Mountain Computer
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CPS PASCAL and CP/M
Software User's Guide

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Software User's Guide

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Manual Part Number   11-00431-01

Table of Contents

INTRODUCTION

This manual contains information for using the CPS MultiFunction Card with Apple Pascal^{tm} or CP/M^{tm} (via a Microsoft Z80 Softcard^{tm}). Section 1 contains hookup information for the CPS Pascal system (software is resident on the back side of the MCI 12-00417 diskette. Section 2 contains hookup information for the CP/M system.

It is assumed that the user is familiar with Apple Pascal and/or Digital Research CP/M.

Section 1
CPS PASCAL

HOW TO GET STARTED

This section contains information about the Pascal programs res-
ident on the CPS Pascal-CP/M diskette (MCI PN 12-00417). It
supplies information on transfering files from the CPS Pascal
diskette to the Pascal Apple 1 diskette. This diskette allows
the user to connect a printer, remote device (modem etc.), exter-
nal terminal, and/or clock in a Pascal environment.

SLOT ASSIGNMENTS

Apple Pascal requires peripheral I/O interfaces to be dedicated
to specific I/O slots by device type, as shown in Table 1.

The CPS Card configures slots (phantom slots) to accommodate
either serial or parallel data I/O. The 12-00215 BASIC diskette,
SETUP program Set Slot Assignments Menu, must be utilized to meet
both these requirements. Refer to the CPS Multifunction Card
Reference Manual for additional information.

Table 1   Apple Pascal Peripheral I/O Slot Requirements

DEVICE TYPE	SLOT ASSIGNMENT	I/O TYPE
Printer Interface	1	Serial or Parallel
Remote (Modem) Interface	2	Serial
Console Interface	3	Serial
Disk Drive Interface	4,5,6	Disk
Unassigned	7	

NOTE

If the CPS Card is located in a slot of a device
type in use (1, 2, or 3) this will provide the
user with an additional slot. Insure that the
default device associated with the Card is set
correctly.

CAUTION

Only one serial and/or parallel device
can be assigned. Assigning two serial
devices will cause an operating system
malfunction. Table 2 lists the six
possible device combinations.

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Table 2 Allowable Device Combinations

PARALLEL I/O	SERIAL I/O	ASSOCIATED DRIVER and DATA FILES (CPS PASCAL DISKETTE)	
Printer	Remote	PP-SR.CODE	PP-SR.DATA
Printer	Console	PP-SC.CODE	PP-SC.DATA
Printer	-	PP.CODE	PP.DATA
-	Printer	SP.CODE	SP.DATA
-	Remote	SR.CODE	SR.DATA
-	Console	SC.CODE	SC.DATA

SYSTEM.ATTACH

SYSTEM.PASCAL looks for the program SYSTEM.ATTACH during boot.
If it finds SYSTEM.ATTACH it will execute it before executing
SYSTEM.STARTUP .

SYSTEM.ATTACH will use ATTACH.DATA and ATTACH.DRIVERS to config-
ure the system for proper peripheral device I/O.

NOTE

When SYSTEM.ATTACH is executed, the ATTACH drivers will
be initialized. They are not known to the System at this
time (an oversight in the ATTACH implementation). A
re-initialization is forced, to make the drivers known to
the System.

If ATTACH is modified to correct this anomaly, then MCI will
support the change.

CAUTION

If the re-initialization message does not
appear (re-initialization did not occur),
type I to re-initialize.

The peripheral device setup must conform to <u>one</u> of the six con-
figurations listed in Table 2.

Copy the appropriate .DATA file (refer to Table 2) to the Apple 1
diskette ATTACH.DATA file. Copy the appropiate .CODE file to the
ATTACH.DRIVERS file (e.g PP.DATA to ATTACH.DATA and PP.CODE to
ATTACH.DRIVERS).

NOTE

SYSTEM.ATTACH is not required if user Pascal
requirements are limited to the CPS clock.

