsbf02.mail.aol.com
X-Newsreader: AOL Offline Reader

In article <4vfkun$m5s@nnrp1.news.primenet.com>, bpvh@primenet.com
(Bradley P. Von Haden) writes:

>
>
>>Fattening the PS +5V and GND leads cut glitching significantly. On
>>the motherboard, adding #16 gauge wires from the +5V and GND PS
>>connector pads to +5V and GND points on Slots 3 and 7 finished the
>>job. (Second Sight board users may need to fatten the +12V lead,
>>too)  Anyway, no glitches-- the power supply "went good".
>
>
>Is this one of those modifications that if I am not sure how to do it
>I definitely should not try it?
>
>

     That depends on your alternatives. If your GS is bombing regularly
and your setup fits the "power supply problem" profile, then _someone_
needs to do a fix. Maybe the local Apple Users Group could have a Power
Supply Fix meeting. Those familiar with the work required could guide
users through the motherboard and PS leads mods and check their work along
the way.

     Regarding the motherboard additions: Most likely, nobody especially
likes to remove all cords and plugs, remove the Power Supply, pull out
cards, pop out the motherboard-- be sure to undo any hold-down bolts or
nuts-- and do mods. (Also, be sure to mark/label boards & cords and keep
notes of what goes where!)

     Once you've got the MB out, the actual mod is not that bad a job. #16
gauge wire is fairly easy to work with.

     Mainly, you will constantly be worrying about whether or not you are
connecting to the right places. Have a picture or drawing showing the
pin-out for a Slot and have it oriented so that the pin#26/pin#25 end
matches positioning of the MB. Then, since you are working on the bottom
side, remember that left-right is switched.

So: with the MB back facing you, the Slots will be closest to you. Flip
```

the board over left-right to view the bottom.. On each Slot, The Slot pins closest to you will be #26 (left) and #25 (right). #26 (left) is GND; #25 (right) is +5V. The PS connector is just to the left of Slot 1.

Bottom View



Use an Ohm meter to verify the above. Check resistance between PS Connector GND and Pin 26 at each Slot. The resistance should be close to zero in each case. (The meter may show close to 1 Ohm.) Mark GND for Slots 1, 3, and 7 using whiteout or a marker.

Check resistance between PS Connector +5 and Pin 25 on each Slot. Check resistance between PS Connector +12 and Pin 50 on each Slot. As above, resistances should be very low.

NOTE: An Ohm meter passes a small current through the circuit being measured. If you want to check R from, say, Slot Pin 1 to PS Connector +12 (to verify that Pin 1 is _not_ the +12 pin), then set the meter for X100. This reduces the measurement current. By the way, there will be _some_ detectable connection between most circuit points and any of the PS Connector points. The measured resistances will usually be fairly high. Depending upon meter lead polarity, the measured resistance from a +5 point to GND may be fairly low; but, it will be significantly different from zero. In general, avoid doing R measurements on the motherboard except where you are verifying a likely direct connection.

Check out the empty case. You will get some idea of where supports crop up to hold the motherboard. When connecting wires from the PS connector to Slots 3 and 7, remember to leave enough slack to route around the supports.

Using a pencil type soldering iron (approx. 25-35 watts) and good quality solder (like Kester "44) connect the wires. Avoid using wire with very thin insulation. It helps to use color-coded leads-- like Black for GND, Red for +5, and Orange for +12. Run separate leads from the PS Connector points to each Slot.

Quickie Check (viewing work from back end, bottom):

1. The wires to Slot 3 'look like' the wires going to Slot 7
2. The GND and +5 leads go to the same end of the Slot, the end closest to you
3. The GND and +12 leads go to the left side of the Slot
4. The +12 lead is on the Slot end farthest from you
5. The +5 lead is the only one on the right side of the Slot
6. The GND leads go to one of the two PS connector points farthest from you

....

.....

Regarding the Fat Power Supply leads mod, as Will Baguhn suggests, #14 gauge copper is probably heavy enough and it is easier to work with than #12 gauge. (Someone who has done a fair number of linear PS designs tends to go for the heaviest gauge that can be bent into place.) Whether #12 or #14, try to get stranded stuff for the PS leads. It is easier to position without having to worry about twisting and breaking loose from the PS circuit board.

Rubywand

END OF FILE motherboard.power

```
##########################################################################
### FILE: mouse.iie
##########################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!uwm.edu!newsfeed.internetmci.com!in2.uu.net!comp.vuw.ac.nz!waikato!news.
express.co.nz!actrix.gen.nz!atlantis.actrix.gen.nz!not-for-mail
From: dempson@atlantis.actrix.gen.nz (David Empson)
Newsgroups: comp.sys.apple2
Subject: Re: IIGS ADB keyboard fix
Date: 21 Jun 1996 21:02:04 +1200
Organization: Actrix - Internet Services
Lines: 69
Message-ID: <4qdoec$6oo@atlantis.atlantis.actrix.gen.nz>
References: <4q0fpp$8fa@milo.vcn.bc.ca> <mac-1706961455590001@aurora10.wco.com>
NNTP-Posting-Host: atlantis.actrix.gen.nz

In article <mac-1706961455590001@aurora10.wco.com>, MAC <mac@wco.com> wrote:
> In article <4q0fpp$8fa@milo.vcn.bc.ca>, trebor@vcn.bc.ca (Robert Lee_Kwen)
> wrote:
>
> > Also does a apple //e mouse card work on a Rom 03 apple //gs?
> >
>
> The Mouse card will not work in a GS of any ROM version.

Wrong.  The original IIgs mouse support (ROM 00 and ROM 01) was
specifically designed to allow the use of a IIe mouse card, so that a
IIe user upgrading to a IIgs could plug in their mouse card and
continue to use their mouse, rather than having to fork out money for
an ADB mouse.

In the ROM 00 and ROM 01, the ADB mouse is controlled by the slot 4
mouse firmware.  If you disable this, then you lose all access to the
mouse, from GS/OS and ProDOS-8.  However, if you install a IIe mouse
card (in any slot, as long as it is set to "Your Card"), then that
mouse can be used in all ProDOS-8 and GS/OS applications.  (There may
be some programs which assume the IIgs mouse is always in slot 4, or
bypass the firmware and try to use the ADB mouse directly.  These
programs would not work with a IIe mouse card.)

If the ROM 03 IIgs, Apple rewrote the mouse firmware.  The ADB mouse
is controlled directly by the IIgs toolbox (Miscellaneous Toolset),
and the slot 4 mouse firmware uses the toolbox code.  (The ROM 00/01
is the other way around - the toolbox calls use the slot firmware.)

This means that for a ROM 3, if you set slot 4 to "Your Card", you can
still use the mouse in GS/OS programs, but you cannot use it in
ProDOS-8 programs.  I have my system set up this way.

If you install a IIe mouse card into a ROM 3, then that mouse will be
available to ProDOS-8 applications, provided they use the standard
firmware entry points (which are the same for the IIe card, the IIc
and IIgs).  You should set slot 4 to "Your Card" to avoid confusion
with the ADB mouse.

GS/OS programs will not use the IIe mouse on a ROM 3, but they will
continue to work with an ADB mouse.
```

Summary of mouse used in each situation:

Slot 4 Setting	IIe mouse card	ROM 00/01 P8	ROM 00/01 GS/OS	ROM 03 P8	ROM 03 GS/OS
Mouse Port	Not installed	ADB	ADB	ADB	ADB
	In slot 1-3	ADB?	ADB?	ADB?	ADB
	In slot 4	ADB	ADB	ADB	ADB
	In slot 5-7	IIe?	IIe?	IIe?	ADB
Your Card	Not installed	None	None	None	ADB
	In any slot	IIe	IIe	IIe	ADB

I'm not sure which order the slots are supposed to be scanned when searching for the mouse. In the table, I've assumed that the scan is supposed to start at slot 7.

As I mentioned earlier, there may be some programs which differ from this behaviour, but this is how things should work for any programs which use the standard methods to access the mouse.

--

David Empson
dempson@actrix.gen.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand

END OF FILE mouse.iie

```
##############################################################################
### FILE: mousepens
##############################################################################

Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!207.24.245.130!nyd.news.ans.net
!newsfeeds.ans.net!news.idt.net!dca1-
hub1.news.digex.net!digex!lynx.unm.edu!ben09.unm.edu!buggie
From: buggie@ben09.unm.edu (stephen e buggie)
Newsgroups: comp.sys.apple2
Subject: Fellows ADB mouse-pen --- works great!
Date: 12 Jan 1999 07:58:13 GMT
Organization: University of New Mexico, Albuquerque
Lines: 29
Message-ID: <77eval$shi$2@lynx.unm.edu>
NNTP-Posting-Host: ben09.unm.edu
X-Newsreader: TIN [version 1.2 PL2]
Xref: news1.icaen comp.sys.apple2:143992


I'm NOT selling this ---- just describing it!.  I just received two
Fellows mouse-pens.  They are ADB for IIgs or Mac.

They are surprisingly smooth.  It would take getting used to the cable
coming out of the top, but it gives a third option, beyond mouse or
trackball.  There are two buttons, positioned just right.

Having a variety of pointers might help minimize the growth of carpel
tunnels in the wrists maybe.....

I'm keeping them both, but if anyone wants to write for them, the
manufacturer is: Fellowes,  1789 Norwood Ave., Itasca, IL 60143-1095.

Yet ANOTHER item to be lowered into my grave with me when I eventually
croak.....     ;-)          Steve


  Stephen Buggie                                    |Sorry sir, "APPLE II |
  Psychology Dept.                                  |  FOR DUMMIES"  was  |
  Univ. of New Mexico, Gallup                       |   never published;  |
  200 College Rd.                                   |could you get the IBM|
  Gallup, NM  87301                                 |   version instead?  |
 **=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=**
 ** buggie@unm.edu                      voice: (505) 863-7504 or 863-2390 **
 **              Apple IIgs/IIe/IIe;  Mac SE/Classic                       **
 **=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=*=**




### END OF FILE mousepens
```

```
######################################################################
### FILE: nsc-smartwatch.ds1216e
######################################################################

Newsgroups: comp.sys.apple2
Subject: Re: IIe no-slot-clock: battery replacement?
From: dempson@actrix.gen.nz (David Empson)
Date: Wed, 13 Jan 1999 03:19:38 +1300
Message-ID: <1dljucj.kj0xt4ozaa7iN@dempson.actrix.gen.nz>
References: <77arda$o42$1@lynx.unm.edu> <3699EB80.8DA4F9DF@EuropeM01.nt.com>
<77e85t$1sdi$1@news.gate.net> <david.916111490@u513>
Organization: Empsoft
X-Newsreader: MacSOUP 2.3
NNTP-Posting-Host: 202.49.157.176
X-Trace: 13 Jan 1999 01:11:03 -1300, 202.49.157.176
Lines: 41
Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!128.174.5.49!vixen.cso.uiuc.edu
!logbridge.uoregon.edu!su-news-hub1.bbnplanet.com!lsanca1-
snf1!news.gtei.net!news.netgate.net.nz!news.xtra.co.nz!news.iprolink.co.nz!news.ac
trix.gen.nz!dempson
Xref: news1.icaen comp.sys.apple2:144000

David Wilson <david@uow.edu.au> wrote:

> louiss@gate.net  (Louis Schulman) writes:
> >I may be mistaken, but isn't the NSC just a Dallas Smartsocket?
>
> It is actually a SmartWatch - the SmartSocket goes under a RAM chip and
> turns it into NVRAM. The SmartWatch goes under a ROM and just provides time.
> There is one that goes under a RAM and provides time and NVRAM as well.

The one that goes under a RAM is also called a SmartWatch.  There are
several different models.  The letter suffix indicates the chip size and
type.  Here is a full list from Dallas Semiconductors' 1989 data book:

DS1216   SmartWatch/RAM 16/64K
DS1216C  SmartWatch/RAM 64/256K
DS1216D  SmartWatch/RAM 256K/1M
DS1216E  SmartWatch/ROM 64/256K
DS1216F  SmartWatch/ROM 64/256K/1M

The capacities refer to bits, not bytes.  The different sizes are
required because various static RAMs and ROMs are different sizes and
have the power supply pins in different places.

In the case of the No Slot Clock, you need a DS1216E to replace it.



In <3699EB80.8DA4F9DF@EuropeM01.nt.com>, Robert Lacoste
<RLACOSTE@EuropeM01.nt.com> writes:
>Even if you find a way to change the battery, do you think it will pass
>the Y2K bug ?

Dallas Semiconductor posted a Y2K statement on their web site about
this.  I haven't read it myself, but I believe it states that all their
timekeeper products are Y2K compliant, and will operate correctly up to
the year 2099.
```

--
David Empson
dempson@actrix.gen.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand

END OF FILE nsc-smartwatch.ds1216e

```
##############################################################################
### FILE: nsc.battery
##############################################################################

Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!207.24.245.130!nyd.news.ans.net
!newspump.monmouth.com!newspeer.monmouth.com!intgwpad.nntp.telstra.net!news1.optus
.net.au!optus!news.usyd.edu.au!news.uow.edu.au!david
From: david@uow.edu.au (David Wilson)
Newsgroups: comp.sys.apple2
Subject: Re: Replacement for No-Slot Clock
Date: 4 Mar 99 01:54:48 GMT
Organization: University of Wollongong, Australia
Lines: 40
Message-ID: <david.920512488@wraith>
References: <36DC56CE.F66EE96A@lexis-nexis.com> <7biqf7$1aa8$3@lynx.unm.edu>
NNTP-Posting-Host: wraith.cs.uow.edu.au
X-Trace: wyrm.its.uow.edu.au 920513993 23390 130.130.64.1 (4 Mar 1999 02:19:53
GMT)
X-Complaints-To: usenet@wyrm.its.uow.edu.au
NNTP-Posting-Date: 4 Mar 1999 02:19:53 GMT
X-Newsreader: NN version 6.5.0 #15 (NOV)
Xref: news1.icaen comp.sys.apple2:145476

buggie@callisto.unm.edu (stephen e buggie) writes:
>About six weeks ago, there was a thread on this topic ---- rejuvenating
>the NS Clock.   There _are_ two points on the green daughterboard on the
>"chip" at which an external batter could be attached.  Check with DAVID
>EPSON (New Zealand).  It looks like the external battery is feasible, but
>a trace should be cut somewhere so that the exterenal battery is not
>drained by the dead internal unit.....   [David --- please supply
>details!]     Steve Buggie

I think you may be getting David Empson (of New Zealand) mixed up with me
[David Wilson (of Australia)].

I certainly posted information about the battery in a NSC.

If you remove the ROM chip from the NSC you will be able to see a chip,
PC board and a large letter (A/B/C/D/E/F depending on model of SmartWatch).

Placing the clock chip so that the letter is the right way up (and to the
right hand end of the chip, look for two small terminals to the right of
the letter (above and below). They should be marked - (the top one) and +
(the bottom one). You will see a trace leading from the -ve terminal to
the top righthand corner of the chip inside the SmartWatch. This goes to
both pins at the rh end of the chip then goes past the + terminal to the
external pin on the SmartWatch package (pin 12 or 14 depending on the model).

It looks like the +ve terminal is connected on the other side of the PC board.

If you were to cut the connection between the -ve terminal and the chip,
this would disconnect it. Then you could connect an external battery +ve
wire to the +ve internal battery terminal and the external battery -ve
wire to the chip side of the cut you made in the -ve PC board trace then
the external battery would be used and the internal disconnected.

To see the board layout in more detail, download the file app04.pdf from
the Dallas web site. It is a 4 page document with descriptions of the
```

Smartwatch options that can be changed by cutting traces and joining jumpers
on the PC board. I think there is an error in this document as it has
the DS1216D diagram twice and no picture of the DS1216E.
--
David Wilson School of IT & CS, Uni of Wollongong, Australia david@uow.edu.au

END OF FILE nsc.battery

```
##########################################################################
### FILE: octoram
##########################################################################

Newsgroups: comp.sys.apple2
Path: news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!zaphod.mps.ohio-
state.edu!cs.utexas.edu!uunet!munnari.oz.au!comp.vuw.ac.nz!actrix!David.Empson
From: David.Empson@bbs.actrix.gen.nz
Subject: Re: OctoRAM Memory upgrade
Organization: Actrix Information Exchange
Date: Sun, 17 Jan 1993 13:28:02 GMT
Message-ID: <1993Jan17.132802.18052@actrix.gen.nz>
References: <1993Jan12.022552.27758@nuscc.nus.sg>
Sender: David.Empson@actrix.gen.nz (David Empson)
Lines: 65

In article <1993Jan12.022552.27758@nuscc.nus.sg> ltchean@iss.nus.sg (Lim Thye
Chean) writes:
>
> Hi, any OctoRAM users out there?

Yep.  :-)

> I lost my OctoRAM manual, so I have to ask this in InterNet:
>
> I am now using 2MB on my RAM card, all 8 rows filled with 256K simms. I plan
> to upgrade to at least 4MB.
>
> 1. Can I upgrade to more than 4MB?

Yes.  You can use eight 1 megabyte SIMMs, but DMA compatibility might
be a problem.

> 2. Do I have to throw away all 8 rows of 256K simms and used all 1MB simms?

Yes.

> 3. Can I mixed both simms? For example, reserved 6 rows of 256K simms
>    (6 x 256K = 1.5MB), and used 2 rows of 1MB simms to get a total of
>    3.5MB? Or reserved 4 rows of 256K simms (4 x 256K = 1MB) and used 4
>    rows of 1MB simms to get 5MB?

No.  All SIMMs must be the same type.

> 4. Can I have the dip-switch configuration?

In the following diagrams, L means 'jumper to the left' and R means
'jumper to the right', and the jumpers are listed top to bottom.

Using 256k SIMMs:

1 (256k)   L, L, L, L, L
2 (512k)   L, L, L, R, L
4 (1 MB)   L, L, L, R, R
8 (2 MB)   R, L, L, R, R     (This should be your current setting)

Using 1 MB SIMMs:

1 (1 MB)   L, R, R, L, L
```

2 (2 MB)   L, R, R, R, L
4 (4 MB)   L, R, R, R, R
8 (8 MB)   R, R, R, R, R

> 5. What precautions should I take?

When buying the SIMMs, make sure you get ones that will work on a Mac Plus, SE, or II.

IBM SIMMs (9 way) should also work, but I've heard of some people who have had problems.

If you're installing less than 8, make sure you put them in the correct slots. The first SIMM goes in the top of the group of two slots, the second below that, then fill the group of six slots from the top.

The only valid combinations are 1, 2, 4 or 8 SIMMs.
--
David Empson

Internet: David.Empson@bbs.actrix.gen.nz   EMPSON_D@kosmos.wcc.govt.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand
Path: news.weeg.uiowa.edu!news.uiowa.edu!uunet!ddsw1!panix!not-for-mail
From: blakjak@panix.com (Noah Mittman)
Newsgroups: comp.sys.apple2
Subject: Re: need OctoRam manual
Date: 27 Feb 1994 19:38:17 -0500
Organization: School of Visual Arts: Video Junkies
Lines: 42
Message-ID: <2kredp$4eq@panix.com>
References: <CLwMww.Au4@cuug.ab.ca>
NNTP-Posting-Host: panix.com
X-Newsreader: TIN [version 1.2 PL2]

Richard Murray 235-4680 (xint@cuug.ab.ca) screamed from comp.sys.apple2:
: As the heading implies I am searching for instructions on how to set my
: OctoRam cards jumpers to accept 1 meg SIMMS. Any help would be Appreciated.

The following are the jumper positions for the 1Meg SIMM configurations:
- [ ] means jumper over middle and right pins
[ ] - means the opposite
==========

[ ] -
- [ ]
- [ ]
[ ] -
[ ] -   FOR 1 MEG

[ ] -
- [ ]
- [ ]
- [ ]
[ ] -   FOR 2 MEG

[ ] -
- [ ]

- [ ]
- [ ]
- [ ] FOR 4 MEG

- [ ]
- [ ]
- [ ]
- [ ]
- [ ] FOR 8 MEG

--
b l a c k J A C k
Internet blakjak@panix.com FVNet #3@#53 original score by Wierzbowski
written and directed by Noah Mittman produced by SVA & digitalTarget video
"She's dead. She's alive. It's a little confusing."-Alek COMING THESIS '95

END OF FILE octoram

```
##############################################################################
### FILE: oldserial.dips
##############################################################################

Newsgroups: comp.sys.apple2
Path:
news.uiowa.edu!news.uiowa.edu!uunet!in1.uu.net!news.sprintlink.net!usenet.kornet.n
m.kr!news.kreonet.re.kr!overload.lbl.gov!lll-winken.llnl.gov!fnnews.fnal.gov!nntp-
server.caltech.edu!news.ridgecrest.ca.us!owens!croton
From: Cyrus Roton <croton@ridgecrest.ca.us>
Subject: Re: Need info on old serial card
In-Reply-To: <437rhg$kg6@iitmax.acc.iit.edu>
X-Sender: croton@owens
X-Nntp-Posting-Host: owens
Content-Type: TEXT/PLAIN; charset=US-ASCII
Message-ID: <Pine.SUN.3.91.950914112728.3233D-100000@owens>
Sender: usenet@ridgecrest.ca.us (Ridgenet Usenet admin)
Organization: RidgeNet - SLIP/PPP Internet, Ridgecrest, CA. (619) 371-3501
References: <437rhg$kg6@iitmax.acc.iit.edu>
Mime-Version: 1.0
Date: Thu, 14 Sep 1995 18:35:24 GMT
Lines: 26

The switch settings for the old Apple Serial Interface card:

1    2    3      baud rate
on   on   on     110
off  on   on     134.5
on   off  on     300
off  off  on    1200
on   on   off   2400
off  on   off   4800
on   off  off   9600
off  off  off  19200

sw 4  off = enable delay after CR

5    6    line wt   video
on   on    40       enable
off  on    72       disable
on   off   80       disable
off  off   132      disable

sw 7  off = enable LF after CR

Cyrus Roton   croton@ridgecrest.ca.us
Ridgecrest Apple User Group




### END OF FILE oldserial.dips
```

```
########################################################################
### FILE: paddles
########################################################################

Path: news.uiowa.edu!chi-news.cic.net!uwm.edu!math.ohio-
state.edu!pacific.mps.ohio-state.edu!freenet.columbus.oh.us!not-for-mail
From: dalloff@freenet.columbus.oh.us (Dave Althoff)
Newsgroups: comp.sys.apple2
Subject: Re: Paddles
Date: 17 Oct 1995 01:03:20 -0400
Organization: The Greater Columbus FreeNet
Lines: 27
Message-ID: <45vdeo$c0n@acme.freenet.columbus.oh.us>
References: <38133725.110409771@mit.bison.mb.ca> <45ree4$eqm@gap.cco.caltech.edu>
<45rism$e2@gap.cco.caltech.edu>
<NEWTNews.813870598.14448.oeefcu@pixiuser.pixi.com>
NNTP-Posting-Host: acme.freenet.columbus.oh.us
X-Newsreader: TIN [version 1.2 PL2]

(Q:  Can one obtain Apple ][ paddles)

You could build your own...they are extremely simple.  The toughest part
is finding a 150K-ohm linear potentiometer.  The circuit is something like
this...

                              150k ohms
          +5v-------------------/\/\/\/\/\/\--------|
                                   ^               |
          PDL(n)-----------------------|           |
                                                   |
          Gnd---------------------------------------
                              |
                        |     |
          PB(n)_____.---._____|

Okay, so as a schematic, it's pretty awful.  And the button input might
need to connect to +5v instead of ground; it has been a long time since I
built mine.  But you get the idea.  If you need the pin-outs of the game
connectors, I have those around here someplace.

--Dave Althoff, Jr.
--
    /-\        _       _                  __*** Closed for the season ***
   /XXX\      /X\     /X\_      _     /XX\_      _     _       _____
  /XXXXX\    /XXX\  _/XXXX\_   /X\   /XXXXX\    /X\   /X\      /XXXXX
_/XXXXXXX\__/XXXXX\/XXXXXXXX\_/XXX\_/XXXXXXX\__/XXX\_/XXX\_/\_/XXXXXX
Path: news.uiowa.edu!chi-
news.cic.net!newsfeed.internetmci.com!news.mel.aone.net.au!inferno.mpx.com.au!metr
o!cassius!adrianw
From: adrianw@cassius (Adrian Whichello)
Newsgroups: comp.sys.apple2
Subject: Re: Paddles
Date: 19 Oct 1995 23:52:22 GMT
Organization: Electrical Engineering, University of Sydney
Lines: 15
Distribution: inet
Message-ID: <466obm$6bl@metro.ucc.su.OZ.AU>
```

References: <45rism$e2@gap.cco.caltech.edu>
<NEWTNews.813870598.14448.oeefcu@pixiuser.pixi.com>
<45vdeo$c0n@acme.freenet.columbus.oh.us>
NNTP-Posting-Host: cassius.ee.su.oz.au

In article <45vdeo$c0n@acme.freenet.columbus.oh.us> dalloff@freenet.columbus.oh.us (Dave Althoff) writes:
>(Q: Can one obtain Apple][paddles)
>
>You could build your own...they are extremely simple. The toughest part
>is finding a 150K-ohm linear potentiometer.

Other values can be used, provided you compensate by changing the 0.022uF capacitor to maintain the same RC time constant (which is 150Kohms x 2.2nF = 3.3ms with the supplied values). It's easiest to do this be decreasing the R and then connecting a suitable capacitor from the wiper arm of the pot to ground in your homebuilt paddle box, to avoid having to replace components on the Apple motherboard. I did this with a couple of RS joystick controllers (100Kohm) I picked up for two dollars, by putting in an extra 1.1nF capacitance.

Adrian.

END OF FILE paddles

```
##########################################################################
### FILE: paddles.info
##########################################################################

Newsgroups: comp.sys.apple2
Path:
news.weeg.uiowa.edu!news.uiowa.edu!uunet!orca!javelin.sim.es.com!animal!mmunson
From: mmunson@animal.es.com (Mark Munson)
Subject: Re: Joystick readings from ML
Message-ID: <1992Oct5.211758.17368@javelin.sim.es.com>
Sender: news@javelin.sim.es.com
Nntp-Posting-Host: animal.sim.es.com
Reply-To: mmunson@animal.es.com (Mark Munson)
Organization: Evans & Sutherland Computer Corp., Salt Lake City, UT
References:  <1992Oct2.181113.27082@cs.uow.edu.au>
Date: Mon, 5 Oct 1992 21:17:58 GMT
Lines: 67


Shane:

Unfortunately, there isn't another ROM based routine for reading the joysticks.
You'll have to write your own in machine language. It might seem like a
problem, but it's really easy once you see it done.

First, you need to know what the paddle (joystick) hardware is doing.  When
you strobe the paddles, a charge is applied to a capacitor.  A variable
resistor (paddle) allows the capacitor to discharge to ground.  By measuring
the time for this to occur, you can guage the setting of the paddle.

The ROM based paddle routines use the Apple II running at 1 MHz, with a known
paddle resistance in the 0 to 150 ohm range (or was that 150 K-Ohm?)  Even on
a GS, the call still slows the machine down during this timing sensistive
process.

Strobing the paddles, starts the process on all of the 4 possible paddles.
If the paddle you are reading finishes quickly, and you try to read the
next paddle (which hasn't finished), you will get faulty values for the
second paddle.

Example:

     PDL 0:  +-----------!
     PDL 1:  +----------------!
             _____________________________
             0          100       200   255

In the example above, you would get a value of 100 for PDL(0).  If immediately
try and read PDL(1) before it has a chance to finish, then you might get a
value of 50 {150 - 100} for PDL(1).

A cheap way to correct for this is to check the paddle switch location to insure
that the paddle has timed out before you strobe the paddle.  It works, but it
wastes time.  There is a faster way to get both paddle values, without running
into timing problems like the one above.


Read Both Paddles at the Same Time
```

Insure both paddles are clear, then strobe the paddle switch.
Start counting, and look at both paddles.
As each paddle times out, save the counter value for the paddle.
By strategicly placing NOP instructions into the loop paths, you can
insure that the timing will stay constant for each pass of the counter.

When both paddles have timed out, you are done.

If you write in 65C816 code, you can read both paddle values with a single LDA instruction. In fact, the code gets a lot tighter in 65C816 code, so your resolution will be higher than the stock 0-254 of a 1 MHz 6502 call.

This factor can present some problems if the game is running on an accelerated GS. So you'll want to calibrate the joystick for various speeds, and divide the joystick results by an appropriate factor.

If you want the joystick routine to be of a consistent length, then you only need to add on a dummy loop that will waste the time that would have been used had both paddles been set to thier maximum (highest resistance) value.

I've got copies of routines (65C816) that do this type of thing. When I unpack my GS, I'll try and upload an example.

[MGM]

END OF FILE paddles.info

```
##############################################################################
### FILE: parallel2ibm
##############################################################################

Path: news1.icaen!news.uiowa.edu!chi-news.cic.net!EU.net!cpk-news-hub1.
bbnplanet.com!news.bbnplanet.com!feed1.news.erols.com!howland.erols.net!
newsxfer.itd.umich.edu!uunet!in1.uu.net!142.77.1.4!news.uunet.ca!news.on.
rogers.wave.ca!n4tor.istar!tor.istar!east.istar!news1.istar.ca!news
From: i.hate.spam@no.junk.email (Honker)
Newsgroups: comp.sys.apple2,comp.sys.apple2.programmer
Subject: Messing around with a parallel i/o card
Date: 22 Feb 1997 06:11:39 GMT
Organization: -
Lines: 115
Message-ID: <5em2mr$olc@news.istar.ca>
NNTP-Posting-Host: ts20-10.vcr.istar.ca
Xref: news1.icaen comp.sys.apple2:116933 comp.sys.apple2.programmer:8486

I've been having some fun with a home brew parallel i/o card for
Apple2. It's a modified parallel printer card with a flat cable that
plugs into an IBM-PC parallel port allowing the two computers to
exchange data directly.

Using Borland C I wrote some preliminary software for the IBM to
configure it as a file server for ProDos 8 but just as easily it
could directly download programs, operating systems such as DOS 3.3,
etc.

So far I've been using a MacroprintPlus card (by Macrotech Computer
Products of BC, Canada) as it was designed for parallel i/o as well
as printing.

However, the Grappler+ is much more widely available, especially the
clone versions. Some time ago I posted instructions on how to modify
a Grappler for this function and I've thought up an extension of the
concept to make it more versatile by allowing the on-board firmware
to be writable at run time. This is particularly handy for me because
I use a 6502 cross-assembler on the IBM.

Basically the idea involves using both RAM and EPROM. The operating
system, program and firmware would all be downloadable from the IBM
which has much more storage resources than the usual II+ or //e
system with 143k floppy drives. The ROM would contain only minimal
boot code, used to download whatever firmware is needed at the
moment.

It would be handy if the RAM were non-volatile, and Dallas
Semiconductor makes a battery-backed 2k x 8 RAM, the DS1220.

Modifying the Grappler+
-----------------------

This card has the following hardware features:

* socket for 2732 EPROM (more on this below)

* 8-bit latched output port

* output strobe (active low)
```

* 8-bit input port, currently allocated as:
    bit 0: printer ACK-
    bit 1-3: printer status
    bit 4-6: DIP switches
    bit 7: interrupt pending

* optional interrupt (IRQ-) generated by printer ACK-

The provision for a 2732 (4k x 8) EPROM is the basis for this scheme because this chip is replaced by a 2716 (2k x 8) EPROM and a 4116 static RAM of the same size. The high order address line, A11 normally used to select the Grappler's firmware banks becomes the device select line; low for EPROM and high for RAM.

The physical placement of the two chips is a minor consideration; The RAM can piggybacked on the ROM, pin for pin except CE- or it can be fitted somehow onto the solder side of the card. In my computer this card is in slot 7 so there's no problem with clearance room on the component side.

A slight modification is needed to make the RAM writable. I tried this tonight with a 4116 in the firmware socket and it seems to work:

1. Since this is RAM, it needs a WR- signal to accept data. I cut the trace to U9-21 (was A11 on the 2732 but now the WR- input for a 4116.) and connected a jumper wire from this pin to U3-3, ie. the RD/WR- line.

2. I cut the short trace from U9 pin 20 (OE-) that connects it to the line from U6-11 to U9-18. This pin needs to be connected to the invert of RD/WR-, ie. RD-. For my present purposes I don't need interrupts from this card, so the resources normally used for interrupts become available including the latch at U2A, etc., and RD- was derived from the NAND gate at U6A.

When I tried this with a card in slot 1 I could write and read to $C100 - $C1FF with no problem. However, $C800 to $C8FF seems to be mapped into this same space, so the expansion ROM space really starts at $C900.

The Grappler+ soft switches are somewhat peculiar. According to the manual the nominal designations for an i/o write are as follows

$C080,Y output
$C081,Y Select ROM bank 2
$C082,Y reset interrupt Req and IRQ data bit
$C084,Y output/interrupt on ACK

What actually happens is this:

1. If A0 is high then ROM bank 2 is selected. (From IC U1C). Note: ROM bank 1 is selected on any access to the peripheral firmware (ie $C700 - C7FF for slot 7, etc.)

2. If A0 and A1 are both low then the data bus is written to the output latch and an output STB- is initiated. Also, the ACK latch at U2C is reset.

3. If A1 is high then the interrupt latch is reset. (U1B)

4. If A2 is high then the interrupt latch is set. (U1A

Point 2. above is why the card also performs output on $C084,Y.

Anyway, after all this messing about I'll be able to program an 2716 just once with some minimal interface code and from then on everything else will be downloadable from the IBM in a convenient way. So when I show my friends a highly modifed board crawling with jumper wires and cables leading here and there and if anyone asks me what's the point, I'll just say -- hacking, that's what the Apple 2 was all about (originally) -- and despite mega this and giga that on the latest Pentiums, the spirit lives on.

END OF FILE parallel2ibm

```
##############################################################################
### FILE: parallelpro
##############################################################################

Path:
blue.weeg.uiowa.edu!news.uiowa.edu!uunet!cs.utexas.edu!howland.reston.ans.net!agat
e!library.ucla.edu!psgrain!rainrgnews0!news.teleport.com!news.teleport.com!not-
for-mail
From: nlayton@teleport.com (Neal Layton)
Newsgroups: comp.sys.apple2
Subject: Re: Parallel Pro : HELP
Date: 30 Jan 1995 05:36:56 -0800
Organization: Teleport - Portland's Public Access (503) 220-1016
Lines: 23
Message-ID: <3giq1p$co@kelly.teleport.com>
References: <3ggbd6$9kh@aristotle.algonet.se>
NNTP-Posting-Host: kelly.teleport.com

Here they are straight from my book.

Printer  1234
--------------
Epson    cccc
IBM      occc
NEC      cocc
C.Itoh   oocc
Toshiba  ccoc
Okidata  ococ
Okimate  cooc
AppleDMP oooc

o = open/off
c = closed/on

Hope this helps



--
nlayton@teleport.com
WAC BBS (503) 363-0861


### END OF FILE parallelpro
```

```
##########################################################################
### FILE: pc2a2.joystick
##########################################################################

Path: news.uiowa.edu!chi-
news.cic.net!news.math.psu.edu!news.cse.psu.edu!uwm.edu!math.ohio-
state.edu!howland.reston.ans.net!news-
e2a.gnn.com!newstf01.news.aol.com!newsbf02.news.aol.com!not-for-mail
From: rubywand@aol.com (RUBYWAND)
Newsgroups: comp.sys.apple2
Subject: Re: ADB port/game
Date: 28 Jun 1996 18:47:38 -0400
Organization: America Online, Inc. (1-800-827-6364)
Lines: 65
Sender: root@newsbf02.news.aol.com
Message-ID: <4r1nea$9t0@newsbf02.news.aol.com>
References: <4q75dl$1l5e@hearst.cac.psu.edu>
NNTP-Posting-Host: newsbf02.mail.aol.com
X-Newsreader: AOL Offline Reader

In article <Pine.OSF.3.91.960628092447.25462A-100000@unicorn.it.wsu.edu>,
Sedgwick <sedgwick@wsunix.wsu.edu> writes:

>
>Can you post how to make these converters. I have a good PC stick siting
>on my desk right now that I would love to use.
>


     Okay. The following is condensed from an article in the Spring issue
of II Alive:

         To PC Stick                              To Apple II
(15-pin female connector)              (9-pin male connector)

         [1] [4] and [5] ---------------------------- [2]  +5V
         [2] ------------------------------------------[7]  Button 0
         [3] ------------------------------------------[5]  X-axis
         [6] ------------------------------------------[8]  Y-axis
         [7] ------------------------------------------[1]  Button 1
                                                       [3]  Ground

     On the 9-pin Apple II side ...
        add 680 Ohm resistor between [7] & [3]
        add 680 Ohm resistor between [1] & [3]
        add .01 uF cap between [5] & [3]*
        optional: add 50K-100K trim pot in series with the cap
        add .01 uF cap between [8] & [3]*
        optional: add 50K-100K trim pot in series with the cap

*NOTE: The Capacitors compensate for smaller R range of PC sticks. The C
values are approximate. For standard 100K Ohm PC sticks, .01 uF pretty
well guarantees you will be able to cover the full Apple II X and Y range
(0-255). Values of .01 uf  (X-axis)  and .005 uF (Y-axis)  worked well on
the PC "FlightStick" when plugged into our Apple II+.

     Most likely, you will find that the a stick tops-out too early in the
X and/or Y
max direction. For best control precision, what you want is for extreme
```

values to occur near the extremes of stick movement:

```
X (horizontal)  Left= 0   Right= 255
Y (vertical)      Up= 0    Down= 255
```

For adjusting, use a program which continuously reads and displays X and Y stick values. The program below does this and displays "B0" when Button 0 is pushed and "B1" when Button 1 is pushed. Do a CTRL-C to exit.

```
20 PRINT "X= "; PDL(0); TAB(15); "Y= ";PDL(1); TAB(30);
30 IF PEEK(49249)>127 THEN PRINT "  B0";
40 IF PEEK(49250)>127 THEN PRINT "  B1";
50 PRINT: GOTO 20
```

Experiment with capacitance values between .002 uF and .01 uF to get the best 'spread'. For easier fine-tuning, add the 50K-100K trim pots in series with each capacitor.

The converter I built fit inside heat-shrink tubing. Putting it in a small plastic box may be better. You can mount the trim pots (and/or switches with fixed "trim resistors") and select between settings for a 'fast' (short swing) Game Stick and 'normal' (full swing) Graphics Stick.

Rubywand

END OF FILE pc2a2.joystick

```
##############################################################################
### FILE: pc2gs.hscable
##############################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!uwm.edu!vixen.cso.uiuc.edu!newsfeed.internetmci.com!in2.uu.net!newsfeed.
pitt.edu!scramble.lm.com!pink.lm.com!not-for-mail
From: mportune@telerama.lm.com (Matt Portune)
Newsgroups: comp.sys.apple2
Subject: Re: Cable pinouts for...
Date: 25 Jun 1996 13:38:05 -0400
Organization: Telerama Public Access Internet, Pittsburgh, PA
Lines: 28
Message-ID: <4qp85t$clp@pink.lm.com>
References: <4qeuvr$5me@news-old.tiac.net>
NNTP-Posting-Host: pink.lm.com
X-Newsreader: TIN [version 1.2 PL2]

Andy Kress (kress@jar.com) wrote:
> ...a null modem cable between a GS and a PC?  I could spend some time
> with a breakout box and figure it out, but if someone already has this
> I would appreciate it!  Id like to transfer some files and when GS/TCP
> becomes available Id like to use my PC as a router (ppp).  Thanks
> in advance for any help.

IIgs                    PC
1                       5
2                       4
3                       3
4                       7
5                       2
8                       7  (ground)

A IIgs serial port pinout looks like this, looking at the back of the
computer:

8 7 6
5 4 3
 2 1

(this is a simple hardware handshaking cable)
--
      /--- Matt Portune ----------------- "Now Running: Buggie Power!" --\
      |  mportune@telerama.lm.com                    The Avatrax Studio  |
      |  ae094@dayton.wright.edu                     Blue Monday BBS     |
      \------------------- http://www.lm.com/~mportune ------------------/


### END OF FILE pc2gs.hscable
```

```
##########################################################################
### FILE: pcstick
##########################################################################
```

Re: Need Joystick for GS

From: rubywand@aol.com (RUBYWAND)
Reply to: RUBYWAND
Date: 5 Aug 1996 05:00:07 -0400
Organization: America Online, Inc. (1-800-827-6364)
Newsgroups:
comp.sys.apple2
Followup to: newsgroup(s)
References:
<3202CF83.130A@inlink.com>

**In article <3202CF83.130A@inlink.com>, "Doug S." <dougs@inlink.com>
writes:**

>
>Can anyone supply me with the pinout info for converting a PC joystick to
>Apple II? I have a spare PC stick, and the Apples are hard to find
locally.
>
>

**Sure. The stuff below is condensed from an article in the Spring
issue**
of II Alive:

```
         To PC Stick                              To Apple II
(15-pin female connector)              (9-pin male connector)

         [1] [4] and [5] ---------------------------- [2]  +5V
         [2] ------------------------------------------[7]  Button 0
         [3] ------------------------------------------[5]  X-axis
         [6] ------------------------------------------[8]  Y-axis
         [7] ------------------------------------------[1]  Button 1
                                                       [3]  Ground
```

On the 9-pin Apple II side ...
add 680 Ohm resistor between [7] & [3]
add 680 Ohm resistor between [1] & [3]
add .01 uF cap between [5] & [3]*
optional: add 50K-100K trim pot in series with the cap
add .01 uF cap between [8] & [3]*
optional: add 50K-100K trim pot in series with the cap

***NOTE: The Capacitors compensate for smaller R range of PC**
sticks.The C values are approximate. For standard 100K Ohm
PC sticks, .01 uF pretty well guarantees you will be able to
cover the full Apple II X and Y range (0-255).

Values of .01 uf (X-axis) and .005 uF (Y-axis) worked
well on the PC "FlightStick" when plugged into our Apple II+.

**Most likely, you will find that the a stick tops-out too early
in the X-max and/or Y-max direction. For best control precision,**

what you want is for extreme values to occur near the extremes
of stick movement:

X (horizontal) Left= 0   Right= 255
Y (vertical)   Up= 0   Down= 255

This way, you have lots of active swing which makes graphics
work and playing most games much easier.

     For adjusting, use a program which continuously reads and
displays X and Y stick values. The program below does this and
displays "B0" when Button 0 is pushed and "B1" when Button 1
is pushed. Do a CTRL-C to exit.

```
20 PRINT "X= "; PDL(0); TAB(15); "Y= ";PDL(1); TAB(30);
30 IF PEEK(49249)>127 THEN PRINT "  B0";
40 IF PEEK(49250)>127 THEN PRINT "  B1";
50 PRINT: GOTO 20
```

     Experiment with capacitance values between .002 uF
and .01 uF to get the best 'spread'. For easier fine-tuning,
add the 50K-100K trim pots in series with each capacitor.

     The converter I built fit inside heat-shrink tubing. Putting it
in a small plastic box may be better. You can mount the
trim pots (and/or switches with fixed "trim resistors") and
select between settings for a 'Fast', short swing, 'hot' Game
Stick and a 'Normal', full swing, 'cool' Game/Graphics Stick.
Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-state.edu!uwm.edu!
spool.mu.edu!newspump.sol.net!www.nntp.primenet.com!nntp.primenet.com!
newsfeed.internetmci.com!newsxfer2.itd.umich.edu!portc01.blue.aol.com!
newstf01.news.aol.com!newsbf02.news.aol.com!not-for-mail
From: rubywand@aol.com (RUBYWAND)
Newsgroups: comp.sys.apple2
Subject: Re: Kraft Joystick Question!
Date: 6 Sep 1996 11:28:10 -0400
Organization: America Online, Inc. (1-800-827-6364)
Lines: 56
Sender: root@newsbf02.news.aol.com
Message-ID: <50pfua$mgd@newsbf02.news.aol.com>
References: <322ee39d.323258278@news.concentric.net>
NNTP-Posting-Host: newsbf02.mail.aol.com
X-Newsreader: AOL Offline Reader

In article <322ee39d.323258278@news.concentric.net>, wernst@cris.com
(Warren "Llama" Ernst) writes:

>.... What did you do about the buttons? I built one of these years ago,
but
>I found that the Apple expects the buttons to be "push to close
>connection" and the PC expects teh buttons to be "push to open
>connection" (or vice versa, its been a while). Someone suggested an
>inverter, but I just went out and bought the correct modem.
>
>Won't this converter still give you button problems?

         To PC Stick   To Apple II
(15-pin female connector)   (9-pin male connector)

```
          [1] [4] and [5] --------------------------- [2]  +5V
          [2] -----------------------------------------[7]  Button 0
          [3] -----------------------------------------[5]  X-axis
          [6] -----------------------------------------[8]  Y-axis
          [7] -----------------------------------------[1]  Button 1
                                                       [3]  Ground
```

On the 9-pin Apple II side ...
add 680 Ohm resistor between [7] & [3]
add 680 Ohm resistor between [1] & [3]
add .01 uF cap between [5] & [3]*
optional: add 50K-100K trim pot in series with the cap
add .01 uF cap between [8] & [3]*
optional: add 50K-100K trim pot in series with the cap

The 680 Ohm resistors take care of the problem. Each resistor is running from a Button to GND. The other end of each Button goes to +5V.

```
+5V
|
|
X Button Switch
|
|________ 'Button output to Apple'
|
Z
Z 680 Ohm resistor
Z
|
GND
```

680 Ohms holds a button's output to a logical 0. Pressing a button sends +5V (logical 1) to the output.

Rubywand

END OF FILE pcstick

```
##########################################################################
### FILE: pcstick.conv
##########################################################################
```

Re: Need Joystick for GS

From: Edhel Iaur <drsmooth@baldcom.net>
Reply to: Edhel Iaur
Date: Wed, 07 Aug 1996 04:04:31 -0400
Organization: ART MATRIX - LIGHTLINK
Newsgroups:
comp.sys.apple2
Followup to: newsgroup(s)
References:
<31FD8EC2.6EBA@inlink.com>
<4tpsn1$rno@newsbf02.news.aol.com>
<3202CF83.130A@inlink.com>
<dempson-0608962319210001@dempson.actrix.gen.nz>

David Empson wrote:
>
> In article <3202CF83.130A@inlink.com>, "Doug S." <dougs@inlink.com> wrote:
>
> >RUBYWAND wrote:
> >>
> >> Finding a good quality new Apple II joystick could be difficult. If
> >> you build a PC-to-Apple converter you can walk into any computer-stuff
> >> shop and pick out the PC stick you want.
> >>
> >> Rubywand
> >>
> >Can anyone supply me with the pinout info for converting a PC joystick to
> >Apple II?
>
> It needs more than simply rewiring the joystick. The PC and Apple II
> joysticks use different resistances, so you need to add four capacitors to
> compensate.
>
> The switch is also wired to connect to the opposite power rail. A little
> careful experimentation may be needed to verify that the joystick is not
> attempting to use the power rail for something unexpected, and if not,
> then you can wire up the "wrong" power rail to get the button to work.
>
> I don't have the exact details handy (and I'm not likely to be able to
> find them - I'd have to work it out again from the circuit diagrams).
>
> --
> David Empson
> dempson@actrix.gen.nz
> Snail Mail: P.O. Box 27-103, Wellington, New Zealand

3-button Gravis joysticks are available from The Arc (1-800-753-0114).

Here is the conversion info, even tho I've never tryed it, myself:

From: rubywand@aol.com (RUBYWAND)
Newsgroups: comp.sys.apple2
Subject: Re: Joysticks for Newbie? IIc and IIe.

Re question: What joystick can I use on a IIc and where can I buy one? Same for a IIe. ...

When John Dobbins emailed a question about stick wiring, it suddenly dawned upon me that I've never seen a modern, pure PC stick converted for use on an Apple II or a "PC-to-Apple converter cable". It seemed like a good idea to actually try building a converter cable.

My PC stick is a standard CH Products "FlightStick". A resistance measurement produced a disconcerting revelation: the X and Y pots top-out around 100K Ohms-- 50K less than a standard Apple II stick! Fortunately, you can compensate for the difference just fine by adding a bit of capacitance. The finished converter is shown below:

```
         To PC Stick                          To Apple II
(15-pin female connector)             (9-pin male connector)

         [1]  and  [4] ------------------------------ [2]  +5V
         [2] -------------------------------------------[7]  Button 1
         [3] -------------------------------------------[5]  X-axis
         [6] -------------------------------------------[8]  Y-axis
         [7] -------------------------------------------[1]  Button 2
                                                        [3]  Ground
                              add 680 Ohm resistor between [7] & [3]
                              add 680 Ohm resistor between [1] & [3]
                              add .01 uF cap between [5] & [3]*
                              add .01 uF cap between [8] & [3]*
```

*NOTE: These C values are approximate. For standard 100K Ohm PC sticks, .01 uF pretty well guarantees you will be able to cover the full Apple II X and Y range (0-255).

However, you may find that the stick tops-out too early in the X and/or Y max direction. For best control precision, what you want is for extreme values to occur near the extremes of stick movement.

Use a program which continuously reads and displays X and Y stick values and experiment with capacitance values between .002 uF and .01 uF to get the best 'spread'.

Values of .01 uf (H-axis) and .005 uF (Y-axis) worked well on the PC "FlightStick" when plugged into our Apple II+.
--
==========
-=37th Wisest Wizard Edhel Iaur=- -=APPLE // FOREVER=-
Geek Code(C)v2.1: GCS/AT -d+@ H s-: g+ p0 !au(-) a-- w@ v@ C++(+++) L 3
E? N K W+(++) M+(++) !V po@ Y@ t+ !5 j R+(++) G+ D- e
tv@ b++ B-- u@ h!(++) f !r n+ !y+

*For info on the Geek Code(C) v2.1 standards, Netscape yourself over to
http://www.cs.swarthmore.edu/~binde/teatime/Miscellaneous/geek_code.txt
 -OR DO A NET SEARCH! (I use www.lycos.com & www.altavista.digital.com)
"My dependable Dell computer never cras
==========

END OF FILE pcstick.conv

```
##########################################################################
### FILE: pcsticks
##########################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!cs.utexas.edu!news.sprintlink.net!news-peer.sprintlink.net!news-
peer.gsl.net!news.gsl.net!portc01.blue.aol.com!newstf01.news.aol.com!newsbf02.news
.aol.com!not-for-mail
From: rubywand@aol.com (RUBYWAND)
Newsgroups: comp.sys.apple2
Subject: Re: Looking for connecting Pc game port and Joystick IIe
Date: 19 Sep 1996 09:46:58 -0400
Organization: America Online, Inc. (1-800-827-6364)
Lines: 109
Sender: root@newsbf02.news.aol.com
Message-ID: <51risi$g3d@newsbf02.news.aol.com>
References: <323F0F16.20B1@union-fin.fr>
NNTP-Posting-Host: newsbf02.mail.aol.com
X-Newsreader: AOL Offline Reader

In article <323F0F16.20B1@union-fin.fr>, Philippe Collard
<pcollard@union-fin.fr> writes:

>
>Has anybody the wiring sheme to adapt an Apple Joystick IIe to a PC game
>port ?
>
>


     Below are pin-outs and info for Apple II and PC joysticks. As you can
see, there are three major points of difference:

1. The Apple II stick uses a 9-pin plug vs. the PC's 15-pin plug. (Older
Apple II sticks may use a 16-pin plug which fits in an IC socket.)

2. The Apple II stick's X, Y controller potentiometers are a bit larger.

3. The buttons are wired differently.


     You can use an Apple-to-PC adaptor to handle plug conversion; or, you
can replace the entire cable with one from an old PC stick.

     The PC will work with 150k pots; but, in some applications, you may
notice a tendency to max out early in the stick swing. You can correct
this by connecting a 300k resistor across each pot (from the center to the
end with a wire going to it).

     The difference in button wiring is the main reason an Apple-to-PC
conversion involves opening the joystick and making changes. (The Apple
stick has a slightly more complex, less flexible circuit. Apple-to-PC is
not as easy as PC-to-Apple.)

     Basically, you need to change the Apple stick's button wiring so that
it looks like the PC stick's button wiring.

     The mods mentioned above are not difficult, especially if you swap in
a PC cable. If you want to be able to use the stick on an Apple II, then
```

some kind of switching will be required.

```
        Apple II Joystick
    (9-pin male connector)         (Old 16-pin IC-style plug)

        [2]--------------  +5V              ------- 1
        [7]--------------  Button 0        ------- 2
        [5]--------------  X-axis          ------- 6
        [8]--------------  Y-axis         ------- 10
        [1]--------------  Button 1      ------- 3
        [3]--------------  Ground        ------  8
```

```
        PC Joystick
 (15-pin female connector)

        [1]--------------  +5V
        [2] -------------- Button 0
        [3] -------------- X-axis
        [6] -------------- Y-axis
        [7] -------------- Button 1
        [4] and/or [5] Ground
```

Both sticks tie one end of each X, Y potentiometer to +5 and send the center (wiper) to the an output. (Or the wiper may go to +5V and an end to the output; it doesn't much matter.) The standard Apple II pot is 150K Ohms; most PC sticks use 100k Ohm pots.

The buttons are wired differently.

On the Apple II stick (see below), each button switch goes to +5V. The other end goes to GND through a resistor (one resistor for each button). A button's Output is from the junction of the switch and its resistor. When the button switch is not closed, its Output is near 0V (=logic 0). Pressing a button sends +5V to the output (= logic 1).

```
+5V
|
|
X Button Switch
|
|_____Button output to Apple (Press => "1")
|
Z
Z 680 Ohm resistor
Z
|
GND
```

As shown below, a PC stick button Output is normally an unconnected wire. Most likely, inside the computer, a PC or compatible Game Port has this line tied to a 1k-3k resistor going to +5V. So, the line will normally be at something close to +5V (= logic 1). Pressing the button grounds the line and pulls it down near to 0V (= logic 0).

```
_____Button output to PC (Press => "0")
|
|
X Button Switch
|
|
GND
```

Rubywand

END OF FILE pcsticks

```
##########################################################################
### FILE: pctconnections
##########################################################################

Newsgroups: comp.sys.apple2
Subject: Re: Question, PC Transporter...again
From: dempson@actrix.gen.nz (David Empson)
Date: Mon, 9 Nov 1998 02:32:35 +1300
Message-ID: <1di7fta.1uzxlwp1p62oN@dempson.actrix.gen.nz>
References: <labelas-0711980224420001@1cust91.tnt23.atl2.da.uu.net> <labelas-
0711980340260001@1cust91.tnt23.atl2.da.uu.net>
<19981107131556.27006.00000643@ng103.aol.com> <labelas-
0711981822360001@1cust19.tnt23.atl2.da.uu.net>
Organization: Empsoft
X-Newsreader: MacSOUP 2.3
NNTP-Posting-Host: 202.49.157.176
X-Trace: 9 Nov 1998 02:31:19 -1300, 202.49.157.176
Lines: 54
Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!vixen.cso.uiuc.edu!howland.erol
s.net!newsfeed.berkeley.edu!news-
stock.gip.net!news.gsl.net!gip.net!news.iprolink.co.nz!news.actrix.gen.nz!dempson
Xref: news1.icaen comp.sys.apple2:141496

Labelas Enoreth <labelas@hotmail.com> wrote:

> So then, I'm guessing that the 5-pin plug at J5 is where I'd hook up the
> IBM keyboard adaptor if I had one?

As Supertimer says, you don't really need this, especially if you have
an extended keyboard on the IIgs.

Anyway, in case you want to try it, I have in my hand the IBM keyboard
adaptor.

Going on the same numbering scheme as the IIc serial ports, the DIN 5 is
numbered as follows, looking into the surface of the plug:

    T

5       1
 4     2
    3

The tag (shield) is not connected.

The other end of the cable is a 5-pin molex connector, with a ribbon
cable between the two.  Looking into the face of the molex connector
(the side that goes onto the pins on the card), the pins are closer to
one edge than the other.  Holding the plug so that narrow edge is along
the top (so the locking clips for the molex pins are on the bottom), the
pins are numbered 1 to 5 from left to right.

(Let me know if you want a diagram of this in case it isn't clear enough
from my description.)

The cable doesn't go straight through.  The wiring is rearranged at the
DIN-5 end.  The end result is:
```

```
Molex          DIN-5
  1  ----------  1
  2  ----------  3
  3  ----------  5
  4  ----------  2
  5  ----------  4
```

> Hmm. Wish I had schematics for wiring a cable for either the RGB from J6
> or the keyboard from J5...I mean, I can do the two wires for the composite
> signal, but...the rest...

I don't have the CGA cable, but the picture of it in the manual looks
like a straight-through 10-way ribbon cable to a DE-9 female connector.
I can't tell you which wire doesn't go through (either 1 or 10).

--
David Empson
dempson@actrix.gen.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand

END OF FILE pctconnections

```
##########################################################################
### FILE: pctdrive.pinout
##########################################################################

Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!nyd.news.ans.net!newsfeeds.ans.
net!news.idt.net!newsfeed.cwix.com!192.26.210.166!sunqbc.risq.qc.ca!news.uow.edu.a
u!david
From: david@uow.edu.au (David Wilson)
Newsgroups: comp.sys.apple2
Subject: Re: PC transporter drives
Date: 13 Nov 98 02:00:48 GMT
Organization: University of Wollongong, Australia
Lines: 54
Message-ID: <david.910922448@wraith>
References: <B271239E96682783E@testarossa.clubi.ie>
NNTP-Posting-Host: wraith.cs.uow.edu.au
X-Trace: wyrm.its.uow.edu.au 910923223 17278 130.130.64.1 (13 Nov 1998 02:13:43
GMT)
X-Complaints-To: usenet@wyrm.its.uow.edu.au
NNTP-Posting-Date: 13 Nov 1998 02:13:43 GMT
X-Newsreader: NN version 6.5.0 #15 (NOV)
Xref: news1.icaen comp.sys.apple2:141718

gospodin@clubi.ie (Vincent Quinn) writes:
>As there have been a few postings about PC Transporter recently, I thought
>I'd make my contribution.
>_Firstly_, I want to hook up a standard PC 360K, 5.25 floppy drive as drive B
>(I have an Apple 3.5 as drive A). Problem is, I don't have a complete pinout.


Mini/Micro Floppy Interface

Pin#  Description       Alternate Functions
----  -----------       -------------------
1     GND               Eject, Disk Change Reset
3-33  Odd pins are GND
2     High Density
4     Head Load         In Use, Eject
6     Drive Select 3
8     Index Pulse +
10    Drive Select 0          Motor On A  \  IBM twisted
12    Drive Select 1          Drive Select B     \ cable - both
14    Drive Select 2          Drive Select A     / drives are
16    Motor On          Motor On B  /  strapped DS1
18    Direction
20    Step
22    Write Data
24    Write Enable
26    Track Zero +
28    Write Protect +
30    Read Data +
32    Select Head
34    Disk Changed +          Ready +

+ signal from drive to controller

>I'm assuming that the pinout of the PCT 19-pin drive connector is the same
>as
```

>that of the IIGS SmartPort (that's logical, since Apple 3.5 drives work
>perfectly with the PCT) and that the 5.25 drive comes first in the chain
>(as
>indicated by the PCT manual). So a 19-pin pass-through connector needs to
>be
>added at the rear of the PC drive for chaining the Apple 3.5" drive to. OK.

Hang on, there is no way you are going to be able to connect a PC 360KB drive
to an Apple 19 pin disk port (well, I do have a drive that is a standard
PC style drive with an adapter board that makes it emulate a Disk][drive)
and read PC 360KB disks.

Apple 5.25" drives use the 4 step lines to manually step the head in or out.
IBM 5.25" drives hold the Direction line high or low and send a single pulse
on the Step line to move the head in or out. Ditto for IBM 3.5" drives.
Apple 3.5" drives use the 4 step lines to select a comand and another line
to strobe it into the drive (or something like that).
--
David Wilson School of IT & CS, Uni of Wollongong, Australia david@uow.edu.au

END OF FILE pctdrive.pinout

```
##########################################################################
### FILE: pctvideo
##########################################################################

Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!nyd.news.ans.net!newsfeeds.ans.
net!news.idt.net!cpk-news-
hub1.bbnplanet.com!news.news.gtei.net!portc02.blue.aol.com!audrey03.news.aol.com!n
ot-for-mail
From: supertimer@aol.com (Supertimer)
Newsgroups: comp.sys.apple2
Subject: Re: Question, PC Transporter...again
Lines: 35
NNTP-Posting-Host: ladder03.news.aol.com
X-Admin: news@aol.com
Date: 7 Nov 1998 18:12:53 GMT
Organization: AOL http://www.aol.com
References: <labelas-0711980224420001@1cust91.tnt23.atl2.da.uu.net>
Message-ID: <19981107131253.27006.00000642@ng103.aol.com>
Xref: news1.icaen comp.sys.apple2:141453

labelas@hotmail.com (Labelas Enoreth) wrote:

>Hey, I was looking at my PCT card again and noticed some things I'd ask
>questions about, since I have no manual and such...besides, everyone's
>been so helpful so far...
>on the rear of the card, there is a 40-pin empty socket...what option or
>upgrade utilized this? an optional z80, or...?

That's for the math co-processor.  Just plug in an 8087, boot
the PCT, enter its control panel, configure it to use the 8087,
and you are done.

>next to the keyboard and modulator connections, there is a 5-pin
>connector, what is this for? There is also a 20-pin plug to attach a cable
>of some kind to as well. Which of these is where the ColorSwitch attached?
>(Not that I have one, though I would quite like one) and which is for the
>CGA-out cable? I was under the impression the CGA out would be 2 pins. Or
>am I supposed to attach the CGA out to the pins that are coming out to the
>modulator?

Both CGA and ColorSwitch video connect to J6, the plug
that's on the upper right hand corner of the card.
The ColorSwitch board simply takes the CGA video and
converts it into analog RGB so that it works with the
AppleColor RGB monitor.  If you got a CGA monitor,
you can just plug it into this connector (with the right cable).

The two pin connector at J2 is for COMPOSITE VIDEO.
That's the same kind of monitor the IIe uses.  This is
probably the best bet...hook up a IIe monitor to the PCT
and you can run the PCT on your IIGS without a
ColorSwitch card.

J2 is located near the top of the card and half way
between the center and the right edge of the card.


### END OF FILE pctvideo
```

```
##############################################################################
### FILE: peaking.coil
##############################################################################

Path: news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!zaphod.mps.ohio-
state.edu!caen!uunet!cs.utexas.edu!qt.cs.utexas.edu!yale.edu!yale!not-for-mail
From: elvey-matthew@cs.yale.edu (Matthew Elvey)
Newsgroups: comp.sys.apple2
Subject: Re: Solid red monitor screen
Date: 30 Nov 1992 17:22:51 -0500
Organization: Yale U.
Lines: 111
Distribution: world
Message-ID: <1fe47rINNsch@SCORPION.ZOO2.CS.YALE.EDU>
References: <9211231450.AA00178@TIS.COM>
NNTP-Posting-Host: scorpion.zoo2.cs.yale.edu


Here's a more detailed possible solution:
I still have to get around to doing this.
The following message is from last year sometime.

From: dennis mcclain-furmanski <mccla_d@cs.odu.edu>
I never did have time to get to my RGB monitor. But I found
this on AOL this week:

"It isn't easy, being green..."
                                Kermit, ca. 1982

     I'd started to think my Apple 2GS RGB monitor was
immortal.  It had always worked for me just as it did when I
first turned it on in 1987 or thereabouts.  Then without any
precursor warnings my monitor's screen lit up with a
hurt-your-eyes green raster and no video.  50-dollar bills
flashed before my eyes.

     I'm no stranger to tv servicing, so there was no
question but that I 'd give it my best effort before
spending the big bucks for repair or replacement.  I hit the
wall without service data.  The local electronics-supply
dealer told me, "Nah, there is no Sams Photofact for the
Apple 2GS monitor...  Apple never did sell many 2GSs, so
Sams didn't do anything for the 2GS!"  I drew myself to my
full height, started to tell him about the millions of Apple
2GS computers still in use then said, "Ok..." and left the
store.  I'm tired of arguing the point.

     I made my own Sams by tracing out the pc-board
circuitry.  A boring but necessary step.  The paper
schematic helped to make sense out of the voltage readings
on the pc board's various test points.

     The excess greenness was the result of an open peaking
coil.  Peaking coils are small inductors used to extend the
frequency response of video amplifiers.  A transistor
amplifier has unavoidable capacitance that bypasses
high-frequency video components.  It's these high-frequency
signals that enable the CRT to change brightness quickly as
it forms sharp edges.  Inductance, such as that found in a
```

peaking coil, cancels capacitance. If you choose just the right amount of inductance you can compensate for the unwanted capacitance, which is exactly what happens when a peaking coil is doing its thing.

The open inductor in my monitor's circuitry allowed the green cathode on the CRT to drop about 100 volts lower than normal, and this action biased the green gun into saturation.

It was obvious that something was amiss once I'd determined that the peaking coil had100 volts across it's terminals. I had two good peaking peaking coils for comparison in the red and blue circuitry. Each of these good coils measured about 10-ohms resistance. The flakey coil was open. Shorting the open coil for a test eliminated the excess green on the screen but at the expense of poor green bandwidth.

How do I get a replacement peaking coil? The local electronics supply dealer was about as helpful as he'd been with the Sams Photofact deadend. "Peaking coils almost never fail. You have to go back to the manufacturer to get a replacement! Forget it!" This time I stood up to him, asked to see his stash of peaking coils. I needed a 20-microHenry inductor, and he did have a 22-microHenry unit. $1.95.
The 10% excess made no noticeable difference and my monitor seems as good as new.

Being green is not so bad if your monitor can also be red and blue.

***

I wrote him and asked if the part was labeled L6G2, a small blue component with a red and black dot, just above the transistor Q6G2, on the board hanging on the back of the CRT. This is the reply:

Subj: Re: RGBlues
Date: 92-08-26 11:25:01 EDT
From: AFA DonB
To: DynaSoar01

You have the right part... It's a small blue component with one black dot on the side, a black and a red dot on top...

Measure the dc voltage across the component. If it's open (defective), you'll measure somewhere around 100 volts... If it's good, the voltage drop will be negligible.

Another way to check: Measure the voltage at each of checkpoints on the CRT socket. All three should measure about 175 volts, referenced to the ground trace on the pc board that rides on the back of the tube. If the peaking coil is open for one of the three color circuits, that color's testpoint will measure about 70 or 80 volts...

This is turning out to be a really common problem. Your

report is not the first I've heard! Fortunately, once you
know what to look for, it's an easy fix!

Don (Apple Hardware AFA)
--
Matthew Elvey
elvey@yale.edu or elvey@minerva.cs.yale.edu or
elvmatr@yalevm or Matthew_Elvey@quickmail.ycc.yale.edu
Box 5186; Yale U.; New Haven, CT 06520-5186 (203)436-1251

```
Print "Hello, World!"
Input (response)
if response = nil
Print "Uh-Oh!"
```

END OF FILE peaking.coil

```
##############################################################################
### FILE: pinouts
##############################################################################

Xref: news.weeg.uiowa.edu comp.sys.apple2:62853 misc.wanted:26311
comp.sys.ibm.pc.hardware:79907
Path:
news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!moe.ksu.ksu.edu!crcnis
1.unl.edu!wupost!uwm.edu!cs.utexas.edu!uunet!munnari.oz.au!metro!news.cs.uow.edu.a
u!news.cs.uow.edu.au!not-for-mail
From: david@wraith.cs.uow.edu.au (David E A Wilson)
Newsgroups: comp.sys.apple2,misc.wanted,comp.sys.ibm.pc.hardware
Subject: Re: ** WANTED: PINOUTS.....Please read!
Date: 17 Sep 1993 09:53:10 +1000
Organization: University of Wollongong, NSW, Australia.
Lines: 71
Message-ID: <27au96$sio@wraith.cs.uow.edu.au>
References: <bitzm.361.2C964727@columbia.dsu.edu>
NNTP-Posting-Host: wraith.cs.uow.edu.au

bitzm@columbia.dsu.edu (MICHAEL BITZ) writes:
>Hello.  I am in need of a list of pin configurations for the following ports:
>* Centronics parallel printer (such as a Panasonic KX-P1123, etc)
>* Standard RS-232 Serial port
>* Laser 128 Parallel printer port (15-pin)
>* Laser 128 Serial modem port (5-pin round)

The Laser pinouts would require a Laser manual (which I do not have).
The first two are available in any good reference. For example I have a catalog
from CommsWare and in the data section at the back we find:

RS-232/V.24 Interface

EIA   CCITT To    Description       Pin number
RS-232      V.24
-------------------------------------------------------
AA    101         Frame Ground            1
BA    103   DCE   Transmit Data           2
BB    104   DTE   Receive Data            3
CA    105   DCE   Request To Send         4
CB    106   DTE   Clear To Send           5
CC    107   DTE   Data Set Ready          6
AB    102         Signal Ground           7
CF    109   DTE   Data Carrier Detect     8
                  +Test Voltage           9
                  -Test Voltage           10
                  Unassigned        11
SCF   122   DTE   2nd Data Carrier Detect 12
SCB   121   DTE   2nd Clear To Send 13
SBA   118   DCE   2nd Transmit Data 14
DB    114   DTE   Transmit Clock (DCE)    15
SBB   119   DTE   2nd Receive Data  16
DD    115   DTE   Receive Clock (DCE)     17
            DCE   Receiver Dibit Clock    18
SCA   120   DCE   2nd Request To Send     19
CD    108.2 DCE   Data Terminal Ready     20
CG    110   DTE   Signal Quality Detect   21
CE    125   DTE   Ring Indicator          22
CH/I  111/2 DCE   Data Rate Select  23
```

```
DA    113   DCE   External Transmit Clk   24
            DCE   Busy              25

For DCE read Modem and for DTE read Terminal.
=============================================================================
Centronics/Parallel Interface

Signal            36 way connector  IBM 25 way connector    To
-----------------------------------------------------------------
Data Strobe 1                 1                 Printer
Data Bit 1-8      2-9               2-9               Printer
Acknowledge 10                10                Computer
Busy        11                11                Computer
Paper End   12                12                Computer
Select            13                13                Computer
AutoFeed    14 (may be Gnd)         14                Printer
OSCXT       15
Logic Gnd   16
Chassis Gnd 17
+5          18
Data Strobe Gnd   19
Data Bit Gnds     20-27             18-25
Acknowledge Gnd   28
Busy Gnd    29
Input Prime Gnd   30
Input Prime 31                16                Printer
Fault       32                15                Computer
Unassined   33-35
Select Input      36                17                Printer
--
David Wilson                          +61 42 213802 voice, +61 42 213262 fax
Dept Comp Sci, Uni of Wollongong      david@cs.uow.edu.au
Path: news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-
state.edu!caen!dmag
From: dmag@engin.umich.edu (Daniel Demaggio )
Newsgroups: comp.sys.apple2
Subject: Re: Super Serial Card Usage
Date: 2 Apr 1994 01:29:55 GMT
Organization: University of Michigan Engineering, Ann Arbor
Lines: 188
Distribution: world
Message-ID: <2nihqjINN7dr@srvr1.engin.umich.edu>
References: <1994Mar30.182757.14280@muug.mb.ca>
NNTP-Posting-Host: ga.engin.umich.edu
Keywords: Apple2 Serial

In article <1994Mar30.182757.14280@muug.mb.ca> krussell@muug.mb.ca (Kirk Russell)
writes:
>     I have a Super Serial Card for my AppleII+, but have lost the
>     documentation :(


The following is archived in /pub/apple2/hardware on
apple2.archive.umich.edu: (The original info was stolen off the net)

-=-=-=

Name:   Apple SSC
Type:   Super Serial Card
```

Short description:

The SSC gives the Apple][a serial port (RS232). Up to 19200 baud are possible. Full handshake is supported.

Installation:

The card plugs into Slot 1, 2 or 3 of the Apple. Slot 1 is usually for a serial printer (Imagewriter), Slot 2 for a modem and Slot 3 for a terminal.
The DB25 connector goes to the printer/modem/terminal line, the 10-pin connector on the other side of the cable goes into the cable socket at the rear side of the card.

Jumper settings:

The card has two jumpers and a additional jumper block.
The jumper block can be installed two ways:

1) Arrow pointing towards the word TERMINAL
2) Arrow pointing towards the word MODEM

Jumpered as MODEM, it will wire thru, jumpered as TERMINAL, it will twist 2-3, 4-5 and 6-20 (called null modem).
The jumper switches are called SW1 and SW2, the switches are numbered SW1-1 to SW1-7 and SW2-1 to SW2-7 from left to right.

SW1-1	SW1-2	SW1-3	SW1-4	
off	off	off	off	19200 baud
off	off	off	on	9600 baud
off	off	on	off	7200 baud
off	off	on	on	4800 baud
off	on	off	off	3600 baud
off	on	off	on	2400 baud
off	on	on	off	1800 baud
off	on	on	on	1200 baud
on	off	off	off	600 baud
on	off	off	on	300 baud
on	off	on	off	150 baud
on	off	on	on	135 baud
on	on	off	off	110 baud
on	on	off	on	75 baud
on	on	on	off	50 baud

SW2-1 off 2 stopbits
SW2-1 on 1 stopbit

SW2-2 off no delay on carriage return
SW2-2 on 1/4 sec delay

SW2-3	SW2-4	
off	off	132 chars/line, apple screen off
off	on	80 chars/line, apple screen off
on	off	72 chars/line, apple screen off
on	on	40 chars/line, apple screen on

SW2-5 off no line feed after carrigae return
SW2-5 on line feed

SW2-6 off ignore interrupts
SW2-6 on generate interrupts

SW1-7 on and SW2-7 off pin 4 or 20 (clear to send)
SW1-7 off and SW2-7 on in 19 (secondary clear to send)

-=-=-
From
caen!batcomputer!munnari.oz.au!metro!news.cs.uow.edu.au!news.cs.uow.edu.au!not-for-mail Thu Sep 23 21:59:45 EDT 1993
Article: 62305 of comp.sys.apple2
Path:
caen!batcomputer!munnari.oz.au!metro!news.cs.uow.edu.au!news.cs.uow.edu.au!not-for-mail
From: david@wraith.cs.uow.edu.au (David E A Wilson)
Newsgroups: comp.sys.apple2,misc.wanted,comp.sys.ibm.pc.hardware
Subject: Re: ** WANTED: PINOUTS.....Please read!
Date: 17 Sep 1993 09:53:10 +1000
Organization: University of Wollongong, NSW, Australia.
Lines: 71
Message-ID: <27au96$sio@wraith.cs.uow.edu.au>
References: <bitzm.361.2C964727@columbia.dsu.edu>
NNTP-Posting-Host: wraith.cs.uow.edu.au
Xref: caen comp.sys.apple2:62305 misc.wanted:32415 comp.sys.ibm.pc.hardware:80049

bitzm@columbia.dsu.edu (MICHAEL BITZ) writes:
>Hello. I am in need of a list of pin configurations for the following ports:
>* Centronics parallel printer (such as a Panasonic KX-P1123, etc)
>* Standard RS-232 Serial port
>* Laser 128 Parallel printer port (15-pin)
>* Laser 128 Serial modem port (5-pin round)

The Laser pinouts would require a Laser manual (which I do not have).
The first two are available in any good reference. For example I have a catalog from CommsWare and in the data section at the back we find:

RS-232/V.24 Interface

EIA RS-232	CCITT V.24	To	Description	Pin number
AA	101		Frame Ground	1
BA	103	DCE	Transmit Data	2
BB	104	DTE	Receive Data	3
CA	105	DCE	Request To Send	4
CB	106	DTE	Clear To Send	5
CC	107	DTE	Data Set Ready	6
AB	102		Signal Ground	7
CF	109	DTE	Data Carrier Detect	8
			+Test Voltage	9
			-Test Voltage	10
			Unassigned	11
SCF	122	DTE	2nd Data Carrier Detect	12
SCB	121	DTE	2nd Clear To Send	13
SBA	118	DCE	2nd Transmit Data	14
DB	114	DTE	Transmit Clock (DCE)	15
SBB	119	DTE	2nd Receive Data	16
DD	115	DTE	Receive Clock (DCE)	17
		DCE	Receiver Dibit Clock	18
SCA	120	DCE	2nd Request To Send	19
CD	108.2	DCE	Data Terminal Ready	20
CG	110	DTE	Signal Quality Detect	21
CE	125	DTE	Ring Indicator	22
CH/I	111/2	DCE	Data Rate Select	23

DA	113	DCE	External Transmit Clk	24
		DCE	Busy	25

For DCE read Modem and for DTE read Terminal.

Centronics/Parallel Interface

Signal	36 way connector	IBM 25 way connector	To
Data Strobe	1	1	Printer
Data Bit 1-8	2-9	2-9	Printer
Acknowledge	10	10	Computer
Busy	11	11	Computer
Paper End	12	12	Computer
Select	13	13	Computer
AutoFeed	14 (may be Gnd)	14	Printer
OSCXT	15		
Logic Gnd	16		
Chassis Gnd	17		
+5	18		
Data Strobe Gnd	19		
Data Bit Gnds	20-27	18-25	
Acknowledge Gnd	28		
Busy Gnd	29		
Input Prime Gnd	30		
Input Prime	31	16	Printer
Fault	32	15	Computer
Unassined	33-35		
Select Input	36	17	Printer

--

David Wilson +61 42 213802 voice, +61 42 213262 fax
Dept Comp Sci, Uni of Wollongong david@cs.uow.edu.au

-=-=-=-=-=-=-=-=-=-=-=-=

Hey I just happen to have my Apple II SSC Installation and Operating Manual with me.

On page 98, under the section called Connector Pin Assignment:

10-pin header	DB-25 Connector	Signal name
1	1	Frame Ground
2	2	Transmit Data (TXD)
3	3	Receive Data (RXD)
4	4	Request to Send (RTS)
5	5	Clear to Send (CTS)
6	6	Data Set Ready (DSR)
7	19	Secondary Clear to Send (SCTS)
8	7	Signal Ground
9	20	Data Terminal Ready (DTR)
10	8	Data Carrier Detect (DCD)

-=-=-

--

dmag@umich.edu | When laws are outlawed, | Ono-Sendai: the best
Dangerous Dan | only outlaws will have laws. | Sim Stim decks

END OF FILE pinouts

```
##############################################################################
### FILE: power.fix
##############################################################################

Path:
news.uiowa.edu!news.uiowa.edu!uunet!in1.uu.net!newsfeed.internetmci.com!tank.news.
pipex.net!pipex!dispatch.news.demon.net!demon!mail2news.demon.co.uk!toshibai.demon
.co.uk
From: Mike Smith <mikes@toshibai.demon.co.uk>
Newsgroups: comp.sys.apple2
Subject: Re: Power supply for Apple GDSII
Date: Tue, 29 Aug 1995 08:44:50 GMT
Organization: None
Lines: 16
Message-ID: <479083031wnr@toshibai.demon.co.uk>
References: <DDz24q.720@actrix.gen.nz>  <817049950wnr@toshibai.demon.co.uk>
Reply-To: mikes@toshibai.demon.co.uk
X-NNTP-Posting-Host: toshibai.demon.co.uk
X-Broken-Date: Tuesday, Aug 29, 1995 08.44.50
X-Newsreader: Newswin Alpha 0.7

David, thank you for the reply.

I found the problem this weekend, there was a 100k bias resistor in the
front end of the inverter. The resistor was open circuit. Sympton was
that one of the elctrolytic capacitors was at 260 volt & the other
was at 30 volt. When running correctly they are both at same voltage
( approx 140 volt) and within the 200 volt working rating of the
capacitor.


For information, from my memory, its a 6 pin molex type connector.

Thank you for your comment.

-- Best Regards,Mike Smith===========


### END OF FILE power.fix
```

```
##############################################################################
### FILE: power.plug
##############################################################################

Newsgroups: comp.sys.apple2
Path: news.uiowa.edu!chi-
news.cic.net!newsfeed.internetmci.com!howland.reston.ans.net!agate!ames!waikato!co
mp.vuw.ac.nz!actrix.gen.nz!dempson
From: dempson@atlantis.actrix.gen.nz (David Empson)
Subject: Re: Dying GS power supply?
Message-ID: <DIMKEH.Iwt@actrix.gen.nz>
Sender: news@actrix.gen.nz (News Administrator)
Organization: Actrix - Internet Services
Date: Sun, 26 Nov 1995 00:37:26 GMT
References: <48ub1a$52f@gap.cco.caltech.edu> <491mtp$jqa@newsbf02.news.aol.com>
<497q68$413@gap.cco.caltech.edu>
X-Nntp-Posting-Host: atlantis.actrix.gen.nz
Lines: 22

In article <497q68$413@gap.cco.caltech.edu>,
Nathan Mates <nathan@cco.caltech.edu> wrote:
>
> Now, if someone could post the pinouts for the GS motherboard's
> connector, I can pull out my soldering iron and go about putting a
> better power supply on it.

7   -5V             0.25 A
6   -12V            0.25 A
5   +12V            1.0 A
4   +5V             4.0 A
3   No connection
2   GND
1   GND

The pins are numbered as above when you are sitting in front of the
computer, i.e. 7 is closest to the back of the motherboard.

--
David Empson
dempson@actrix.gen.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand


### END OF FILE power.plug
```

```
##########################################################################
### FILE: power.problems
##########################################################################

Path:
news1.icaen!news.uiowa.edu!news.physics.uiowa.edu!newsrelay.iastate.edu!vixen.cso.
uiuc.edu!howland.erols.net!news2.digex.net!digex!swbell!not-for-mail
From: Rubywand <rubywand@swbell.net>
Newsgroups: comp.sys.apple2
Subject: Re: Power supplies
Date: Wed, 08 Oct 1997 17:37:51 +0000
Organization: Southwestern Bell Internet Services, Richardson, TX
Lines: 136
Message-ID: <343BC4EF.7019@swbell.net>
References: <97281.113842JCA31@MAINE.MAINE.EDU>
NNTP-Posting-Host: ppp-207-193-16-54.hstntx.swbell.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Trace: nnrp1.rcsntx.swbell.net 876353636 3807 (None) 207.193.16.54
X-Complaints-To: usenet@nnrp1.rcsntx.swbell.net
X-Mailer: Mozilla 2.02E (Win16; I)

JCA31@MAINE.MAINE.EDU writes ...
>
> I now have in my posession several II's that have dead power supplies.
> ....
>
> Since they all seem to be the same design, and about the same age, i'm
> suspicious that there's something that typically goes wrong in these
> beasties. If anyone can provide hints on what that might be, not only
> could i repair the supplies (and thus the machines) i do have, but when
> the others inevitably go, it won't be an irreversible loss.
> ....

     Maybe my earlier email got lost; so, just in case, below is a kind of
general purpose fix-it guide ...


     First, it's a good idea to check for shorting caused by Coke
spills etc. Open the case and look for gunk on the motherboard and power
supply. If everything looks okay, fine. If not clean away
the mess. After cleaning (and drying), turn ON the power to see if the
problem is fixed.


Bad or Cross-socketed Slot Card

     Pull all cards from Slots and turn ON power. If the machine 'comes
alive' one or more of your cards may have a short or may have been
cross-socketed. Clean the contacts on each card (e.g. with alcohol). With
power OFF, replug a card (be sure to line-up card and Slot contacts) and
turn ON power. Do this for each card. If a card causes the machine to
fail, it is, probably messed up. If no card produces a failure the
original problem was, likely, a card which was not properly inserted.


Bad Power Cord
```

Unplug and replug the power cord at the point where it connects to the IIe. Turn ON power. Try wiggling the power cord. If the Power Supply comes ON at any time, try substituting a power cord from a known-working IIe. If this fixes the problem, you can be pretty sure that the problem was a power cord with a broken wire.

Poor Power Supply Connector Connection

Unplug and re-plug the Power Supply cable to the motherboard. Turn ON power. If the machine seems to respond, or responds when the connector is wiggled, you probably have a dirty or loose connection.

Clean the power supply plug and socket with an alcohol swab. Using long-nosed pliers slightly re-crimp the 'holes' on the socket (or, insert a jewler's screwdriver into the space between each hole and the plastic casing and twist). The idea is to restore a firm grip for all contacts.

Another possibility is a loose or broken socket solder connection to the motherboard. The repair is to remove the motherboard and re-solder the connections to the socket.

Bad Switch

It is fairly easy to identify a bad switch-- it will, usually, not snap cleanly into position, feel crunchy, and/or have a burn spot. The repair is to replace the switch with some AC power switch that will fit. Or, you can permanently connect the switched lines and add an in-line switch to the power cord.

Blown Fuse

Some power supplies may have a fuse. Open the power supply. Look for a fuse mounted to the circuit board. If there is one, check it. An Ohm meter can be used to check for continuity if it is not obvious that the fuse is blown. If the fuse is blown, replace it.

Bad "Globar" Element

Look toward the end where the power cord is connected. Somewhere close to the place where wires from the switch go to the circuit board there should be a small disk-shaped component which is not a disk capacitor. Probably, it will be black with no markings. This is a "globar" resistor. Check it to be sure that it is not cracked and that both leads are really connected to the disk.

If the globar element is broken or if a lead has popped off, you will need to get a replacement from an electronics supply shop. (Tell the shop person where the globar resister comes from and describe its size.)

Blown Electrolytic Capacitor(s)

On the end of the circuit board near the Switch are some relatively large electrolytic capacitors (typically these are tubular aluminum things with shrink-wrapped grey or light-green covers on which there are markings). Usually, they are the same size and have the same uF value and Voltage

rating. One (or more) of these may be obviously blown or may just show some slime near the base.

If you find something like this, the suspect capacitor should be replaced by one of the same (or slightly larger) uF value with the same (or larger) Voltage rating. Size and shape are, also, important in order to get a good fit.

When removing the bad cap, be sure to mark the "+" side on the board--use the markings on the cap's cover to identify the "+" side. Install the replacement cap with its "+" lead in the marked hole.

Messed-up or 'Dirty' Adjustment

The power supply may have a mini-potentiometer mounted on the circuit board for fine-tuning voltage output. Usually, it will be somewhere near the end opposite the Switch and will have a slotted plastic 'knob'.

If there is such an adjustment, mark its current position and, then, turn it back and forth. (If you have some Radio Shack, etc. 'Circuit Cleaner', into the mini-pot first is a good idea.)

Set the adjustment a bit to one side of the original setting and plug in the power supply. If it now seems to work the problem was a 'dirty' voltage adjustment control.

Check the voltage on the +5V line with a meter and adjust it to 5 Volts. (Note: _no_ output due to a dirty adjustment control seems unlikely. Incorrect output is more probable; and, this could cause a IIe to not work.)

Beyond the above, you are, most likely, looking at a bombed electrolytic capacitor which is not obviously bad or a blown main power transistor (the big silvery thing mounted on a heatsink). Unless you enjoy more involved electronic testing and repair work, your best course is, probably, to get a replacement power supply.

Rubywand

END OF FILE power.problems

```
##########################################################################
### FILE: power.supply
##########################################################################

Path:
blue.weeg.uiowa.edu!news.uiowa.edu!uunet!tcsi.tcs.com!agate!msuinfo!harbinger.cc.m
onash.edu.au!yarrina.connect.com.au!werple.apana.org.au!boombox.apana.org.au!tlp!p
eterm
From: peterm@tlp.apana.org.au (Peter Maloney)
Newsgroups: comp.sys.apple2
Subject: Re: IIe power supply problems
Message-ID: <JVg1Rc1w165w@tlp.apana.org.au>
Date: Fri, 02 Sep 94 16:53:18 PDT
References: <1994Aug31.162618.1101@sandia.gov>
Organization: The Lower Planes BBS
Lines: 45

kjhass@sandia.gov (Joe Hass) writes:

>
> Wizards of the Net:
>
> I'm trying to help a local elementary school keep their IIe's running and
> have found what appears to be a bad power supply.
>
> The machine will boot properly when it's warm but the power supply won't
> come up if it's cool.  When it's cool the +5 output is at about 1.1V, the
> -5 is at about -1.1V and the +/- 12V outputs are proportionately low.
> Sometimes, if it's not too cool, the voltages will slowly rise and then
> the supply will suddenly come to life and be fine.  I know it's the supply
> and not the motherboard because I've swapped them with another machine,
> and I've tried heating the supply alone with a hair dryer. Also, when the
> supply is cool but disconnected from the motherboard the positive voltages
> are about 1% above nominal and the negative voltages are about 10% more
> positive than nominal.
>
> I can't see any cold solder joints or obviously bad components.  The
> machine is of 1985 vintage and the supply was made by Astech.
>
> Any diagnostic suggestions would be appreciated, as well as pointers to
> a low-cost vendor for a new supply. I'm an EE so I have a passing
> familiarity with switching power supplies, but I don't have the schematics
> for this guy.
>
> TIA,
> Joe
>
> --
> Joe Hass               | library clever_sigs;          | My opinions are my o
> kjhass@sandia.gov      | use rock_and_roll.verses.ALL; |   not Sandia's and
> Sandia National Labs   | use lineprinter.art.ALL;      |   not the DOE's

Theis problem is usually caused by a failed capacitor (220uf/16V?)
that sits near the big power transistor. Test it by warming it up
before you power on.
Regds,
 Peter M.

peterm@tlp.apana.org.au               TLP - The only *REAL* A2 BBS in
```

Peter Maloney Melbourne
A2 Hardware Freak

Path: blue.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-state.edu!usc!bloom-beacon.mit.edu!senator-bedfellow.mit.edu!pbauer
From: pbauer@ATHENA.MIT.EDU (Paul H Bauer)
Newsgroups: comp.sys.apple2
Subject: Apple II Power Supplies
Date: 28 Nov 1994 04:09:04 GMT
Organization: Massachusetts Institute of Technology
Lines: 21
Message-ID: <3bbl50$2lj@senator-bedfellow.MIT.EDU>
NNTP-Posting-Host: puttanesca.mit.edu

For those of you that have had power supply problems!

This week-end I descided to clean up my work bench and either repair or throw out a few AII power supplies I had in various states of disrepair. I made an interesting discovery on two supplies, one an aztec (?) unit, and the other a dead unit from a late model platinum 2e. The supply from the platinum unit was dead. After checking almost all of the semi-conductors and finding them good I finally started looking at the resistors and found a 100k 1 watt
unit that kick starts the supply was open. Replacing this resistor fixed the supply. I then looked at the aztec unit. This unit woul sometimes start but most of the time it would not. I looked at the same resister (R3) which is a 150k 1 watt resister. I changed this to a 100k 1 watt unit and the supply works like a champ.

If you have a dead supply you might check these resisters as they could be the culprit. The resister goes from the + rectified line side to low voltage oscillator that drives the power switching transistor.

pbauer@mit.edu

END OF FILE power.supply

```
##########################################################################
### FILE: power.supplyfix
##########################################################################

Path: blue.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-
state.edu!usc!howland.reston.ans.net!agate!msuinfo!harbinger.cc.monash.edu.au!news
.cs.su.oz.au!metro!ob1.uws.edu.au!lancelot.st.nepean.uws.edu.au!adrianw
From: adrianw@guinevere.st.nepean.uws.edu.au (Adrian Whichello)
Newsgroups: comp.sys.apple2
Subject: Re: Apple II+ power supply woes
Date: 13 Aug 1994 17:09:31 +1000
Organization: University of Western Sydney
Lines: 40
Message-ID: <adrianw.776761728@lancelot.st.nepean.uws.edu.au>
References: <adrianw.776562249@lancelot.st.nepean.uws.edu.au>
NNTP-Posting-Host: 137.154.148.15
Keywords: power supply woes

adrianw@kay.st.nepean.uws.edu.au (Adrian Whichello) writes:


>Hi Netland

>I have an old 2+ which runs the model railway, among other things.
>Last week it's power supply gave up. I wasn't there at the time,
>I've found that leaving the computer permanently switched on is
>good insurance - the power supplies tend to die between cycles if
>eft off for long periods. Anyway, I opened it up and found that
>an electrolytic had swelled up so much that it had torn it's connections
>out of the circuit board. I replaced it, but all the power supply
>wants to do now is go click click click ie it won't oscillate
>properly. It does this if plugged into the motherboard or not.
>Any suggestions about what else could be wrong. I'm not wild
>about diving into a circuit that is connected directly to the
>house supply without some clues.