SECTION 1 CPS PASCAL SOFTWARE USER'S GUIDE

ATTACHUD and ATTACH.TEXT

The ATTACHUD.CODE utility program, on the MCI CPS Pascal
diskette, enables the user to setup the ATTACH.DATA file for
devices (including the CPS Card) and other devices. To setup
the corresponding ATTACH.DRIVERS file, the user can use the
LIBRARY utility to link the appropriate code files. A com-
plete description in the use of both utilities can be found
in the ATTACH.TEXT file. Refer to the Attach-Bios For Apple
II Pascal 1.1 manual for additional information.

DEVICE HOOKUP EXAMPLE

The following procedure connects a parallel printer and a
serial Hazeltine 1500 Console (it assumes that the user has a
two disk drive system):

1. Position the CPS Card in Apple peripheral slot 3. From
    the BASIC environment, boot the CPS Multifunction BASIC
    diskette and type **RUN SETUP**
    and select option **4** (SET SLOT ASSIGNMENTS) of the
    Primary Menu.

2. Configure the slot asignments for the parallel printer
    interface in slot 1.

3. Return to the Primary Menu and select options 6 and 7
    to set the default input and output to serial (for the
    Hazeltine terminal.)

4. Place the Apple 1 Pascal diskette in drive 1 and the
    CPS Pascal diskette in drive 2 .

                          NOTE

       The Apple 1 Pascal diskette must be Version 1.1
       Disk Drive 1 and 2 must be connected to peripheral
       peripheral slot 6 (volume 4).

5. Boot the Apple 1 Pascal diskette and enter the Filer.

6. When the Filer prompt appears type **T**
    then enter **CPS:PP-SC.CODE,APPLE1:ATTACH.DRIVERS**
    and press the RETURN key.

7. Type **T**
    then enter **CPS:PP-SC.DATA,APPLE1:ATTACH.DATA**
    and press the RETURN key.

8. Type **T**
    then enter **CPS:SYSTEM.ATTACH,APPLE1:SYSTEM.ATTACH**
    and press the RETURN key.

9. Type **T**
    then enter   **CPS:CLOCK.LIBRARY,APPLE1:SYSTEM.LIBRARY**
    and press the RETURN key.

10. Type **T**
    then enter   **CPS:SYSTEM.STARTUP,APPLE1:SYSTEM.STARTUP**
    and press the RETURN key.

                        NOTE

        If a console driver is not required,
        omit steps 11 through 19.

11. Remove the CPS Pascal diskette and insert the Apple 3
    Pascal diskette.

12. Type **Q**

13. Type **X**

14. When the file prompt appears type **APPLE3:BINDER**
    and press the RETURN key.

15. When the GOTOXY ? prompt appears type **APPLE3:HAZELGOTO**
    and press the RETURN key.

16. When segment copying is complete enter the Filer.

17. Type **T**
    then enter   **NEW.PASCAL,SYSTEM.PASCAL[36]**
    and press the RETURN key.

    When the prompt REMOVE OLD APPLE1:SYSTEM.PASCAL appears,
    type: **Y**

18. Type **R**
    then enter **NEW.PASCAL**
    and press the RETURN key.

    When the prompt
        UPDATE DIRECTORY ?
    appears, type   **Y**

19. Type **T**
    then enter
    APPLE3:HAZEL.MISCINFO,APPLE1:SYSTEM.MISCINFO[1]
    and press the RETURN key.

    When the prompt REMOVE OLDAPPLE1:SYSTEM.MISCINFO
    appears, type   **Y**

20. Press the RESET key to initialize the system.

CPS CLOCK

The CPS Clock has been implemented as a Pascal unit in the
CLOCK.LIBRARY resident on the 12-00417 diskette. This library
contains the code for procedures and functions found in the
SYSTEM.LIBRARY plus a unit called CLOCKSTUFF (CLOCKSTUFF source
code has been included).