>Adrian.

>ps surely this must be a FAQ by now - I have several old supplies
>that are dead for one reason or another.


Hi Netland

     had a go at the power supply over the weekend.  I was successful, because
I typed this on the Apple.  There was nothing wrong with the bridge rectifier
and input side - there was over 300V on the collector of the big transistor.
None of the inductors had burnt out and all the diodes and transistors checked
out OK with a simple multimeter check.  In fact nothing looked wrong at all,
physically.  There was just hardly any (~0.5VDC) voltage on the output side.
I was getting desperate!  I decided to check out the voltage reference section
- I faked 5VDC (from the bench power supply) on the anode of the TL-431C and
up came the power!  So then the penny dropped, the capacitor the temporarily
shorts out the 4.7K 1% resistor at power on wasn't doing it's job.  I replaced
it and away we went, all systems go.  Anyone else found this?

Adrian.
```

END OF FILE power.supplyfix

```
##########################################################################
### FILE: powerfix.cap
##########################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!newsfeed.internetmci.com!news.sprintlink.net!herm
es.is.co.za!news.pix.za!digitec!stephen.shaw
From: stephen.shaw@digitec.co.za (STEPHEN SHAW)
Newsgroups: comp.sys.apple2
Subject: My //e fails to turn on!
Message-ID: <8B8A08A.02210015A8.uuout@digitec.co.za>
Date: Thu, 11 Jan 96 02:18:00 +0200
Distribution: world
Organization: Digitec Online - South Africa
Reply-To: stephen.shaw@digitec.co.za (STEPHEN SHAW)
X-Newsreader: PCBoard Version 15.22
X-Mailer: PCBoard/UUOUT Version 1.20
Lines: 41


Hello Alberto!

On 01/02/96, Alberto Roffe wrote to All:


 AR> I am having some problems with my Apple //e! It fails to turn on! I
   > have to turn its power switch on and off several times and sometimes
   > wait a long time till it finally powers up!

    Are you using an uninterruptable power supply (UPS). The output should
be sine wave but some components in them change with age giving a square
wave that Apple power supplies don't like.


 AR> What could be the problem? The power supply? Would replacing it solve
   > the problem?
   > Someone suggested me that the power switch might be wearing off so I
   > decided to leave the computer turned on and just turn off the
   > regulator where I connect the computer and all its peripherals but the
   > problem persists! So that can't be the problem, or can it?

    If you open the power supply up (WITH THE MAINS PLUG OUT!) you will
find a capacitor C7 near the transformer in the middle of the printed
circuit board (a 220 uF 16V capacitor if I remember correctly) change it
for a 220uF 25V 85 degree Centigrade rated capacitor and it should clear
the problem up.

 AR> I also checked the computer's power cord at both ends, connecting and
   > disconnecting it several times without success, and I checked inside
   > the computer; the power supply seems properly connected to the
   > motherboard. Thanks for any advice.

 AR> ---------------------------------------------------------------------
   > ------ Alberto Roffe Illades                  You never know what you
   > have Roffe@delphi.com                            until you lose it
   > ---------------------------------------------------------------------
   > ------

 * 2qwk! 2.0 * Insomnia isn't anything to lose sleep over!
```

```
### END OF FILE powerfix.cap
```

```
##########################################################################
### FILE: powerglove
##########################################################################

Path:
news.uiowa.edu!uunet!in2.uu.net!usc!news.cerf.net!mvb.saic.com!news.mathworks.com!
newsfeed.internetmci.com!swrinde!sdd.hp.com!vixen.cso.uiuc.edu!ux7.cso.uiuc.edu!ta
ubert
From: taubert@ux7.cso.uiuc.edu (Derek Anthon Taubert)
Newsgroups: comp.sys.apple2
Subject: Re: Power Glove quest...
Date: 21 Nov 1995 21:02:49 GMT
Organization: University of Illinois at Urbana
Lines: 61
Message-ID: <48tepp$58b@vixen.cso.uiuc.edu>
References: <48e3ej$did@terrazzo.lm.com>
NNTP-Posting-Host: ux7.cso.uiuc.edu

mportune@telerama.lm.com (Matt Portune) writes:
>Well, I found a bunch of text on the web concerning hooking up a power
>glove to a PC, but what fun is that?  BORING.  I could have sworn I once
>saw something with the GS.  So, if anybody can help me with this, I'd be
>grateful!  Here is what I snagged from one of the sites...

Matt seems to have brought me out of lurk mode by sending me some e-mail, so
here goes.  I wrote the chessy little "driver" for the GS that lets you use
the joystick as an alternate mouse (JoyMouse or something like that).  It was
actually the first GS specific program I ever wrote, and since I didn't have
an assembler at the time, I hand coded it and bsaved it (it isn't in OMF
format).  Then I wrote an init in TML Pascal to load the thing.

Somewhere in the docs for that I must have mentioned my work on a power glove
driver.  I never did get around to finishing it, but I have a folder here
of misc 65816 code and schematics needed to make it all work.

>Now, can this be easily rigged to the GS joystick (db9) port?  I'm dying
>to do this.  Thanks for any help!

No, but you can rig it up to the internal port and use the annunciators and
button inputs to communicate with it.  Unfortunately, I never pursued it
enough to learn how to communicate with it in a "raw" mode to get X-Y-Z info
from it, I just know how to use it like a regular Nintendo joystick.

The standard nintendo connector looks like this:
                  o1 - Ground
   +5 volts - o7  o2 - Data clock
         NC - o6  o3 - Latch
         NC - o5  o4 - Data out

So, from the I/O port, hook up +5V (pin 1) and GND (pin 8), connect SW2 (pin 4)
to Data out, ANN1 (pin 14) to Data clock, and ANN0 (pin 15) to Latch.

Then you can use this Applesoft (I know, eww) program to read the data back
from whatever Nintendo controller you wish.

10  REM Set latch to 0 and clock to 1
20  POKE 49240,0
30  POKE 49243,0
40  TEXT : HOME
```

```
50  VTAB 12
60  POKE 49241,0: POKE 49240,0
70  FOR A = 1 TO 8
80 D(A) =  INT ( PEEK (49251) / 128)
90  POKE 49242,0: POKE 49243,0
100  NEXT A
110  FOR A = 1 TO 8
120  PRINT D(A);" ";
130  NEXT A
140  PRINT
150  GOTO 50
```

That should be enough to get you started. Enjoy, let me know what you come up with...

Derek Taubert |
taubert@uiuc.edu | Ask me about TCP/IP for the Apple IIgs!
http://www.ceg.uiuc.edu/~taubert | Really, I'm serious!
FAX:(217) 359-0010 |
GS/TCP info: http://www.winternet.com/~taubert/gstcp.html

END OF FILE powerglove

```
##############################################################################
### FILE: powersuppley.caps
##############################################################################

Newsgroups: comp.sys.apple2
Path: news.uiowa.edu!chi-
news.cic.net!newsfeed.internetmci.com!in1.uu.net!usc!newshub.cts.com!crash!pro-
palmtree!jpoore
From: jpoore@pro-palmtree.cts.com (James Poore)
Subject: Re: Apple IIe malfunctions! Help?
Organization: The Palmtree BBS - 310/453-8726 - Santa Monica, CA
Date: Sat, 27 Jan 96 12:15:58 PST
Message-ID: <ar45656@pro-palmtree.cts.com>
In-Reply-To: drissman@detroit.freenet.org (Avi Drissman)
Lines: 13

That problem that you talk about is a classic power-supply problem.
The filter capacitors off the line rectifier are going south.  These
capacitors are the largest tubular devices in the power supply.  There are
most likely 2 of them.  Damage estimate...about $2.50 to $5.00 a piece.
The values are something like 680 Mf @ 200 VDC.

Jim


-----
The Palmtree BBS  310-453-8726 v.32
Inet: jpoore@pro-palmtree.cts.com



### END OF FILE powersuppley.caps
```

```
######################################################################
### FILE: powersupply.fix
######################################################################

Path: news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!usenet.ins.cwru.edu!cleveland.Freenet.Edu!co057
From: co057@cleveland.Freenet.Edu (Steven H. Lichter)
Newsgroups: comp.sys.apple2
Subject: Re: Power Supply Problems. HELP!
Date: 8 Apr 1994 14:50:33 GMT
Organization: Case Western Reserve University, Cleveland, Ohio (USA)
Lines: 10
Message-ID: <2o3qvp$s22@usenet.INS.CWRU.Edu>
NNTP-Posting-Host: nextsun.ins.cwru.edu


90% of the problem with the power supply is the low end diode that
was used. Replace that and you have a good power supply, but make
sure it is rated higher and also know what you are doing or have
them fixed by someone who does.
--
       ************************************************************
       |       -=- Sysop: Apple Elite II -=- an Ogg-Net Hub BBS      |
       |            (909) 359-5338 12/24/96/14.4 V32/V42bis          |
       ************************************************************


### END OF FILE powersupply.fix
```

```
##########################################################################
### FILE: powersupplyfix.resistors
##########################################################################

Path: news.uiowa.edu!chi-
news.cic.net!news.uoregon.edu!news.emf.net!overload.lbl.gov!news.kreonet.re.kr!use
net.kornet.nm.kr!ames!news.tulane.edu!darwin.sura.net!spool.mu.edu!bloom-
beacon.mit.edu!senator-bedfellow.mit.edu!pbauer
From: pbauer@athena.mit.edu (Paul H Bauer)
Newsgroups: comp.sys.apple2
Subject: Re: IIGS power supply
Date: 17 Nov 1995 01:24:08 GMT
Organization: Massachusetts Institute of Technology
Lines: 27
Message-ID: <48go7o$6tu@senator-bedfellow.MIT.EDU>
References: <48dfqm$lan@madeline.INS.CWRU.Edu>
NNTP-Posting-Host: arcadia.mit.edu



<        I recently bought a Rom 01 GS from a friend of my brother.  The only
<problem with it is a bad power supply.


               Greg Smith


Greg;
        I have had several Apple 2e and GS power supplies that have gone
south and in every case it has been a single failed resister. The resister in
question is a 1/2 watt 100k resister that is approximately in the middle of
the power supply board. It is a kind of starting resister for the supply and
usually what happens is it probably runs hot, the reason for the 1/2 watt,
andeventually opens up. You can only measure it by taking it out of the
board. If I remenber correctly it is the only 100k 1/2 watt resister on the
supply. I would check this item first  right after making sure the fuse
hasn't blown.

Paul                    pbauer@mit.edu




### END OF FILE powersupplyfix.resistors
```

```
##############################################################################
### FILE: pwrfix
##############################################################################

Newsgroups: comp.sys.apple2
Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!usc!newshub.cts.com!crash!pro-palmtree!jpoore
From: jpoore@pro-palmtree.cts.com (James Poore)
Subject: Re: Apple III Power Supply
Organization: The Palmtree BBS - 310/453-8726 - Santa Monica, CA
Date: Tue, 19 Mar 96 07:48:23 PST
Message-ID: <cj28495@pro-palmtree.cts.com>
In-Reply-To: else@cray.com (Derek Else  {x66676 CF/SYS})
Lines: 15

I am not familiar with the Apple /// Power supplies, but the following info
is good for most switching supplies.  Most switcher problems are capacitor
related.  The capacitors dry-up from heat and age and lose effectiveness.
The capacitors that are the #1 failure are the raw DC filters at input from
the AC line.  These are the largest tubular devices in the power supply.
There are usually 2 of these with a value of 470 mf 200 volt or similar.
Changing these will usually clear up the problem.

Jim


-----
The Palmtree BBS  310-453-8726 v.32
Inet: jpoore@pro-palmtree.cts.com



### END OF FILE pwrfix
```

```
########################################################################
### FILE: pwrsppl.leads
########################################################################

Path: news.uiowa.edu!iagnet.net!205.197.247.129!digex!news2.digex.net!swbell!not-
for-mail
From: Rubywand <rubywand@swbell.net>
Newsgroups: comp.sys.apple2
Subject: Power Supply Mods Kit (was Re: Apple IIgs upgrades)
Date: Fri, 03 Oct 1997 09:28:03 +0000
Organization: Southwestern Bell Internet Services, Richardson, TX
Lines: 169
Message-ID: <3434BAA3.1DD2@swbell.net>
References: <34340450.38B8@home.com>
NNTP-Posting-Host: ppp-207-193-8-78.hstntx.swbell.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Trace: nnrp3.rcsntx.swbell.net 875892178 17112 (None) 207.193.8.78
X-Complaints-To: usenet@nnrp3.rcsntx.swbell.net
X-Mailer: Mozilla 2.02E (Win16; I)
Xref: news.uiowa.edu comp.sys.apple2:127573

Jeff Tacy writes ...
>
> Hi all, does anyone here remember the Mac SE upgrade kit that included
> 18-ga wire, a bunch of new caps and other fun stuff, that increased the
> computer's amperage and allowed more upgrades, also fixed many problems?
> Is there anything like this for the Apple IIgs that someone has
> constructed? ....


     Okay; here is your very own

             A2-2000 On-Line Power Supply Mods Kit!


     Swapping-in fat leads is, technically speaking, a pretty simple job.
You pop out the power supply, open it, unsolder old +5, +12, and Ground
leads, solder in the new leads, close and replace the power supply. The
tricky part is what hackers call the "mechanics".

     First, #12 or #14 gauge wire is not very flexible. Getting stranded
wire (instead of solid)  helps. Probably, #14 gauge is more than fat enough
for all three leads. One case where #12 or #10 gauge may be worth the extra
trouble is the +5V lead.

     Use wires colored the same as those you replace. On the standard
connector, the first two leads are Ground. Almost always, these are black.
Next, there is a space, then, in order +5, +12, -12, -5.

     Depending on the bother involved, you can unwedge the wire bundle
where it passes through the supply case and remove the three old wires
(+5V, +12V, and one Ground wire). Or, you can just cut away each old lead.
Leave the -5V and -12V leads and one Ground lead alone.

     Getting to the PS circuit board involves some work. After removing the
mounting bolts, you will have to scooch up the board in order to get to the
bottom side. This will be easier if the wire bundle has been unwedged.
```

Another hurdle is soldering to the circuit board. Once the old leads and excess solder are removed, you will probably find that the holes are too small! A jeweler's screwdriver makes a good hand drill for enlarging holes. (Drill from the circuit side. Be careful not to tear or dislodge the printed circuit.)

The new leads should be routed through the unused fan slots. (If a fan is attached, remove it. It's in the wrong place to do much good in cooling your GS.)

Note: If you have a fan mounted to the PS and you wish to keep it, then, it will be necessary to enlarge the original cable exit hole. A sheet metal "munching" tool should let you do this without having to entirely remove the PS circuit board. (Just be sure to catch all of the munched pieces!)

When routing the leads be careful not to place a twisting force on a lead where it is soldered to the circuit board.

To get to each spronger (contact) in the plug, press on it through the slot on the side near the wire end. This pushes up a small retaining tab so that pulling on the attached lead will pull out the spronger.

Cut off the old lead, clean the end, and solder on the new lead. Press the spronger back into the plug. To avoid mixups, it's best to complete the process for each lead before doing the next.

When plugging in the power supply, take time to shape and arrange the wires to minimize stress on the motherboard.

Motherboard Mod

Fatter +5, +12, and Ground leads should protect you power supply and reduce circuit noise.

If audio noise in your stereo card output and/or system bombing due to noise glitches were problems, they may be eliminated. A lot depends upon which cards you've installed, which slots they are in, and whether your IIgs is a ROM-01 or ROM-03.

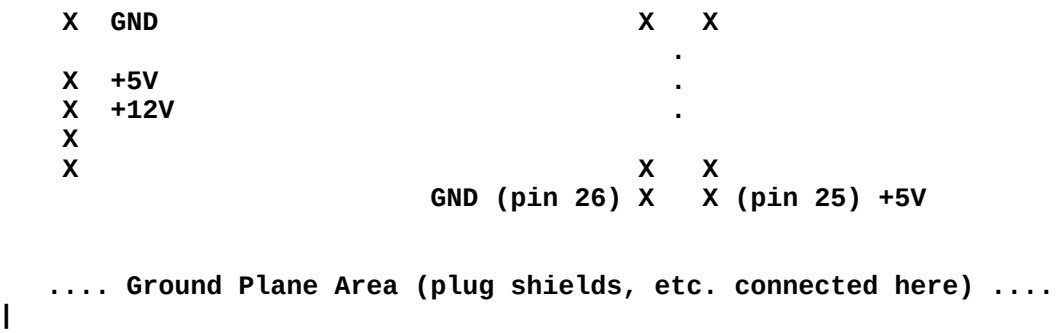
The motherboard circuit traces supplying power to each Slot are fairly skimpy, especially on ROM-01 boards. A heavy power user in Slot 7 can produce significant noise up and down the entire Slot 'backplane'.

The cure is to remove the motherboard and run leads to a couple Slots ....

First, flip over the motherboard and get oriented. Below is a quickie sketch showing the Power Connector points as well as key power pins for a Slot. The view is from the _Bottom_ with the _Back_ of the motherboard facing you:

Bottom of Motherboard

Power Connector	Socket		Slot	
X	GND	+12V (pin 50)	X	X (pin 1)



A good way to make sure you know what's where is to use an Ohm meter to check Resistance from pin 26 (GND) to a metal plug shield near the back of the motherboard. (Set your meter to Ohms X1. Touch one meter lead to pin 26 and the other to a metal plug shield. Resistance should read nearly zero. Reverse the leads and repeat the check. Again, Resistance should read nearly zero.)

Repeat the check for R between pin 26 and the GND points on the Power Connector socket. R should be nearly zero. Using a marker pen or white-out, mark pin 26 (GND) on Slots 3 and 7. Also mark the GND points of the Power Connector socket.

GND: On the bottom side of the motherboard, connect a Black #16 gauge wire from one of the Ground points of the Power Connector socket to the Ground plane area near the back of the motherboard. Run a short Black #16 gauge wire from pin 26 of Slot 3 to the Ground plane; run a short Black #16 gauge wire from pin 26 of Slot 7 to the Ground plane. (You may need to scrape through green insulating lacquer to solder to the Ground plane area.)

+5V: On the bottom side of the motherboard, connect two #16 gauge Red wires to the +5V point of the Power Connector socket. Connect the other end of one +5V Red wire to pin 25 of Slot 3; connect the other end of the second +5V Red wire to pin 25 of Slot 7.

+12V: If you have any cards which are likely to draw heavily on the +12V line, then, on the bottom side of the motherboard, run a #18 gauge White wire from the +12V point of the Power Connector socket to pin 50 of the Slot in which the card is normally located. Otherwise, just run an #18 gauge White wire from the +12V point of the Power Connector socket to pin 50 of Slot 7.

Check your connections. One quick check is that the GND and +5V wiring to Slots 3 and 7 should be Black, Red (moving left to right) and Slots 3 and 7 should 'look the same'. Any +12V wire should be on the same side of the Slot (i.e. the same column of pins) as GND. None of the wires should be connected to a middle pin on any Slot.

Notes:

1. All wires are insulated.

2. When cutting wires, allow enough slack to permit routing each wire. You want to avoid having a wire rest against pointy connections on the motherboard. Route wires away from motherboard mounting holes and around

places where the bottom of the case supports the motherboard.

3. The case's bottom and back metal shields are something of a shorting hazard. Replacing the motherboard is much easier if these shields are popped out and ditched.

Once everything checks out, replace the motherboard taking care that no wires are caught between a support point and the motherboard.

Rubywand

END OF FILE pwrsppl.leads

```
##############################################################################
### FILE: pwrspply.fixes
##############################################################################

Path: news1.icaen!news.uiowa.edu!chi-
news.cic.net!205.197.247.129!news2.digex.net!news7.digex.net!news1.rcsntx.swbell.n
et!usenet
From: Rubywand <rubywand@swbell.net>
Newsgroups: comp.sys.apple2
Subject: Re: IIe problems. (power?)
Date: Sat, 14 Jun 1997 03:10:15 +0000
Organization: Southwestern Bell Internet Services
Lines: 94
Message-ID: <33A20B97.4207@swbell.net>
References: <866164244.648266@moon.aa.net> <33A1336D.ADF@swbell.net>
<866249990.83885@moon.aa.net>
NNTP-Posting-Host: ppp-207-193-8-216.hstntx.swbell.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Mailer: Mozilla 2.02E (Win16; I)

G. Johnson or K. Hartman writes ...
>
> ....
>
> Let me rephrase my question. Some of our IIes work and some don't. I
> use the same out let to test them. We don't have power strips for IIes
> (no room in budget). Is it something internal? Does the power source
> need to be replaced? Are they unfixable and should be used for parts?
>

     If "don't work" means you plug in a IIe, flip ON the power switch,
and 'nothing happens', then, there are a few quickie fix tries ...

 1. Open the case and check inside for indications of Coke spills,
debris, etc.. If everything looks okay, continue on. If not clean away
the mess; it could be causing a short. After cleaning (and drying), turn
ON the power to see if the problem is fixed.

 2. If there is a fuse socket, pull the fuse and check it. (If it's
blown, try replacing it. If the new fuse blows, replace it, pull all Slot
cards and try powering ON again. If the fuse does not blow, hop to #7
below. If the fuse blows with no cards installed your best course is,
probably, to forget about repairs and get a replacement power supply.)

 3. Unplug and replug the power cord at the point where it connects to
the IIe. Turn ON power. Try wiggling the power cord.

 4. Substitute a power cord from a known-working IIe and turn ON power.

 5. Turn ON the power. Jiggle the power switch. If the machine shows
signs of life, the switch is probably bad.

 6. Open the case. Unplug and re-plug the Power Supply cable to the
motherboard. Turn ON power. If the machine seems to respond, try cleaning
the power supply plug and socket.

 7. Pull all cards from Slots and turn ON power. If the machine 'comes
```

alive' one or more of your cards may have a short or may have been cross-socketed. Clean the contacts on each card (e.g. with alcohol). With power OFF, replug a card (be sure to line-up card and Slot contacts) and turn ON power. Do this for each card. If a card causes the machine to fail, it is, probably messed up. If no card produces a failure the original problem was, likely, a card which was not properly inserted.

If the above tries get you nowhere, remove the power supply from the 'dead' machine and swap in one removed from a good machine. (Removing power supplies is pretty easy.) If the 'dead' machine now works you will know that the original power supply is, probably, bad.

IIe power supplies can be repaired. The bother involved varies considerably with the cause of malfunction. For example, it is fairly easy to identify a bad switch-- it will, usually, not snap cleanly into position, feel crunchy, and/or have a burn spot. The repair is to replace the switch with some AC power switch that will fit. Or, you can permanently connect the switched lines and add an in-line switch to the power cord.

Open the "bad" power supply. Look toward the end where the power cord is connected. Somewhere close to the place where wires from the switch go to the circuit board there should be a small disk-shaped component which is not a disk capacitor. Probably, it will be black with no markings. This is a "globar" resistor. Check it to be sure that it is not cracked and that both leads are really connected to the disk. If it is broken, you will need to get a replacement from an electronics supply shop. (Tell the shop person where the globar resister comes from and describe its size.)

Look for a fuse mounted to the circuit board. If there is one, check it. An Ohm meter can be used to check for continuity if it is not obvious that the fuse is blown. If the fuse is blown, replace it. Continue as outlined in #2 above.

If the power supply has a slotted adjustment, mark its current position and, then, turn it back and forth. Set the adjustment a bit to one side of the original setting and plug in the power supply. If it now seems to work the problem is/was a 'dirty' voltage adjustment control. It's a good idea to spritz the adjustment with circuit cleaner. Check the voltage on the +5V line with a meter and adjust it to 5 Volts. (Note: _no_ output due to a dirty adjustment control seems unlikely. Incorrect output is more probable; and, this could cause a IIe to not work.)

Beyond the above, you are, most likely, looking at a bombed electrolytic capacitor or a blown main power transistor (the big silvery thing). Unless you enjoy electronic repair work, your best course is, probably, to get a replacement power supply.

Naturally, no][hardware hacker would just dump a defective power supply unless he/she were already neck-deep in junk parts. Whether or not a bad power supply may have some value for replacement parts to a school depends upon who may be available to do repairs.

Rubywand

END OF FILE pwrspply.fixes

```
##########################################################################
### FILE: pwrsuppl.globar
##########################################################################

Path:
news1.icaen!news.uiowa.edu!iagnet.net!207.22.81.9!europa.clark.net!206.229.87.25!n
ews-peer.sprintlink.net!news-sea-19.sprintlink.net!news-in-
west.sprintlink.net!news.sprintlink.net!Sprint!151.164.1.34!swbell!not-for-mail
From: Rubywand <rubywand@swbell.net>
Newsgroups: comp.sys.apple2
Subject: Re: GS Power Supply:  Warning signal?
Date: Mon, 29 Sep 1997 21:20:50 +0000
Organization: Southwestern Bell Internet Services, Richardson, TX
Lines: 54
Message-ID: <34301BB2.2415@swbell.net>
References: <60oiq6$rjk@login.freenet.columbus.oh.us>
NNTP-Posting-Host: ppp-207-193-12-19.hstntx.swbell.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Trace: nnrp1.rcsntx.swbell.net 875589387 27199 (None) 207.193.12.19
X-Complaints-To: usenet@nnrp1.rcsntx.swbell.net
X-Mailer: Mozilla 2.02E (Win16; I)

Dave Althoff writes ...
>
> Just wanted to relate my experience with GS power supply failures on
> upgraded ROM 00 GSes.  My GS at work is a ROM 00 upgraded to a ROM 01.  It
> is now on its third power supply
>
> ....
> Anyway, I have noticed what seems to be a warning signal when the power
> supply is about to die. ....
>
> It seems that when the power supply is about to go, the crackling becomes
> more frequent and more pronounced. .... Then, when I returned a bit later,
> the supply was dead. In fact, I cracked the thing open and there is this
> nice crunchy ceramic cap, and a couple of clearly overheated spots on the
> board.
>
> .... I thought I would pass that along in case there are GS
> users out there watching for telltale signs of power supply failure...
>

     Thanks for the info.

     Your GS seems to be eating power supplies. Ours is a Woz ROM-00 machine
(one of the first three purchased in Houston) which went through the ROM-01
upgrade and a few motherboard swaps. It is still on the original (no
internal fan) power supply, except that, before adding a Zip-GSx accelerator,
4MB RAM, etc., we fattened-up the PS leads.

     If there is something odd about the line voltage at your workplace--
like it is too low or too high and/or you get frequent surges-- you may want
to get an UPS. Otherwise, the thin leads on your power supply could be
contributing to instability, over-currents, and failure.

     You mention finding a "nice crunchy ceramic cap". Are you sure it was a
cap?
```

A common failure point on Apple II supplies is a capacitor-looking thing called a "globar". It is a disc-shaped resistance element which is in series with the AC line input. When power is turned ON, the globar is cold and has a resistance of, very roughly, 50 Ohms. A second or so after turn-ON, it has heated up and its resistance drops to just a few Ohms. The idea is to limit initial surge voltages.

A globar can fail quickly-- a lead pops off or the element cracks and separates; either way, the AC input line is broken and everything stops cold. Or, a globar may fail slowly-- a lead connection fractures or the element develops cracks but does not separate. A slow-failing globar could produce the audio noise you mention.

Anyway, try beefing-up the +5V, +12V, and one GND lead to #10 or #12 gauge. This may help save your present power supply.

Rubywand

END OF FILE pwrsuppl.globar

```
######################################################################
### FILE: pwrsuppl.iie2iigs
######################################################################

Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!nyd.news.ans.net!newsfeeds.ans.
net!news.idt.net!dca1-hub1.news.digex.net!digex!lynx.unm.edu!ben15.unm.edu!buggie
From: buggie@ben15.unm.edu (stephen e buggie)
Newsgroups: comp.sys.apple2
Subject: IIGS INTERNAL P.S.: Transplant IIe  ps innards
Date: 5 Sep 1998 14:55:24 GMT
Organization: University of New Mexico, Albuquerque
Lines: 69
Message-ID: <6srjcs$8au$1@lynx.unm.edu>
NNTP-Posting-Host: ben15.unm.edu
X-Newsreader: TIN [version 1.2 PL2]
Xref: news1.icaen comp.sys.apple2:139033

          RESURRECTING A DEAD IIGS INTERNAL POWER SUPPLY WITH THE
                MECHANISM OF A IIE INTERNAL POWER SUPPLY
          ======================================================


"One small step for an Apple ..... one giant leap for AppleDom!"


Bugg-Power remains the BEST Apple II power supply: abundant power,
freedom from heat, reliability, low $27 cost.

The ONLY advantage that the internal (standard IIgs or IIe) power supply
has is PORTABILITY --- if you move your computer system frequently, then
the tiny internal unit is more convenient than the external Bugg-Power,
which rests on the floor and connects via a 5 ft cable.

The problem for IIgs users is that the Apple IIgs internal units are in
short supply.  But IIe power supplies are abundant (Crow Fred of
Scottsdale AZ sells IIe power supplies for just $5 each.)

This past weekend, I successfully transplanted a working IIE power supply
mechanism into the CASING of a IIgs internal unit.   IT WORKS!

PROCEDURE:   Open both units.  Remove the six mounting screws, and clip
the wires going to the rocker switch and to the female IEC power socket.
Two of the mounting holes on the IIE mechanism are in the wrong place, so
carefully drill out of the IIE power supply motherboard two holes at the
right places.  (There are no critical traces at those places).  Glue
cardboard insulation along the inner length of the IIgs casing.  Solder
the rocker switch and IEC female power socket to the IIe unit.
Reassemble.   THAT'S IT!

I tested it on a IIgs for a half day before returning the IIgs resurrected
power supply to its local owner.

The only question is whether the IIe unit will generate enough amps to
satisfy the IIgs.   On the +5 and +12v lines, the IIe unit is RATED at
2.5 amps and 1.5 amps, while the printed rating of the IIgs unit is 4.0
amps and 2.5 amps   (By comparison, with BUGG-POWER, you get 15 amps and 5
amps!)
```

But, with my half-day test, the resurrected IIgs unit got no warmer than a standard internal IIgs unit, and there were no crashes!

I CAN RESURRECT YOUR DEAD IIGS POWER SUPPLIES in the manner described here.

COST: You supply the dead IIgs power supply: I charge $5 for the IIe unit, $2.00 for labor, plus return postage.

Postage of course is less if you send several units as a batch.

==========
Long live the IIe-to-IIgs internal power supply resurrection!
==========

Steve Buggie

=
** Stephen Buggie, Psychology, Univ. of New Mexico, Gallup NM 87301 **
** buggie@unm.edu voice: (505) 863-7504 or 863-2390 **
** NEW MEXICO: Indian pueblos, sunshine, atomic relics, white sands, **
** stealth jets, scenery, alien crash sites, and..... enchantment! **
=
..

END OF FILE pwrsuppl.iie2iigs

```
##########################################################################
### FILE: pwrsupply.fixes
##########################################################################

Path: news1.icaen!news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!news.cis.ohio-
state.edu!newsfeed.berkeley.edu!cyclone.swbell.net!typhoon01.swbell.net.POSTED!not
-for-mail
Message-ID: <370BA2FC.CE633107@swbell.net>
From: Rubywand <rubywand@swbell.net>
Reply-To: rubywand@swbell.net
X-Mailer: Mozilla 4.51 [en] (Win95; U)
X-Accept-Language: en
MIME-Version: 1.0
Newsgroups: comp.sys.apple2
Subject: Re: //e power supply
References: <3704c09f.22344937@news.zipworld.com.au>
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
Lines: 170
Date: Wed, 07 Apr 1999 13:25:00 -0500
NNTP-Posting-Host: 207.193.9.84
X-Complaints-To: abuse@swbell.net
X-Trace: typhoon01.swbell.net 923509360 207.193.9.84 (Wed, 07 Apr 1999 11:22:40
PDT)
NNTP-Posting-Date: Wed, 07 Apr 1999 11:22:40 PDT
Organization: SBC Internet Services
Xref: news1.icaen comp.sys.apple2:146657

Jlogo writes ...
>
> Just recently one of my Platinum //e's power supplies appears to have
> failed.  When I switched on my //e the system responded normally but
> after I turned it off then turned it on again (rather quickly - maybe
> this caused the problem?) it no longer shows any power on indicator
> from the front keyboard.  Is it possible that the power supply is
> overloaded or short-circuited?.
>
> BTW, The power supply is a silver coloured one and looks very similar
> to the IIgs one.  I just wish these power supplies were'nt so flaky -
> this is the second //e power supply that I've used which quit working.
 ....


     Here is some information which may help ...

>>

     Apple II power supplies can often be repaired. The bother involved varies
considerably with the cause of malfunction.

Note: The following refers more or less directly to II+ and IIe supplies; however,
many of the ideas will work with the IIgs power supply as well.


Bad Power Cord

     Unplug and replug the power cord at the point where it connects to the IIe.
Turn ON power. Try wiggling the power cord. If the Power Supply comes ON at any
```

time, try substituting a power cord from a known-working IIe. If this fixes the problem, you can be pretty sure that the problem was a power cord with a broken wire.

Poor Power Supply Connector Connection

Unplug and re-plug the Power Supply cable to the motherboard. Turn ON power. If the machine seems to respond, or responds when the connector is wiggled, you probably have a dirty or loose connection.

Clean the power supply plug and socket with an alcohol swab. Using long-nosed pliers slightly re-crimp the 'holes' on the socket (or, insert a jeweler's screwdriver into the space between each hole and the plastic casing and twist). The idea is to restore a firm grip for all contacts.

Another possibility is a loose or broken socket solder connection to the motherboard. The repair is to remove the motherboard and re-solder the connections to the socket.

Bad Switch

It is fairly easy to identify a bad switch-- it will, usually, not snap cleanly into position, feel crunchy, and/or have a burn spot. The repair is to replace the switch with some AC power switch that will fit. Or, you can permanently connect the switched lines and add an in-line switch to the power cord.

Blown Fuse

Some power supplies may have a fuse. Open the power supply. Look for a fuse mounted to the circuit board. If there is one, check it. An Ohm meter can be used to check for continuity if it is not obvious that the fuse is blown. If the fuse is blown, replace it.

Bad "Globar" Element

Look toward the end where the power cord is connected. Somewhere close to the place where wires from the switch go to the circuit board there should be a small disk-shaped component which is not a disk capacitor. Probably, it will be black with no markings. This is a "globar" resistor. Check it to be sure that it is not cracked and that both leads are really connected to the disk.

If the globar element is broken or if a lead has popped off, you will need to get a replacement from an electronics supply shop. (Tell the shop person where the globar resister comes from and describe its size.)

Blown Electrolytic Capacitor(s)

On the end of the circuit board near the Switch are some relatively large electrolytic capacitors (typically these are tubular aluminum things with shrink-wrapped grey or light-green covers on which there are markings). Usually, they are the same size and have the same uF value and Voltage rating. One (or more) of these may be obviously blown or may just show some slime near the base.

If you find something like this, the suspect capacitor should be replaced by

one of the same (or slightly larger) uF value with the same (or larger) Voltage rating. Size and shape are, also, important in order to get a good fit.

When removing the bad cap, be sure to mark the "+" side on the board-- use the markings on the cap's cover to identify the "+" side. Install the replacement cap with its "+" lead in the marked hole.

Note: Also see the C7 fix discussion in next Question.

Messed-up or 'Dirty' Adjustment

The power supply may have a mini-potentiometer mounted on the circuit board for fine-tuning voltage output. Usually, it will be somewhere near the end opposite the Switch and will have a slotted plastic 'knob'.

If there is such an adjustment, mark its current position and, then, turn it back and forth. (If you have some Radio Shack, etc. 'Circuit Cleaner', into the mini-pot first is a good idea.)

Set the adjustment a bit to one side of the original setting and plug in the power supply. If it now seems to work the problem was a 'dirty' voltage adjustment control.

Check the voltage on the +5V line with a meter and adjust it to 5 Volts. (Note: _no_ output due to a dirty adjustment control seems unlikely. Incorrect output is more probable; and, this could cause a IIe to not work.)

Beyond the above, you are, most likely, looking at a bombed electrolytic capacitor which is not obviously bad or a blown main power transistor (the big silvery thing mounted on a heatsink). Unless you enjoy more involved electronic testing and repair work, your best course is, probably, to get a replacement power supply.

From: O Aaland

012- My Apple IIe fails to turn on! I have to turn its power switch on and off several times and sometimes wait a long time before it finally powers up!

If the power supply you are working on is an ASTEC brand the most common problem is the 10V 220 uf capacitor located about 1 inch to the rear and left of the transformer. I find this to be the cause in about 80 pecent of the ones I repair. Use a 25V 220uf capacitor as a replacement and chances are real good that it will not fail again.

From: Stephen Shaw

If you open the power supply up (WITH THE MAINS PLUG OUT!) you will find a capacitor C7 near the transformer in the middle of the printed circuit board (a 220 uF 16V capacitor if I remember correctly) change it for a 220uF 25V 85 degree Centigrade rated capacitor and it should clear the problem up.

From: Jeff Allen

I've been trying to fix several dead Apple II power supplies from a local school and have managed to bring back one from the dead now. The fix was to replace the 10V, 220uF electrolytic cap with a new one. (I used a 35V piece). Assuming that the board markings are useful, this was C7, on an Astec board with the datecode "T8312" on it. I'm curious if anyone else that has replaced that cap has noticed any browning of the pc board where the leads enter from that 27ohm 2W 'R4' beast. ....

<<

Rubywand

END OF FILE pwrsupply.fixes

```
######################################################################
### FILE: pwrsupply.globar
######################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!news-
e1a.megaweb.com!newstf01.news.aol.com!newsbf02.news.aol.com!not-for-mail
From: rubywand@aol.com (RUBYWAND)
Newsgroups: comp.sys.apple2
Subject: Re: My //e fails to turn on!
Date: 12 Jan 1996 07:14:46 -0500
Organization: America Online, Inc. (1-800-827-6364)
Lines: 17
Sender: root@newsbf02.news.aol.com
Message-ID: <4d5jbm$d1j@newsbf02.news.aol.com>
References: <8B8A08A.02210015A8.uuout@digitec.co.za>
NNTP-Posting-Host: newsbf02.mail.aol.com
X-Newsreader: AOL Offline Reader


On 01/02/96, Alberto Roffe wrote to All:


 AR> I am having some problems with my Apple //e! It fails to turn on! I
   > have to turn its power switch on and off several times and sometimes
   > wait a long time till it finally powers up!

    If you decide to open up your PS, another thing to check is the
'start-up resistor'. Usually, this is a disk-shaped object in series with
the AC input located on the circuit board near the switch and AC cord
socket. It should have a designation like R1 (not C1 or C-anything).  This
device-- sometimes called a "globar" resistor-- is supposed to suppress
turn-ON surge and then quickly drop in resistance. If it is cracked or a
lead is barely making contact, then the PS might behave the way you
describe.



### END OF FILE pwrsupply.globar
```

```
##############################################################################
### FILE: pwrsupply.pinout
##############################################################################

Path:
news1.icaen!news.uiowa.edu!news1.chicago.iagnet.net!qual.net!iagnet.net!newsfeed.i
nternetmci.com!169.132.11.200!news.idt.net!newsgate.swbell.net!151.164.30.35.MISMA
TCH!cyclone.swbell.net!swbell!not-for-mail
From: Rubywand <rubywand@swbell.net>
Newsgroups: comp.sys.apple2
Subject: Re: A2 Pwr Supply pin outs?
Date: Tue, 07 Apr 1998 03:47:22 -0500
Organization: Southwestern Bell Internet Services, Richardson, TX
Lines: 24
Message-ID: <3529E81A.DA7ADE4C@swbell.net>
References: <6gc80b$1r7$1@news.d.umn.edu>
Reply-To: rubywand@swbell.net
NNTP-Posting-Host: ppp-207-193-8-221.hstntx.swbell.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Trace: (null) 891938455 8180 (None) 207.193.8.221
X-Complaints-To: usenet@nnrp3
X-Mailer: Mozilla 4.04 [en] (Win95; I)
Xref: news1.icaen comp.sys.apple2:132135

blair aakre writes ...
>
> Hi there! I have a power supply out of an Apple II+ that I would like to use
> for another project. I was wondering if anyone out there had the pin out of
> the motherboard connector? ....


 Apple II+ Motherboard Power Socket
   (from Apple II Reference)


    -5V +12V  GND
     _____________
    /             |
    | 6   4   2   |
    |             |
    | 5   3   1   |
    \_____________|

   -12V  +5V  GND



Rubywand


### END OF FILE pwrsupply.pinout
```

```
##############################################################################
### FILE: ramfast
##############################################################################

Path: ns-mx!hobbes.physics.uiowa.edu!zaphod.mps.ohio-
state.edu!mips!spool.mu.edu!agate!dog.ee.lbl.gov!ucbvax!gnh-
cathouse.cts.com!ferret
From: ferret@gnh-cathouse.cts.com (Brendan Hoar)
Newsgroups: comp.sys.apple2
Subject: posts from America Online from CVTech Re: RamFASTs
Message-ID: <m0lYk19-0000UCC@crash.cts.com>
Date: 9 Apr 92 08:31:24 GMT
Sender: usenet@ucbvax.BERKELEY.EDU
Organization: The Internet
Lines: 87
X-Unparsable-Date: Tue Apr 07 92 at 19:48:19 (EST)

Taken from America Online:
Path: CV Technologies/RamFast SCSI

Subj:  Another fix..                          92-04-05 16:52:32 EDT
From:  TGrams

If you think the pseudo mapping in P8 is hurting you with the RamFast, this
patch to the P8 file will disable it.  Be sure to save a copy of the file
before you patch it.

Block 5, byte $1A3, change $A5 to $00 (or anything)

Let me know if it helps.

Tim

------------------------------------------------------------------------
Path: CV Technologies/RamFast SCSI

Subj:  A Note...                              92-04-06 01:49:36 EDT
From:  JP1

The patch seems to work great--thanks a _bunch_, Tim!!  It's nice to be able
to
use the RF's ability to 'locate' partitions, again.

Now, for those who use Deliverance for byte editing, please note that when
Chris Warner wrote it, he followed the 'computer convention' that the first
block of a file is Block 0.  So, when you go looking for the value $A5 via
Deliverance, look for it in Block _4_ of the P8 file.

The string of characters in the region is 10 BF C9 A5 D0 07...
                                                  ^
This is the one to change to 00 -------------------|

John P.

------------------------------------------------------------------------
Path: CV Technologies/RamFast SCSI

Subj:  Rom revisions.....                     92-04-06 11:47:46 EDT
From:  CVTech
```

We seem to have found the problem.

RF rom revisions prior to version 2.01a maintain a device list of 12 volumes and flip them online/offline at will. We did this so that we could mount/dismount volume under Finder without having to play with creating a new device entry on the fly. People with early 2.0 roms and Prosel will recall the complaints we got about having double digit device numbers and a device list full of offline volumes. Wellllllllllll, in version 2.01a we fixed that and didn't mount offline volumes in either Gs/OS or P8. Previous to version 2.01a the RF software had the potential to map an offline volume into the P8 table and that seems to be causing the appleworks crash. Tim's patch will fix this until you upgrade to either 2.01c (free) or 3.00a ($15). Sorry we didn't catch this but 2.01a was release 10 months ago and we didn't test 6.0 with the previous versions of the RF board. Version 3.0 gives you your choice on which method of device table mapping you want to use. If you map any of the spare partitions then we tell P8v2 that we only have 2 devices and they won't "double map" our extra partitions. If you do not map any of the extra volumes then we assume you want to use the P8v2 method and we tell P8v2 that we have as many volumes as we have and P8v2 maps them where they want them. Personally I like our method better because you don't have to map in volumes you don't want and you have a visible representation of your P8 table.

Drew

p.s. We are throwing in the rom 3.0 for free for people that want to upgrade their boards from rev C to rev D. ($69)

p.p.s. We are taking orders for rom 3.0. Send us a check for $15 and include a shipping address and the SERIAL NUMBER ON YOUR BOARD. The serial number is very important.

(sorry about the formatting - bgh)

badbunny@gnh-starport.cts.com
ferret@gnh-cathouse.cts.com
Cyborgs From Saturn Landed In My Garden and Injured Eighty-Nine Bananas.
- Insists Cindy Lauper
You are in a maze of tiny little net.sigs, all different.

END OF FILE ramfast

```
##########################################################################
### FILE: ramfast.docs
##########################################################################

Path: news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!vixen.cso.uiuc.edu!mrcnext.cso.uiuc.edu!bazyar
From: bazyar@mrcnext.cso.uiuc.edu (Jawaid Bazyar)
Newsgroups: comp.sys.apple2.programmer
Subject: RamFAST Technical Documentation
Date: 14 Dec 1993 17:34:58 GMT
Organization: University of Illinois at Urbana
Lines: 13
Message-ID: <2ektg2$7g7@vixen.cso.uiuc.edu>
NNTP-Posting-Host: mrcnext.cso.uiuc.edu

RamFAST Technical Documentation is now available on the Sequential
Systems BBS.. (303) 666-7797., 300-14400 baud.

The documentation includes a text file describing the 8-bit SmartPort
interface, and a bit of sample source code which accesses the RamFAST
interface directly from GS/OS.


--
 Jawaid Bazyar              |   Like UNIX? Like your Apple IIGS? Then ask
 Procyon, Inc.              |   me about GNO/ME for the Apple IIgs!
 bazyar@cs.uiuc.edu         |   P.O Box 620334
 --Apple II Forever!--      |   Littleton, CO 80162-0334   (303) 781-3273


### END OF FILE ramfast.docs
```

```
##############################################################################
### FILE: resistor.codes
##############################################################################

Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!jamie!Qual.Net!nyd.news.ans.net
!newsfeeds.ans.net!news.idt.net!nntp.giganews.com!newsgate.swbell.net!151.164.30.3
5.MISMATCH!cyclone.swbell.net!swbell!not-for-mail
From: Rubywand <rubywand@swbell.net>
Newsgroups: comp.sys.apple2
Subject: Re: NEEDED: Color-code for carbon-film resistors
Date: Sun, 21 Jun 1998 15:44:05 -0500
Organization: Southwestern Bell Internet Services, Richardson, TX
Lines: 42
Message-ID: <358D7095.FF0020F6@swbell.net>
References: <6mjhli$oie$2@lynx.unm.edu>
Reply-To: rubywand@swbell.net
NNTP-Posting-Host: ppp-207-193-18-2.hstntx.swbell.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Trace: (null) 898461794 8142 (None) 207.193.18.2
X-Complaints-To: usenet@nnrp3
X-Mailer: Mozilla 4.04 [en] (Win95; I)
Xref: news1.icaen comp.sys.apple2:135942

stephen e buggie writes ...
>
> COLOR CODE NEEDED FOR RESISTORS
> ==============================
>
> I've misplaced my color-code for the standard round carbon-film resistors.
>
> If anyone has it handy, could you type it in?   Then I'll print it and
> tape it to each of my boxes containing resistors.
>

Color   Digit   Multiplier (when 3rd band)  Example

Black     0       x1              --  Red Red Black =         22 Ohms
Brown     1       x10             --  Blue Grey Brown =      680 Ohms
Red       2       x100            --  Orange White Red =    3900 Ohms
Orange    3       x1000           --  Yellow Violet Orange = 47k Ohms
Yellow    4       x10000          --  Red Green Yellow =    250k Ohms
Green     5       x100000         --  Orange Orange Green = 3.3M Ohms
Blue      6       x1000000        --  Red Yellow Blue =      24M Ohms
Violet    7       x10000000       --  ...
Grey      8       x100000000
White     9       x1000000000

Gold      -       x 0.1           -- Brown Brown Gold =      1.1 Ohms
Silver    -       x 0.01          -- Orange White Silver =  0.39 Ohms


Tolerance (4th band)

Gold is           5%
Silver is        10%
no color is      20%
```

Example: Grey Red Orange Gold   is 82k Ohms +/- 5%
Example: Brown Black Green Silver is 1M Ohms +/- 10%

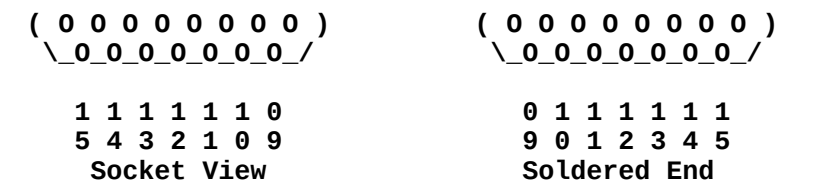
Note: carbon resistors almost always err on the high side.

Rubywand

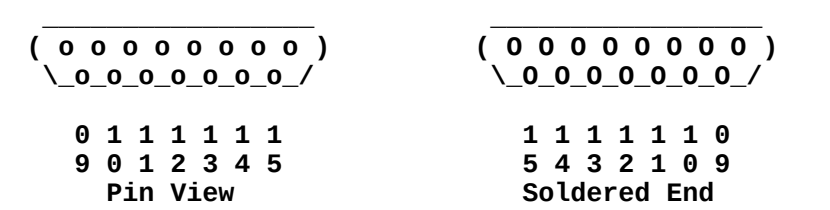
END OF FILE resistor.codes

```
##########################################################################
### FILE: rgb.cable
##########################################################################

Newsgroups: comp.sys.apple2
Path:
news.weeg.uiowa.edu!news.uiowa.edu!uunet!cs.utexas.edu!torn!utgpu!utstat!philip
From: philip@utstat.uucp (Philip McDunnough)
Subject: Re: Has the 2GS been dropped?
Message-ID: <1992Aug19.050645.12833@utstat.uucp>
Organization: University of Toronto, Dept. of Statistics
References: <14367@mindlink.bc.ca>
Date: Wed, 19 Aug 1992 05:06:45 GMT
Lines: 14

In article <14367@mindlink.bc.ca> Herbert_Fung@mindlink.bc.ca (Herbert Fung)
writes:

[ ]
>
>I can't remember where, but I recall reading somewhere that Apple added a
>special cable to it's price list about a year ago that would let one hook
>up the Mac LC's monitor to a GS. If this is so, then that excuse about not
>being able to get GS RGB monitors is just that, an excuse.

Well I don't recall Apple claiming they couldn't get GS monitors, but I
do recall the cable. The part # is A9M0333  Retail price is $29.

Philip McDunnough
philip@utstat.toronto.edu


### END OF FILE rgb.cable
```

```
########################################################################
### FILE: rgb.connect
########################################################################

Path: blue.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!news.sprintlink.net!nwnexus!rook!eugene.welcome
From: EUGENE.WELCOME@rook.wa.com (eugene welcome)
Newsgroups: comp.sys.apple2
Subject: RGB-connection question??
Message-ID: <10DC16A9@rook.wa.com>
Date: Fri, 09 Dec 1994 06:15:34 GMT
Organization: Knight-Line! (206) 565-0594
Distribution: world
Lines: 61

>Hello, I have a friend with an Apple 2c+. I asked me what the pin
>configuration is,but I honestly have no idea.

Hi Joe: Here is what I have on the IIc and Laser128 as they were the
same. I took this from a larger posting that shows all the Apple II
series Serial connectors from DB25 to the newer Mini-Din8 connectors
plus their signal identifications. This happens to include the IIgs
RGB but not the IIe RGB info I am presently tracking down to update
this part of my file. If anyone is interested I can post the entire
serial connectors with pin outs.  Gene. K7EEK
eugene.welcome@rook.wa.com

                    Apple RGB Connections

The RGB port on the IIgs has the following output: This is not the
same for the Apple IIe. I do not have info on the IIe RGB port and do
not know if the IIc RGB port is the same.
          The Apple IIc and Laser 128 are also shown.

 Apple IIgs RGB                Apple IIc and Laser-128 RGB
 Pin     Signal                    Pin      Signal
 ===     ======                    ===      ======
  1   Ground                        1   Intensity signal
  2   Red analog video              2   F14M - 14 MHz
  3   Composite sync                3   Red - signal
  4   Not connected                 4   Blue - signal
  5   Green analog video            5   Spkr sound output
  6   Ground                        6   Load Pulse for LCD
  7   -5 volts                      7   Dispen for LCD
  8   +12 volts                     8   +12 volts DC
  9   Blue analog video             9   Horizontal Sync Signal
 10   Not connected                10   Composite Video Sync Signal
 11   Sound                        11   Serial out - Data for LCD
 12   Composite video (NTSC, PAL,  12   Composite Video Output
        or SECAM )                 13   Ground
 13   Ground                       14   Vertical Sync Signal
 14   Not connected                15   Green - Signal
 15   Not connected             Note  LCD = Liquid Crystal Display
=======================================================================

             Female DB-15. Chassis Connector

    8 7 6 5 4 3 2 1            1 2 3 4 5 6 7 8
   _________________          _________________
```



Male DB-15. Cable Connector



Newsgroups: comp.sys.apple2
Path: blue.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-state.edu!howland.reston.ans.net!wupost!waikato!comp.vuw.ac.nz!actrix.gen.nz!dempson
From: dempson@atlantis.actrix.gen.nz (David Empson)
Subject: Re: RGB-connection question???
Message-ID: <D0JLvC.J8x@actrix.gen.nz>
Nntp-Posting-Host: atlantis.actrix.gen.nz
Sender: news@actrix.gen.nz (News Administrator)
Organization: Actrix - New Zealand Internet Service Providers
Date: Fri, 9 Dec 1994 12:11:35 GMT
References: <3c7034$oh3@styx.uwa.edu.au>
Lines: 25

In article <3c7034$oh3@styx.uwa.edu.au>,
Joseph Turner <jturner@tartarus.uwa.edu.au> wrote:
> Hello, I have a friend with an Apple 2c+. I asked me what the pin
> configuration is,but I honestly have no idea. Is there anyone who help us
> to determine the pin configuration? ANY help will be appreciated.

First, I should correct a misconception: the video port on the back of the IIc+ is _not_ an RGB port. It is a video expansion port, which provides all of the internal video generation signals used by the IIc/IIc+ which can be used to generate an alternative video output signal.

To produce RGB output (or anything else) from this port, you need an external adaptor box which generates the appropriate video signals.

I believe there is (or was) an RGB output adaptor for the IIc, which should also work on the IIc+.

This adaptor is not simple: it has to decode the colour information from the NTSC video signal (or generate it by detecting the graphics mode and monitoring bit patterns), generate appropriate sync signals, etc.
--
David Empson
dempson@actrix.gen.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand
Newsgroups: comp.sys.apple2
Path: blue.weeg.uiowa.edu!news.uiowa.edu!uunet!gatech!howland.reston.ans.net!wupost!waikato!comp.vuw.ac.nz!actrix.gen.nz!dempson

From: dempson@atlantis.actrix.gen.nz (David Empson)
Subject: Re: RGB-connection question??
Message-ID: <D0JnBL.Lnt@actrix.gen.nz>
Nntp-Posting-Host: atlantis.actrix.gen.nz
Sender: news@actrix.gen.nz (News Administrator)
Organization: Actrix - New Zealand Internet Service Providers
Date: Fri, 9 Dec 1994 12:42:56 GMT
References: <10DC16A9@rook.wa.com>
Lines: 73

In article <10DC16A9@rook.wa.com>,
eugene welcome <EUGENE.WELCOME@rook.wa.com> wrote:
> >Hello, I have a friend with an Apple 2c+. I asked me what the pin
> >configuration is,but I honestly have no idea.
>
> Hi Joe: Here is what I have on the IIc and Laser128 as they were the
> same. [snip]

The information in your post about the IIc video port is WRONG!

It may be correct for the Laser 128. The IIc's video port has a set of internal signals. The pins listed here might be correct for an RGB adaptor attached to the IIc video port, but the video port itself does NOT have any of the signals expected by an RGB monitor (they have to be generated by an adaptor).

The following table (from your post) is correct for the IIgs, but most of the listed signals for the IIc are wrong.

Apple IIgs RGB		Apple IIc and Laser-128 RGB	
Pin	Signal	Pin	Signal
1	Ground	1	Intensity signal
2	Red analog video	2	F14M - 14 MHz
3	Composite sync	3	Red - signal
4	Not connected	4	Blue - signal
5	Green analog video	5	Spkr sound output
6	Ground	6	Load Pulse for LCD
7	-5 volts	7	Dispen for LCD
8	+12 volts	8	+12 volts DC
9	Blue analog video	9	Horizontal Sync Signal
10	Not connected	10	Composite Video Sync Signal
11	Sound	11	Serial out - Data for LCD
12	Composite video (NTSC, PAL, or SECAM)	12	Composite Video Output
		13	Ground
13	Ground	14	Vertical Sync Signal
14	Not connected	15	Green - Signal
15	Not connected	Note	LCD = Liquid Crystal Display

The actual functions of the IIc video port are as follows:

1	TEXT	Indicates text mode is active (special function in DHR mode)
2	14M	14 MHz clock sigal
3	SYNC	Horizontal and vertical sync
4	SEGB	Vertical counter signal from IOU, or lo-res indication
5	1VSOUND	Sound output (one volt peak-to-peak)
6	LDPS	Video shift load enable
7	WNDW	Active area display blanking
8	+12V	+12 volts DC

9	PRAS	RAM row address strobe
10	GR	Graphics mode enable
11	SEROUT	Serialized character generator output
12	NTSC	Composite NTSC video output
13	GND	Ground reference
14	VIDD7	Bit 7 of video shift latch (for hires mode colour shifting)
15	CREF	Colour reference timing signal

These come from the IIc Technical Reference, both first and second editions.

It is odd that your listing for the IIc is correct for some of the signals, but has RGB outputs in place of the IIc's timing signals.

You cannot connect a monitor directly to the IIc video port (with the possible exception of the the LCD display, or an NTSC monitor). An adaptor is required to generate the appropriate video signals for an RGB monitor.

--

David Empson
dempson@actrix.gen.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand

END OF FILE rgb.connect

```
##############################################################################
### FILE: rgb.flyback.fix
##############################################################################

Path:
blue.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!newsrelay.iastate.edu!
news.iastate.edu!irsman
From: irsman@iastate.edu (Ian Schmidt)
Newsgroups: comp.sys.apple2
Subject: Re: Dead IIGS Monitor ?!?
Date: 23 Jun 1994 18:38:47 GMT
Organization: Iowa State University, Ames, IA
Lines: 62
Distribution: world
Message-ID: <2uckrn$kqs@news.iastate.edu>
References: <9406231518.AA23056@joshua.sybgate.sybase.com>
NNTP-Posting-Host: vincent1.iastate.edu

In article <9406231518.AA23056@joshua.sybgate.sybase.com> rankins@SYBASE.COM (Ray
Rankins) writes:

>When I turn the monitor on, I can here the high frequency sound that a
>normal monitor makes, but the picture is completely black and the LED
>power indicator on the front doesn't light up.
>
>Does anyone have any idea what may be wrong with it?  Has something
>possibly just come loose that needs to be reseated or resoldered?
>Anyone else experience similar problems with their monitor?
>
>Maybe I should just give it up for dead.  It is about seven years old.
>Maybe it has just expired after a normal lifespan?

This is classic flyback-solder-itits.  Following is my usual set of
instructions on how to fix it; if you don't understand something I'll be happy
to clarify.

---begin Ian's Standard Fix, with thanks to Scott Gentry---

Opening up the RGB is a bit nasty, but not TOO bad.  remove the 4 screws on
the back: (the one on the bottom doesn't matter).

 _____________
| @         @ |
|             |
|             |
|             |
| @         @ |
 ~~~~~~~~~~~~~

Next, carefully pull on the back a little, making sure to feed the power cord
thru the hole in the case.  After not too long, the case will be caught on 2
different connectors.  The first one is from the power switch to the left side
(facing from the back still) of the main board.  Go ahead and unplug it (both
connectors you need to remove are keyed so they only go one way :).  The case
will then pull off a bit more and you can (carefully) remove the cable from
the brightness and contrast knobs to the board on the back of the CRT.  Make
sure not hit flip the 'service/normal' switch on the board next to the
connector.  After this, the case should come almost completely away (the power
plug won't fit thru the hole, oh well).

Now you can locate the flyback.  It's the largish component on the right side
(from the back) with a cable coming out of it leading to the CRT.  Turn the
```

monitor upside down so you can see the solder side of the board. The flyback has 10 connections arranged in a semicircle. Ground each one of the connections to the nearby chassis frame (I just used a screwdriver, if you'd like to avoid any scary snaps and pops, use like a 100k resistor). Go ahead and resolder each of the 10 connections, making sure to do a clean job (any solder bridges here could be fatal to your monitor).

Once you finish, put the case back on in the opposite order, being careful not to try and force the 2 connectors the wrong way. You may want to try the monitor to make sure its all okay before retightening the screws. If you turn it on and the picture's just a horizontal line in the middle of the screen, it means you bumped the service/normal switch I mentioned before, and you should flip it back to 'normal' :)

After you do this, your RGB should be good-as-new.

---end standard fix, permission is given to do whatever you like with this as long as you don't change it---

--
Ian Schmidt / irsman@iastate.edu / irsman@cs.iastate.edu
"The look in your eyes as you head for the door is a cold fire" - Neil Peart

END OF FILE rgb.flyback.fix

```
##########################################################################
### FILE: rgb.pinouts
##########################################################################

Path: news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!zaphod.mps.ohio-
state.edu!sdd.hp.com!nigel.msen.com!yale.edu!yale!gumby!destroyer!cs.ubc.ca!unixg.
ubc.ca!kakwa.ucs.ualberta.ca!ersys!crs-sys!traider!fkarmali
From: fkarmali@traider.ersys.edmonton.ab.ca (faisal karmali)
Newsgroups: comp.sys.apple2
Subject: Re: Apple2 RGB color monitor help!!!
Message-ID: <kF393B3w165w@traider.ersys.edmonton.ab.ca>
Date: Sat, 08 May 93 15:19:43 PDT
References: <1993May4.105921.24391@aristo.tau.ac.il>
Reply-To: fkarmali@traider.ersys.edmonton.ab.ca (faisal karmali)
Organization: Traiders of the Lost .ARC! - Edmonton, Alberta, Canada
Lines: 44

koby01@ccsg.tau.ac.il (gabai jacob) writes:

>
> hello all
>
> a friend of mine has a problem the monitor cable was cut
> if any one can help with the pin out connector
>
>
> APPLE II RGB COLOR MONITOR    (model A9M0208    written at the back of monito
> (the monitor is the amicran ytpe 110V with a motor switch to adjust the
> screen )
>
>
> does anyone have the pinout list of the 15 Pin D-TYPE Connector
> please Email the answer because he doesn't have access to the net
> at the apple center in France they ignored the request even tho the U.S.A
> center transfred the request there
>
>
> email to  koby01@ccsg.tau.ac.il
>
> thanks
>

APPLE RGB MONITOR PORT

 @08 @07 @06 @05 @04 @03 @02 @01
   @15 @14 @13 @12 @11 @10 @09

01 - Signal GND (red)          10 - NC
02 - Analog RED                11 - Sound 1 volt peak to peak
03 - Composite sync            12 - Monochrome video out
04 - NC                        13 - Signal GND (blue)
05 - Analog GREEN              14 - NC
06 - Signal GND (green)        15 - NC
07 - -5 volts DC               Shield - System GND
08 - +12 volts DC              GND = Ground
09 - Analog BLUE

Fkarmali  @Traider.ersys.edmonton.ab.ca   -or-   @ersys.edmonton.ab.ca
```

My quotation collection is 288 strong. Please e-mail me with more!
     "Suicide (n.): What to do if Macs take over the world"
Newsgroups: comp.sys.apple2
Path:
blue.weeg.uiowa.edu!news.uiowa.edu!uunet!newsflash.concordia.ca!canopus.cc.umanitoba.ca!mona.muug.mb.ca!jfenske
From: jfenske@muug.mb.ca (John Fenske)
Subject: Re: Need IIgs to Amiga Magnavox Pinouts
Message-ID: <1994Jul26.020953.643@muug.mb.ca>
Organization: Manitoba Unix User Group, Winnipeg, Manitoba, Canada
References: <30npnj$m3s@xmission.xmission.com>
Date: Tue, 26 Jul 1994 02:09:53 GMT
Lines: 98

In <30npnj$m3s@xmission.xmission.com> Brian Wiser <brwiser@xmission.com> writes:

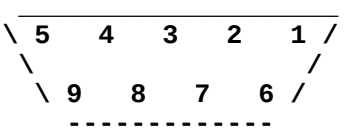
>I am trying to connect my IIgs to my Amiga 1084 monitor (also known as
>Magnavox 8CM515). Does anyone know the pinouts for either end? Thanks
>and please respond my email if possible.

from a previous post...

> Is anyone use the Commodore's 1084s monitor for their IIgs ?
> If you know the pinout of the RGB connection please send me mail
> about the connection.

pin assignment of 1084S monitor:

pin #	analog RGB signal
1	ground
2	ground
3	red
4	green
5	blue
6	not used
7	composite sync.
8	horizontal sync.
9	vertical sync.



pin assignment of IIGS RGB connector:

pin #	signal
1	ground (for red ?)
2	red
3	composite sync. (in German: Farbmischsynchronisation)
4	not used
5	green
6	ground (for green ?)
7	-5 V
8	+12 V
9	blue
10	not used

```
         11              audio output (not used)
         12              monochrome screen off (???)
         13              ground (for blue ?)
         14              not used
         15              not used
                         system ground
                            |
                            |
                  __________|_____________________________
                 \ 8    7    6    5    4    3    2    1 /
                  \  15   14   13   12   11   10    9  /
                    ----------------------------------
```

THE PIN ASSIGNMENTS...

On the //GS RGB Monitor Port PIN NUMBER		On the 1084S ANALOG RGB In PIN NUMBER
2		4
(Analog RED)		(Analog RED)
5		1
(Analog GREEN)		(Analog GREEN)
9		5
(Analog BLUE)		(Analog BLUE)
3		2
(Composite SYNC)		(Horizontal SYNC)
1		3
(Signal GROUND Red)		(GROUND)
6		3
(Signal GROUND Green)		(GROUND)
13		3
(Signal GROUND Blue)		(GROUND)
4		3
(No Connection)		(GROUND)

***** ATTENTION:**

**Although there are six pins on the Commodore RGB connector,
DO NOT hook up Pin 6 (Vertical Sync) to the GS 15 Pin connector.
Just chop it off.**

END OF FILE rgb.pinouts

```
##########################################################################
### FILE: RGB.repair
##########################################################################

Newsgroups: comp.sys.apple2
Path:
news.weeg.uiowa.edu!news.uiowa.edu!uunet!europa.eng.gtefsd.com!paladin.american.ed
u!howland.reston.ans.net!cs.utexas.edu!utnut!helios.physics.utoronto.ca!neufeld
From: neufeld@helios.physics.utoronto.ca (Christopher Neufeld)
Subject: Re: Bouncing screen...
Message-ID: <CK4GKn.AoC@helios.physics.utoronto.ca>
Sender: news@helios.physics.utoronto.ca (News Administrator)
Organization: University of Toronto Physics/Astronomy/CITA
References: <C011894125213.949@damage.cleve.fnet.org>
Date: Mon, 24 Jan 1994 06:55:32 GMT
Lines: 71

In article <C011894125213.949@damage.cleve.fnet.org>,
 <Damin@damage.cleve.fnet.org> wrote:
>
>>The screen on my IIgs monitor (standard Apple issue) has begun to bounce
>>from top to bottom a bit shortly after I turn it on. If I thump the sides
>>the problem usually goes away, but that doesn't seem like a good long-term
>>solution. Any helpful advice will be appreciated.
>
>I have the exact same problem with my GS monitor as does Dr. Quack! The fix is
>simple! We hit it.
>
>Is this "doom bearing down" on the monitor?
>
   If it's what I think it is, then yes, it is doom bearing down. One day
that monitor is going to die for good, and that day may be sooner than
you would like. I'm including the fixup procedure here, courtesy of Ian
Schmidt. I fixed my monitor successfully this way. Needless to say, don't
do this if you don't know what you're doing. If there's any doubt, bring
the monitor and this procedure to a person who has experience soldering.

--- BEGIN INCLUDED FILE ---


Opening up the RGB is a bit nasty, but not TOO bad.  remove the 4 screws on
the back: (the one on the bottom doesn't matter).

 _____________
| @         @ |
|             |
|             |
|             |
| @         @ |
 ~~~~~~~~~~~~~
Next, carefully pull on the back a little, making sure to feed the power cord
thru the hole in the case.  After not too long, the case will be caught on 2
different connectors.  The first one is from the power switch to the left side
(facing from the back still) of the main board.  Go ahead and unplug it (both
connectors you need to remove are keyed so they only go one way :).  The case
will then pull off a bit more and you can (carefully) remove the cable from
the brightness and contrast knobs to the board on the back of the CRT.  Make
sure not hit flip the 'service/normal' switch on the board next to the
connector.  After this, the case should come almost completely away (the power
plug won't fit thru the hole, oh well).
```

Now you can locate the flyback. It's the largish component on the right side (from the back) with a cable coming out of it leading to the CRT. Turn the monitor upside down so you can see the solder side of the board. The flyback has 10 connections arranged in a semicircle. Ground each one of the connections to the nearby chassis frame (I just used a screwdriver, if you'd like to avoid any scary snaps and pops, use like a 100k resistor). Go ahead and resolder each of the 10 connections, making sure to do a clean job (any solder bridges here could be fatal to your monitor).

Once you finish, put the case back on in the opposite order, being careful not to try and force the 2 connectors the wrong way. You may want to try the monitor to make sure its all okay before retightening the screws. If you turn it on and the picture's just a horizontal line in the middle of the screen, it means you bumped the service/normal switch I mentioned before, and you should flip it back to 'normal' :)

After you do this, your RGB should be good-as-new.

Ian Schmidt
irsman@iastate.edu

--- END INCLUDED FILE ---

--
Christopher Neufeld....Just a graduate student neufeld@physics.utoronto.ca
"Don't edit reality for | "The nerd projection operator recovers most of his
the sake of simplicity" | amplitude." Insult, probably self-referential.
| -rw-rw-rw- : the file permission of the beast

END OF FILE RGB.repair

```
##########################################################################
### FILE: RGBcable
##########################################################################

Path:
news.weeg.uiowa.edu!news.uiowa.edu!uunet!olivea!koriel!male.EBay.Sun.COM!eb5ts4.EB
ay.Sun.COM!keithhar
From: keithhar@eb5ts4.EBay.Sun.COM (Keith Hargrove)
Newsgroups: comp.sys.apple2
Subject: Re: What use is a Taxan Monitor? Apple2? Vcr Monitor?
Date: 14 Dec 1993 16:35:10 GMT
Organization: Sun Microsystems, Mt. View, Ca.
Lines: 101
Message-ID: <2ekpvu$7k3@male.EBay.Sun.COM>
References: <C121393123103.486@damage.cleve.fnet.org>
NNTP-Posting-Host: eb5ts4.ebay.sun.com

In article <2egqkk$6o2@charm.magnus.acs.ohio-state.edu> you write:
 >In article <jspinnowCHwnnG.HD5@netcom.com> jspinnow@netcom.com (John S. Pinn
ow)
 > writes:
 >>I had a taxan monitor sitting in my closet for awhile and would love
 >>to do something with it.
 >>
 >>
 >>It has the following settings.
 >>
 >>IT has a switch:
 >>
 >>    Position I: IBM P/C
 >>    Position II: Apple II & NEC PC 8001
 >>    Position III: Apple III
 >>
 >>    Two plugs:
 >>
 >>    A circular outlet that will accept 8 prongs.
 >>
 >>    Another a flat connecter similar to this:
 >>          ______---_____
 >>        |  * * *  *     |
 >>        |  * * *  *     |
 >>        |_______________|
 >>
 >>
 >>One of two possibile things that I want to do with it.
 >>
 >>One:     Use it as a possible Apple IIgs monitor.
 >>Two:     Use it for a vcr monitor and turn it into sortof a tv.
 >>
 >>
 >>I would really love to know of a way to get this thing to allow input
 >>of NTSC video.
 >>
 >>
 >>Any recommendations? Thank you!

 >That big rectangular connector is a 'classic' VCR connector.  Those eight pins
 >include Audio IN, Audio OUT, Video IN (NTSC), and Video OUT.  That particular
 >connector was often used for industrial and professional VCRs.  The upshot o
```

f
>all this is that, YES, you can get the monitor to accept NTSC video. Just
>connect the tip and ring of an RCA cable to the appropriate pair of pins.
>Unfortunately, I can't seem to find my copy of that data right now. Try
>setting the switch to the Apple][position, then experiment with connecting

>the tip of an RCA cable (connected to the VIDEO OUT on the computer) to each
of
>the eight pins, and connecting the sleeve to the pin opposite. Meanwhile, I
'll
>look around and find out for sure what those pinouts are.
>
>--Dave Althoff, Jr.

I think this is the RGB version I have this plug on two of my monitors
and it is RGB for pc CGA card. The cable for this plug is sold at Frys
a local computer shop. I have used this plug on one monitor to go to my GS
but it was a pain the sync out of the GS is not TTL.
The other monitor would not work at all due to fact that all inputs run into
a digital buffer. I think the din would be the best way to go for a GS.
If the monitor does not have digital buffers in it, it should make a good gs
monitor.

Boot the GS and put up a white screen to use while making the cable.
Find a din plug and plug it in. Find the ground pin ohm it out with the
monitor or unpluged.
Use the 3rd prong if it has one else check to the screws in the back
or the din shell.
After ground is located power up the monitor and check ground to all pins
if any of the pins have power on them (ie +5v or +12v)
make a note NOT TO TOUCH THEM!!
now connect monitor ground to gs ground pin 1,6,13
crank up the contrast and bright
now connect gs sync pin 3 to a wire use this wire to touch the pins in the din
you should be able to tell when you hit the sync you might have two connect
this to two pins one for Horz. and one for Vert connect it.
Now connect red pin 2 on the GS to a wire and touch the din pins when you get
the red screen connect it.

Now connect green pin 5 on the GS to a wire and touch the din pins when you get
the yellow screen connect it.

Now connect blue pin 9 on the GS to a wire and touch the din pins when you get
the white screen connect it.

I have had done this to many different monitor and it works very good.
You might think about making a a,b box too, for a sega or snes both the
sega and the snes have rgb outputs like the GS and look great on a rgb monitor.

good luck

END OF FILE RGBcable

##
FILE: romproject-cgo.html
##

From: "Terence J. Boldt" Newsgroups: comp.sys.apple2 References: <364919f0.0@news.cgocable.net> <364A692F.CBB9289B@cyberhighway.net> Subject: Re: Hardware Project Date: Thu, 12 Nov 1998 01:27:51 -0500 Lines: 17 X-Newsreader: Microsoft Outlook Express 4.72.3110.1 X-MimeOLE: Produced By Microsoft MimeOLE V4.72.3110.3 NNTP-Posting-Host: cgowave-77-24.cgocable.net Message-ID: <364a8024.0@news.cgocable.net> X-Trace: 12 Nov 1998 01:28:52 -0500, cgowave-77-24.cgocable.net Path: news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!nyd.news.ans.net!newsfeeds.ans.net!ptdnetP!newsgate.ptd.net!cyclone.news.idirect.com!island.idirect.com!news1.tor.metronet.ca!news.cgocable.net!cgowave-77-24.cgocable.net Xref: news1.icaen comp.sys.apple2:141695 Frank Carney wrote in message <364A692F.CBB9289B@cyberhighway.net>... >Do you have a web page describing what you are doing? I do now as of about 15 minutes ago. Thanks for the idea. There's not much there. I have to photograph and scan a bunch of stuff some weekend. Maybe I'll spend more than 10 minutes on the html as well. :-) http://www.cgocable.net/~apple2 apple2@cgocable.net -- Terence J. Boldt

END OF FILE romproject-cgo.html

```
##########################################################################
### FILE: scc
##########################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.erols.net!newspump.sol.net!news.mindspring.com!L2Co
From: L2Co@mindspring.com (Larry Knight)
Newsgroups: comp.sys.apple2.programmer
Subject: Re: Apple II Email (Network Connections)
Date: Thu, 10 Oct 1996 21:19:08 -0400
Organization: The L2 Company
Lines: 82
Message-ID: <19961010211908645007 7@user-168-121-33-105.dialup.mindspring.com>
References: <32546DD2.7CF3@wctc.net> <3255CE3F.4C16@uwrf.edu>
<3255D023.4090@wctc.net> <53e6i8$493@cisu2.jsc.nasa.gov> <325B944D.2414@wctc.net>
NNTP-Posting-Host: user-168-121-33-105.dialup.mindspring.com
X-Server-Date: 11 Oct 1996 01:18:32 GMT
X-Newsreader: MacSOUP 2.2b3

OK, I am new to this discussion, and completely ignorant of Apple II hardware,
but I think I can be of some service.

I am a hardware engineer that designs cache cards for Power Macs, and in a
former life spent a little time with LocalTalk issues when I worked for Hayes
(the modem guys).

A few comments/questions:

1: At the physical layer, LocalTalk (or PhoneNet) boxes are little more than
transformers (open one up sometime and look). They allow the RS-422 (NOT
RS-232!) outputs of the Mac serial ports to drive the signal onto the "bus"
which is the two-wire LocalTalk or PhoneNet cabling that is shared by multiple
devices.  RS-422 is a "push-pull" differential output and input system which has
superior noise cancellation properties than "single-ended"  drive types like
RS-232.  Don't worry though, the conversion between RS232 and RS422 is very
simple and cheap.

2: LocalTalk runs at 230,400 bps, and not at any slower speeds. Not only that,
but it is driven by a particular modulation scheme called Manchester II
encoding, and moreover it uses a SYNCHRONOUS protocol (I think it is SDLC, but
don't quote me on that).  Basically, to do LocalTalk easily, you pretty much
should use the chip that Apple uses on their motherboards - The SCC (Serial
Communications Controller), or 8530, available commercially from either Zilog
(are they still around??) or AMD (definitely still around!).

3: Does the Super Serial Card have the SCC on it, or just a simple UART? If
anyone has one handy that they can look at, just read the numbers on the largest
chips on the board, and I can probably tell you what kind of communications chip
that they have there. If it is NOT an SCC (just look for "8530" somewhere on the
chip markings), you will have big obstables to overcome in implementing
AppleTalk.  If the Super Serial Card DOES have an SCC on it, then you're far
along the path. The only remaining obstable is the proper programming of the
part, etc. (I'm not saying that is trivial, but at least the hardware support is
there).

4: If the Super Serial Card does NOT have an SCC on it, the most straightforward
path seems to get Apple to allow someone to make the Apple II workstation board
again, license-free (which I will guarantee without even looking at it that it
has an SCC on it).
```

I own a small hardware company (we engineer and manufacture cache cards for Power Macs), and would possibly be interested in manufacturing this board again, but certainly would need Apple's blessing.

Can anyone loan me a Apple II workstation board for a few days so I can take a look at one to see what the manufacturing costs would be? It can be dead or alive. If you have a dead one, could I keep it?

Comments? Does anyone have a clue as to whom should be contacted within Apple about this? Anyone out there know WOZ? He may be supportive of this movement to give the venerable Apple IIs another shot of life. There are lots of schools with these things just lying around gathering dust, and they could make great email stations for students!

By the way, in this discussion, I have not heard OfficeMail mentioned. It is from Claris, and is an Email POP server for a LAN. Any POP client can talk to it over LocalTalk OR TCP/IP - either will work. Of course, Claris would like you to use Emailer, which is a client for OfficeMail, and is also a great Eudora competitor as a general internet and online service email reader.

OfficeMail would make a nice server for the Apple II clients. Moreover, since it is from Claris, which is owned by Apple, there could be the remote possibility of some help from them in this adventure! It is also CHEAP - $275 or so for the server sofware, and there are NO license fees for adding clients (if you use a freeware mail program like Eudora).

Gee, I wonder if Claris would make a freeware Apple II version of Emailer that is HIGHLY stripped down? Wouldn't THAT be a kick! And a hell of a public service to the many schools owning these machines. TCP/IP would not be necessary, since the Apple II would be using LocalTalk.

Hey, WOZ, wherever you are! Can you chat up some of your friends at Claris? Can you give us some guidance here?

Larry Knight

--
The L2 Company http://www.mindspring.com/~l2co
3544 Jefferson Township Pkwy eMail: L2Co@mindspring.com
Marietta, GA, USA, 30066-1782
International: +1 770 641 9650 FAX : +1 770 641-9433

END OF FILE scc

```
##############################################################################
### FILE: shiftkeymod
##############################################################################

Path: news1.icaen!news.uiowa.edu!chi-
news.cic.net!feeder.chicago.cic.net!arclight.uoregon.edu!feed1.news.erols.com!howl
and.erols.net!news.sprintlink.net!news-
peer.sprintlink.net!visi.com!ns.qnis.net!not-for-mail
From: Steve Jensen <sjensen@ns.qnis.net>
Newsgroups: comp.sys.apple2
Subject: Re: Videx U/L-case board
Date: 20 Jan 1997 07:42:36 GMT
Organization: (missing)
Lines: 92
Message-ID: <5bv7lc$mfs@darla.visi.com>
References: <travis-1601970039570001@dream-king.cisco.com>
<5busst$jf9@borg.svpal.org>
NNTP-Posting-Host: ns.qnis.net
X-Newsreader: TIN [UNIX 1.3 unoff BETA release 961203]

Paul Creager <wily@svpal.svpal.org> wrote:
: Ward C. Travis (travis@cluracan.org) wrote:
: : I opened an Apple II+ the other day and two things surprised me...
: : First, there was a board labeled "VIDEX" tacked under the keyboard;

: The official name is the Videx Keyboard Enhancer.  It replaces Apple's
: keyboard encoder board underneath the keyboard.  Besides providing true
: U/L capability (with the Shift Key), it had a small (10-20 character)
: buffer and supported programmable macro keys.

: I had one on my ][+, until it went south.  I can't remember all that much
: about installation, dip switches, etc.  I do remember a couple of wires
: had to be run to the motherboard.  One enabled true Shift key usage.  The
: other I can't remember.  If you don't have a wire running to an IC on the
: motherboard, that explains why your Shift key isn't working.  It could
: very well be the same spot where the "traditional" Shift key mod is made,
: if that's any help.

Here's 3 files I have on the 'shift key mod':

                        II+ SHIFT KEY MOD
                        =================
Here is the "shift key mod" for a II+.  A wire should run from
the second pin from the edge opposite the power supply on the connector
between the keyboard and its piggy-back board (pin 24 if counting from
the other end).  It should go to one of the game port pins (pin 4) or
to pin 1 of a nearby 74LS251 (at board location "H14").

This wire connects the SHIFT keys to the "Switch 2" input on the game
port (which is infrequently used).  It allows programs to sense the
state of the shift key by watching the SW2 I/O location ($C062).  If
bit 7 is set, then the shift key is up.  If bit 7 is clear, then the
shift key is down.


HOW TO DO A "SHIFT KEY MOD"

To install the "shift key mod" on a II+ what you need to do is connect
a wire from the shift key pin on the keyboard aux. circuit board (this
```

hangs below the keyboard) to annunciator 3 on the joystick port. The shift key pin is the second pin from the right on the "piggy-back" circuit board under the keyboard. You will probably need to solder it on. Pin 4 on the joystick connector is where you stick the other end. You can just push the wire in and then probably replace the joystick (if there is one) right on top of it.

In case that was unclear, 2nd from the right means as you look under the keyboard from the front, and pin 4 is the fourth pin down on the left with
the notch at the top (on the joystick connector). Now, when the shift key is pressed, it sets (or clears?) AN3. Some programs look for this. However, DOS and Applesoft don't, as far as I know.

APPLE II SHIFTKEY MODIFICATION

The one wire shiftkey mod is the oldest and simplest fix that can be made to the Apple II to get true upper and lower case operations with the shift key. Most good word processors have input routines that check the PB2 input on the game I/O port to determine if the shift key is being pressed. Some programs that have these routines are Wordstar, Write-on, Apple Pascal 1.1 and many others. Follow the steps below to install the shift key mod.

parts:
1 mini-grabbette clip (Radio Shack PN 270-370)
1 15 in. piece of small guage wire
1 16 pin socket

1) Solder one end of the wire to the mini-grabbette clip.
2) Solder the other end of the wire to pin 4 of the 16 pin socket as close to the body of the socket as possible.
3) Turn the Apple II off and remove the cover.
4) Remove anything plugged into the game I/O socket.
5) Attach the mini-grabbette clip to pin 24 of the keyboard encoder connector. This connector is located inside the Apple II directly beneath the RESET key. Pin 1 is nearest the power supply and pin 25 is nearest the right edge of the Apple II. Use the grabbette clip to attach to the standoff _pin 24_ (second from the end).
6) Lead the other end of the wire with socket attached along the right edge of the motherboard and plug it into the game I/O port. Be careful to plug pin 1 to pin 1 when putting this socket in. Pin 1 of the game I/O port is towards the front of the computer.
7) Replace the cover and start using lower case characters.

eof

--

sjensen@qnis.net

END OF FILE shiftkeymod

```
########################################################################
### FILE: sider.tapes
########################################################################

Path: news1.icaen!news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.erols.net!news.maxwell.syr.edu!newscore.univie.ac.at!newsmaster-
01.vbs.at!newsfeed03.univie.ac.at!newsrouter.chello.at!news.chello.at!not-for-mail
From: "gasper" <gasper@teleweb.at>
Newsgroups: comp.sys.apple2.marketplace
References: <5gHH2.348$Vl4.13553@newsfeed.slurp.net>
Subject: Re: sider tape units ....what kinda tapes
Lines: 33
X-Newsreader: Microsoft Outlook Express 4.72.3155.0
X-MimeOLE: Produced By Microsoft MimeOLE V4.72.3155.0
Message-ID: <yBeI2.6995$_k1.4862@news.chello.at>
Date: Thu, 18 Mar 1999 21:53:34 GMT
NNTP-Posting-Host: 212.17.115.58
X-Complaints-To: news@telekabel.at
X-Trace: news.chello.at 921794014 212.17.115.58 (Thu, 18 Mar 1999 22:53:34 MET
DST)
NNTP-Posting-Date: Thu, 18 Mar 1999 22:53:34 MET DST
Organization: Chello Austria
Xref: news1.icaen comp.sys.apple2.marketplace:27775

Hallo,

Pls look for the following tapes for the SIDER Tape drive:

TEAC CT600H
VERBATIM ST600
MAYNSTREAM (MAYNARD) DATA CASETTE 600

hope this helps

Bye Michael
brad weelborg schrieb in Nachricht
<5gHH2.348$Vl4.13553@newsfeed.slurp.net>...
>found and old sider hd compatible tape unit (remember those) they use a
>wierd tape  looks like a cassette
>tape in a hi fi they were white i think..what kinda tape were they called
>????
>
>wondering if i can still get them someplace was gonna try the puppy out..
>
>(in sad need of a life)
>
>brad
>sysop@lost-gonzo.com
>www.lost-gonzo.com
>checkout my bbs i have 2 apple bbs systems running as doors off my www site
>apple file area plus extras telneter's get 90min a day free.
>
>
>
>
```

END OF FILE sider.tapes

```
##########################################################################
### FILE: sirius.ram
##########################################################################

Path: news1.icaen!news.uiowa.edu!news.physics.uiowa.edu!math.ohio-state.
edu!uwm.edu!chicago-news-feed2.bbnplanet.com!news.bbnplanet.com!newsfeed.
enteract.com!news.enteract.com!netnews.com!news.idt.net!nyd.news.ans.net!
newsfeeds.ans.net!newsxfer.itd.umich.edu!news2.acs.oakland.edu!cwis-20.wayne.
edu!moose!pschultz
From: Paul Schultz <pschultz@med.wayne.edu>
Newsgroups: comp.sys.apple2
Subject: Re: Question:ZipGS/RAMfast SCSI/ROM 3 GS
Date: Fri, 29 May 1998 17:05:43 -0400
Organization: Wayne State University
Lines: 80
Message-ID: <Pine.SOL.3.96.980529164903.22013A-100000@moose>
References: <1998052801021600.VAA24188@ladder01.news.aol.com>
<1998052802082600.WAA03446@ladder01.news.aol.com>
NNTP-Posting-Host: 146.9.3.20
Mime-Version: 1.0
Content-Type: TEXT/PLAIN; charset=US-ASCII
X-Sender: pschultz@moose
To: LJSILICON <ljsilicon@aol.com>
In-Reply-To: <1998052802082600.WAA03446@ladder01.news.aol.com>
Xref: news1.icaen comp.sys.apple2:134620

On 28 May 1998, LJSILICON wrote:

> Supertimer,
> Yes, the control panel was set to YOUR CARD.
>
> I hadn't seen the post on removing the first bank of SIMS. I did not get much
> doc with the card. There are 5 sets of 3 jumpers on the front of the Sirius
> card. Do any of these jumpers need changed if the SIMM is pulled? Do you have
> any idea what these jumpers control.
>

If you have the Sirius with the set of jumpers then you have version 2.0
of the memory card. The previously quoted comments of mine were in regard
the the version 1.0 Sirius card which had no jumpers since it could 'self
detect' SIMMs in its slots. It is version 1.0 which works better if you
have a SIMM in the 8th slot even if it is being used on a ROM 3.