To use the CPS Clock perform the following steps:

1.   Set the clock time using the CPS BASIC diskette Setup
     Program, Set The Time Menu.

2.   Transfer the CLOCK.LIBRARY to your working diskette
     or incorporate CLOCKSTUFF into your system library by
     using the Library utility described in the Apple Pascal
     Operating System Reference Manual.

                         NOTE

     The CPS need only be resident in one of
     the Apple peripheral slots for the Clock
     to be utilized (slot assignment is not
     required).

PROGRAM USE Of The CLOCK

To use the clock routines in the CLOCKSTUFF unit, place
     USES CLOCKSTUFF
after the program name.

This will provide the user with the following procedure and
variables:
     VAR SYSTIME : TIMEREC ;
The variable SYSTIME is a global record of type TIMEREC.

The record TIMEREC is constructed as follows:

```
TYPE  TIMEREC = RECORD
   DAYOFWEEK : (MONDAY,TUESDAY,WEDNESDAY,THURSDAY,
                FRIDAY,SATURDAY,SUNDAY);
   DATE:  RECORD
             MONTH: 0..12;
             DAY:  0..31;
             YEAR:  0..99
             END;
   TIME:  RECORD
             HOUR:  0..23;
             MINUTE,
             SECOND: 0..59
             END
   END;
```

The procedure TIMESTAMP is used to get the current time. It
requires one argument of type TIMEREC and will update the
variable with the current time, e.g. TIMESTAMP (SYSTIME)
will update SYSTIME.

The Boolean Clock will always be available.   It will return
the value TRUE if the CPS Card is resident.

NOTE

If TIMESTAMP is invoked and CLOCK is false
(CPS Card is missing), then SYSTIME.DATE.MONTH
and SYSTIME.DATE.DAY will both have a value of
zero.

CLOCK DEMO PROGRAMS

There are four clock programs on the 12-00417 diskette as follows:

SYSTEM.STARTUP   This program places the current date on the
diskette (last program executed during the boot). This date
is then available for System use.

NOTE

An existing SYSTEM.STARTUP can be modified to include
the current date update by incorporating CPS:START.TEXT

ACLOCK4.CODE   This program places an analog clock face on the
monitor (not the same as the BASIC Analog Clock.)

DISPLAY.CODE The Display program displays the day, month, and
time (AM or PM) on the CRT .

LISTER.CODE The Lister program will print a listing of user
text files (it requires a printer to be on-line). It skips
over the paper fan-fold perforations and prints the date,
time and page number on each page.

NOTE

In order for the Lister program to operate properly,
the Printer device parameters (line length and paging)
must have been entered from the CPS BASIC diskette
Setup program, Set Device Parameters menu.

If paging is set to zero, the page numbers will be
omitted and paging will not be performed.

PASCAL BIBLIOGRAPHY

Attach-Bios For Apple II Pascal 1.1   by B. Haynes
P.O. Box 976 Daly City, Ca 94017

Apple II Apple Pascal Operating System Reference Manual
Apple[tm] Computer Cupertino, Ca.

Apple Pascal Language Reference Manual
Apple[tm] Computer Cupertino, Ca.

Section 2
CPS CPM

HOW TO GET STARTED

This section contains information about the programs resident on
the CPS Pascal-CP/M diskette (MCI PN 12-00417). This diskette,
coupled with the Microsoft Softcard^{tm}, and the CPS Multifunction
Card allow the Apple^{tm} user to connect a printer, remote device
(modem etc.), external terminal, and/or clock in a CP/M environ-
ment.

SLOT ASSIGNMENTS

CP/M requires peripheral I/O interfaces to be dedicated to spe-
cifc Apple I/O slots by device type, as shown in table 3.

NOTE

The Apple slot configuration requirements
for CPS Pascal peripheral devices are
identical to those shown in Table 3.