As for your version 2.0 card and the jumpers....

The jumpers are used to configure the card so it knows how many SIMMs
you have installed and whether they are 256KB or 1MB SIMMs. You can
have the following set-ups according to the docs (1 sheet of paper!):
(assumes 1 MB SIMMs unless explicitly noted)

1 Meg:

 7.5C o=o o
   D4 o o=o  D6
1024K o=o o  256K
    L o o=o  CRow0
    H o o=o  CRow1

2 Meg:
```

```
 7.5C o=o o
   D4 o o=o  D6
1024K o=o o  256K
    L o o=o  CRow0
    H o=o o  CRow1

4 Meg:

 7.5C o=o o
   D4 o o=o  D6
1024K o=o o  256K
    L o o=o  CRow0
    H o o=o  CRow1

8 Meg:

 7.5C o o=o
   D4 o o=o  D6
1024K o=o o  256K
    L o o=o  CRow0
    H o o=o  CRow1

1 Meg (256K SIMMs):

 7.5C o=o o
   D4 o=o o  D6
1024K o o=o  256K
    L o o=o  CRow0
    H o o=o  CRow1

2 Meg (256K SIMMs):

 7.5C o o=o
   D4 o=o o  D6
1024K o o=o  256K
    L o o=o  CRow0
    H o o=o  CRow1

I hope this is helpful.

Paul.

pschultz@med.wayne.edu
Paul Schultz



### END OF FILE sirius.ram
```

```
##############################################################################
### FILE: sonicblaster
##############################################################################

Path: news.uiowa.edu!chi-
news.cic.net!newsfeeder.sdsu.edu!newspump.sol.net!spool.mu.edu!noc.nyx.net!nyx10.c
s.du.edu!not-for-mail
From: wbaguhn@nyx10.cs.du.edu (Will Baguhn)
Newsgroups: comp.sys.apple2
Subject: Sonic Blaster
Date: 26 Jun 1996 23:21:14 -0600
Organization: I am the error in apps of delight
Lines: 38
Message-ID: <4qt5oa$hqm@nyx10.cs.du.edu>
NNTP-Posting-Host: nyx10.nyx.net


Some time ago, I got an AE Sonic Blaster, but didn't get the cable/backplate
that went with it (i.e. I just had the card, and nothing through which
I could attach it to speakers).  A little poking around, and that
annoying Brian Hammack (:) sent me the "magic" pinouts of how to build the
cable.  I'm sharing the info with the world, just in case someone else
gets a Sonic Blaster... (or, in case someone wants to re-build their
current audio backplate to have sheilded cable...)

>Here's the schematic according to my limited ability:

>MOLEX-6 ON CARD    OUT (1/8" stereo jack)
> ----
> || .1             Barrel - 2
> || .2                Mid - 1
> || .3                Tip - 3        IN (1/8" stereo jack)
> || .4
> || .5                               Barrel - 5
> || .6                                  Mid - 4
> ----                                   Tip - 6
>
>The original plate & cable is as such when looking from the keyboard
>end, top to bottom, blue red white blue red white off the molex-6 with
>the top three going to the OUT and the bottom three going to the IN,
>with the two "sets" both in heatshrink tube.

>The plate the two jacks are on is metal, and is screwed down into the
>metal frame inside the GS's outlet as grounding; I'll assume that since
>they are "internal" jacks the barrel contacts do the actual work. :)
>The manual really stresses that the plate MUST be touching the metal
>shield inside the case for proper operation so take heed.

>Hope this all helps...                                  << mushroom >>

> * 2qwk! 2.02 * "You go online, you get techno-weenievision." - J.Harris

--
                                        --- SPQR (wbaguhn@nyx.net)


### END OF FILE sonicblaster
```

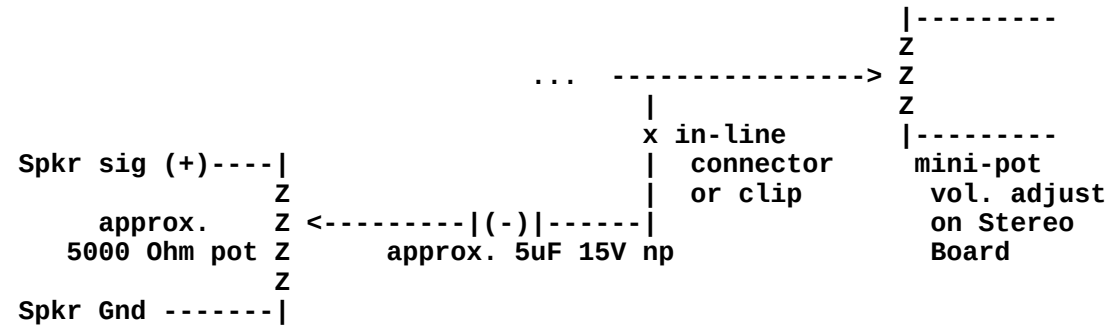
```
##########################################################################
### FILE: sound.caps
##########################################################################

Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!nyd.news.ans.net!newsfeeds.ans.
net!news.idt.net!nntp.giganews.com!cyclone.swbell.net!typhoon01.swbell.net.POSTED!
not-for-mail
Message-ID: <366D7DB8.A108FA6B@swbell.net>
From: Rubywand <rubywand@swbell.net>
Reply-To: rubywand@swbell.net
X-Mailer: Mozilla 4.06 [en] (Win95; I)
MIME-Version: 1.0
Newsgroups: comp.sys.apple2
Subject: Re: SuperSonic
References: <366d5143.0@news.pacifier.com>
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
Lines: 76
Date: Tue, 08 Dec 1998 13:27:52 -0600
NNTP-Posting-Host: 207.193.9.50
X-Complaints-To: abuse@swbell.net
X-Trace: typhoon01.swbell.net 913145089 207.193.9.50 (Tue, 08 Dec 1998 11:24:49
PDT)
NNTP-Posting-Date: Tue, 08 Dec 1998 11:24:49 PDT
Organization: SBC Internet Services
Xref: news1.icaen comp.sys.apple2:142768

Ronald Clark writes ...
>
> Is there a way to make sounds not from the sound chip to go in the card?

     If you are connecting your Stereo Board outputs to a stereo
amplifier or to speakers with built-in amplifiers, a simple way to mix
in 'Old Apple' sounds is to connect a capacitor from the signal ("+" or
non-ground) Spkr lead to one of the Stereo Card outputs.

     This connection mixes in combined (mono) IIgs sound, too. This is
why a pot is included in the circuit. It lets you adjust how much of the
Old Apple and mono GS sound to mix in so that, when sound is coming
through the Stereo Board, the Stereo Board sound will predominate.

     The pic below shows a 5uF 15V non-polarized electrolytic cap
running from a pot across the Spkr leads to the center of the Right
Output socket. (You can use a couple regular 10uF caps connected back to
back.)


 ----------------------------------------------o) Left Output

 ----------------------------------------------o) Right Output
                                               |
                                               x in-line connector
 Spkr sig (+)----|                             |   or clip
                 Z                             |
      approx.    Z <------------|(-)|------|
    5000 Ohm pot Z      approx. 5uF 15V np
                 Z
 Spkr Gnd -------|
```

None of the values shown is especially critical and it does not matter which channel output you connect to. The in-line connector or clip is to allow disconnecting the Old Apple Sound wire when you wish to remove the Stereo Board for cleaning, etc.. It can be just a place where the wires are twisted together and covered with tubing which fits snugly.

A handy place to connect the pot leads is on the Speaker connector at the right front corner of the motherboard. You can tac on wires near the bottom of the pins to leave room for reconnecting the Speaker plug.

Note: As you face the front, the Left pin is +. It does not matter which outside leads of the pot go to which pins unless you care about having a clockwise turn = more volume. Otherwise, just connect the end leads and set the pot for the output level you like.

If your Stereo Board has outputs which can drive speakers and you want to connect plain (unamplified) speakers to the board, the above connection will not do the job. If you do not mind poking around on your Stereo Board, you can probably find a couple of mini pots which set output volume for each channel. (I do not know if the SuperSonic board has these. It's a fairly common feature on sound boards with power amp outputs.) The middle lead of one of the pots (either one) is a pretty good bet as the place to connect the lead coming from the in-line connector.



Rubywand

END OF FILE sound.caps

```
##########################################################################
### FILE: sound.cards
##########################################################################

Path: news1.icaen!news.uiowa.edu!uunet!in3.uu.net!128.230.129.112!news-
spur1.maxwell.syr.edu!news.maxwell.syr.edu!sunqbc.risq.qc.ca!newsflash.concordia.c
a!not-for-mail
From: spec@vax2.concordia.ca (Mitchell Spector)
Newsgroups: comp.sys.apple2
Subject: Re: What is the Best Sound card for the IIgs?
Date: 24 Sep 1997 02:13 -0500
Organization: Concordia University
Lines: 48
Distribution: world
Message-ID: <24SEP199702130245@vax2.concordia.ca>
References: <604j2a$bap$2@mentor.telis.org>
NNTP-Posting-Host: vax2.concordia.ca
NNTP-Posting-User: SPEC
News-Software: VAX/VMS VNEWS 1.50AXP

In article itsme <quantum@telis.org> writes...

>What is the best sound card for the IIgs?  I would like options like
>stereo, microphone input, software controllable output...
>
>What are some good sound cards, and what features do they have?

    The best one out there is probably Applied Engineering's Audio
Animator. That consisted of an interface board with a Z8530 serial
chip that connected up to an external sound mixer box. It used its
own ADC (inside the shielded box) to digitize sound at a much higher
quality than the Ensoniq's own ADC, and with the ability to capture
in true stereo (some cards did not offer this). The mixer included
two 1/4" phono connectors and four RCA connectors for input/output,
as well as volume sliders to control sound levels. Another nice
touch was that it also provided MIDI compatibility and had three
standard DIN5 connectors for that.

    Another good card (and probably just as good as the AE AA) was
the Applied Visions FutureSound card. It too used its own ADC to
digitize sound and gave very clean stereo output, though these are
a little on the rare side to find.

    Other options worth checking into are the MDIdeas SuperSonic
Stereo card, which gave clean output (if you jumpered the card using
the 'LN' output) and had a piggyback digitizer option. However that
used the ADC from the Ensoniq and generally was very hissy and noisy
from my own experience with at least three of these boards. There
was the 'Digitizer Pro' option which was a full sized card, and like
the others above used its own ADC, but this is extremely rare and
hard to find (so few people have owned them I have no idea how well
it worked). Although it was decent, I was never fond of the MDIdeas
card because all the connectors were internal, forcing you to run
wires and speaker connectors _inside_ the GS's case (I damaged a pair
of speakers having to wedge the 1/8" phono's tail up against the back
of the case).

    The only stereo/digitizer board you can still purchase new is
the Alltech (formely Econ) SoundMeister card. It's an average card,
```

it works but nothing to say beyond that. I list it here because you can still buy it, not because it was an exceptional card. There are of course other cards out there, but they're mostly mediocre ones (speaking of mediocre, avoid the AE SonicBlaster, that was a poorly designed card that wasn't properly shielded and had problems with output at certain levels I recall).

Mitchell Spector
spec@vax2.concordia.ca
Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!nyd.news.ans.net!newsfeeds.ans.net!news.idt.net!news-peer-east.sprintlink.net!news.sprintlink.net!sunqbc.risq.qc.ca!newsflash.concordia.ca!not-for-mail
From: spec@vax2.concordia.ca (Mitchell Spector)
Newsgroups: comp.sys.apple2
Subject: Re: Sound Boards
Date: 13 Aug 1998 02:53 EDT
Organization: Opus One
Lines: 85
Distribution: world
Message-ID: <13AUG199802534868@vax2.concordia.ca>
References: <35D20115.11F9@terra.cira.colostate.edu>
NNTP-Posting-Host: vax2.concordia.ca
News-Software: VAX/VMS VNEWS 1.50AXP
Xref: news1.icaen comp.sys.apple2:138054

In article Jeff Lemke <lemke@terra.cira.colostate.edu> writes...

>Can anybody give me a comparison of the sound capabilities of the
>Applied Engineering Phasor and the native sound capabilties of the IIgs?

The Phasor:

Well the Phasor was an optional plug-in board designed for the Apple II Plus and IIe (which had no sound capabilities built-in, other than a speaker which could be toggled on/off to produce a click or beep like PC's). It used 4 General Instrument AY-3-8913 sound chips, an SSI-263 speech chip (with the option of adding a second) and had a built-in 4 watt amplifier which could output in true stereo. There were DIP switches on the card which would allow it to emulate other Apple II sound cards, such as the old Mockingboard or Echo+ speech card (I was never able to get the latter emulation to function).

Each AY-3-8913 (identical to the AY-3-8910 as far as I know, only it came in a smaller package) could produce 3 independant voices, plus a 4th channel for a white noise generator. With all the chips combined, that gave it 12 voices, 4 white noise channels and 1 or 2 synthesized speech channels. The AY-3-8910 could be used to produce sounds and music and was commonly used in old arcade machines in the 80's (not to mention a couple of computers, like the TI99/4a, Intellivision, Atari ST, etc). It was limited though in that it could only produce sound using pre-calculated waveforms (squarewave, sinewave, tringlewave and so on) so it was rather artifical sounding. It was similar to IBM sound cards like the AdLib and SoundBlaster, only those were much more advanced and used FM synthesis.

The Apple IIgs:

The IIgs came standard with a sound coprocessor chip built-in every machine. That chip was the Ensoniq 5503 Digital Oscillator Chip (Ensoniq DOC). It had 32 oscillators, which could either be used independantly or paired with others to create richer sound. The Apple IIgs paired them (with two reserved, for timing control I believe) and had 15 voices. Some programs unpaired them to get near 32 voices (e.g. Diversi-Tune) while others paired them twice to get better sound (e.g. synthLAB, which has 7 voices). Unlike the Phasor and other sound chips, the Ensoniq could do wavetable synthesis. In otherwords, it could use an unlimited spectrum of waveforms to create all sorts of sound variations and of course, very realistic ones (you could digitize the sound of a real piano or real violin as a basis for your waveform. Nothing exciting today, but back in 1986 this was unheard of in a personal computer).

The Ensoniq 5503 worked in 8-bit sound resolution, and could play back at sampling rates up to 44.1 kHz and even _much_ higher [I'll leave out any comments about the low pass filter as I'm a little confused about it presently, as half the people out there say it is bad, while the other half say its good. Oh, and no need to repost those article clippings, Supertimer and Scott G. ;-)] It had both a DAC and ADC built-in, so you could play back and record digital sound recordings. It also had 8 independant stereo channels through which each of the 32 oscillators could play through, potentially giving the GS the ability to have stereo sound came out of multiple speakers (sound in front, back, sides, up and down). Unfortunately Apple wired all 8 channels into one monorail channel through the 1/8" headphone jack, but they made the signals available through a molex connector on the mainboard. All existing third party stereo cards only decoded two channels, so you only got left/right stereo, like most computers and home audio equipment today.

In summary, while you could do interesting sound and speech with the Phasor card, the Ensoniq chip in the IIgs complete blew it away (as well as all other computers back in the 80's--and most in the early 90's). The Ensoniq was a professional music synthesizer chip, the same one used in the Mirage keyboard. It could do everything the Phasor was capable of, including speech synthesis, not to mention even emulate the Phasor's AY-3-8913 chips. Today its fairly obsolite compared with modern versions of the Ensoniq and other wavetable chips and technologies (you can see that if you try to use it to play MIDI files ;-) though still quite impressive for a 12 year old machine! For example, you can play 8 voice MOD files using a stock 2.6 MHz Apple IIgs as the chip acts as a coprocessor (the Macintosh Plus and SE, with its more powerful 68000 but lesser 4 channel DAC, cannot play MODs at all).

Mitchell Spector
spec@vax2.concordia.ca

END OF FILE sound.cards

```
######################################################################
### FILE: sound.digitizer
######################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!newsfeed.internetmci.com!in2.uu.net!newsflash.con
cordia.ca!not-for-mail
From: spec@vax2.concordia.ca (Mitchell Spector)
Newsgroups: comp.sys.apple2
Subject: Re: Sound Input on IIGS
Date: 3 Aug 1996 05:18 -0500
Organization: Concordia University
Lines: 18
Sender: spec@vax2.concordia.ca (vax2.concordia.ca)
Distribution: world
Message-ID: <3AUG199605184864@vax2.concordia.ca>
References: <4tstqs$s61@milo.vcn.bc.ca> <4tsv92$p1v@login.freenet.columbus.oh.us>
NNTP-Posting-Host: vax2.concordia.ca
News-Software: VAX/VMS VNEWS 1.50AXP

In article dmasters@freenet.columbus.oh.us (Dan Masterson) writes...
>
>Al Crout (acrout@vcn.bc.ca) wrote:
>: An interesting article by Roland Gustavson (I think) appeared in an issue
>: of A+ or inCider on how to use a Radio Shack intercom as a microphone to
>: connect to the 7 pin connector on the motherboard of the IIGS for sound
>: sampling.
>
>Which issue?

   A+ Magazine, April 1987 issue, on page 93. There is also a follow-up
in the September 1987 issue (page 84) with a brief mention of the what's
involved, complete with photo diagrams. The page before it has an Applesoft
BASIC listing for a real-time oscilloscope which you can test it with (I'm
fairly sure MDIdeas shipped it with their SuperSonic digitizer card :)

Mitchell Spector
spec@vax2.concordia.ca


### END OF FILE sound.digitizer
```

```
##########################################################################
### FILE: soundin
##########################################################################
```

Re: Sound Input on IIGS

From: dempson@actrix.gen.nz (David Empson)
Reply to: David Empson
Date: Tue, 06 Aug 1996 01:02:22 +1200
Organization: Empsoft
Newsgroups:
comp.sys.apple2
Followup to: newsgroup(s)
References:
<4tsc5k$r7l@news.vanderbilt.edu>
<3AUG199606073181@vax2.concordia.ca>
<4u3tos$ian@news.vanderbilt.edu>

In article <4u3tos$ian@news.vanderbilt.edu>, lesherjt@vuse.vanderbilt.edu (Tilghman Lesher) wrote:

>Mitchell Spector (spec@vax2.concordia.ca) wrote:
>: In article lesherjt@vuse.vanderbilt.edu (John Lesher) writes...
>: >
>: > How can I get the IIGS to sample sound? When I had
>: >my //e, I had this nifty little program to sample sound via
>: >the cassette port, but the IIGS has no cassette port. Is
>: >there a simple method? Or must I buy a peripheral card?
>
>[snip]
>
>: As I mention above, sound sampling is built-in to the chip (ADC),
>: but Apple didn't add any conventional way to plug in your sound source.
>: They did however provide a set of molex I/O pins. You basically have
>
>[snip]
>
>Where on the motherboard are these pins and (if > 2) what are the
>pinouts?

It is the 7-pin molex connector in the lower right corner of the motherboard, next to the Ensoniq. All stereo cards plug into this connector.

Most of the pins are used for sound output and associated demultiplexing. Pin 1 is the sound input and pin 2 is analog ground. (Pin 1 is the one closest to the back of the computer, right next to the legend "J25" on the ROM 1 motherboard.)

The sound input expects a signal which has a maximum range of 2.5V peak to peak. The input impedance is 3000 ohms.

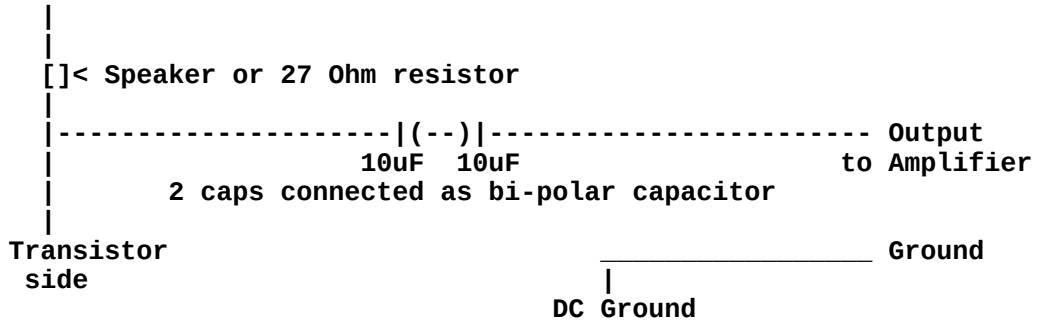
I'm not all that clear on audio impedances and voltages, so I'm not sure if it is safe to connect anything directly to this pin. It may be necessary to use a simple amplifier circuit to handle impedance matching.

Can anyone elaborate on this?

--
David Empson
dempson@actrix.gen.nz
Snail Mail: P.O. Box 27-103, Wellington, New Zealand

END OF FILE soundin

```
##########################################################################
### FILE: speaker.plug
##########################################################################

Path: news1.icaen!news.uiowa.edu!news2.chicago.iagnet.net!qual.net!
iagnet.net!newsreader.digex.net!dca1-hub1.news.digex.net!digex!howland.
erols.net!netnews.com!news.idt.net!nntp.giganews.com!newsgate.swbell.
net!151.164.30.35.MISMATCH!cyclone.swbell.net!swbell!not-for-mail
From: Rubywand <rubywand@swbell.net>
Newsgroups: comp.sys.apple2
Subject: Re: Apple speaker
Date: Thu, 30 Apr 1998 23:50:22 -0500
Organization: Southwestern Bell Internet Services, Richardson, TX
Lines: 48
Message-ID: <3549548E.7DDA2A4B@swbell.net>
References: <1998042605430701.BAA23437@ladder01.news.aol.com>
Reply-To: rubywand@swbell.net
NNTP-Posting-Host: ppp-207-193-11-206.hstntx.swbell.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Trace: (null) 893997620 17195 (None) 207.193.11.206
X-Complaints-To: usenet@nnrp3
X-Mailer: Mozilla 4.04 [en] (Win95; I)
Xref: news1.icaen comp.sys.apple2:133175

TomMage writes ...
>
> Hello, I tried it, bought a cable with an RCA plug at one end and two
> bare wires on the other end. Tried hooking it up by splicing into the
> speaker wires and also disconnecting the speaker wires at the post and
> hooking up directly to the posts. Neither method seems to work, do you
> have any idea why??

 ....


     Yes. The speaker is in the Collector circuit of the output
transistor-- one end of the spkr goes to a resistor and capacitor
connected to the output transistor Collector and the other goes to +5V
(not ground).  To get an audio output signal, the spkr must be in place;
or, you can substitute a 1 watt resistor-- something in the 22-39 Ohm
range.

     The output should come from the side of the spkr (or 1 watt
resistor) going to the resistor & capacitor connected to the
transistor-- i.e. the side which is _not_ the +5V side. The output goes
through a coupling capacitor to the center lead of your RCA plug. The
Ground side of the RCA plug goes to ground.

    "Ground" is DC ground = any motherboard trace area which is
connected to the ground side of the power supply. For example, the
outside "shell" of the composite video output is soldered to ground.


     Here is a rough picture ...


     +5V side
```



You can get a bi-polar coupling capacitor at Radio Shack (2uF-5uF is fine) or make one by connecting two 10uF caps neg end to neg end. (The value is not critical, two 5uF caps connected back to back is fine.)

Rubywand

END OF FILE speaker.plug

```
##########################################################################
### FILE: speed.demon
##########################################################################

Path:
blue.weeg.uiowa.edu!news.uiowa.edu!uunet!MathWorks.Com!news.kei.com!eff!wariat.org
!malgudi.oar.net!mercury.wright.edu!college.antioch.edu!adbbs!John_L._Graham
Message-ID: <-525008930.485734@adbbs.adbbs.antioch.edu>
Date: 05 Sep 1994 01:35:29 -0000
From: John_L._Graham@adbbs.antioch.edu (John L. Graham)
Organization: Apple Dayton Users Group, Dayton OH
Reply-To: John_L._Graham@adbbs.antioch.edu
Subject: Re: Zip question (not Zip GS)
Distribution: world
Newsgroups: comp.sys.apple2
Lines: 12

Yeah, I have a IIc+, but every time I need to run it at 1 MHz I have to look
the key sequence up. The Zip is a LOT easier. When you turn on an Apple II
with a Zip there's a slight pause (about 1 sec) before you hear the startup
beep. If you press the "escape" key during the pause it comes up at 1 MHz.
Older Speed Demon cards worked the same way, but you had to continue the boot
with a control-reset. I have IIs with both Zips and Speed Demons in them, and
they just keep chugging away!

Have fun!

John



### END OF FILE speed.demon
```

```
##############################################################################
### FILE: speeddemon
##############################################################################

Path:
nexus.uiowa.edu!uunet!cs.utexas.edu!howland.reston.ans.net!agate!library.ucla.edu!
news.mic.ucla.edu!ctc.com!news.cs.umb.edu!hsdndev!dartvax.dartmouth.edu!saturn.cap
s.maine.edu!maine.maine.edu!io10677
Organization: University of Maine System
Date: Fri, 24 Dec 1993 18:52:09 EST
From: Douglas M. Howell <IO10677@MAINE.MAINE.EDU>
Message-ID: <93358.185209IO10677@MAINE.MAINE.EDU>
Newsgroups: comp.sys.apple2
Subject: Re: Speed Demon Dip Switches...
References: <estabroo.756598365@maroon.tc.umn.edu>
Lines: 64


This is from the 1-page manual that comes with the card:
    For owners without a Bank Switch Language Card in thire Apple, the first
seven DIP switches control the access speed of the following:
      switch 1 -- controls -- slot 1
      switch 2 --    "     -- slot 2
      switch 3 --    "     -- slot 3
      switch 4 --    "     -- paddle/joystick port
      switch 5 --    "     -- slot 5
      switch 6 --    "     -- slot 6
      switch 7 --    "     -- slot 7

OFF indicates slot/port is accessed at High Speed.
ON indicates slot/port is to Slow Down for access.

     All slots that can be accessed at High Speed and all empty
slots should have the corresponding Dip switch set to "OFF" (this
is the non-bank switch setting).

Special Note about Switch 4:
     Switch 4 on the SpeedDemon DIP switch no longer controlsthe access
speed to slot 4.   It now controls how the joystick and paddles are
read.
     If switch 4 is in the "ON" position, the SpeedDemon will slow down
to normal Apple speed for 50 milliseconds each time the joystick is
accessed.  This allows the software to read the joystick or paddles
correctly.  If switch 4 is in the "OFF" position, the SpeedDemon will not
slow down when they are accessed.
     Access to slot 4 is always at SLOW (normal) Apple speed.
     Certain programs, such as Appleworks, use the joystick location, even
when the joystick is not in use.  If dip switch 4 is set to "ON" then
these programs will not show any speed for some functions, such as
calculations and sorts. Therefor, unless you need youysticks for your
applications, switch 4 should be set in the "OFF" position.
     If you have a Bank Switch Card (extended 80-col card, Ramworks II,
Titan Saturn 128k card, excetera..) set switch 8 to the "ON" position.

Bank Switch Language Card Location:
   Dip Switches 1-3 encode the location of your Bank switch language card.
Use the following table to find the appropriate setting for your machine:
      Dip Switch   Bank Switch Card Location
      1   2   3    Slot #
```

---	---	---	------
off	off	off	0
off	off	on	1
off	on	off	2
off	on	on	3
on	off	off	4
on	off	on	5
on	on	off	6
on	on	on	7

If you have two bank switch cards in your system, one must reside in slot 0. The other must be in the slot selected by DIP switches 1-3 above.

Special Note: Because the first three switches are used to encode the location of the Bank Switch Language Card, you can no longer control the speed of all the slots. Specifically you can not control slots 1,3, or 6. These slots woll now always run Fast except for slot 6 which will always run Slow.

Special Note: The slot that the SpeedDemon card resides in should be set to the "Off" position

Note: The above information is for version 3.03, your milage may vary.

END OF FILE speeddemon

```
##############################################################################
### FILE: ssc.cable
##############################################################################

Newsgroups: comp.sys.apple2
Path:
blue.weeg.uiowa.edu!news.uiowa.edu!uunet!comp.vuw.ac.nz!actrix.gen.nz!dempson
From: dempson@atlantis.actrix.gen.nz (David Empson)
Subject: Re: Request 4 SSC cable diagram
Message-ID: <Czs16J.Eox@actrix.gen.nz>
Nntp-Posting-Host: atlantis.actrix.gen.nz
Sender: news@actrix.gen.nz (News Administrator)
Organization: Actrix - New Zealand Internet Service Providers
Date: Thu, 24 Nov 1994 14:49:29 GMT
References: <59437-785633280@mindlink.bc.ca>
Lines: 28

In article <59437-785633280@mindlink.bc.ca>,
Allan Crout <Allan_Crout@mindlink.bc.ca> wrote:
> Greetings,
>
> I would be grateful if some one would post the Super Serial Card cable
> wiring: IDC (10pin at the card end) to DB25 (male) connector?

The DB-25 is female, not male.

From the original SSC manual:

IDC-10    DB-25   Function (with block in MODEM position)

1         1       Frame Ground
2         2       Transmit Data
3         3       Receive Data
4         4       Request To Send
5         5       Clear To Send
6         6       Data Set Ready
7         19      Secondary Clear To Send
8         7       Signal Ground
9         20      Data Terminal Ready
10        8       Data Carrier Detect

--
David Empson
dempson@actrix.gen.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand


### END OF FILE ssc.cable
```

```
##############################################################################
### FILE: ssc.cts.etc
##############################################################################

Path:
news.weeg.uiowa.edu!news.uiowa.edu!uunet!decwrl!waikato.ac.nz!comp.vuw.ac.nz!actri
x!David.Empson
Newsgroups: comp.sys.apple2
Subject: Re: Apple SSC and CTS/RTS choking on the 6551
Message-ID: <1992Nov22.120942.24952@actrix.gen.nz>
From: David.Empson@bbs.actrix.gen.nz
Date: Sun, 22 Nov 1992 12:09:42 GMT
Sender: David.Empson@actrix.gen.nz (David Empson)
References: <uerics.721932539@mcl> <1992Nov16.215050.13861@cs.UAlberta.CA>
<1992Nov20.210357.24001@mintaka.lcs.mit.edu>
Organization: Actrix Information Exchange
Lines: 25

In article <1992Nov20.210357.24001@mintaka.lcs.mit.edu> johnp@silver.lcs.mit.edu
(John Palaima) writes:
> Does anyone know a hardware cure for fixing the screwy 6551 on the
> SSC card other than replacing it with the CMOS..it fixes the problem
> but the timing ould be too far off

Please elaborate.  What do you mean by "the timing would be too far
off"?  The 6551 and 65C51 have nearly identical bus interface
timings characteristics.

I gather your problem with the 6551 is that CTS kills the trasmitter,
RTS kills the transmitter, DTR kills the receiver AND the transmitter,
and DCD kills the receiver.

On the 65C51, CTS still kills the transmitter, but it lets a partial
byte through.  Similarly, DCD kills the receiver but lets a partial
byte through.

The other signals behave as before - turning off RTS will disable the
transmitter, turning off DTR will disable all transmit and receive (and
interrupts).
--
David Empson

Internet: David.Empson@bbs.actrix.gen.nz    EMPSON_D@kosmos.wcc.govt.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand
Path: news.weeg.uiowa.edu!news.uiowa.edu!uunet!cs.utexas.edu!ut-
emx!ccwf.cc.utexas.edu
From: foegelle@ccwf.cc.utexas.edu (Michael Foegelle)
Newsgroups: comp.sys.apple2
Subject: Re: Fast modems and the SSC
Message-ID: <84168@ut-emx.uucp>
Date: 22 Nov 92 22:21:19 GMT
References: <01GR5CHJVLQAB7AW8E@RCNVMS.RCN.MASS.EDU>
<1992Nov14.220135.23211@netcom.com> <1992Nov16.074456.13677@actrix.gen.nz>
Sender: news@ut-emx.uucp
Organization: The University of Texas at Austin, Austin TX
Lines: 46

In article <1992Nov16.074456.13677@actrix.gen.nz> David.Empson@bbs.actrix.gen.nz
writes:
```

>Regarding the Super Serial Card, which uses a 6551:
>
>The 6551 has two very nasty features with its flow control inputs. If
>the CTS input goes inactive, the transmit data signal is IMMEDIATELY
>cut off.
>
    >Stuff about DCD and DSR deleted<
>
>The CMOS 6551 (65C51) is somewhat better: CTS cuts off the transmitter
>after the current byte has been completely transmitted. It has the
>same behaviour for DCD.
>Its other advantage is that disabling receive interrupts also disables
>the DCD and DSR change of state interrupt. This cannot be disabled on
>the original 6551, which is why a IIe will usually hang if you unplug
>the modem from the SSC while you aren't in a comms program.
>
Be careful with your descriptions. The 65C51A works as you describe, but the
65C51 works identically to the 6551 in terms of CTS. At least that's the way
the GE/Harris/RCA version works. I believe there's also a 6551A available
which may solve the problem as well.

>BUT, I don't think you can simply replace a 6551 with a 65C51. We
>tried this in one of the products my company produces, and it didn't
>work reliably, because the two chips expect different types of crystals.
>--
I'm using a 65C51A in my SSC with my 14.4Kbaud Supra with no problems. It
also solved the problem that the 6551 had with RTS low forcing CTS low
internally (a problem mentioned several months back).

For about six bucks from a mail order electronics house, it's a pretty easy
fix.

>David Empson
>
>Internet: David.Empson@bbs.actrix.gen.nz   EMPSON_D@kosmos.wcc.govt.nz
>Snail mail: P.O. Box 27-103, Wellington, New Zealand

--

Michael Foegelle		foegelle@ccwf.cc.utexas.edu
_____	You want it	foegelle@utaphy.ph.utexas.edu
		GEnie: M.FOEGELLE2
University of	WHEN?	Wunderland BBS (512) 472-0544
Texas at Austin		14.4kbaud, v.32/bis: Sysop

END OF FILE ssc.cts.etc

```
##############################################################################
### FILE: ssc.dips
##############################################################################

Newsgroups: comp.sys.apple2.programmer
Path: news.uiowa.edu!chi-
news.cic.net!news.gryffin.com!news.ece.uc.edu!babbage.ece.uc.edu!news.kei.com!news
.mathworks.com!tank.news.pipex.net!pipex!news.sprintlink.net!in2.uu.net!news1.digi
tal.com!decwrl!waikato!comp.vuw.ac.nz!actrix.gen.nz!dempson
From: dempson@atlantis.actrix.gen.nz (David Empson)
Subject: Re: Apple Super Serial Cards
Message-ID: <DFrs8D.H5v@actrix.gen.nz>
Sender: news@actrix.gen.nz (News Administrator)
Organization: Actrix - Internet Services
Date: Sun, 1 Oct 1995 12:33:48 GMT
References: <447dhe$a33@server05.icaen.uiowa.edu>
X-Nntp-Posting-Host: atlantis.actrix.gen.nz
Lines: 203

In article <447dhe$a33@server05.icaen.uiowa.edu>, 2230  <brockman> wrote:
> I have 2 apple IIe's that I'm trying to get to communicate with each other...
> And I need doc's on the card, or some info...
> Specificaly,  What should I set the dips to... Modem or Terminal, and
> finnally.. what about the Software....

Below is an extract from a mail message I sent to someone a while ago
which should contain enough information to get you started.

To connect two super serial cards together for communications, your
best option is to set both of them for a MODEM connection in
Communications mode, and use a null-modem cable wired as follows:

2   -------------------------- 3
3   -------------------------- 2
4,5 -------------------------- 8
8   -------------------------- 4,5
7   -------------------------- 7
6   -------------------------- 20
20  -------------------------- 6

Note that the cable is symmetrical.

You can probably get away with a few less flow control signals, but
this will guarantee that everything works properly.

If you only have a straight through ribbon cable available, change one
of the jumper blocks to the TERMINAL position, which reverses all of
the data and flow control pins (see below for details).

Software: any IIe-based communications software should do the trick.
There are some freeware and shareware programs around, e.g. Z-Link
(shareware) and Kermit (freeware).

--- Begin extract ---

The plug on the card can be in either of two configurations.  If you
look near the back of the card, you will see a large black block with
an arrow on it, and the words MODEM above and TERMINAL below it.
The arrow will be pointing to either of these words.  You can remove
```

the block (it is socketed) and reverse it.

With the arrow pointing to TERMINAL, the card is configured to plug directly into a terminal or printer with a straight-through serial cable. With the arrow pointing to MODEM, the card is configured to plug directly into a modem with a straight-through serial cable.

In the MODEM position, the connector is wired as a DTE. It uses the following pins:

1 Frame Ground
2 Transmit Data
3 Receive Data
4 RTS
5 CTS
6 DSR
7 Signal Ground
8 DCD
20 DTR

In the TERMINAL position, the connector is wired as a DCE. It uses the following pins:

1 Frame Ground
2 Receive Data
3 Transmit Data
4 (incoming flow control, goes to DCD input of 6551 if switch enabled)
5 (looped back from pin 4)
6 (outgoing flow control, comes from DTR output of 6551)
7 Signal Ground
8 (outgoing flow control, comes from RTS output of 6551, also goes to CTS input of 6551)
20 (incoming flow control, goes to DSR input of 6551)

A switch can also be used to connect the SCTS pin (19) to the DCD input of the 6551, instead of the RTS/CTS pins.

Here are the switch settings.

Switch SW1-1 through 1-4: Set the default bit rate

1-1	1-2	1-3	1-4	Default bit rate
ON	ON	ON	ON	undefined
ON	ON	ON	OFF	50
ON	ON	OFF	ON	75
ON	ON	OFF	OFF	109.92 (110)
ON	OFF	ON	ON	134.48 (134.5)
ON	OFF	ON	OFF	150
ON	OFF	OFF	ON	300
ON	OFF	OFF	OFF	600
OFF	ON	ON	ON	1200
OFF	ON	ON	OFF	1800
OFF	ON	OFF	ON	2400
OFF	ON	OFF	OFF	3600
OFF	OFF	ON	ON	4800
OFF	OFF	ON	OFF	7200
OFF	OFF	OFF	ON	9600
OFF	OFF	OFF	OFF	19200

Switch SW1-5 and 1-6 set the operation mode of the card.

1-5	1-6	mode
ON	ON	Communications
OFF	ON	Printer
ON	OFF	Emulate Apple Serial Interface Card with P8 PROM
OFF	OFF	Emulate Apple Serial Interface Card with P8A PROM

Switches SW1-7 and SW2-7 select between the standard and secondary Clear To Send signals when the jumper block is set to TERMINAL.

1-7	2-7	pin
ON	OFF	CTS
OFF	ON	SCTS

If the jumper block is set to MODEM, SW1-7 should always be ON and SW2-7 should always be OFF.

Switches SW2-1 through SW2-4 have different functions if "Printer" or "Communications" mode is enabled.

In "Printer" mode, the functions are as follows:

SW2-1	Default data format
ON	8 data, 1 stop
OFF	8 data, 2 stop

SW2-2	Delay after sending out a RETURN character
OFF	None
ON	32 milliseconds

SW2-3 and SW2-4 set line width and video output

2-3	2-4	Function
ON	ON	40 column output, video on
ON	OFF	72 column output, video off
OFF	ON	80 column output, video off
OFF	OFF	132 column output, video off

In "Communications" mode, the functions are as follows:

SW2-1	Default number of stop bits
ON	1 stop bit
OFF	2 stop bits

SW2-2	Default number of data bits
ON	8 data bits
OFF	7 data bits

SW2-3	Default parity mode (if parity is enabled)
ON	odd parity
OFF	even parity

SW2-4	Default parity enable
ON	parity disabled
OFF	parity enabled

Switch SW2-5 enables automatic line feed generation after sending a carriage return (both modes).

SW2-5	Automatic line feed
ON	Yes
OFF	No

Switch SW2-6 enables interrupts.

SW2-6	Interrupts
ON	Yes
OFF	No

Switch SW2-7 was described above (SCTS enable).

Communications software will usually override most of the switch settings. The important settings are:

SW1-5	ON
SW1-6	ON
SW1-7	ON
SW2-6	ON (assuming the software supports interrupts)
SW2-7	OFF

Note: if the software does not support interrupts, you must set SW2-6 OFF, or the computer will crash as soon as the serial card is enabled.

If you are using the card to connect to a printer, all of the switches should be set correctly - most software will use the card's settings and will not override them.

Note that "Communications" and "Printer" mode is a switch selection. It is independent of the MODEM or TERMINAL setting of the jumper block.

In "Communications" mode, the card expects commands starting with a Control-A character (by default). In "Printer" mode, the card expects commands starting with with a Control-I character (by default).

--

David Empson
dempson@actrix.gen.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand

END OF FILE ssc.dips

```
##########################################################################
### FILE: ssc.example
##########################################################################

Path: ns-mx!uunet!wupost!waikato.ac.nz!comp.vuw.ac.nz!actrix!David.Empson
From: David.Empson@actrix.gen.nz (David Empson)
Newsgroups: comp.sys.apple2
Subject: Re: memory mapped locations ($0CXXX) needed for printer, serial ports.
Message-ID: <1991Aug31.143948.10353@actrix.gen.nz>
Date: 31 Aug 91 14:39:48 GMT
References: <3275@pdxgate.UUCP>
Organization: Actrix Information Exchange, Wellington, New Zealand
Lines: 91
Comment-To: kevins@eecs.cs.pdx.edu

In article <3275@pdxgate.UUCP> kevins@eecs.cs.pdx.edu (Kevin Stanton) writes:
>
>     I am attempting to use my Apple II+ as a printer buffer (serial in,
> parallel out).  However, my Super Serial Card manual is rather sparse on
> details, as it is strictly a users manual.

I'm assuming you are using assembly language here.

Is this a real Apple Super Serial Card, or a clone of it?  Even the
clone SSCs that I've seen come with a full manual.

> It gives certain entry points, but they are blocking, not polling.

Which entry points are these?  The BASIC interface is entirely
blocking (JSR $Cn00 to set up, then use COUT and RDKEY to get or send
bytes).  The Pascal interface's I/O calls are also blocking, but there
is a status call, which you can ask 'are you ready for output' and 'do
you have any input available'.

To confirm that your card has the Pascal interface, check the
following bytes (assuming the card is in slot 's'):

Signature bytes: $Cs05 = $38, $Cs07 = $18, $Cs0B = $01.

The entry points for the Pascal interface are contained in a lookup
table starting at $Cs0D.  Each table entry contains the low byte of
the start address of the corresponding routine.  The high byte is $Cs.

$Cs0D  offset to INITIALIZE routine
$Cs0E  offset to READ routine
$Cs0F  offset to WRITE routine
$Cs10  offset to STATUS routine

For example, if $Cs0D contains the number $44, the initialize routine
starts at $Cs44.

All the routines must be called with X containing $Cs and Y containing
$s0 (e.g. $C2 and $20 for slot 2).

WRITE: A contains byte to write
READ:  Byte read is returned in A
STATUS: A=0 for 'are you ready for output', A=1 for 'do you have input
ready'.  In both cases, the SSC will return with carry set if the
answer to the question is 'yes'.
```

You could go down to the hardware level if you want. Use the serial
firmware to initialize the card (baud rate, etc.)

To transmit:

```
      LDX   #$s0        ; s is slot number, e.g. $20 for slot 2
      LDA   $C089,X           ; read status register
      AND   #$10        ; test Transmitter Empty flag
      BEQ   IsBusy
      LDA   Byte_to_send      ; get the byte you want to transmit
      STA   $C088,X           ; stick it in the transmit data register
```

To receive:

```
      LDX   #$s0        ; s is slot number, as above
      LDA   $C089,X           ; read status register
      AND   #$08        ; test Receive Full flag
      BEQ   NoByte
      LDA   $C088,X           ; get the received byte
      STA   Byte_received
```

> I also seem to be unclear in regard to initializing the devices (can
> both the printer card and the SSC be active at the the same time?

Using the BASIC interface, you can only have one input device and one
output device. For example, in Applesoft BASIC, you can do a PR#1 to
output to slot 1, and an IN#2 to input from slot 2.

If you use the PASCAL interface or talk to the hardware directly, you
can do simultaneous I/O to as many slots as you like.

> The printer card is an Apple Dumpling, and is equally spare in
> details. All it gives is a sample 12 line driver which I can't seem
> to get to work.

Sorry, I know nothing about this card. Check the above ID bytes to
see if it supports the Pascal interface. If it does, you're home
free. If it doesn't,... I've given you half the solution, anyway.

--
David Empson

USENET: David.Empson@bbs.actrix.gen.nz

END OF FILE ssc.example

```
##############################################################################
### FILE: ssc.info
##############################################################################

Path: news.uiowa.edu!chi-news.cic.net!io.org!van-
bc!news.mindlink.net!uniserve!news.sol.net!daily-
planet.execpc.com!sundog.tiac.net!imci3!imci2!newsfeed.internetmci.com!in1.uu.net!
nwnews.wa.com!nwfocus.wa.com!golden.ncw.net!bing.ncw.net!progreen
From: progreen@ncw.net (Chuck Orem)
Newsgroups: comp.sys.apple2.comm
Subject: Re: Super Serial Card Dip Pin Settings Help Needed!
Date: 17 Nov 1995 18:27:34 GMT
Organization: North Central Washington Network
Lines: 101
Message-ID: <48ik6m$bsm@golden.ncw.net>
References: <erpeters.816561530@copper>
NNTP-Posting-Host: bing.ncw.net
X-Newsreader: TIN [version 1.2 PL2]

Eric J.Peters (erpeters@copper.ucs.indiana.edu) wrote:

>     If anybody could help, I've got an Apple Super Serial card and
>      need to know what the dip switches do. *(Yeah, I said pin in the

       APPLE SUPER SERIAL CARD DIP SWITCH FUNCTIONS


 _____________________ Switch Block #1 _____________________________
|Switch number      Definition | Switch number      Definition|
|------------------------------|------------------------------|
|1   2   3   4       Baud Rate | 5   6            Mode Setting|
|==============================|==============================|
|ON  ON  ON  ON      Undefined | ON  ON         Communications|
|ON  ON  ON  OFF            50 | OFF ON               Printer|
|ON  ON  OFF ON             75 | ON  OFF      SIC P8 emulation|
|ON  ON  OFF OFF           110 | OFF OFF     SIC P8A emulation|
|ON  OFF ON  ON            135 |_____________________________|
|ON  OFF ON  OFF           150 |
|ON  OFF OFF ON            300 |
|ON  OFF OFF OFF           600 |
|OFF ON  ON  ON           1200 |
|OFF ON  OFF ON           2400 |
|OFF ON  OFF OFF          3600 |
|OFF OFF ON  ON           4800 |
|OFF OFF ON  OFF          7200 |
|OFF OFF OFF ON           9600 |
|OFF OFF OFF OFF         19200 |
|______________________________|

 _____________________ Switch Block #2 ____________________________________
|Switch   Definition  | Switch  Def | Switch    Definition                |
|---------------------|-------------|-------------------------------------|
|1        Data Format | 2  CR delay | 3   4     Line width/video          |
|=====================|=============|=====================================|
|ON   8 data, 1 stop  | ON   32 ms  | ON  ON   40 columns, video ON       |
|OFF  8 data, 2 stop  | OFF  none   | ON  OFF  72 columns, video OFF      |
|                     |             | OFF ON   80 columns, video OFF      |
|                     |             | OFF OFF  132 columns, video OFF     |
|_____________________|_____________|_____________________________________|
```

Switch Block #2 cont'd

Switch	Definition
5	Linefeeds
ON	add LF after CR
OFF	don't add LFs

Switch	Definition
6	Interrupts
ON	Interrupts on
OFF	No interrupts

Handshaking

Switch	Definition
1-7/2-7	CTS
ON/OFF	Normal (Pin 20)
OFF/ON	Alt (Pin 19)

Connector Pin Assignments

10 Pin Header	DB-25 Connector	Signal Name
1	1	Frame GND
2	2	TXD
3	3	RXD
4	4	RTS
5	5	CTS
6	6	DSR
7	19	SCTS
8	7	Signal GND
9	20	DTR
10	8	DCD

Jumper Block Wiring

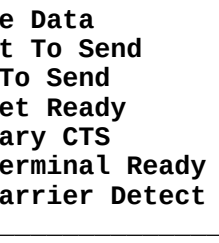
SSC signal	MODEM (pin)		TERMINAL (pin)	
TXD	TXD	2	RXD	3
RXD	RXD	3	TXD	2
RTS	RTS	4	DCD	8
CTS	CTS	5	DCD	8
DSR	DSR	6	DTR	20
DCD	DCD	8	RTS	4
DCD	DCD	8	CTS	5
DTR	DTR	20	DSR	6

Note that RS-232-C signals on the SSC use negative-true logic; that is, they are true at 0v and false at +5 volts

Explanation Of Signals

GND	Ground, either Frame or Signal
TXD	Transmit Data
RXD	Receive Data
RTS	Request To Send
CTS	Clear To Send
DSR	Data Set Ready
SCTS	Secondary CTS
DTR	Data Terminal Ready
DCD	Data Carrier Detect

Jumper Block



Pins 1-7 and 2-7 are set together to determine the SSC pin to be read for the Hardware Handshaking signal. Generally set to monitor Pin #20.

Common Configurations: [Don't Forget The JUMPER Block]

	Hi Speed Modem		ImageWriter I/II	
	1234567	1234567	1234567	1234567
ON	XXXXXX	XXXXXX	X XX	X XX
OFF	X	X	XXX X	XX XX

--

Need BinSCII? Need Shrinkit? [] progreen@ncw.net c.orem@genie.geis.com []
Need an Apple II Comm Soft? [] ^^^^^^^^^^^^^^^^ ^^^^^^^^^^^^^^^^^^^^ []
E-mail / Finger me for info! [] ***New Address** If nothing else works []

Path:
news1.icaen!news.uiowa.edu!NewsNG.Chicago.Qual.Net!nyd.news.ans.net!newsfeeds.ans.net!news.idt.net!news.maxwell.syr.edu!news.mel.connect.com.au!news.syd.connect.com.au!news.bri.connect.com.au!not-for-mail
From: Warren Spink <wspink@winshop.com.au>
Newsgroups: comp.sys.apple2
Subject: Re: Apple IIgs and Super Serial card
Date: Sat, 05 Dec 1998 01:31:18 +1000
Organization: ICQ#22790704
Lines: 179
Message-ID: <36680045.D9F5C1ED@winshop.com.au>
References: <748g37$t5i$1@nnrp1.dejanews.com>
NNTP-Posting-Host: dg-1-p28.winshop.com.au
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Mailer: Mozilla 4.5 [en] (Win95; I)
X-Accept-Language: en
Xref: news1.icaen comp.sys.apple2:142588

A little trick, hold down the option key when you turn the gs on and you get a menu come up. press 1 and enter the set-up. move to slots and change the modem slot to your card. then all you have to do is plug your card into slot 2.
before you do that, you have change the switch to terminal haven't you? if not right next to where the cable attaches to the card there should be a black square thingy with a white triangle on it. make sure the triangle is pointing to terminal (next to the black square thingy on the board is modem and terminal written) also use the following info to set up your SSC

Warren

Someone very nice sent me this:
==========

Here's something that I found on the web that may help:

-- Begin extract ---
The plug on the card can be in either of two configurations. If you look near the back of the card, you will see a large black block with an arrow on it, and the words MODEM above and TERMINAL below it. The arrow will be pointing to either of these words. You can remove the block (it is socketed) and reverse it.

With the arrow pointing to TERMINAL, the card is configured to plug directly into a terminal or printer with a straight-through serial cable. With the arrow pointing to MODEM, the card is configured to plug directly into a modem with a straight-through serial cable. In the MODEM position, the connector is wired as a DTE. It uses the following pins:

1 Frame Ground
2 Transmit Data
3 Receive Data
4 RTS
5 CTS
6 DSR
7 Signal Ground
8 DCD20 DTR

In the TERMINAL position, the connector is wired as a DCE. It uses the following pins:

1 Frame Ground
2 Receive Data
3 Transmit Data
4 (incoming flow control, goes to DCD input of 6551 if switch enabled)
5 (looped back from pin 4)
6 (outgoing flow control, comes from DTR output of 6551)
7 Signal Ground
8 (outgoing flow control, comes from RTS output of 6551, also goes to CTS input of 6551)
20 (incoming flow control, goes to DSR input of 6551)

A switch can also be used to connect the SCTS pin (19) to the DCD input of the 6551, instead of the RTS/CTS pins.

Here are the switch settings.

Switch SW1-1 through 1-4: Set the default bit rate

1-1	1-2	1-3	1-4	Default bit rate
ON	ON	ON	ON	undefined
ON	ON	ON	OFF	50
ON	ON	OFF	ON	75
ON	ON	OFF	OFF	109.92 (110)
ON	OFF	ON	ON	134.48 (134.5)
ON	OFF	ON	OFF	150
ON	OFF	OFF	ON	300
ON	OFF	OFF	OFF	600
OFF	ON	ON	ON	1200
OFF	ON	ON	OFF	1800
OFF	ON	OFF	ON	2400
OFF	ON	OFF	OFF	3600
OFF	OFF	ON	ON	4800
OFF	OFF	ON	OFF	7200
OFF	OFF	OFF	ON	9600
OFF	OFF	OFF	OFF	19200

Switch SW1-5 and 1-6 set the operation mode of the card.

1-5	1-6	mode
ON	ON	Communications
OFF	ON	Printer
ON	OFF	Emulate Apple Serial Interface Card with P8 PROM
OFF	OFF	Emulate Apple Serial Interface Card with P8A PROM

Switches SW1-7 and SW2-7 select between the standard and secondary Clear To Send signals when the jumper block is set to TERMINAL.

1-7	2-7	pin
ON	OFF	CTS
OFF	ON	SCTS

If the jumper block is set to MODEM, SW1-7 should always be ON and SW2-7 should always be OFF.

Switches SW2-1 through SW2-4 have different functions if "Printer" or "Communications" mode is enabled.

In "Printer" mode, the functions are as follows:

SW2-1	Default data format
ON	8 data, 1 stop
OFF	8 data, 2 stop

SW2-2	Delay after sending out a RETURN character
OFF	None
ON	32 milliseconds

SW2-3 and SW2-4 set line width and video output

2-3	2-4	Function
ON	ON	40 column output, video on
ON	OFF	72 column output, video off
OFF	ON	80 column output, video off
OFF	OFF	132 column output, video off

In "Communications" mode, the functions are as follows:

SW2-1	Default number of stop bits
ON	1 stop bit
OFF	2 stop bits

SW2-2	Default number of data bits
ON	8 data bits
OFF	7 data bits

SW2-3	Default parity mode (if parity is enabled)
ON	odd parity
OFF	even parity

SW2-4	Default parity enable
ON	parity disabled
OFF	parity enabled

Switch SW2-5 enables automatic line feed generation after sending a carriage return (both modes).

SW2-5	Automatic line feed
ON	Yes
OFF	No

Switch SW2-6 enables interrupts.

SW2-6	Interrupts
ON	Yes
OFF	No

Switch SW2-7 was described above (SCTS enable).

Communications software will usually override most of the switch settings. The important settings are:

SW1-5	ON
SW1-6	ON
SW1-7	ON
SW2-6	ON (assuming the software supports interrupts)
SW2-7	OFF

Note: if the software does not support interrupts, you must set SW2-6 OFF, or the computer will crash as soon as the serial card is enabled.

If you are using the card to connect to a printer, all of the switches should be set correctly - most software will use the card's settings and will not override them.

Note that "Communications" and "Printer" mode is a switch selection. It is independent of the MODEM or TERMINAL setting of the jumper block.

In "Communications" mode, the card expects commands starting with a Control-A character (by default). In "Printer" mode, the card expects commands starting with with a Control-I character (by default).

END OF FILE ssc.info

```
##############################################################################
### FILE: ssc.jumper
##############################################################################

Newsgroups: comp.sys.apple2.comm
Path: blue.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!wupost!waikato!comp.vuw.ac.nz!actrix.gen.nz!demps
on
From: dempson@actrix.gen.nz (David Empson)
Subject: Re: How to replace the "triangle chip" on Apple Super Serial Card?
Message-ID: <Cx91B2.DtE@actrix.gen.nz>
Organization: Actrix Information Exchange
References: <36ut57$ruk@news1.digex.net> <dchiuCx8DpC.CCJ@netcom.com>
Date: Thu, 6 Oct 1994 11:30:38 GMT
Lines: 47

In article <dchiuCx8DpC.CCJ@netcom.com>,
David C.W. Chiu <dchiu@netcom.com> wrote:
> In article <36ut57$ruk@news1.digex.net>,
> Christoph Berendes <berendes@access4.digex.net> wrote:
>
> >I'd rather not replace the whole Super Serial card. Anyone have any leads
> >on where I might find just that little chip? I suspect it's apple
> >proprietary, and a first round of phone calls to local repair shops
> >supports this.
>
> That isn't a chip, but a jumper block. I no longer recall the internal
> wiring, but you can probably figure it out using a multimeter...

Or look at the original (Apple II+ generation) manual for the card,
which has a full circuit diagram, and shows the internal wiring of the
jumper block.

It is a 16-pin jumper block, wired as follows:

1 --\ /-- 16
    | |
2 --/ \-- 15

3 --\ /-- 14
    | |
4 --/ \-- 13

5 ------- 12

6 ------- 11

7 ------- 10

8 ------- 9


i.e. 1-2, 3-4, 13-14, 15-16, 5-12, 6-11, 7-10, 8-9.

The arrow points to the right side (pins 9-16) in the above diagram.

With the jumper block inserted into the card and the arrow pointing to
MODEM (up), the card is in its "standard" configuration, with pin 1 in
the lower left corner.
```

--
David Empson
dempson@actrix.gen.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand

END OF FILE ssc.jumper

```
##############################################################################
### FILE: ssc.regs
##############################################################################

Path: news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!usc!news.service.uci.edu!cerritos.edu!wilbur!qed!
quor
Newsgroups: comp.sys.apple2.programmer
Subject: Re: SSC info wanted (again)
Message-ID: <s04y7B4w165w@qedbbs.com>
From: quor@qedbbs.com (Matthew Ghio)
Date: 20 Jul 93 06:37:51 GMT
Sender: bbs@qed.UUCP
References: <199307152147.AA18084@ghostwheel.bga.com>
Organization: The QED BBS, Lakewood CA
Lines: 96

khym@ghostwheel.bga.com (Dave Huang) writes:

> OK, try #3.. if this doesn't work I'll have to steal someone's NNTP
> server :-) (and apologies if you've seen this before :)
>
> I was wondering, what do $C088 + n0 through $C08B + n0 on a Super
> Serial Card do?

Ok, here's something I dug up from my archives (you're not the first person to ask
that question)...

------------------------------------------------------------------------------

Programming the Apple Super Serial Card and compatible serial interfaces:
These docs brought to you by Quor, March 27, 1993.


The SSC has four registers beginning at $C088 plus the slot number of the SSC
multiplied by 16.  They are described below:


$C0x8: Send/receive register

When a byte is received, it is placed in this register, and can be read.  Writing
a byte to this register sends it out.


$C0x9: Status Register (read only)

 bit 0: This is set when a parity error has been detected.
 bit 1: This is set when a framing error has been detected.
 bit 2: This is set when an overrun occured (data was not read and has been
        lost)
 bit 3: This is set when a new byte has been received and is waiting in the
        receive register.
 bit 4: This is set when the transmit register is empty, and therefore is ready
        to send another byte.
 bit 5: This reports the status of the data carrier detect (DCD)
 bit 6: This reports the status of the data set ready (DSR)
 bit 7: This is set when an interrupt (IRQ) was generated by the SSC
```

$C0xA: Command register (read/write)

bit 0: Setting this bit turns on the Data Terminal Ready
bit 1: Setting this bit will cause an interrupt to be generated every time a byte is received.
bits 2&3: Control the transmitter as follows:

bit 2	bit 3	
0	0	transmit interrupt disabled, RTS high, transmitter off
0	1	transmit interrupt disabled, RTS low, transmitter on
1	0	transmit interrupt enabled, RTS low, transmitter on
1	1	transmit interrupt disabled, RTS low, transmit break

bit 4: If this bit is set, and bits 2 and 3 are both zero, all data received will automatically be echoed back to the sender.
bits 5-7: If bit 5 is set, parity will be checked and transmitted besed on the following settings of bits 6 & 7:

bit 6	bit 7	
0	0	odd parity transmitted and checked
1	0	even parity transmitted and checked
0	1	mark transmitted, no check
1	1	space transmitted, no check

$C0xB: Control register

bits 0-3: Baud rate:

bit 3	bit 2	bit 1	bit 0	
0	0	0	0	Use external clock
0	0	0	1	50 bps
0	0	1	0	75 bps
0	0	1	1	109.92 bps
0	1	0	0	134.58 bps
0	1	0	1	150 bps
0	1	1	0	300 bps
0	1	1	1	600 bps
1	0	0	0	1200 bps
1	0	0	1	1800 bps
1	0	1	0	2400 bps
1	0	1	1	3600 bps
1	1	0	0	4800 bps
1	1	0	1	7200 bps
1	1	1	0	9600 bps
1	1	1	1	19200 bps

bit 4: Receiver clock source. When set (1), use baud rate generator, when clear (0), use external clock
bits 5-6: Word legnth:

bit 6	bit 5	
0	0	8 bits
0	1	7 bits
1	0	6 bits
1	1	5 bits

bit 7: If clear, send one stop bit, if set, send two.

Final note: On the Apple SSC, $C0x1 and $C0x2 report the status of the DIP switches on the card.

Newsgroups: comp.sys.apple2.programmer

Path:
blue.weeg.uiowa.edu!news.uiowa.edu!uunet!comp.vuw.ac.nz!actrix.gen.nz!dempson
From: dempson@actrix.gen.nz (David Empson)
Subject: Re: Need info re accessing serial card
Message-ID: <CtyK8t.4wH@actrix.gen.nz>
Organization: Actrix Information Exchange
References: <312eat$ls0@nic-nac.csu.net> <CtLMtG.246@actrix.gen.nz>
<31cfcr$orr@kodak.rdcs.Kodak.COM> <Cttr07.3vz@griffin.cuc.ab.ca>
Date: Wed, 3 Aug 1994 12:05:16 GMT
Lines: 103

In article <Cttr07.3vz@griffin.cuc.ab.ca>,
Sean Dockery <dockery@griffin.cuc.ab.ca> wrote:
>
> I always thought that the DIP switch on the SSC was similar to the power
> bar concept for your computer: It doesn't prevent you enabling interrupts
> through software when it is OFF (power bar OFF, computer ON), but it also
> doesn't force you to enable interrupts when it is ON (power bar ON,
> computer OFF). Someone please correct me if this is not the case.

Sorry, but that isn't correct. The interrupt enable switch (SW2-6)
must be ON for any interrupts to get through from the ACIA. It
disconnects the IRQ line if it is OFF.

Some of the ACIA's interrupt sources (DSR and DCD change) cannot be
disabled through software if you want to use the serial card (they are
disabled if the DTR output of the ACIA is turned off, but that disables
the whole chip). If the interrupt switch was on and you enabled the
DTR line (e.g. PR#2), any change on DSR or DCD would crash unless you
had an interrupt handler to catch it.

See my other posting on this thread for further details.

> Hmmm... I don't see the problem why everyone is so concerned about
> unlikely (or impossible) interrupts. Consider:
>
> The 6551 is only generating interrupts during the following situations when
> both receipt and transmission interrupts are enabled:
>
>   o receipt register full
>   o transmission register full
>   o DCD state change
>   o DSR state change
>
> The first two can be explicitly disabled on the 6551 through software.
>
> The third one will only occur if you are online and your host hangs up on
> you, or if you have your modem set to auto-answer and someone phones in
> with a modem carrier.
>
> The last one won't ever occur if you are not transmitting.

Either DCD or DSR may change state if you unplug the modem, or switch
it on/off.

> Remember the following two quirks about the 6551 as well:
>
>   o You cannot send if you have the DTR signal set to false.

You can't do ANYTHING - it turns off everything in the chip (all

interrupt sources, transmit and receive).

>   o You cannot receive if the DCD signal is false.

You also cannot transmit if RTS is turned off.

> CONTROL REGISTER ($C08B + $n0)

> 4   - receiver clock source
>   0 = external receiver clock

Don't use this setting on the SSC - there is no external receiver clock.

> 3210   - internal baud rate generator
>   0 0 0 0 = external receiver clock x 16

Don't use this setting on the SSC - it only works if the ACIA is being
clocked by a square wave input, not a crystal.

> COMMAND REGISTER ($C08A + $n0)

> 32 - transmitter controls (RTS signal)
>   0 0 = transmit IRQ disabled, RTS high

That is "transmitter AND transmit IRQ disabled, RTS high"

> STATUS REGISTER ($C089 + $n0)

> 7   - IRQ pending status
>   0 = no interrupt
>   1 = interrupt has occurred

Be very careful when reading the status register with interrupts
enabled: if the IRQ bit is set, it is cleared by reading this
register. This means, for example, if you you are are using receive
interrupts but are polling the status register to detect when you can
next transmit a character, you may cause an IRQ to be lost if it
happens to be read by the transmit routine first.

To avoid this, you must check the IRQ flag whenever this register is
read.

This is really only a problem if you're relying on the IRQ
flag to detect an interrupt from the SSC - the interrupt will still
occur, but the interrupt handler will not see the IRQ flag set. If it
is a receive or transmit interrupt, there is a separate flag you can
check, but you cannot identify a state change interrupt for DCD or DSR
unless the IRQ bit is set. You can save the previous state for DCD
and DSR, but a three-way toggle on one of the lines may cause two
interrupts but go undetected.
--
David Empson
dempson@actrix.gen.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand

END OF FILE ssc.regs

```
##########################################################################
### FILE: ssc.settings
##########################################################################

Path:
news1.icaen!news.uiowa.edu!news1.chicago.iagnet.net!iagnet.net!newsfeed.internetmc
i.com!206.229.87.25!news-peer.sprintlink.net!news-backup-east.sprintlink.net!news-
in-east.sprintlink.net!news.sprintlink.net!Sprint!151.164.1.34!swbell!not-for-mail
From: Rubywand <rubywand@swbell.net>
Newsgroups: comp.sys.apple2
Subject: Re: Transfer files PC - Apple II+
Date: Sun, 18 Jan 1998 01:24:29 -0600
Organization: Southwestern Bell Internet Services, Richardson, TX
Lines: 133
Message-ID: <34C1AE2D.3E52@swbell.net>
References: <34C01AAE.7A51703F@ibm.rhrz.uni-bonn.de>
Reply-To: rubywand@swbell.net
NNTP-Posting-Host: ppp-207-193-11-60.hstntx.swbell.net
Mime-Version: 1.0
Content-Type: text/plain; charset=iso-8859-1
Content-Transfer-Encoding: 8bit
X-Trace: nnrp1.rcsntx.swbell.net 885107482 28441 (None) 207.193.11.60
X-Complaints-To: usenet@nnrp1.rcsntx.swbell.net
X-Mailer: Mozilla 3.04GoldC-SBXA  (Win95; I)
Xref: news1.icaen comp.sys.apple2:129297

J^rg Fichl writes ...
>
> ....
> i got an apple II+ for free and want now to transfer files from the PC
> to it, but there was neither a description of the ssc nor communication
> software with. could anyone tel me where to get the source of a
> comm-prog to type it in for this purpose? ....
>


     Most likely, Steve Cavenaugh (editor of Apple Blossom) is still
distributing the Chuck Orem Modemming Starter Disk for a few dollars. It
is a nice collection of telecom and related wares. The version I bought
includes a telecom program which runs on a II+ called "COMM.SYSTEM". You
can check with Steve to make sure it is still included. Below is contact
info recently supplied to me by Dr. Tom:

Apple Blossom (Apple Blossom Publishing, P.O. Box 120434, Boston, MA
02112-0434) is a bi-montly mini-magazine edited by Steve Cavenaugh.
(http://people.delphi.com/appleblossom/
email: appleblossom@delphi.com)


     You mentioned a problem getting SSC info. If "SSC" means "Super
Serial Card" the following should help:

From: Tom Kelly

013- What are the settings for the Apple Super Serial Card?

SUPER SERIAL CARD (SSC) SETUP SETTINGS

Recomended slots:
```

slot 1 for terminal use (e.g. printer)
slot 2 for communication use (e.g. modem)

Jumper Block:
for communication use label is upside down (arrow points up)
for terminal use label is right side up (arrow points down)

Note that RS-232-C signals on the SSC use negative-true logic; that is, they are true at 0v and false at +5 volts.

SW1 Dip Switch Settings:

Baud	SW1-1	SW1-2	SW1-3	SW1-4	SW1-8
50	on	on	on	off	not used
75	on	on	off	on	"
110	on	on	off	off	"
135	on	off	on	on	"
150	on	off	on	off	"
300	on	off	off	on	"
600	on	off	off	off	"
1200	off	on	on	on	"
1800	off	on	on	off	"
2400	off	on	off	on	"
3600	off	on	off	off	"
4800	off	off	on	on	"
7200	off	off	on	off	"
9600	off	off	off	on	"
19200	off	off	off	off	"

Switch Settings For Communication mode:

SW1-5; SW1-6; SW1-7 are all set on

Data Bits	Parity	Stop Bits	SW2-1	SW2-2	SW2-3	SW2-4
7	none	1	on	off	off	on
7	odd	1	on	off	on	off
7	even	1	on	off	off	off
7	none	2	off	off	off	on
7	odd	2	off	off	on	off
7	even	2	off	off	off	off
8	none	1	on	on	off	on
8	odd	1	on	on	on	off
8	even	1	on	on	off	off
8	none	2	off	on	off	on
8	odd	2	off	on	on	off
8	even	2	off	on	off	off

Note: SW2-1 thru SW2-4 settings can be overridden by software.

SW2-5:

ON for linefeed out
OFF for no linefeed out

SW2-6:

ON for baud rates greater than 1199 baud

SW2-7:

OFF in communication mode

SW2-8:

Not used

Connector Pin Assignments

10-Pin Header	DB-25 Connector	Signal Name
1	1	Frame Ground
2	2	Transmit Data (TXD)
3	3	Receive Data (RXD)
4	4	Request To Send (RTS)
5	5	Clear To Send (CTS)
6	6	Data Set Ready (DSR)
7	19	Secondary Clear To Send (SCTS)
8	7	Signal Ground
9	20	Data Terminal Ready (DTR)
10	8	Data Carrier Detect (DCD)

Pins 1-7 and 2-7 are set together to determine the SSC pin to be read for the Hardware Handshaking signal. Generally set to monitor Pin #20.

Common Configurations: [Don't Forget The JUMPER Block]

	Hi Speed Modem		ImageWriter I/II	
	1234567	1234567	1234567	1234567
ON	XXXXXX	XXXXXX	X XX	X XX
OFF	X	X	XXX X	XX XX

Rubywand

END OF FILE ssc.settings

```
##########################################################################
### FILE: ssc6551
##########################################################################

Path: news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!zaphod.mps.ohio-
state.edu!swrinde!news.dell.com!math.utexas.edu!ut-emx!ccwf.cc.utexas.edu
From: foegelle@ccwf.cc.utexas.edu (Michael Foegelle)
Newsgroups: comp.sys.apple2
Subject: Re: SSC - //e - High Speed Modem - ProTERM question
Message-ID: <79953@ut-emx.uucp>
Date: 17 Sep 92 17:10:48 GMT
References: <3310@carroll1.cc.edu>
Sender: news@ut-emx.uucp
Organization: The University of Texas at Austin, Austin TX
Lines: 49

In article <3310@carroll1.cc.edu> acct069@carroll1.cc.edu (Ron) writes:
>I've been having a little bit of trouble with my set up, and am wondering
>if anyone else is having the same problems.  I've been in contact with the
>author of ProTERM v3.0 about this, and would like to comfirm that this
>isn't just my problem before persuing it further.
>
>I'm looking for people that are running a high speed modem ( >9600 ) and a
>Super Serial Card with ProTERM v3.0.
>
>What I'd like to know is if you are having trouble with Zmodem sends to a
>remote system at a transfer rate faster than 9600 bps.  (Hardware flow
>control is needed for this operation)
>
>The problem I'm seeing is that I get errors in the transfer when the CTS
>light flashes.
>
>Greg Schaefer explains the problem as a 6551 problem.  He says that when
>the CTS line goes low, the 6551 chip stops transmitting data, even if it's
>in the middle of a character!

There are two different types of the 6551 ACIA, a 6551 and a 6551A.  The
difference is in the way they handle the CTS.  The 6551 stops sending
immediately, even if in the middle of a character, while the 6551A sends the
whole data byte and then stops.  (I believe the 6551 resends the aborted
character after CTS resumes.)  A 6551A (or 65C51A) only runs about $6 or so
from most electronics dealers, so it's no big deal to go buy one and pull the
offending 6551 and replace it with a 6551A.  I also discovered that some 6551's
tend to for some reason drop CTS internally when you drop RTS.  That means if
your program is telling the modem not to send anything because it's too busy to
receive, then the program can't send anything OUT to the modem either!  I'm
using a 65c51A from GE/Harris/RCA (all the same semiconductor company now)
which solves all these problems for me.


>
>Anyone else having trouble?
>--
>Ron                       | Lightning Systems, INC. | Apple // Forever!
>acct069@carroll1.cc.edu   | (414) 363-4282  62megs  | Van Halen Rules!
>carroll1!acct069@uwm.edu | 14.4k HST/V.32bis       | Bill & Ted are cool!

Michael Foegelle
--
```

```
-------------------------------------------------------------------------------
   Michael Foegelle  |                     |   foegelle@ccwf.cc.utexas.edu
     _____________   |     You want it     |   foegelle@utaphy.ph.utexas.edu
                     |                     |   GEnie:   M.FOEGELLE2
    University of    |        WHEN?        |   Wunderland BBS  (512) 472-0544
   Texas at Austin   |                     |   14.4kbaud, v.32/bis:  Sysop
```



```
Newsgroups: comp.sys.apple2.programmer
Path: blue.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-
state.edu!howland.reston.ans.net!gatech!newsxfer.itd.umich.edu!nntp.cs.ubc.ca!unix
g.ubc.ca!quartz.ucs.ualberta.ca!acs.ucalgary.ca!cpsc.ucalgary.ca!debug!griffin!doc
kery
From: dockery@griffin.cuc.ab.ca (Sean Dockery)
Subject: Re: Need info re accessing serial card
Message-ID: <Cttr07.3vz@griffin.cuc.ab.ca>
Organization: Griffin Software Development
References: <312eat$ls0@nic-nac.csu.net> <CtLMtG.246@actrix.gen.nz>
<31cfcr$orr@kodak.rdcs.Kodak.COM>
Date: Sun, 31 Jul 1994 21:43:18 GMT
Lines: 145
```


scott@image.Kodak.COM wrote the following article:

> or disable the interrupts. I am not familiar with the ACIA used on the
> SSC, although I have programmed the 6850 ACIA several times, which
> allows the CPU to tell it to enable/disable all types of interrupts,
> rather than just the transmit/receive interrupts. If I leave the
> SSC interrupt switch turned on, and I turn the modem power on/off
> while running non-interrupt-aware software, the computer crashes. The
> CCS 7710 serial card used the 6850 ACIA and so it didn't have this problem,
> but unfortunately it uses DIP switches to set the bit rate.
>
> Does anyone know of a different serial card which both allows software
> control of the bit rate AND software control of interrupt enable/disable?

I always thought that the DIP switch on the SSC was similar to the power bar concept for your computer: It doesn't prevent you enabling interrupts through software when it is OFF (power bar OFF, computer ON), but it also doesn't force you to enable interrupts when it is ON (power bar ON, computer OFF). Someone please correct me if this is not the case.

Hmmm... I don't see the problem why everyone is so concerned about unlikely (or impossible) interrupts. Consider:

The 6551 is only generating interrupts during the following situations when both receipt and transmission interrupts are enabled:

- o receipt register full
- o transmission register full
- o DCD state change
- o DSR state change

The first two can be explicitly disabled on the 6551 through software.

The third one will only occur if you are online and your host hangs up on you, or if you have your modem set to auto-answer and someone phones in with a modem carrier.

The last one won't ever occur if you are not transmitting.

Remember the following two quirks about the 6551 as well:

```
      o You cannot send if you have the DTR signal set to false.
      o You cannot receive if the DCD signal is false.

For those with the expertise to understand how to program ACIA's, here is a
little informatin about the 6551 specifically on a Super Serial Card or
inside an Apple //c and Apple //c Plus taken from Leventhal, 6502 Assembly
Language Programming, McGraw Hill, ISBN 0-07-881216-X:

CTRLREG ($C08B + $n0) (read/write)

7     - stop bits
            0 = 1 stop bit
            1 = 2 stop bits, or
                1 stop bit if word length = 8 bits and parity, or
                1.5 stop bits if word length = 5 bits and no parity
65    - word length (data byte size)
            0 0 = 8
            0 1 = 7
            1 0 = 6
            1 1 = 5
4     - receiver clock source
            0 = external receiver clock
            1 = internaal baud rate generator
3210  - internal baud rate generator
            0 0 0 0 = external receiver clock x 16
            0 0 0 1 = 50 bps
            0 0 1 0 = 75 bps
            0 0 1 1 = 109.92 bps
            0 1 0 0 = 134.58 bps
            0 1 0 1 = 150 bps
            0 1 1 0 = 300 bps
            0 1 1 1 = 600 bps
            1 0 0 0 = 1200 bps
            1 0 0 1 = 1800 bps
            1 0 1 0 = 2400 bps
            1 0 1 1 = 3600 bps
            1 1 0 0 = 4800 bps
            1 1 0 1 = 7200 bps
            1 1 1 0 = 9600 bps
            1 1 1 1 = 19200 bps

CMNDREG ($C08A + $n0) (read/write)

765   - parity generator
            - - 0 = parity disabled, parity check disabled
            0 0 1 = odd parity
            0 1 1 = even parity
            1 0 1 = mark parity, parity check disabled
            1 1 1 = space parity, parity check disabled
4     - normal/echo mode for receiver
            0 = normal
            1 = echo all received characters
32    - transmitter controls (RTS signal)
            0 0 = transmit IRQ disabled, RTS high
            0 1 = transmit IRQ enabled, RTS low
            1 0 = transmit IRQ disabled, RTS low
            1 1 = transmit IRQ disabled, RTS low, send break
1     - receive IRQ enable
            0 = enabled
```

```
            1 = disabled
0     - data terminal ready
            0 = disable receiver/transmitter (DTR high)
            1 = enable receiver/transmitter (DTR low)

STATREG ($C089 + $n0) (read/write -- write causes master reset)

7     - IRQ pending status
            0 = no interrupt
            1 = interrupt has occurred
6     - data ready (DSR)
            0 = DSR low (ready)
            1 = DSR high (not ready)
5     - carrier detect (DCD)
            0 = DCD low (detected)
            1 = DCD high (not detected)
4     - transmission register empty
            0 = not empty
            1 = empty
3     - receipt register full
            0 = not full
            1 = full
2     - overrun error (two receives since last IRQ servicing)
            0 = no overrun
            1 = overrun
1     - framing error (word length mismatch)
            0 = no framing error
            1 = framing error detected
0     - parity error (NOTE: mark and space parity are not checked)
            0 = no parity error
            1 = parity error detected

RDREG ($C088 + $n0) (read only)

TDREG ($C088 + $n0) (write only)

The addresses are the base mapping to the I/O registers on an Apple II
added to the slot in which the card resides multiplied by sixteen.

| Kevin Scott
| scott@image.kodak.com
--
Sean Dockery                          |  Tickle us, do we not laugh?
Griffin Software Development Group    |  Prick us, do we not bleed?
dockery@griffin.cuc.ab.ca             |  Wrong us, shall we not revenge?


### END OF FILE ssc6551
```

```
##############################################################################
### FILE: sscclone.manual
##############################################################################

Path: news.uiowa.edu!chi-
news.cic.net!newsfeeder.sdsu.edu!hookup!usenet.eel.ufl.edu!news.bright.net!news
From: Rick Kerman <rkerman@brutus.bright.net>
Newsgroups: comp.sys.apple2
Subject: Re: Super Serial Card II DIP switches
Date: Tue, 09 Jul 96 17:13:10 EDT
Organization: BrightNet Ohio
Lines: 219
Message-ID: <NEWTNews.836946907.6619.rkerman@rkerman.bright.net>
References: <31D8C593.4244@ais.net>
NNTP-Posting-Host: kali1-cs-15.dial.bright.net
Mime-Version: 1.0
Content-Type: TEXT/PLAIN; charset=US-ASCII
X-Newsreader: NEWTNews & Chameleon -- TCP/IP for MS Windows from NetManage


In Article<31D8C593.4244@ais.net>,
<jobrien@ais.net> wrote:

> An Apple IIe that I rescued a couple months ago had an Apple Super
> Serial Card II installed with two banks of DIP switches but no manual
> (Why do people throw out the manuals?!  What are they thinking?!?!) to
> describe what the switches handle.  Does anybody have this information
> or know where I could find it??
>
> Jon

The following should help.

*========================================*
* Super Serial Clone 1.0 Operation Guide *
*========================================*
CONTENTS:
CHAPTER 1 -- General Switches and Commands
CHAPTER 2 -- Printer Mode
CHAPTER 3 -- Communications Mode
CHAPTER 4 -- Emulation Modes
CHAPTER 5 -- Use with BASIC
CHAPTER 6 -- DB-25 pinout

========================================
CHAPTER 1 -- General Switches and Commands

  BAUD    SW1-1     SW1-2     SW1-3     SW1-4     CTL-I/A
undefined   ON        ON        ON        ON    0B=switches
    50      ON        ON        ON       OFF        1B
    75      ON        ON       OFF        ON        2B
   109.92   ON        ON       OFF       OFF        3B
   134.58   ON       OFF        ON        ON        4B
   150      ON       OFF        ON       OFF        5B
   300      ON       OFF       OFF        ON        6B
   600      ON       OFF       OFF       OFF        7B
  1200     OFF        ON        ON        ON        8B
  1800     OFF        ON        ON       OFF        9B
  2400     OFF        ON       OFF        ON       10B
```

3600	OFF	ON	OFF	OFF	11B
4800	OFF	OFF	ON	ON	12B
7200	OFF	OFF	ON	OFF	13B
9600	OFF	OFF	OFF	ON	14B
19200	OFF	OFF	OFF	OFF	15B

MODE	SW1-5	SW1-6
Communications	ON	ON
Printer Mode	OFF	ON
P8 Emulation	ON	OFF
P8A Emulation	OFF	OFF

DATA FORMAT	SW2-1	SW2-2*	CTL-I/A
8 data, 1 stop	ON	ON	0D
7 data, 1 stop	ON	OFF	1D
6 data, 1 stop			2D
5 data, 1 stop			3D
8 data, 2 stop	OFF	ON	4D
7 data, 2 stop	OFF	OFF	5D
6 data, 2 stop			6D
5 data, 2 stop			7D

*SW2-2 serves a different purpose in printer mode, and only 8 data, 1 stop or 8 data, 2 stop are available by setting switches. CTL-I/A commands still work.

DELAY AFTER CR	SW2-2*	CTL-I/A
none	OFF	0C
32 ms	ON	1C
250 ms (1/4 sec)		2C
2000 ms (2 sec)		3C

*SW2-2 affects delay after <CR> only in Printer Mode.CTL-I/A commands still work.

PARITY	SW2-3*	SW2-4*	CTL-I/A
none		ON	0,2,4,6P
odd	ON	OFF	1P
even	OFF	OFF	3P
mark			5P
space			7P

*SW2-3 and SW2-4 are used for a different purpose in Printer Mode. CTL-I/A commands still work.

<LF> AFTER <CR>	SW2-5	CTL-I/A
yes	ON	L E
no	OFF	L D

INTERRUPTS	SW2-6
yes	ON
no	OFF

JUMPER BLOCK
Terminal -- performs the function of modem eliminator.
Modem -- standard function (RS-232 pinout).

==========

CHAPTER 2 -- Printer Mode

RS-232 SIGNALS:	SW1-7	SW2-7
Normal CTS	ON	OFF
Secondary CTS	OFF	ON

LINE WIDTH/VIDEO	SW2-3	SW2-4
40 char/video on	ON	ON
72 char/video off	ON	OFF
80 char/video off	OFF	ON
132 char/video off	OFF	OFF

SOFTWARE COMMANDS -- CTL-I <CMD> <RETURN>

CMD	FUNCTION	VALUES
<n>B	Set Baud Rate	See Ch.1
<n>C	Set CR Delay	0=none, 1=32mS, 2=250mS, 3=2S
<n>D	Set Data Format	See CH.1
<n>F	Set FF Delay	0=none, 1=32mS, 2=250mS, 3=2S
<n>L	Set LF Delay	0=none, 1=32mS, 2=250mS, 3=2S
<n>N	Set Line Width	40 to 255
<n>P	Set Parity	0,2,4,6 none, 1=odd, 3=even, 5=mark, 7=space
<n>T	Translate LC	0=change LC to UC 1=leave LC 2=change LC to UC inverse 3=change LC to UC, UC to inverse
C	Column overflow	
I	Video on, Line Width 40	
K	Disable Auto LF	
R	Reset the SSC	
Z	Zap (disable commands)	
F_<n>	Find keyboard	E or D
L_<n>	Auto LF after CR	E or D
M_<n>	Mask LF after CR	E or D
T_<n>	Tab in BASIC	E or D
X_<n>	Use XON/XOFF	E or D

Special: <Ctrl-I> <Ctrl-something else> changes
the default command character.
Also: <Ctrl-I> <Ctrl-I> sends a Ctrl-I to output.

==========

CHAPTER 3 -- Communications Mode

SPECIAL SWITCHES:	SW1-7	SW2-6	SW2-7
Interrupts off		OFF	
Interrupts on		ON	
RS-232C Signals	ON		OFF

<LF> AFTER <CR>	SW2-5	CTL-A
yes	ON	L E
no	OFF	L D

SOFWARE COMMANDS -- CTL-A <CMD> <RETURN>

CMD	FUNCTION	VALUES
<n>B	Set Baud Rate	See Ch.1
<n>C	Set CR Delay	0=none, 1=32mS, 2=250mS, 3=2S
<n>D	Set Data Format	See Ch.1
<n>F	Set FF Delay	0=none, 1=32mS, 2=250mS, 3=2S
<n>L	Set LF Delay	0=none, 1=32mS, 2=250mS, 3=2S
<n>P	Set Parity	0,2,4,6 none, 1=odd, 3=even, 5=mark, 7=space
<n>S	Slot to chain	0 - 7
<n>T	Translate LC	0=change LC to UC 1=leave LC 2=change LC to UC inverse 3=change LC to UC, UC to inverse
B	Break	
Q	Quit terminal mode	
R	Reset the SSC	
T	Terminal mode	
Z	Zap (disable commands)	
E_<n>	Echo	E or D
F_<n>	Find keyboard	E or D

```
L_<n>    Send LF after CR   E or D
M_<n>    Mask LF after CR   E or D
S_<n>    Special chars      E or D
X_<n>    Use XON/XOFF       E or D

Special -- <Ctrl-A> <Ctrl-something else> changes
the default command character.
<Ctrl-A> <Ctrl-A> sends Ctrl-A to output.

TERMINAL MODE
In Communications Mode, a dumb terminal mode is available.
Enter this mode by typing <Ctrl-A>T.  Exit by typing <Ctrl-A>Q.
Also supports old Apple Communications Interface Card commands
<Ctrl-T> enter terminal mode and <Ctrl-R> exit terminal mode.

============================
CHAPTER 4 -- Emulation Modes

SW1-5 and SW1-6 select these modes (see ch.1).
Emulates P8 or P8A versions of Apple ][ Serial Interface Card (SIC).

COMPATIBILITY
Partial Peek & Poke compatibility with SIC.
Supports ETX/ACK software handshake.

DOES NOT SUPPORT
P8 SIC block moves.
Baud rates or data formats other than those listed.
<ESC>U or <ESC>L commands for upper and lower case.
Current loop operation.

============================
CHAPTER 5 -- Use with BASIC

PRINTER MODE:  Use PR#s where s is the slot of the card to activate,
use CTL-I commands to reset parameters.

COMMUNICATIONS MODE:  Use PR#s and IN#s where s is the slot of the
card to activate, use CTL-A commands to reset parameters.

JUMPER BLOCK:  In terminal position, performs the function of
modem eliminator.  In modem position, expects full RS-232 signals.

=========================
CHAPTER 6 -- DB-25 pinout

 1   Frame Ground
 2   Transmit Data
 3   Receive Data
 4   Request To Send
 5   Clear To Send
 6   Data Set Ready
 7   Signal Ground
 8   Data Carrier Detect
19   Secondary Clear To Send
20   Data Terminal Ready
```

END OF FILE sscclone.manual

```
##############################################################################
### FILE: sva
##############################################################################

Newsgroups: comp.sys.apple2
Path: news.weeg.uiowa.edu!news.uiowa.edu!uunet!cis.ohio-
state.edu!pacific.mps.ohio-state.edu!linac!sunova!sunova.ssc.gov!cchang
From: cchang@quasar.ssc.gov (Charles Chang)
Subject: Need help on Megabyter 8" floppy drive
Message-ID: <1992Sep9.233150.22647@sunova.ssc.gov>
Sender: usenet@sunova.ssc.gov (News Admin)
Nntp-Posting-Host: dssg1
Reply-To: cchang@quasar.ssc.gov
Organization: Superconducting Super Collider Laboratory, Dallas, Texas
Date: Wed, 9 Sep 1992 23:31:50 GMT
Lines: 15

I recently acquired an 8" floppy disk drive called MegaByter made by
Sorrento Valley Associates.  It has a controller came with it.  I hooked
it up to my //e, it won't boot up itself on slot 6, and it is not
recognized at all if I use it on slot 5 along with a Disk II card
on slot 6.  Would some of you happen to know this heavy monster?
Any information would be greatly appreciated.  I don't have manuals
or any diskettes (need drivers maybe?) came with it.  Thanks in advance.

--

/*------------------------------------------------------------------------*\
 |  Charles Chang, System Development Group, Physics Research Division  |
 |  Superconducting Super Collider Laboratory, Dallas, Texas 75237      |
 |  Internet: cchang@quasar.ssc.gov             Phone: (214) 708-6100   |
\*------------------------------------------------------------------------*/


### END OF FILE sva
```

```
##############################################################################
### FILE: sva8
##############################################################################

Path: news.weeg.uiowa.edu!news.uiowa.edu!uunet!cis.ohio-
state.edu!ucbvax!blkbox.com!jdb8042
From: jdb8042@blkbox.com ("John D. Baker")
Newsgroups: comp.sys.apple2
Subject: trouble with EXECing files
Message-ID: <9208100202.aa02465@blkbox.COM>
Date: 10 Aug 92 07:02:42 GMT
Sender: daemon@ucbvax.BERKELEY.EDU
Lines: 69

This may seem like a strange help request, but this problem's got me baffled.

I just got the BINSCII v1.0.3 Executioner-format file from
wuarchive.wustl.edu.

It seems simple enough--just EXEC <filename> from BASIC.SYSTEM to
create the executable form of BINSCII.

However, after the initial 'CALL-151' statement, I am greeted with
beeps from the monitor apparrently indicating that the line it was given
to act on was invalid.

following this, BASIC.SYSTEN complains about "NO BUFFERS AVAILABLE"
for the simplest tasks even asking for a catalog of the disk.

I also have a BASIC program saved as a text file intended for EXECing
into executable form.  Attempting to do so results in an infinite string
(well, until the file is exhausted) or SYNTAX ERRORs and when it has
finished, I again get "NO BUFFERS AVAILABLE".

The BASIC program EXEC trick is one I've used many times in the past and
I can't for the life of me understand why it doesn't work now.  YES, I've
examined th files in question and they look like valid ProDOS text files
to me (I used the file viewer in Shrinkit v3.0.3 which was left on the
used Hard Disk I recently added to my //e) .

Fro the Record:

     Apple //e, Extended Keyboard (platinum case)
        AUX:  Apple Extended 80-column card
        SLOT1:  64K Buffered Grappler+
        SLOT2:  <empty>
        SLOT3:  CardZ180 Z-System processor
        SLOT4:  Apple II SCSI Card, Rev. C
        SLOT5:  Apple UniDisk 3.5 controller
        SLOT6:  Apple Disk ][ controller
        SLOT7:  SVA ZVX4 Dual-Density 8" Disk Controller

     ProDOS 8 v2.0.1 (w/FTA launcher installed)
     BASIC.SYSTEM v1.2

The SCSI Card and v2.0.1 of ProDOS are the only things that have changed
on my system since I last EXECed a BASIC program into memory.  The prefix
set at the time was "/DH0/WORK"  on the first partition of my hard disk
(/DH0).
```

I tried the same operations under v1.8, and v1.4 of ProDOS each using v1.2 and v1.1 of BASIC.SYSTEM. Each had exactly the same result as described above.

At the same time, I found I was unable to launch many programs by specifying the full path to them. I tried to launch Shrinkit 3.0.3 while prefixed to /DH0/WORK by issuing "-/DH0/UTILITIES/PACKERS/SHRINKIT" (which is a correct path) and was again rewarded with "NO BUFFERS AVAILABLE". At one point I couldn't even re-start prodos while prefixed to the root directory!

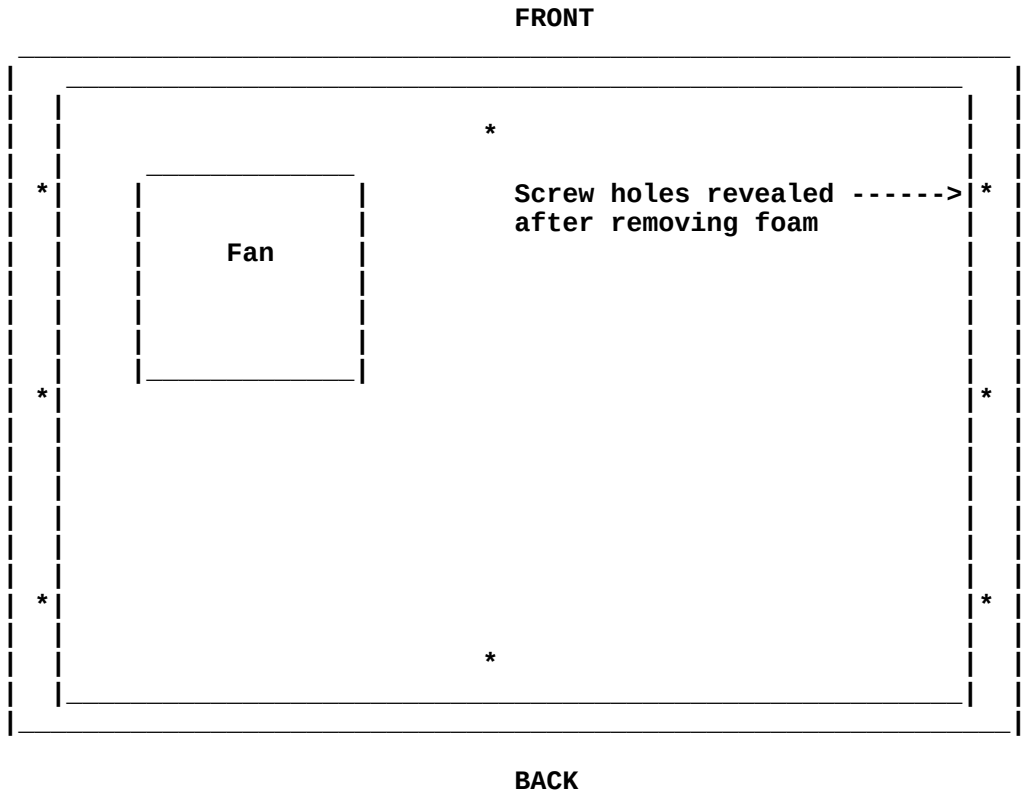
However, once re-started, I could always launch any type SYS file from the FTA launcher.

This is all very strange behaviour to me and any enlightenment and or solutions will be greatly appreciated.

John D. Baker ->An Apple 3.5", 5.25", 8", HD5.25" CardZ180 Z-System nut//
Internet: jdb8042@blkbox.com jdbaker@taronga.com
UUCP: nuchat!blkbox!jdb8042 ...!taronga!jdbaker
BBSs: JOHN BAKER on Z-Node #45 [(713) 937-8886],
The Vector Board [(716) 544-1863], PIC of the Mid-Town [(713) 527-8939]
Karnage: "I am certainly very happy for you, but--WHAT ARE YOU TALKING ABOUT?!"

END OF FILE sva8

```
##########################################################################
### FILE: syssaver.fan
##########################################################################

Path: news1.icaen!news.uiowa.edu!news.physics.uiowa.edu!math.ohio-state.
edu!howland.erols.net!portc02.blue.aol.com!cpk-news-hub1.bbnplanet.
com!news.bbnplanet.com!cam-news-hub1.bbnplanet.com!news.mathworks.
com!enews.sgi.com!arclight.uoregon.edu!news.bc.net!info.ucla.edu!nnrp.
info.ucla.edu!usenet
From: pubpc17@library.ucla.edu
Newsgroups: comp.sys.apple2
Subject: csa2 chronicles: hacker's corner
Date: 23 Nov 1996 20:40:50 GMT
Organization: University of California, Los Angeles
Lines: 92
Message-ID: <577ngi$1qig@uni.library.ucla.edu>
NNTP-Posting-Host: dyn-biomed0-206.library.ucla.edu
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Mailer: Mozilla 1.2N (Windows; I; 16bit)

Hacker's Corner

Replacing the System Saver IIGS Fan

Does your Kensington System Saver IIGS sound like a broken record?  It may
be that the fan inside the unit is showing wear.  The good news is that
replacing the fan is an easy and rewarding task.

I knew my fan was starting to die when it sounded like it was wheezing
during spin-up.  The fan, a Sprite model SU2C7, uses sleave bearings,
whose lifespan is determined by the lubricating oil supply in the
bearings.  When enough of the oil evaporates, metal will grind against
metal resulting in heat and resistance that cause the fan to quickly
lock-up.  Better quality fans use ball-bearings, but Kensington
apparently used the cheapest component available.  Even among the models
with sleave bearings, the SU2C7 is the least capable.  It can only move
15 cubic feet of air a minute (half what a typical PC fan moves) and has
a 55,000 hour rating.

In looking for a replacement for my dying fan, I chose to use a better
model.  The Sprite model SU2B1 has the same dimensions as the SU2C7 used
in the System Saver and is readily available from Digi-Key corporation.
It uses ball bearings for long life (the fan is rated for 73,000 hours)
and can move 28 cubic feet of air a minute.  The higher quality is
readily apparent: the replacement is currently noticeably quieter than
the original even though it is moving more air per minute.

Make sure the System Saver is unplugged before opening the case.

Opening the System Saver case involves removing eight screws.  You must
remove the foam weatherstriping along the periphery of the case to expose
the screws.  Once the weatherstripping is removed, you should be able to
see the screw access holes.  They are arranged as shown in the following
diagram (bottom view of the System Saver):
```



Once inside, the fan can be removed by unplugging the power cord that connects it to the circuit board. A grounding wire that is attached by a screw must also be removed. The fan itself is held to the case by two screws. Once you remove the SU2C7, you can replace it with the SU2B1. Now mount everything back together again with the screws. Apply new foam weatherstripping to the periphery of the bottom of the system saver.

The refurbished System Saver is now better than a factory new model! Notice the difference in sound: a quiet hum rather than a load rumble. If you have a lot of cards, you will notice that the inside of the IIGS is a lot cooler too. An upgraded System Saver is a great way to counteract accelerator instability caused by heat.

Sources and parts needed:

1) Part: Sprite model SU2B1 (Digi-Key Part No. CR103-ND)
   Source: Digi-Key Corp. (1-800-344-4536/www.digikey.com)

2) Part: Foam weatherstripping tape (3/8th inch width, 3/16th inch thick)
   Source: Home Depot (or a comparable hardware store)

END OF FILE syssaver.fan

```
################################################################################
### FILE: thermistor
################################################################################

Newsgroups: comp.sys.apple2
Path: news.uiowa.edu!chi-
news.cic.net!newsxfer2.itd.umich.edu!gatech!swrinde!elroy.jpl.nasa.gov!lll-
winken.llnl.gov!fnnews.fnal.gov!nntp-
server.caltech.edu!news.ridgecrest.ca.us!owens!croton
From: Cyrus Roton <croton@ridgecrest.ca.us>
Subject: Re: read temperature from i/o port
In-Reply-To: <4hi4ds$5ej@acme.freenet.columbus.oh.us>
X-Sender: croton@owens
X-Nntp-Posting-Host: owens
Content-Type: TEXT/PLAIN; charset=US-ASCII
Message-ID: <Pine.SUN.3.91.960306080547.2216A-100000@owens>
Sender: usenet@ridgecrest.ca.us (Ridgenet Usenet admin)
Organization: RidgeNet - SLIP/PPP Internet, Ridgecrest, CA. (619) 371-3501
References: <4hgjnd$jls@cloner4.netcom.com>
<4hi4ds$5ej@acme.freenet.columbus.oh.us>
Mime-Version: 1.0
Date: Wed, 6 Mar 1996 16:37:55 GMT
Lines: 39

On 5 Mar 1996, Dave Althoff wrote:

>
> A thermistor is a reisitor which has a variable resistance related to
> ambient temperature.  I've seen them at Radio Shack in the parts cards,
> and those indicate what the resistance is at a particular temperature.
>
> The paddle ports on an Apple ][ are 150k ohm (or was it 150 ohm...I don't
> recall off-hand).  So that is the range of resistances you need to work
> with.  -------------- snip -----------------

You can connect a resistor to a paddle input and supply a voltage to the
other end. Current flows through the resistor to charge a .022 mfd
capacitor inside the apple2. When the paddle is read, the apple2
discharges the capacitor and resets a timmer. Then the cap is allowed to
charge. When the charge reaches the trigger level (3.2 volts) the timmer
is stopped and the count is read out.

The lower the value of the resistor, the faster the charge and the lower
the count. Also, the higher the voltage, the faster the charge.  A
resistance of about 120K with a 5 Volt supply will give a count of about 250.
You can add an external capacitor across the paddle input (to ground) to
increase the charging time (if needed)

 The formula is (charge) = (input volts) * (1 - exp(-t/RC))

So, you can use a supply voltage and external capitor as required to fit
the resistance value of the thermister (or other resistive component).
Probably, the best way to find the correct values woud be to try a
variety of values and plot the "count" as a function of the variable
resistance. Then compare the plot against the resistance curves for the
thermister (probably not linear), and work out some conversion formula to
use in your program to correlate "count" to temperature.
```

Cyrus Roton croton@ridgecrest.ca.us
Ridgecrest Apple User Group

END OF FILE thermistor

```
##########################################################################
### FILE: timemastii
##########################################################################

Newsgroups: comp.sys.apple2.comm
Path:
blue.weeg.uiowa.edu!news.uiowa.edu!uunet!news.mathworks.com!udel!gatech!psuvax1!ne
ws.ecn.bgu.edu!newspump.wustl.edu!news.starnet.net!wupost!waikato!comp.vuw.ac.nz!a
ctrix.gen.nz!dempson
From: dempson@atlantis.actrix.gen.nz (David Empson)
Subject: Re: Still having problems...
Message-ID: <D30HvI.4tE@actrix.gen.nz>
Sender: news@actrix.gen.nz (News Administrator)
Organization: Actrix - New Zealand Internet Service Providers
Date: Thu, 26 Jan 1995 12:11:40 GMT
References: <D2rz3z.EEH@sue.cc.uregina.ca> <D2t09q.BIM@actrix.gen.nz>
<D2xIE4.BnD@sue.cc.uregina.ca>
X-Nntp-Posting-Host: atlantis.actrix.gen.nz
Lines: 61

In article <D2xIE4.BnD@sue.cc.uregina.ca>,
charles macdonald <macdon@HERCULES.CS.UREGINA.CA> wrote:
>
>   The problem was a Time][ card installed in slot#7 (given to me about
> 9 years ago).  It was wreaking havoc with the interrupts.

Aha!

Easy solution there: change the switches on the Time ][ so that it
doesn't have any interrupts enabled.  (It shouldn't have, unless you
have written some software to use them.)

I see from a later posting that you don't have a manual.  Luckily, I
do.

There are eight switches on the card.  To disable all interrupts, set
all the switches to the OFF or OPEN position (towards the edge of the
board).

In case you ever want to use the interrupts, the switches operate as follows:

1   1 Hour   NMI
2   1 Minute NMI
3   1 Second NMI
4   1024 Hz  NMI
5   1 Hour   IRQ
6   1 Minute IRQ
7   1 Second IRQ
8   1024 Hz  IRQ

NMI and IRQ refer to the Non Maskable Interrupt and Interrupt ReQuest
signals.

Only one of the four interrupts in each group may be enabled.  The 1
hour, 1 minute and 1 second interrupts generate a pulse of 122.1
millisecond duration on the appropriate interrupt line.  The 1024 Hz
interrupt generates a pulse of 488 microseconds every 976 microseconds.

It is a very bad idea to have NMI enabled, because an NMI can occur at
```

any time, even while the processor has interrupts disabled. The worst example of this is during a disk write operation: an NMI can cause part of the disk's contents to be destroyed!

The IRQ is less dangerous. If the processor has interrupts enabled, an IRQ from the card will cause the interrupt handler to be called immediately (you can install up to four interrupt handlers if you are running ProDOS).

It is normal practice for an interrupt handler to check that the interrupt comes from its device. This is a little difficult to do with the Time][card, but not impossible.

If no interrupt handler has been installed for the Time][, an interrupt from the card will immediately crash the computer (as you have discovered). Interrupts are normally disabled (within the processor) until you run a communications program or boot ProDOS-8 1.2 or later.

--

David Empson
dempson@actrix.gen.nz
Snail mail: P.O. Box 27-103, Wellington, New Zealand

END OF FILE timemastii

```
##########################################################################
### FILE: titanii
##########################################################################

Path: news1.icaen!news.uiowa.edu!news.physics.uiowa.edu!math.ohio-state.
edu!uwm.edu!newsfeeds.sol.net!ix.netcom.com!news-peer.sprintlink.net!
news-peer.sprintlink.net!news.sprintlink.net!sprint!uunet!in3.uu.net!
206.63.63.70!nwnews.wa.com!rook.wa.com!brian.hammack
From: brian.hammack@rook.wa.com (Brian Hammack)
Newsgroups: comp.sys.apple2
Subject: Re: Titan Accelerator II
Date: Mon, 07 Apr 1997 18:17:00 GMT
Message-ID: <1378104229-970407111700@rook.wa.com>
Distribution: world
Lines: 50

 Mitchell spewed forth:

 SCC(|     I picked up some odds and ends on the weekend (still going
     | through it) and one interesting item is a Titan Accelerator II

I have two, I think they're pretty neat.

 SCC(|     First off, how did this accelerator differ from the TransWarp
     | and ZipChip in terms of functionality and compatibility? I would
     | like to install it in my Apple IIe and use with recent software,
     | like ProTERM. There is a bank of eight switches and seven jumpers

Simply put:  The two blocks correspond to the slots in a //e.  The first
block is for time-dependant slots (drives, printer, etc.) -- flip these
switches OFF if there's something time sensitive in it.  The second is
for any memory you have in (if you are using a ][/][+ the card goes in
the aux slot 0, and goes in any other slot on a //e, so there is no
jumper for slot 0) -- pull the jumper OFF for any slot with memory.

 SCC(|     As for working with the card, when I plug it in most software
     | will refuse to run. An "Unable to load ProDOS" message appears if
     | I try and start most things up (removing the boards fixes this).

I have no clue.  The Titan card replaces having a 65C02 in some
applications but not others (Angel likes it, Shrink It does not).

     | Also odd, if I press control-reset, I see garbage off the to side
     | of the screen, like this:

The card does retain a charge; my experience says that one has to power
down for 15-20 seconds before rebooting to not get garbage.  As for a
control-reset, I haven't done that much lately.  :)

 SCC(|     Is the board not properly configured or does it sound
     | defective? All the chips are socketed (minus the silver "Titan
     | Technologies" box in the corner) but I'm not sure which chips

The only thing I know is that you have to slow the thing down -- speed
is 3.5MHz -- to reset any system clock you have, and some programs don't
really like it (this happened with some BBS program I was setting up).
The POKE there is:  49286,x where x=5 for fast and x=1 for 1MHz, and
x=10 to turn the thing off completely (a dangerous choice).
```

The card does wonders for me in Publish It! 4, speeds up the pagination
in AppleWorks, and doesn't do anything special in ProTerm except change
the tone of the "connect" sounds. :)

 * 2qwk! 2.03 * "Cold meat, mutton pies/Tell me when your mother dies" -boy
--   --
yet another annoying post by brian.hammack@rook.wa.com -- deal with it.

END OF FILE titanii

```
##########################################################################
### FILE: titaniie
##########################################################################

Path: news.uiowa.edu!chi-news.cic.net!newsxfer.itd.umich.edu!bloom-
beacon.mit.edu!senator-bedfellow.mit.edu!pbauer
From: pbauer@athena.mit.edu (Paul H Bauer)
Newsgroups: comp.sys.apple2
Subject: Re: accelerator's slot?
Date: 8 Oct 1995 00:24:39 GMT
Organization: Massachusetts Institute of Technology
Lines: 149
Message-ID: <4575o7$a1l@senator-bedfellow.MIT.EDU>
References: <44ucs3$haa@mordred.cc.jyu.fi>
NNTP-Posting-Host: arcadia.mit.edu
```

TITAN ACCELERATOR IIe

Section 1

STEP 1. DON'T TAKE THE ACCELERATOR IIE OUT OF THE PINK ANTI-STATIC BAG YET.

STEP 2. Turn off the power to your Apple.

STEP 3. Put a piece of aluminum foil on the table next to your Apple.

STEP 4. Take the cover off the Apple.

STEP 5. Make a list of the contents of each slot in a table like the one below:

Slot 0 (or aux slot)	_____	Slot 4	_____
Slot 1	_____	Slot 5	_____
Slot 2	_____	Slot 6	_____
Slot 3	_____	Slot 7	_____

STEP 6. If you have an Apple II or II Plus,we reccomend that you put your Accelerator IIe in slot 0. If you have a memory board in slot 0 now move it to another slot or just take it out. The Accelerator IIe contains its own built-in language card with 16k of memory, so you don't really need another 16k memory board.

STEP 7. On your slot table, mark the slot number(s) that contain DISK CONTROLLER CARD(S), MODEM INTERFACE, VIDEO DIGITIZER CARD, or other interfaces to time-sensitive devices. A time-sensitive device is one whose controlling software makes iterative timing calculations. This does not include memory boards, 80 column cards, or printer interfaces.

STEP 8. Touch the Apple's power supply to discharge any static electricity on your fingers. Then remove the Accelerator IIe from its pink bag and put the board on the aluminum foil. Make sure each pin is touching the aluminum foil to prevent static buildup.

STEP 9. Find the block of small switches on your Accelerator IIe board. Switches 1 to 7 correspond to slots 1 to 7. For each slot with a time sensitive device (refer to your slot table), set the corresponding switch OFF. Set switch 8 OFF. Set all the other switches ON.

STEP 10. Find the block of jumpers on the upper right of the Accelerator IIe. Refer to figure 2. There are 7 jumper positions. The top jumper goes with slot 1, the next with slot 2, etc. The bottom jumper goes with slot 7. Now for each slot where you have any type

of memory board, remove the corresponding jumper(small plastic gadget). If you have an Apple IIe, ignore the auxiliary slot. For an AppleII or II plus, the Accelerator IIe will not recognize a memory board in slot 0. Thus there is no jumper for slot 0. We recommend that you put the Accelerator IIe in slot 0 of an Apple II or II Plus.

STEP 11. Make sure the power is turned off for your Apple.Touch the power supply again. Now plug the Accelerator IIe into the slot 0 on your Apple II or II Plus, or into any available slot on your Apple IIe. Slot 3 is a good choice for the Apple IIe, since the Accelerator IIe wil work in slot 3 whereas most other cards won't.

STEP 12. Replace the cover to the Apple.

STEP 13. If you do NOT have a Z-80 card, skip this step. If you have a Microsoft Z-80 Softcard or another Z-80 card which uses DMA, you must use the preboot disk which came with your Accelerator IIe before you run any Z-80 (CP/M) software. You do not need the pre-boot if you have a Z-80 card which does not use DMA. Consult your Z-80 card manual if in doubt.

To use the pre-boot, just boot the Accelerator IIe pre-boot disk. It is already set for the "desireable" option, which is what you need. Now remove the pre-boot disk, insert your regular CP/M disk, and press the space bar. Run your programs as usual. Your CP/M software will not speed up, since it is not using the Accelerator's 6502. To get back to 6502 operation for DOS or Pascal, you must reboot the system. Just turn off the power and back on to get the accelerated 6502 operation.

STEP 14. All your software (except CP/M programs requiring a Z-80 card) will now run approximately 3-1/2 times faster! If you want to slow down (in order to play games, perhaps), you can use the pre-boot disk provided with your Accelerator IIe board. Just boot this disk before you run your game. Move the cursor to the "slow down" position with the right arrow key. Now remove the pre-boot disk, insert a regular DOS or Pascal disk, and press the space bar. Run your program as usual.

Step 15. For more information, read Section II at your convenience

LIMITATIONS:

1. The Accelerator IIe will not speed upCP/M software running on a Z-80 card. All other applications will run approx. 3-1/2 times faster.

2. The Accellerator IIe is not compatable with the Corvus Omninet or other DMA (direct memory access) devices.

3. The Accellerator IIe will not access the second bank of a Saturn 32k RAM Board, although the built in language card on the Accellerator IIe effectively replaces this second bank.

4. A few programs are not compatible with the CMOS 6502 because they treat newly implemented op-codes as no-ops.

SECTION 2 - Accellerator IIe INFORMATION

PROCESSOR

The Accellerator IIe is based on a CMOS 6502 microprocessor running at 3-1/2 MHZ. This replaces the Apple's 1 MHz 6502 processor for all computation. The Accellerator's clock is derived

from the 7M signal on the expansion bus. The frequency is divided by 2 for normal operation of the Accelerator. Synchronization of off-board cycles is accomplished by cycle stretching.

CMOS parts are particularly sensitive to static electricity, and for this reason the Accellerator IIe should be handled with some care. Ground yourself by touching the Apple's power supply before removing the Accellerator IIe from its anti-static bag. Place the board on a piece of aluminum foil or other conductor to set the switches and jumpers. Be sure every pin on the back of the board is touching the conductor during the operation. Once the board is plugged in, never touch it without first touching the power supply. Avoid excess handling of the Accellerator IIe. The board should always be kept either in its anti-static bag or in one of the Apple's slots.

MEMORY

CONTROL PORT

The Accelerator IIe operating mode may be controlled by execution of a machine language write cycle or BASIC poke according to table 1:

Table 1

Address	Data to write	Function
C086	05H	High speed (normal operating mode, set on power-up)
C086	01H	Low speed
C086	0AH	Disable

I think this should give enough information to write a simple basic program to set the speed of the card or disable it.

Paul pbauer@mit.eduTo:

END OF FILE titaniie

```
##############################################################################
### FILE: transwarp
##############################################################################

Path: blue.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.
ohio-state.edu!usc!howland.reston.ans.net!europa.eng.gtefsd.com!newsxfer.
itd.umich.edu!isclient.merit.edu!msuinfo!harbinger.cc.monash.edu.au!news.
cs.su.oz.au!metro!news.ci.com.au!wabbit.cc.uow.edu.au!wabbit.cc.uow.edu.
au!not-for-mail
From: david@zircon.cs.uow.edu.au (David E A Wilson)
Newsgroups: comp.sys.apple2
Subject: Re: Any Transwarp (//e) users out there?
Date: 22 Sep 1994 10:57:40 +1000
Organization: University of Wollongong, NSW, Australia.
Lines: 53
Message-ID: <35qkq4$e3l@zircon.cs.uow.edu.au>
References: <CwG474.JzM@pts.mot.com>
NNTP-Posting-Host: zircon.cs.uow.edu.au

kburtch@pts.mot.com (Kevin Burtch) writes:
>I just got a //e, and was wondering a few things about the Transwarp card
>that came with it. I already found, by experimentation, that by hitting the
>ESC twice as "Transwarp" is displayed at powerup I can switch it back to low
>gear. (so to speak)

Also you can press 0 or 9 while the logo is displayed and it will run the
built in self test (the 9 puts up a copyright message first). Now why does
this not get a mention in the manual??

>First, just how fast is this thing? I can't find a clock on the card, so I'm
>guessing it uses the 3.5MHz signal from the slots. (am I even close?)

The manual says 3.6MHz (near enough to 3.58 I guess) while the self test shows
3.3 for full speed and 2.1 for half speed (strange - I would have expected less
than 1.7).

>Second, am I right about using ESC twice at bootup being the only way to slow
>it down? After I hit CONTROL-RESET, it speeds back up, just like it says when
>you use the ESC trick. ;^) Is there a POKE or anything I can use from BASIC, or
>assy? How do I speed it back up? Is CONTROL-RESET and power-off/on the only way
>to change the speed? (I'd rather not have to cycle the power every time...)

Pressing ESC disables the Transwarp completely. A poke of 3 to $c074 does the
same. The two switch #8 select the default speed (1/1.7/3.6MHz). A poke of 1 to
$c074 will slow the TW down to 1MHz using the TW CPU.

>Third, what are the switches for? What are the options? (this one is important)
>I know there are two sets of eight swiches, but I really need to know. I assume
>that some are for disabling the accellorator when accessing certain slots, like
>the floppy controller, etc. I really appreciate this one!

Yes. The left bank tells the TW which slots have RAM cards (16k/128k etc).
The right bank tells the TW which slots have slow cards (floppy disks, clocks
etc). Slot number as per switch number. Off means full speed (I think - I will
double check the manual when I get home).

>Fourth, it has 256k onboard, is this used in a "shadow" fashion, or can I use the
>extra RAM somehow? A lot of programs that came with this machine are configured
>for the 1Meg Ramworks II card in the AUX slot. Is it possible to use both the
```

>Transwarp's 256k and the Ramworks II's 1Meg in addition to the 64k onboard?

Yes, it shadows all of the m/b RAM (64k), the ROM (16k), the aux RAM (multiple banks of 64k). I guess if you have more than 128k of aux RAM it will have to start caching. If you have a][+ you can put the TW in slot zero and use it as your language card (provided you do not disable it with ESC or the poke).

>Finally, is there a disk that should have come with the Transwarp? Drivers, or >utilities or something? (I don't have one, or a manual)

I bought mine at ICONfest and it only had the manual. I like my Zip chip a little better as it saves me a slot and runs at 8MHz. Now I have two genuine //e computers that are accelerated.

END OF FILE transwarp

```
##########################################################################
### FILE: turbo.mouse
##########################################################################

Path: news1.icaen!news.uiowa.edu!chi-
news.cic.net!newsfeed.internetmci.com!uunet!in3.uu.net!199.171.6.16!li.net!bookwor
m!mwade
From: Mark Wade <mwade@suffolk.lib.ny.us>
Newsgroups: comp.sys.apple2
Subject: Re: How do you hook kensington turbomouse up to IIgs?
Date: Fri, 4 Jul 1997 18:11:07 -0400
Organization: LI Net (Long Island Network)
Lines: 30
Message-ID: <Pine.SOL.3.95.970704175313.15905A-100000@bookworm>
References: <5phnls$f8f$2@mentor.telis.org> <5pj46g$i7o$1@mentor.telis.org>
Reply-To: Mark Wade <mwade@suffolk.lib.ny.us>
NNTP-Posting-Host: bookworm.suffolk.lib.ny.us
Mime-Version: 1.0
Content-Type: TEXT/PLAIN; charset=US-ASCII
X-Sender: mwade@bookworm
In-Reply-To: <5pj46g$i7o$1@mentor.telis.org>

On 4 Jul 1997, itsme wrote:

>
> P.S.  It is kensington turbo mouse adb model

Version 3.0 Kensington Turbo Mouse ADB works fine on a IIgs.  V4+
will not.

Dip switches:

Right handed use: (Left button click, right button click lock) SW1 Up
Left handed use:  (Right button click, left button click lock) SW1 Down

The other switches are for what they call "chording" and are listed as:

            SW2   SW3   SW6
Command N   Dn    Dn    Up
Command O   Dn    Up    Dn
Command W   Dn    Up    Up
Command S   Up    Dn    Dn
Command P   Up    Dn    Up
Command Q   Up    Up    Dn
Command Z   Up    Up    Up

Mark Wade
mwade@suffolk.lib.ny.us
m.wade7@genie.com
mswade@delphi.com



### END OF FILE turbo.mouse
```

```
##############################################################################
### FILE: turboasb
##############################################################################

Path: news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.erols.net!newsfeed.internetmci.com!newshub.csu.net!cello.gina.ca
lstate.edu!cello.gina.calstate.edu!not-for-mail
From: sjensen@cello.gina.calstate.edu (Steve Jensen)
Newsgroups: comp.sys.apple2
Subject: Re: Please Reprint
Date: 12 Sep 1996 19:06:30 -0700
Organization: GINA and CORE+ Services of The California State University
Lines: 89
Message-ID: <51afj6$28i@cello.gina.calstate.edu>
References: <5141ap$6d2@nntp.seflin.lib.fl.us>
NNTP-Posting-Host: cello.gina.calstate.edu

cybdiver@bcfreenet.seflin.lib.fl.us (Robert Rait) writes:
>
> Someone posted a great artical about Modems for the //e,
> with information that showed that a //e with a super serial
> card could handle upto 14400.  Could you please repost that.
> Thanks

Here 'tiz:

Lightning Systems Product Information Sheet

Lightning Systems offers two (2) products for the Apple // line of computers.

6551-ACIA
---------
This is a replacement chip for the 6551 ACIA (Asynchronous Communications
Interface Adapter) that is standard on most Serial Interface cards for the
Apple //.

Why do you need a replacement chip? Simple, the 6551 chip that is on most
Serial Interface cards has a design flaw in it that causes it to lose a
character every time the CTS line is switched.

In most cases, this is not a problem. However, with modem speeds
continuing to
rise, people have started using Hardware Handshaking cables to connect their
computers to their modems to achieve even higher speeds. This is where the
problem lies.

In typical Hardware Handshaking installations, the computer is sending and
receiving data faster than the modem can receive and transmit data. This
means
that the computer and the modem need a way to communicate between
themselves to
tell each other when it's ok to send or receive data. When the modem's buffer
fills up, the modem switches the CTS (Clear To Send) line to notify the
computer that it is no longer ok to send data. At this point the 6551 chip
stops sending data immediately! This is bad. The 6551 may have been right in
the middle of sending a character (normally 10 bits). That character is now
lost causing an error in the transmission.

This is where the 6551-ACIA comes in. This new 6551 chip fixes the problem.
```

This is a direct replacement for the 6551 chip you now have.

Turbo ASB

Do you have a high-speed modem, or other high-speed serial communications device?
Did you know that most Serial Interface Cards for the Apple // are limited to
only 19.2k bps?

Well, they don't have to be anymore. The Turbo ASB can blow away that nasty 19.2k bps barrier. With the Turbo ASB, your serial communications can run as fast as 230,400 bps!!!

The Turbo ASB is an add-on card replaces that pokey old 6551 chip on your Serial Interface Card and transforms it into a speed demon.

The Turbo ASB supports all the standard bps rates you are used to, (slow...) and adds 38.4k, 57.6k, 115.2k and 230.4k!

At this time the Turbo ASB is supported by ProTERM, Spectrum and ANSITerm. The Turbo ASB includes a 6551-ACIA chip.

Pricing

The 6551-ACIA is $4.00 each. The Turbo ASB is $27.00 each.

Shipping and handling is as follows:

Within the U.S., $3.00 per order.
Canada and Mexico, $5.00 per order.
Everywhere else, $10.00 per order.

Include an E-Mail address if you have one. Monies need to be sent in US funds.

Lightning Systems
P.O. Box 4
Mukwonago, WI 53149-0004
(414) 363-4282 BBS

END OF FILE turboasb

```
##########################################################################
### FILE: twgs
##########################################################################

Path: news.uiowa.edu!news.uiowa.edu!chi-
news.cic.net!brutus.bright.net!usenet.eel.ufl.edu!news.mathworks.com!solaris.cc.vt
.edu!news.genie.net!news2.genie.net!usenet
From: harold.h@genie.com
Newsgroups: comp.sys.apple2
Subject: re: "TWGS not friendly with Appletalk???"
Date: 19 Sep 1995 08:51:54 GMT
Organization: via GEnie Services (1-800-638-9636 or info@genie.com)
Lines: 36
Sender: harold.h@genie.com (Harold Hislop)
Message-ID: <43m0ba$se3@rock104.genie.net>
NNTP-Posting-Host: rock103.is.ge.com

FWIW,

For the last two months I have been running a 14Mhz TWGS in a "Turbo-28"
(prototype ROM_03 IIgs (with production roms installed)) on an AppleTalk
network, with =ZERO= problems (not one single crash / lockup that I have
been able to attribute to the hardware (many I could attribute to bugs
in code while developing ;))

My 65C816 is a 14Mhz rated part, not a -E (eng sample) etc.
The cache in use is ISSI IS61C256AH-15N (15ns) installed on a modified
original (8k) cache daughterboard (no series resistors in the adr lines)
with a v1.8 TWGS rom installed.

The GALs on this TWGS are as follows:
AE #         Lattice #      Lot #
==================================
TWGS1A-I     16V8A 15LP     891532
TWGS2A-I     16V8A 15LP     891532
TWGS3B-I     20V8  25LP     891514
TWGS4A-I     20V8  25LP     891112
TWGS5A-I     20V8  25LP     891811
TWGS6A-I     16V8  25LP     892520
TWGS7A-I     16V8  25LP     892407
TWGS8A-I     16V8A 15LP     891535

I have modified two other TWGS's in like manner, all three have proven
themselves reliable to me.

Memory - CVTech Rev-A 4Mb board w/3Mb installed, Apple 1Mb in back pocket
SCSI - Rev-C RamFast w/3.01e roms, loaded SCI chain
Case - Full sized tower w/300w supply.

-Harold
Hardware Coordinator
Apple II RoundTable, GEnie.


### END OF FILE twgs
```

```
##########################################################################
### FILE: twgs.speed
##########################################################################

Newsgroups: comp.sys.apple2.programmer
Path: news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-
state.edu!cs.utexas.edu!uunet!olivea!pagesat!news.cerf.net!crash!pro-desert!gregd
From: gregd@pro-desert.cts.com (Greg DaCosta)
Subject: Re: TransWarp GS - how to get/set speed?
Organization: ProLine [pro-desert], Greg DaCosta (Sysop)
Date: Tue, 12 Oct 93 20:29:20 PDT
Message-ID: <jc73776@pro-desert.cts.com>
References: <user0213-101093184557@150.203.102.28>
Lines: 345

Ian,

What follows is the Merlin source to an EXE file to control the speed of
the TWGS.  I wrote this about 4 years ago, so it doesn't know anything
about the Cache size.  I hope it helps.



 lst off ;lose the playback!

*========================================================================*
*                                                                        *
*  SPEED ..................................................... ver. 1.0  *
*                                                                        *
*    written by Greg A. DaCosta / copyright 1989, Desert Sun Software    *
*                GEnie: [G.DACOSTA]                                      *
*                                                                        *
* This program may be distributed freely as long as these credits remain *
* intact and unmodified.                                                 *
*                                                                        *
* No fee may be charged for this program other than a minimal distri-    *
* bution fee (not to exceed $10). The only exception is distribution on  *
* the Merlin 16+ disk.                                                   *
*                                                                        *
*========================================================================*
*                                                                        *
* This source code based on the DUMP command by Glen Bredon. It's not too *
* pretty, but it works well.  Thanks to Eric Mueller for his InstDA file *
* which was a valuable aid in making this work.                          *
*                                                                        *
*========================================================================*


        ttl     "SPEED"

        xc
        xc              ;Turn on full 65816 assembly
        mx %00

        cas in          ;case insensitive

         rel
        dsk 6/speed.l
```

```
        typ     exe

        tr
        tr      adr
        exp     off

*================================

CSWH = $37

PNT = $60               ;Misc use
STACKPNT = $68

KEY = $E0C000
STROBE = $E0C010

SetSpeed = $BCFF2C      ;TWGS memory location
CheckTW = $BCFF00       ;ditto here


*================================

Tool    MAC
        IF MX
        ERR 1
        ELSE
        LDX #]1
        JSL $E10000
         FIN
 <<<

WriteChr MAC
 Tool $180C
 <<<

print2 MAC
 JSR SENDMSG2
 ASC ]1,00
 <<<

PRINT MAC
 JSR SENDMSG
 ASC ]1,00
 mx %11 ;eight bit
 <<<

*------------------------------------------------

*================================
* Optional header on EXE files:
*--------------------------------

START   BRL     Speed   ;Initialization entry
        BRL     Speed   ;Secondary entry
        BRL     Speed   ;Other required entry
        BRL     Speed   ; vectors, not used by Speed.
        BRL     Speed
        BRL     Speed
        BRL     Speed
        BRL     Speed
```

```
        DA      0       ;= ID of transient commands

        ASC     'MERLIN' ;= ID of special EXE file

*=======================================
* End of optional structure for EXE file.
*---------------------------------------

Speed   PHK
        PLB

        TSC
        STA     STACKPNT

        TYA
        CLC
        ADC     #8      ;Bypass the "MERLINGS"
        STA     PNT     ; identifier - it is not
        TXA             ; checked for in this
        ADC     #0      ; example
        STA     PNT+2

        lda     #$8d
        jsr     OUTPUT
        jsr     RtnSpcs
        print   "SPEED shell command by Greg A. DaCosta"
        jsr     RtnSpcs
        print   "Copyright 1989, Desert Sun Software"

        SEP     %00110000
        LDY     #0
]LOOP   LDX     #0              ;Look for "SPEED" in order
        PHY                     ; to align index to the
]LUP    LDA     [PNT],Y         ; following part of cmd.
        BEQ     :EX             ;Something wrong if taken
        AND     #%01011111
        CMP     cmdWORD+1,X
        BEQ     :NX
        PLY
        INY
        BRA     ]LOOP

:NX     INX
        INY
        CPX     #5              ;all letters?
        BLT     ]LUP
        PLA                     ;Pop pushed Y
        DEY
]LUP    INY
        LDA     [PNT],Y
        AND     #$7F            ;Not needed
        BEQ     :EX             ;Nothing after "SPEED" so
        CMP     #'*'            ; do nothing.
        BLT     ]LUP            ;Bypass delimiter & spaces
        LDX     #0
]LUP    LDA     [PNT],Y
        AND     #$7F
        CMP     #$60
        BLT     :SB
```

```
        AND     #%01011111
:SB     STA     BUFFER,X
        BEQ     :GOTIT          ;Branch if no more input
        CMP     #'*'
        BEQ     :IX
        CMP     #'.'
        BLT     :GOTIT          ; or if excess input
:IX     INX
        INY
        BRA     ]LUP

:EX
        BRL     EXIT

        mx      %11             ;back to eight bit to store the filename

:GOTIT  STX     Speedname       ;Store length
        DEX
        BMI     :EX
:MOV    LDA     BUFFER,X
        STA     speedname+1,X   ;Save the speed which
        DEX                     ; the user wants installed.
        BPL     :MOV
        rep     #$30
        jsr     IsATwgs         ;Check to see if A TWGS is installed
        bcc     :NoTW
        sep     #$30            ;back to 8 bits for checking
        ldx     #0
        lda     BUFFER,x
        and     #$DF
        cmp     #'F'            ;Is it an "F"?
        beq     :fast
        cmp     #'S'            ;Is it an "S"?
        beq     :slow
        bra     :max            ;Otherwise just set the Max Speed

:NoTW   rep     #$30
        jsr     RtnSpcs
        print   "Sorry, a TWGS is not installed in this System."
        brl     EXIT

:slow   jsr     Slow
        brl     EXIT

:fast   jsr     Fast
        brl     EXIT

:max    jsr     Warp
        brl     EXIT


EXIT    SEP     %00110000
        LDAL    CSWH
        CMP     #$C3
        BNE     EXIT2           ;Exit if not screen output
        lda     #$8d
        jsr     OUTPUT
        jsr     RtnSpcs
        print   "Press RETURN."
```

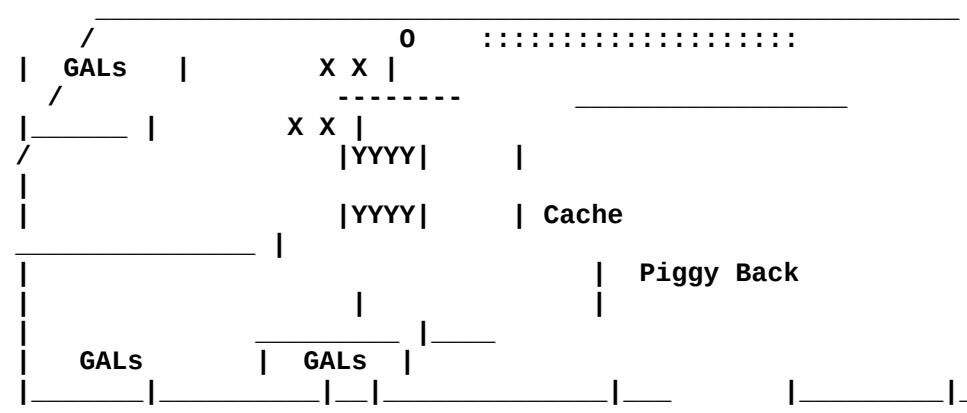
```
]LUP    LDAL     KEY    ;Else wait for key
        BPL     ]LUP
        XBA
        LDAL    STROBE
        XBA
        CMP     #$8D
        BNE     ]LUP
EXIT2   print   8D8D
        rep     #$30
        LDA     STACKPNT
        TCS
        LDA     #0              ;No error
        RTL                     ;All done


        mx      %00

* print some spaces

RtnSpcs  rep    #$30
        lda     #$8d    ;print a return first
        jsr     OUTPUT
Spcs    ldx     #20
:loop   phx
        lda     #$a0
        jsr     OUTPUT
        plx
        dex
        bne     :loop
        rts

*================================

SENDMSG2 REP    %00100001
        LDA     1,S
        INC
        STA     1,S
        SEP     %00110000
        LDY     #0
        LDA     (1,S),Y
        BEQ     :back
        JSR     OUTPUT
        BRA     SENDMSG2
:back   rep     #$30            ;back to full 16 bit
        rts

SENDMSG REP     %00100001
        LDA     1,S
        INC
        STA     1,S
        SEP     %00110000
        LDY     #0
        LDA     (1,S),Y
        BEQ     BACK
        JSR     OUTPUT
        BRA     SENDMSG

OUTPUT  PHA
        PHX
        PHY
```

```
        PHP
        REP     %00110000
        PHA
        WriteChr
        PLP
        PLY
        PLX
        PLA
BACK    RTS

*================================

cmdWord str 'SPEED'

*================================

IsATWgs mx      %00
        lda     >CheckTW                ;check Low word of ID
        cmp     #'TW'                   ;does it say TW?
        bne     :bad                    ;if not, get outta here
        lda     >CheckTW+2              ;check high word
        cmp     #'GS'
        beq     :rts
:bad    clc
:rts rts

Slow    mx      %00
        rep     $30
        php
        ldx     #0
        jsl     SetSpeed
        jmp     rts1

Fast    mx      %00
        php
        rep     $30
        ldx     #1
        jsl     SetSpeed
        jmp     rts1

Warp    mx      %00
        php
        rep     $30
        ldx     #2
        jsl     SetSpeed

rts1    plp
        rts

*================================

BUFFER  DS      $80,$8D

Speedname ds    $80
```


    _ _
   / _ | \ Greg DaCosta, Sysop - Pro-Desert BBS
   _| |_/ Internet: gregd@pro-desert.cts.com

```
### END OF FILE twgs.speed
```

```
######################################################################
### FILE: twgs.upgrade
######################################################################

Path:
news1.icaen!news.uiowa.edu!news1.chicago.iagnet.net!qual.net!iagnet.net!feed2.news
.erols.com!howland.erols.net!newscon04!prodigy.com!not-for-mail
From: "no1inParticular" <compuser@prodigy.net>
Newsgroups: comp.sys.apple2
Subject: TWGS
Date: Sun, 15 Feb 1998 13:17:10 -0800
Organization: Prodigy Services Corp
Lines: 295
Message-ID: <6c7m59$6lc$1@newssvr07-int.news.prodigy.com>
NNTP-Posting-Host: slip-32-100-154-213.ca.us.ibm.net
X-Post-Time: 15 Feb 1998 21:19:37 GMT
X-Auth-User: 002489759/61834314d6447871
X-Problems-To: abuse@prodigy.com
X-Newsreader: Microsoft Outlook Express 4.71.1712.3
X-MimeOLE: Produced By Microsoft MimeOLE V4.71.1712.3
Xref: news1.icaen comp.sys.apple2:130231

Might have wrong information.  I was aiming at a good Replacement for the
complicated instructions in the *FAQ*    Most of this information is
provided in
one way or another already, in other artciles or texts.  I drew the ASCII
picture of the TWGS, and Cut and pasted some other information from CSA2.
All of the FAQ articles are in TEXT And that is why I have created this
article.  I reccommend the HyperCard Stack about Upgrading the Transwarp,
because it has Alot more information, and a
Graphic picture of the TWGS (instead of TEXT)  I TAKE NO CREDIT For the
Following Information.  I tried to Include where I got all of the Info.



U     U    PPPPP    GGGG    RRRR          A         DDD    IIIIIIIIII    N
N    GGGG
U     U    P      P      G             R       R     A    A    D    D      I
NN   N    G
U     U    PPPP       GGGG     RRRR       AAA       D    D      I       N N  N
GGGG
U      U   P               G      G     R  R         A   A      D    D
I       N  N N    G     G
UUUU    P               GGGG    R     R      A    A     DDD   IIIIIIIIII
N      N   GGGG


TTTTTTTT     W           W           W         GGGGGGGG         SSSSSSSS
       TT             W        WW       W          GG                          SS
       TT               W   W    W  W            GGGGGGGG         SSSSSSSS
       TT                  W            W               GG           GG
SS
       TT                  W            W               GGGGGGGG
SSSSSSSS

Instructions on how to Speed up/Information about the TWGS Accelerator card
for the Apple IIgs UPGRADING a Transwarp Cards' speed is EASY.  *2* parts
need to be replaced.
```



XX = Clock Oscillator, 1/2 size. The speed of the Accelerated
XX = Transwarp IIgs is equal to the Oscillator speed Divided by
4

YYYY = Fast Processor Chip. This is the CPU of the TWGS.
YYYY = It is a 65816 CPU and is Upgradeable to 10-15 MHZ

GALs = Chips you don't have to worry about.

Cache = You need at least ROM version 1.5 to go faster.
Piggy = This board Has the SRAM, and ROM. You can
Back = Upgrade the Cache on this board (32k maximum)

WHAT YOU NEED TO UPGRADE:

1) Transwarp IIgs with ROM version 1.5 or greater (With the IIGS turned on, press CONTROL-Apple-ESCAPE And go to the Transwarp CDA)

2) A high speed 65816 chip

3) A 1/2 size Clock Oscillator that is 4X the megahertz you want to your TWGS to run.

Digikey Part #	Clock Oscillator speed	TWGS speed
CTX175-ND	40 mhz	10 mhz
	48 mhz	12 mhz
	60 mhz	15 mhz

You can get the 65c816 -14 PLCC chip from the Western Design Center Their URL is http://www.wdesignc.com/

You can buy 1/2 size Oscillators from Digikey. Their URL is http://www.digikey.com/
You can also get these Oscillators from many Electronics suppliers.

Information about Upgrading the Cache on your Transwarp is near the end of this document.

The following is cut from a post from CSA2 that was made by Scott G

You really should update the out of date
info in your accelerator FAQ. I invite the original poster
of the question to point their web browser to:
http://ground.isca.uiowa.edu/apple2/apple16/Hypermedia/Hypercard/
And download: TWGSupgrade.SHK (or TWGSupgrade.BSQ if you require
7-bit transfer).
Any 65C816 high speed chip manufactured today (and recently [years])
does not require an upgrade to the GALs. Those were only
required with the old "Engineering" chips that WDC used to sell.
I've upgraded a TWGS card by just changing the half-size oscillator
in the corner. No GAL upgrade or ROM upgrade needed. The info
is in my Transwarp GS upgrade stack.
Also, again, your Zip GS upgrade info in the accelerator FAQ is
also in error. Not everyone needs to replace the gates there for
high speed operation. I did not need to for 13.75MHz. Matt
Portune's Zip _would not work_ WITH the replacement gates. And
my stack, ZipUpgrade.SHK and ZipUpgrade.BSQ from ground, also
shows where to get parts for upgrading without soldering the board.
Upgrading both accelerators is easy. Easier than the dated
accelerator FAQ makes it out to be.
-Scott G.

The following is cut from a post from CSA2 that was made by Rubywand
---

Yes indeed. A 10MHz Transwarp GS I tested matches a 12.5MHz
Zip GS in most tasks.
.....
I invite the original poster
of the question to point their web browser to:
http://ground.isca.uiowa.edu/apple2/apple16/Hypermedia/Hypercard/
And download: TWGSupgrade.SHK (or TWGSupgrade.BSQ if you require
7-bit transfer).

Any 65C816 high speed chip manufactured today (and recently [years])
DOES NOT require an upgrade to the GALs. Those were only
required with the old "Engineering" chips that WDC used to sell.
I've upgraded a TWGS card by just changing the half-size oscillator
in the corner. No GAL upgrade or ROM upgrade needed. The info
is in my Transwarp GS upgrade stack.

..... Not everyone needs to replace the gates there for
high speed operation. I did not need to for 13.75MHz. Matt
Portune's Zip _would not work_ WITH the replacement gates. And
my stack, ZipUpgrade.SHK and ZipUpgrade.BSQ from ground, also
shows where to get parts for upgrading without soldering the board.
Upgrading both accelerators is easy. ....
<<
Thanks for re-posting this info with the appropriate headlines--
pretty interesting stuff! (I had overlooked the original.) It seems
that Scott is becoming the IIgs Accelerators Guru.

Rubywand

SPEED COMPARISON OF 8K VS 32K CACHE

The following is cut from an email from Joachim Lange of ///SHH Systeme, who
sells the 8-->32k upgrade board

The larger cache size gives you more speed without the need of increasing
the processor's clock frequency. The overall gain in speed is about 20..30
per cent, however the Finder feeling is a lot more "snappy".

The following is cut from a post from CSA2 that was made by Rubywand
---

John Link charted some comparisons in 1991 involving nine setups:
no-TWGS, and 7, 8, 9, 10mHz boards before and after the 8kB-to-32kB
cache upgrade. He used three benchmarks:

1. time to calculate page breaks in a 218-page Appleworks document
2. time to scroll through a 39-page Awks-GS document
3. time to compile 4800 lines of MD-BASIC source code

The chart shows that a 7mHz TWGS with the 32kB cache performs
slightly better than a 10mHz TWGS with 8kB cache on tests 1 and 3; it is
a bit slower on test 2.
For a 7mHz 8kB TWGS, the speed gain for the 32kB cache upgrade is
roughly 33% to nearly x2.5 plain GS speed.
For a 10mHz 8kB TWGS, the speed gain for the 32kB cache upgrade is
roughly 33% to about x3.25 plain GS speed.

One nice feature of upgrading cache is that you get a good
performance boost without the concerns usually assorted with a
significant increase in clock speed.
The AE cache upgrade kit was priced at $109 in 1991. Now that AE is
gone, the kit may be harder to find than a TWGS with the 32kB upgrade
installed.

As Scott G has noted, SHH Systeme, Germany sells 32kB cache upgrade
materials.
SHH Systeme, Germany (http://users.ids.net/~kerwood/shh.html email:
jlange@tasha.muc.de)
The catch is that, according to information currently displayed at their

web site, you can get everything you need _except_ the v1.7 or v1.8 ROM.
Here is what they say ...

>>
Another important note
======================
The TransWarp GS firmware version 1.5 that came with the TransWarp
8K version does not work with 32K cache boards. You absolutely need
v1.7 or v1.8 for 32K cache operation. Since the firmware is
copyrighted material, we cannot supply copies of the firmware. ....
<<
Of course, when it comes to such matters, one never knows for sure what
is available until the seller is contacted.

SHH does list several options ranging from a bare board through one
with everything installed except the v1.7 or v1.8 ROM. The info below is
from their web site:

==
Option A: Bare boards ("do-it-yourself")
==
What you get:

Two-layer piggyback boards for the TransWarp GS with solder resist,
ready for soldering all components. A sheet of paper with short but
reliable instructions how to assemble the board. NOTHING ELSE.
Heavy soldering required!
US $15 per board plus $14 shipping/handling
(six boards minimum, 22 boards maximum for this s/h fee).

==
Option B: Populated boards, without semiconductors
("dirty-work-done")
==
Since it is much cheaper to buy expensive semiconductors (such as
cache RAMs) in your own country, you might prefer this version.

What you get:

A two-layer piggyback board for the TransWarp GS with solder
resist. All non-semiconductor components (sockets, resistors,
capacitors, header connectors) mounted and ready for use. A sheet
of paper with short instructions how to add the components not
included with the board. All board functions verified. No soldering
required.
US $32 plus $14 shipping/handling
(four boards maximum for this s/h fee).

==
Option C: Fully populated boards, without Firmware EPROM
("almost plug-and-play")
==
What you get:

A two-layer piggyback board for the TransWarp GS with solder
resist. All components but the firmware EPROM soldered and ready
for use. The board includes all sockets and three 32K cache RAMs
62256-15 or equivalent (fast enough for processor clock values of
14 MHz and more). A sheet of paper with short instructions how to
add the components not included with the board. All board functions

verified.
US $69 plus $14 shipping/handling
(four boards maximum for this s/h fee).

So, if you can get the v1.7 or v1.8 ROM (or EPROM), your additional cost for a ready-to-go upgrade is $83. If you have the ROM, then, $83 for a 33% performance increase sounds good, especially since you can also boost clock speed relatively cheaply and end up with a TWGS running at x3 or better a non-TWGS IIgs!
If there's a local Apple Club with users interested in souping-up their TWGS's, option A looks like a good way to go. Cost per board would be way below $83, 'finding' the needed ROM (or EPROM) could be easier, and boards could be checked out by a knowledgeable club member.

Rubywand

END OF FILE twgs.upgrade

```
##########################################################################
### FILE: twiie.dips
##########################################################################

Path: news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-state.edu!magnus.acs.ohio-
state.edu!usenet.ins.cwru.edu!gatech!howland.reston.ans.net!swrinde!news.uh.edu!ne
ws.sccsi.com!nuchat!yob!jeff.brielmaier
From: jeff.brielmaier@yob.com (Jeff Brielmaier)
Newsgroups: comp.sys.apple2
Subject: Re: Setting up a Transwarp IIe
Message-ID: <10213.678.uupcb@yob.com>
Date: 27 Sep 95 05:19:00 GMT
Distribution: world
Organization: Ye Olde Bailey BBS - Houston, TX - 713-520-1569
Reply-To: jeff.brielmaier@yob.com (Jeff Brielmaier)
References: <530165541wnr@klatch.demon.co.uk>
Lines: 50


JL>Well, my TransWarp //e arrived yesterday.  Plugged it in and it works
JL>great!  It too came without any documentation, so just for
JL>completeness, what are the settings for the 2 x 8 dip switches?

JL>Mine is a Rev 1.3, (c) 1985, and has a 65c02p4 chip.

JL>Switches are as follows, assuming bank 1 is lower left furthest from
JL>the edge connector.

JL>Bank1         Bank2
JL>1  closed     1  open
JL>2  closed     2  closed
JL>3  closed     3  closed
JL>4  closed     4  closed
JL>5  closed     5  open
JL>6  closed     6  open
JL>7  closed     7  closed
JL>8  open       8  open

Bank1: Sw 1-7 -> Change to OPEN if there is a memory card that uses the
"Langauge Card bank switching technique". {Normally CLOSED}
Bank1: Sw 1-7 -> Change to OPEN if the plug in card must be accessed at 1 MHz
{Normally CLOSED.  OPEN for Floppy diskette controllers}

Switch 8 on both Banks: Sets the power up speed of Transwarp

Bank1   Bank2
3.6 MHz     OPEN    OPEN  <<Normal>>
1.7 MHz   CLOSED    OPEN
1   MHz     OPEN  CLOSED
1   MHz   CLOSED  CLOSED

JL>Is there a way of disabling it for games (i.e. key press at
JL>power-up/re-boot?)

Press <Esc> at power-up will disable Transwarp completely until the next power
off/on cycle.

A better way is to write a 01 to $C074.  This will slow Transwarp down to 1
MHz without disabling it completely.  Writing a 00 to $C074 will restore
```

Transwarp to it's 'fast' speed.

* KingQWK 1.05 # [PK] * 2Qwk! v2.00:The up-&-coming QWK reader for the Apple //

+---+
|Ye Olde Bailey BBS Zyxel 713-520-1569(V.32bis) USR 713-520-9566(V.34/FC)|
| Houston,Texas   yob.com   Home of alt.cosuard |
+---+

END OF FILE twiie.dips

```
##########################################################################
### FILE: video.pinouts
##########################################################################

Path: news.uiowa.edu!uunet!nwnexus!nwnexus!rook!eugene.welcome
From: EUGENE.WELCOME@rook.wa.com (eugene welcome)
Newsgroups: comp.sys.apple2
Subject: Need info on monitor
Message-ID: <1EE9796A@rook.wa.com>
Date: Fri, 31 Mar 1995 06:05:34 GMT
Organization: Knight-Line! (206) 565-0594
Distribution: world
Lines: 74

>>I recently got an AppleColor RGB Monitor model A2M6014 (manufactured
>>Feb. 1987) for ten bucks, and I'd like to know how to hook it up to
>>either an Apple IIc, a Laser 128,

The AppleColor RGB Monitor model A2M6014 is for the IIgs. It is not
wired for the IIc, IIe or the Laser-128. I do have this same monitor on
my IIgs and I have a Laser-128EX in limbo for now. It has a 15 pin
socket for video connection to RGB. I believe it is the same for the
IIc but not sure what he IIe uses. I also believe the IIe RGB monitor
requires more signal lines such as Intensity, Horiz. sync and vertical
sync. I know the IIe RGB will not work on the IIgs. The IIgs RGB
monitor uses less connections and may not work with what you hope. Try
it if you are handy with the solder. I believe the CGA connection
requirements are similar to the IIgs RGB requirements.

 Gene, K7"EEK" !! a Mouse !!!
eugene.welcome@rook.wa.com

================================================================
               Male DB-15. Connector

    1 2 3 4 5 6 7 8            8 7 6 5 4 3 2 1
   _________________          _________________
  ( o o o o o o o o )        ( O O O O O O O O )
   \_o_o_o_o_o_o_o_/          \_O_O_O_O_O_O_O_/

     0 1 1 1 1 1 1              1 1 1 1 1 1 0
     9 0 1 2 3 4 5              5 4 3 2 1 0 9
       Pin View                 Soldered End

================================================================

The RGB Monitor Cable for the IIgs:

     Pin        Signal
     ===        ======
      1         Red coax Ground (braided shield)
      2         Red composite video  (center wire of coax)
      3         Composite sync
      4         Not connected
      5         Green composite video  (center wire of coax)
      6         Green coax Ground (braided shield)
      7         Not connected
      8         Not connected
      9         Blue composite video  (center wire of coax)
```

10	Not connected
11	Not connected
12	Not connected
13	Blue coax Ground (braided shield)
14	Not connected
15	Not connected
Shell	Outer cable shield ground

==========

Here is the Pinout of the Laser-128 Video port.

Pin	Signal
1	Intesity signal
2	F14M - 14mHz
3	Red signal
4	Blue signal
5	Speaker sound out
6	Load Pulse for LCD
7	Dispen for LCD
8	+12 volts
9	Horizontal sync
10	Composite sync
11	Serial out data for LCD
12	Composite video (connection for a composite monitor)
13	Ground
14	Vertical sync
15	Green signal
Shell	Outer cable shield ground

==========

END OF FILE video.pinouts

```
##############################################################################
### FILE: video7
##############################################################################

Path: blue.weeg.uiowa.edu!news.uiowa.edu!uunet!cs.utexas.edu!math.ohio-
state.edu!magnus.acs.ohio-
state.edu!usenet.ins.cwru.edu!cleveland.Freenet.Edu!dn276
From: dn276@cleveland.Freenet.Edu (Norman L Jaojoco)
Newsgroups: comp.sys.apple2
Subject: Re: //e and color
Date: 4 Oct 1994 10:29:45 GMT
Organization: Case Western Reserve University, Cleveland, OH (USA)
Lines: 38
Message-ID: <36raqq$687@usenet.INS.CWRU.Edu>
References: <1994Oct1.095643.952@pro-freedom.van.wa.us>
Reply-To: dn276@cleveland.Freenet.Edu (Norman L Jaojoco)
NNTP-Posting-Host: nextsun.ins.cwru.edu


In a previous article, jstott@pro-freedom.van.wa.us (Jamie Stott) says:

[..]
>Also, the Video 7 card has 2 little fish hook kind of clamps, a short one
>and a long one--they're supposed to hook somewhere, I suppose to get MORE
>video signal from some place, but it is a mystery as to what these hook up
>to and this is why it is sitting on my shelf. I also note that Second Sight
>doesn't need anything but the card.
>
>Can any of you wizards clue me in on this?  I am not a techical wiz on this
>stuff, just want my //e color back.
[..]

I captured the following info from an earlier posting...

Article #77003 (77516 is last):
From: co057@cleveland.Freenet.Edu (Steven H. Lichter)
>Newsgroups: comp.sys.apple2
Subject: Video 7 Card
Date: Sun Sep 18 02:13:52 1994


A while back I sold a Video 7 RGB Card and a few people wanted to
know how to hook 2 leads down on the //e. I got that information
the other day. Here it is:

The read lead goes on the left side of R7 in the rear of the CPU
near the composite port. The blus lead goes on the right side of
R34 near the xtal in the front. I hope this helps.
--
       ************************************************************
       |       -=- Sysop: Apple Elite II -=- an Ogg-Net Hub BBS      |
       |            (909) 359-5338 12/24/96/14.4 V32/V42bis          |
       ************************************************************

--
Norman LJ


### END OF FILE video7
```

```
##############################################################################
### FILE: voc.pots
##############################################################################

Path:
blue.weeg.uiowa.edu!news.uiowa.edu!uunet!salliemae!kinky.eng.gtefsd.com!europa.eng
.gtefsd.com!howland.reston.ans.net!swrinde!news.uh.edu!jetson.uh.edu!st3b1
From: st3b1@jetson.uh.edu (Fretz, David)
Newsgroups: comp.sys.apple2
Subject: Re: VOC Screen FIX!!!
Date: 26 Jan 1995 00:28 CST
Organization: University of Houston
Lines: 23
Distribution: world
Message-ID: <26JAN199500282027@jetson.uh.edu>
References: <8sVcZc9w165w@ersys.edmonton.ab.ca>
NNTP-Posting-Host: rosie.uh.edu
News-Software: VAX/VMS VNEWS 1.41

In article <8sVcZc9w165w@ersys.edmonton.ab.ca>, herbertf@ersys.edmonton.ab.ca
(Herbert Fung) writes...
>Previously hchan@neptune.uucp (Violens Schultz) wrote:
>
>>Didn't your try the MONITOR'S picture adjustment controls first?  That's
>>what I would've done instead of tinkering with the VOC first.
>
>Now that I know there is something I can adjust, I'll try it the next
>time I open up my GS.

In case anybody want to know, I went to find out what some of those pots are.
Here is the list I got so far:

R13 RGB Intensity
C86 Horizontal Position on RGB
C85 NTSC Color Hue Adjustment
C45 NTSC Frequency Adjustment


*******************************************************************************
  University of Houston    | "And so we are told this is the golden age
                           | and gold is the reason for the wars we wage." (U2)
  GS Games SIG Coordinator | Houston Apple Area User Group  Apple II Forever!
*******************************************************************************


### END OF FILE voc.pots
```

```
##############################################################################
### FILE: voc.setup
##############################################################################

Path: news.weeg.uiowa.edu!news.uiowa.edu!hobbes.physics.uiowa.edu!math.ohio-
state.edu!zaphod.mps.ohio-
state.edu!darwin.sura.net!sgiblab!adagio.panasonic.com!chorus.mei!oskgate0.mei!wno
c-kyo!sh.wide!cawgw!canongw!cbsws1!ushiroda
From: ushiroda@cbs.canon.co.jp (Ushiroda, Atsushi)
Newsgroups: comp.sys.apple2
Subject: Re: Deep Thoughts => More than 3200 or More than 16 grays
Message-ID: <2050@cbsws1.cbs.canon.co.jp>
Date: 25 May 93 02:05:09 GMT
References: <1993May11.034555.20918@fawlty.towers.oz.au>
      <1993May11.222300.28453@fawlty.towers.oz.au>
      <jmk3.737313028@crux1.cit.cornell.edu>
      <1993May16.222335.3385@fawlty.towers.oz.au>
      <1ta50kINNmof@gap.caltech.edu>
      <jmk3.737740731@crux1.cit.cornell.edu>
      <1tcrt4INNpl0@gap.caltech.edu>
Sender: ushiroda@cbs.canon.co.jp
Organization: Canon Inc., Tokyo, JAPAN
Lines: 24

Two years ago, I found that how to take away bank $E0 memory from GS/OS.
I use a special startup disk. It includes following startup programs.
This process is tricky, but it works fine.

----- save as STARTUP (Applesoft) -----
10 LET D$ = CHR$(4)
20 PRINT D$;"EXEC VOC.SETUP"
30 END
---------------------------------------

----- save as VOC.SETUP (EXEC) --------
CALL -151
#
\10 04 00 00 00 00 00 00 40 00 00 00 C0 03 00 E0 60 00 09 02\u
\10 04 00 00 00 00 00 00 40 00 00 10 C0 03 00 E0 60 00 09 02\u
Cn00G
---------------------------------------
In last line, n is slot number of SCSI Card.

Copy these files, P8 (rename to ProDOS), and BASIC.System to startup
floppy disk. Boot from this floppy disk. Then you can get $E0/6000-9FFF
of memory. Its effect continue until power down.

ushiroda@cbs.canon.co.jp (Ushiroda, Atsushi)


### END OF FILE voc.setup
```

```
##############################################################################
### FILE: voltage
##############################################################################

Newsgroups: comp.sys.apple2
Path:
news.weeg.uiowa.edu!news.uiowa.edu!uunet!orca!javelin.sim.es.com!animal!mmunson
From: mmunson@animal.es.com (Mark Munson)
Subject: Re: 5v to 5.25v
Message-ID: <1992Oct1.231351.3416@javelin.sim.es.com>
Sender: news@javelin.sim.es.com
Nntp-Posting-Host: animal.sim.es.com
Reply-To: mmunson@animal.es.com (Mark Munson)
Organization: Evans & Sutherland Computer Corp., Salt Lake City, UT
References:  <fmlin.1p58@terapin.com>
Date: Thu, 1 Oct 1992 23:13:51 GMT
Lines: 94


Frank:

You're power supply won't give you 5.25 Volts directly.  It only
supplies +/- 5 Volts and +/- 12 Volts.  So you've have to get the
5.25 Volts that you want from the 12 Volt line.

First off, you've have to remove the current 5 V line to the
CPU by cutting a trace on the accelerator card.  The new
power supply will be connected to the line where you just
cut it, supplying the chip with power from your new source.

If I recall correctly, the ZipGS (9 MHz) came with some circuitry built
in to boost the voltage up.  7 MHz ZipGS cards don't have the components,
but the circuit board shows where a transistor and a few resistors could
go.  If you have a 7 MHz zip card, find someone with a 9+ MHz version and
add the components that they have on thier board and you don't have on yours.

On a TWGS, you must add the extra circuitry yourself.  This can be done by
building a small breadboard with the compnents attached.

A sample circuit to get a variable voltage supply might look like the
following:


     12 V         12 V                 12 V = +12 Volt line (available from BUS
line)
      |            |                     T = NPN type Transistor (2N2222)
      |            |                   R1 = Resistor ( ~ 100 Kilo-Ohm )
     R1           R3                   R2 = Micro miniature pot (variabl
      |            |                        (resistor  100 K Ohm)
      |     ___C---                 R3 & R4 = Resistor ( ~ 10 Kilo-Ohm )
 --> R2 --B( T )                        B = Transistor Base lead
      |     ---E         [output]         C = Transistor Collector lead
      |         ---+---- 0 - ~5.3 Volts   E = Transistor Emitter lead
      |            |
      |           R4
      |            |
      |            |
     GND          GND
```

Current will flow through R1 and R2, with the voltage at point B beind calculated by

Vb = 12 V * (R2 / (R1 + R2))

When R2 is at its maximum value of 100 K, the voltage at point B will be half that of
the original 12 V, resulting in a Base lead voltage of 6 V. The voltage at the Emitter lead of the transistor will follow that of the Base, but it will be ~ .6 to
..7 less. As a result, the MAXIMUM voltage at the output should be 5.3 - 5.4 volts.
This should prevent you from "accidently" giving your expensive CPU too much power.

R2 can be manually tuned to vary the voltage from 0 to MAXIMUM. Start with 5V, and
move up slowly. You'll want to have a good digital voltmeter attached when you are
doing this. An anolog voltmeter will do OK, if it has a high-precision scale (and you have good eyes).

R3 represents the output load from the transistor circuit. You can omit this if desired, but it will be necessary to have some load when the circuit is being tested
prior to hooking this up to your CPU.

R3 and R4 are matched, so a complete failure of T will result in a maximum voltage of ~ 6.0 V. By increasing the value of R3 relative to R4, you can reduce this down
even further. With a new CPU being so expensive, why take chances that a 20 cent part might fail?

When purchasing your parts, you can get small 1/8 Watt resistors, because the power
level you are working with is small. 1/4 and 1/2 Watt resistors are OK, but they are
larger and bulkier, and will be a slight overkill for this application.

If you purchase a transistor with a metal package (not platic), you will see a small
square tab next to one of the leads. The lead neares the tab is the Emitter, and if
you look at the transistor from the top (wires exiting at the bottom), then you can
orient the device as shown in the illustration above to locate the Collector and Base leads.

If you go to a local electronics shop, you can purchase everything needed for less than
a dollar. Radio shack will expect you to hand over several $$ for the same parts.

Built the circuit seperately from you computer. Use and external power supply (car
battery or charger will do) to test the circuit. When you know it works right, cut the

5 V power to your CPU and replace it with your new 'boosted' source. Start increasing
the frequency and only increase the power if the CPU can't run at the current voltage.

I hope this helps you get going. You may want to increase the resistor values to reduce
the overall power drain. I don't know how much current the CPU will require, but it
couldn't be much.

[MGM]

[MGM]

END OF FILE voltage

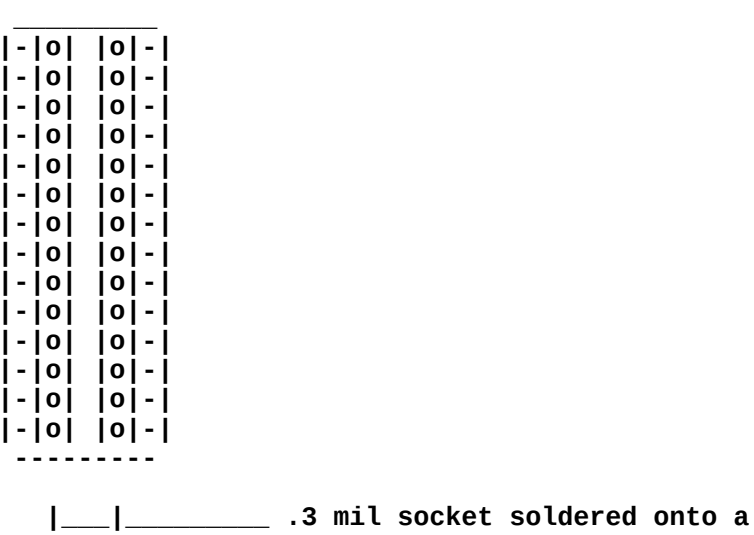
```
##########################################################################
### FILE: wide.narrow
##########################################################################

Path: news1.icaen!news.uiowa.edu!news.physics.uiowa.edu!math.ohio-
state.edu!howland.erols.net!cam-news-hub1.bbnplanet.com!cpk-news-
hub1.bbnplanet.com!news.bbnplanet.com!su-news-hub1.bbnplanet.com!
arclight.uoregon.edu!news.bc.net!info.ucla.edu!nnrp.info.ucla.edu!
usenet
From: pubpc17@library.ucla.edu
Newsgroups: comp.sys.apple2
Subject: Re: ZipGS/TWGS upgrade FAQ
Date: 23 Nov 1996 20:44:15 GMT
Organization: University of California, Los Angeles
Lines: 79
Message-ID: <577nmv$1qig@uni.library.ucla.edu>
NNTP-Posting-Host: dyn-biomed0-206.library.ucla.edu
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Mailer: Mozilla 1.2N (Windows; I; 16bit)

nathan@visi.com (Nathan Mates) wrote:
>   With a little modification you can make a Zip with wide
>   sockets accept both wide and skinny SRAMs. Ground yourself then
>   carefully pry out the static rams. Look at the socket and you will
>   notice two or three horizontal bars holding both sides of the socket
>   together (picture D). Carefully cut those out. This will expose a
>   column of holes where you will solder in half of a socket. Refer to
>   picture E, position skinny (.3 mil) static rams over the left and
>   center columns and wide static rams over outer most columns and making
>   sure the notch on the static ram is facing 12 o'clock.
>
>  *WARNING* Plug the static rams in wrong and you will destroy them.
>
>            CUT
>            ___             ___________ Skinny (.3 mil)
>           |   |           |   |
>            ____ ____       _   _   _
>          |o __V__ o|     |o| |o| |o|
>          |o|  o  |o|     |o| |o| |o|
>          |o|  o  |o|     |o| |o| |o|
>          |o|  o  |o|     |o| |o| |o|
>          |o|  o  |o|     |o| |o| |o|
>          |o|  o  |o|     |o| |o| |o|
>          |o|__o__|o|     |o| |o| |o|
>          |o _____ o|     |o| |o| |o|
>          |o|  o  |o|     |o| |o| |o|
>          |o|  o  |o|     |o| |o| |o|
>          |o|  o  |o|     |o| |o| |o|
>          |o|  o  |o|     |o| |o| |o|
>          |o|__o__|o|     |o| |o| |o|
>          |o _____ o|     |o| |o| |o|
>
>                           |_______|___ Wide (.6 mil)
>
>            (D)              (E)
>
>   Toshi's (tm@netcom.com) notes: I've pulled out all four of my SRAM
```

> sockets and installed carefully cut machine-pin SIPP sockets in mine
> and seems to work pretty well.
>
> Frank: Toshi's had to de-solder all the sockets and, so it isn't
> easier than Long's way. Toshi's came out looking cleaner and neater
> though.

I've managed to make use of skinny SRAMs without directly soldering the Zip at all. What I did was to take a .3 mil wide (wire-wrap type) DIP socket and bent the leads sideways. I then soldered these leads to the contacts on a .6 mil wide DIP component carrier. The result is a .3 mil to .6 mil adapter. I had the skinny SRAM installed on the adapter and the adapter installed on the Zip.

No heat was ever applied to the Zip or the SRAM chips.

The adapters look sort of like this:



If you want to, you can add this method to your FAQ.

END OF FILE wide.narrow

```
##########################################################################
### FILE: x10.software
##########################################################################

Path:
news1.icaen!news.uiowa.edu!news1.chicago.iagnet.net!iagnet.net!newsfeed.internetmc
i.com!206.229.87.25!news-
peer.sprintlink.net!news.sprintlink.net!Sprint!worldnet.att.net!newsadm
From: Art Coughlin <Art.Coughlin@worldnet.att.net>
Newsgroups: comp.sys.apple2,comp.sys.apple2.marketplace,comp.sys.apple2.usergroups
Subject: Re: GS Home Control System
Date: Mon, 12 Jan 1998 09:02:09 -0800
Organization: AT&T WorldNet Services
Lines: 63
Message-ID: <69d77f$hah@mtinsc02.worldnet.att.net>
References: <691j2n$blk$1@newssvr04-int.news.prodigy.com>
NNTP-Posting-Host: 12.68.48.251
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Mailer: Mozilla 3.0C-WorldNet  (Win16; U)
Xref: news1.icaen comp.sys.apple2:129064 comp.sys.apple2.marketplace:22477
comp.sys.apple2.usergroups:2892

ToasterKing wrote:
>
>   One of the things IBM is really pushing in the marketing of their IBM
> Craptiva is the "home control system," which supposedly controls the
> thermostat and security system in your house and can also turn lights on
> and off and stuff.
>   I recall that a home control system, or at least several home control
> devices, were available as peripherals for the Apple IIGS.  Does anyone
> have any of these or remember what they did, or can give me more info on
> them?
>
> Thanks
> TK
>
> --
> Please send a copy of your reply via e-mail, if it's not too much
> trouble.  :>
> --
>                       -ToasterKing-
>                  SpongyToast@prodigy.net
>      "This is your sponge in the toaster.  Enough said."


TK,

  X-10 Inc. makes the 'Computer Interface Model CP290' (part of their
 PowerHouse line).  This device connects to a serial port and allows
 direct control of up to 256 devices (connected to X-10 modules) and
 can store up to 128 timer events.  X-10 Inc. sells packages for Mac
 and IBM/WinTel and used to sell packages for Apple IIe/IIc and
 Commodore 64.  The CP290 unit in each package is identical, the only
 difference between packages is the supplied software and cable.

  Unfortunately, there never was a IIgs specific package and the
 software and cable(s) in the IIe/IIc package wouldn't work with the
```

IIgs serial ports (but would work with a IIgs using a Super Serial Card). The Mac package contains the correct cable for the IIgs, but of course, the software won't work.

Since 1992, I've been selling the 'X10 Survival Kit', which allows you to control a CP290 connected via either IIgs serial port. The 'Kit' contains several GUI elements:

X10House - an NDA that takes full advantage of the CP290.
X10Doctor - a Desktop utility app that lets you backup and restore timer events, run the CP290 self test and control the 3 Inits in the 'Kit'.
X10ACE - an Init that applies sunrise/sunset corrections to specified timer events stored in the CP290.
PowerScreen - an Init that 'blanks' your screen by turning your monitor off.
Virtual10 - an Init that is an automated schedule loader.

For more info about X-10, use your favorite search engine. There are several sites dealing with X-10 (including X-10 Inc.'s site). I don't know the URLs offhand, sorry. For more info about the 'X10 Survival Kit' email me at:

art_coughlin @ delphi. com (note: spaces inserted to foil robo-spammers. Remove all spaces)

Art

END OF FILE x10.software

```
##############################################################################
### FILE: x10.suppliers
##############################################################################

Path:
news1.icaen!news.uiowa.edu!iagnet.net!iagnet.net!ais.net!newsfeed.internetmci.com!
205.139.74.16!news.nccn.net!news
From: TWS <adoyson@nccn.net>
Newsgroups: comp.sys.apple2
Subject: Control your house with X-10 (Apple II!!)
Date: Tue, 02 Jun 1998 09:01:03 -0700
Organization: Nevada County Community Network
Lines: 33
Message-ID: <357421BF.81C8A944@nccn.net>
NNTP-Posting-Host: tc3-181.nccn.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Mailer: Mozilla 4.05 [en] (Win95; I)
Xref: news1.icaen comp.sys.apple2:134721

Wow!  I didn't realize that there was information about using x-10 with
the Apple II!

Find an article about using your Apple II to control your house with
X-10 home automation products at:
http://www.grin.net/~cturley/A2.2000/Sept.Preview/ARTICLES/A2.GS.Home.Automation.t
xt

Here is the URL of a company that still sells the APPLE II version of
the x-10 controller kit (cp-290, cable, software)
http://www.bfree.on.ca/vmall/hometech/active.htm   ******apple
II!**********

If you want to find x-10 appliance modules, light dimmers, telephone
controller, and other APPLE II compatible parts, go to:

http://www.worthdist.com/WDpg32.html
or
http://www.smarthome.com/1130.html

********!@#$^%@#$!$#@^@$%&@#$%^@#$%

Can someone let me know where an X-10 NDA can be found?  I am looking
for IIGS SPECIFIC software to control X-10 equipment

********#$%^#$%^@#$%!#$%!!!!!%#$@%@#$^$%*&#%^(


Once you set up your system, post a description here!

I have my x-10 system connected to the IIgs, controlling the computer
itself, all lights in my house, and a few appliances.  It is a really
neat setup!



### END OF FILE x10.suppliers
```

```
##########################################################################
### FILE: zipgs.fast
##########################################################################

Newsgroups: comp.sys.apple2
Path: news.uiowa.edu!chi-news.cic.net!ddsw1!news.mcs.net!nntp04.
primenet.com!news.shkoo.com!nntp.primenet.com!news.cais.net!hunter.
premier.net!news-res.gsl.net!news.gsl.net!news.mathworks.com!newsfeed.
internetmci.com!newsreader.sprintlink.net!news.sprintlink.net!news-
fw-22.sprintlink.net!howland.reston.ans.net!agate!dog.ee.lbl.gov!
newshub.nosc.mil!newshub.cts.com!crash!pro-palmtree!rder
From: rder@pro-palmtree.cts.com (Richard Der)
Subject: FAQ-Zip GS upgrade: The 10MHz alternative
Organization: The Palmtree BBS - 310/453-8726 - Santa Monica, CA
Date: Sat, 3 Aug 96 10:54:53 PDT
Message-ID: <h339308@pro-palmtree.cts.com>
Lines: 134



Question: How fast can the Zip GS be pushed without getting new SRAMs
          or a new CPU? If I do need new parts, where can I find them
          at the lowest prices?
Answer
------>
You may be able to get it to run at up to 10MHz by just replacing the
oscillator with a faster one for less than two dollars!

I have a Zip GS that came as a 7/32 and was used at 7MHz for a long
time. The board came with a socketed oscillator, so one day I swapped
the 28MHz oscillator with a 36MHz one.  The computer booted up at 9MHz.
When the 36MHz osc was replaced with a 40MHz osc, the Zip ran at an
amazing 10MHz!

Your mileage may vary, though.  The GS that this upgraded Zip resides
has a high output power supply.

Still, considering these oscillators cost $1.39 each, it is worth
trying an oscillator swap alone first.

If a faster oscillator alone won't do the trick, then a faster CPU
and/or faster cache chips may be necessary.  The following are
sources for the parts (osc, CPU, and cache).


----------------------------------------

Here's what you need to upgrade to 10MHz:

>From JDR Microdevices:
        Phone 1-800-538-5000
        Fax   1-800-538-5005
        BBS   1-408-494-1430
        Web   http://www.jdr.com

Get a TTL Output Oscillator rated 4 times the speed you want the Zip to
run.  For example, if you want 8MHz, get a 32MHz osc.  For 10MHz, use
a 40MHz.
```

You will actually probably need a 30MHz, a 32MHz, a 36MHz, and a 40Mhz oscillator:

Part #'s: OSC30.0, OSC32.0, OSC36.0, and OSC40.0

because you want to test the Zip to see how fast it will go. It may top out below 10MHz. If it does, then you need a faster CPU and faster cache RAM if you want 10MHz or faster.

You can get 64K's of fast cache from JDR Microdevices:

Get 4 Static Cache RAM chips,
Part #: HM62256LP-70
Price: $4.69 per chip (you need 4 of these for 64K)

You can get a 14MHz fast CPU from:
The Western Design Center (http://www.wdesignc.com)
2166 E. Brown Road (email: information@wdesignc.com)
Mesa, AZ 85213

Part #: W65C816SPL-14 (for Zip GS or Transwarp GS accelerator cards for the Apple IIgs computer)
Price: $19.80 + $4.00 shipping & handling

(Western Design Center requires payment by Money Order)

Once you get the cache chips and the CPU, remove the 4 (or 2) old cache chips and plug in the 4 new ones, making sure the orientation of the new chips is the same as the old ones were (you've just replaced slow 32K of cache with fast 64K cache). Remove the CPU chip and plug in the new CPU. Finally, experiment with different oscillators, replacing the original, and find the fastest one that works.

DIP switch settings have to be changed when changing cache size. There are two banks of DIP switches on the Zip card.

Switches 7 and 8 on DIP bank 1 determine the cache size. Bank 1 is the bank of DIP switches nearer the top of the card.

The settings are as follows.

size	switch 7	switch 8
8K	on	on
16K	on	off
32K	off	on
64K	off	off

With a faster cache and 14MHz CPU, you may be able to go above 10MHz by plugging in a 48MHz oscillator (for 12MHz Zip), or 64MHz oscillator (for 14MHz).

Note: Even if you need a new cache and CPU in addition to a new

oscillator, you can still upgrade a 7/32 to a 10/64 and beyond for around $40. If you are satisfied with 10MHz and are lucky and don't need the new cache and CPU, then you'd get a 10/32 upgrade for the price of a $1.39 oscillator!

Good luck.

(Note: The speed of these SRAMs will be sufficient to around 10MHz. The advantage of these particular chips are that they are available cheap and in the wide 600 mil package that the Zip sockets require.

For 15MHz operation, even faster SRAMs may be required. Unfortunately, they are mostly available only in the skinny 300 mil packages. To use them, half sockets must be soldered into the Zip. They are also more expensive.

Also consider that the performance advantage going from 10MHz to 15MHz is far less dramatic than from 7MHz to 10MHz. Factor in the risk of seriously damaging the Zip during soldering.

Conclusion: the 10MHz operation is safer, requires no permanent modification of the Zip, and the chips of the right size are available and costs a lot less.)

Please distribute this document freely. Apple II Forever.

The Palmtree BBS 310-453-8726 v.32
Inet: rder@pro-palmtree.cts.com

END OF FILE zipgs.fast

```
##########################################################################
### FILE: zipgs.prblms
##########################################################################

Path: news1.icaen!news.uiowa.edu!news1.chicago.iagnet.net!iagnet.net!cpk-news-
hub1.bbnplanet.com!news.bbnplanet.com!news-peer.sprintlink.net!news-
pull.sprintlink.net!news-in-
east.sprintlink.net!news.sprintlink.net!Sprint!151.164.1.34!swbell!not-for-mail
From: Rubywand <rubywand@swbell.net>
Newsgroups: comp.sys.apple2
Subject: Re: Apple IIGS ZipChip
Date: Tue, 04 Nov 1997 03:53:42 -0600
Organization: Southwestern Bell Internet Services, Richardson, TX
Lines: 62
Message-ID: <345EF0A6.11F1@swbell.net>
References: <345E9949.4C1B@pacbell.net>
Reply-To: rubywand@swbell.net
NNTP-Posting-Host: ppp-207-193-8-53.hstntx.swbell.net
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-Trace: nnrp3.rcsntx.swbell.net 878637174 20651 (None) 207.193.8.53
X-Complaints-To: usenet@nnrp3.rcsntx.swbell.net
X-Mailer: Mozilla 3.01C-SBXA  (Win95; I)

Ron McGowan writes ...
>
> Help!
>
> I have a IIGS with a stock zip chip that, until recently,
> would pass the GS self test, but now fails with
> SYSTEM BAD 05012A00 ....
>


     The DIP switches on at least some versions of the ZipGS are not
especially reliable. On one board, I finally just popped off the switch
assemply cover and removed the switch pieces to guarantee that the
switches that should be open really were. Solder connects were used to
close switches.

     If SW-4 is not closing, the ZipGS will not pass the Self-Test. On
the other hand, your ZipGS will run a bit slower; which is probably why
the default setting is OFF.

     You can use an Ohm meter (set to the x 1000 range to limit current)
to check the switches on your board by measuring across each mini-switch
while you open and close it.

     Another possible problem is Zip Init. Some users install it on
their hard disks because it is available to be installed and forget that
it's there. Zip Init's settings will automatically over-ride your
on-board settings when your system is booted. It is intended for
installation on bootable diskettes for changing settings to match the
booted software (e.g. to keep it from running too fast).

     Some users believe that settings made to the Zip CDA panel (or to
the CDEV panel) get saved to BatRAM. They don't. When you turn OFF the
power they disappear. Also, the checked, "default", settings are not,
```

necessarily, the 'official' factory defaults. They are just the current switch settings on the board.

If you are having problems with a stock ZipGS board, some things to check are ...

1. that the board's connector tabs are making contact with the Slot sprongers. This happens pretty close to the bottom of the card; so, be sure the bottom 1/8 inch is clean.

2. that the ribbon cable from the board to the uP socket does not have any breaks.

3. that the ZipGS plus other cards are not pulling more current than your power setup can handle without producing noise glitches (i.e. fatten the leads on your power supply and consider adding power jumpers to the bottom of the motherboard).

> if I put in the stock 65c816 all is good
> the switch 4 setting on bank 1 of the Zip has no effect on this
>

Where are you plugging in the stock 65C816?

Rubywand

END OF FILE zipgs.prblms

F I N I S