Table 3 CP/M Peripheral I/O Slot Assignment Requirements

DEVICE TYPE	SLOT ASSIGNMENT	I/O TYPE
Printer Interface	1	Serial or Parallel
Remote (Modem) Interface	2	Serial
Console Interface	3	Serial
Disk Drive Interface	4,5,6	Disk
Unassigned*	7	

* Preferred slot for the Microsoft^{tm} Z-80 Card.

NOTE

If the CPS Card is located in a slot of a
device type in use (slots 1 - 3) this will
provide the user with an additional slot.
Insure that the default device associated with
the card is set correctly.

CAUTION

Only one serial and/or parallel device can be
assigned. Table 4 lists the six possible
device combinations.

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Microsoft Z80 Softcard is a trademark of Microsoft Inc.

CP/M is a trademark of Digital Research, Inc.

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Table 4 Allowable Device Combinations

PARALLEL I/O	SERIAL I/O	BASIC PATCH**	ASSOCIATED DRIVER FILES (CPS - Z80 DISKETTE)
Printer	Remote	no	PARPRINT, SERREMOT, PARCLOCK* or CLOCKSL1*
		yes	PARPRINT, SERREMOT, SREMOTBS**,CLOCKSL1*
Printer	Console	-	PARPRINT, SERCONSL, PARCLOCK* or CLOCKSL1*
Printer	-	-	PARPRINT, PARCLOCK*
-	Printer	-	SERPRINT, CLOCKSL1*
-	Remote	no	SERREMOT, CLOCKSL2*
		yes	SERREMOT, SREMOTBS**, CLOCKSL2*
-	Console	-	SERCONSL, CLOCKSL3*

* Clock Drivers
** SREMOTBS provides direct BASIC access to the serial remote device.

CP/M DRIVERS

Drivers (refer to Table 4) are installed via the CONFIGIO utility. If the version of CONFIGIO is not dated 11-12-80 or later, copy the CONFIGIO (via the PIP program etc.) provided on the CPS CP/M diskette to the Microsoft CP/M diskette.

PARPRINT - This driver transmits characters to the parallel list device. It uses the LPT: vector in CP/M. Since CP/M issues a Line Feed after each Carriage Return, the CPS Card Line Feed generation is suppresed when it follows a Carriage Return. If the printer automatically supplies its own Line Feed after each Carriage Return, then the Line Feed normally supplied by CP/M after each Carriage Return may be suppressed. This is done by changing the Auto Line Feed parameter to NO in the CPS Setup Program (refer to CPS Multifunction Operating (Reference) manual for additional information).

SERPRINT - This driver transmits characters to the serial list device. It uses the LPT: vector in CP/M. Since CP/M issues a Line Feed after each Carriage Return, the CPS Card Line Feed generation is suppresed when it follows a Carriage Return. If the printer automatically supplies its own Line Feed after each Carriage Return, then the Line Feed normally supplied by CP/M after each Carriage Return may be suppressed. This is done by changing the Auto Line Feed parameter to NO in the CPS Setup Program (refer to CPS Multifunction Operating (Reference) manual for additional information).

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SERREMOT - This driver transmits and receives characters
to/from the serial remote (modem etc.) device. It also checks
to see if a character is ready to be received. It uses the
UR1: and UP1: vectors in CP/M.

SERCONSL - This driver transmits and receives characters
to/from the serial console. It is identical to SERREMOT
except for the slot number and CP/M User Console vectors
(UC1:). The CRT: vectors may also be patched by using the
EXCONSL program.

SREMOTBS - Provides access to the remote device in the CP/M
BASIC enviroment. Since BASIC cannot communicate directly
with the serial remote device (via the CP/M I/O system), the
following set of calls have been implemented:

```
    CALL  RMIN (CH$)      Read 1 Character
    CALL  RMOT (CH$)      Write 1 Character
    X=USR0(0)            Place status into X
```

These calls are set up in the BASIC program to point to
driver entry points.

PARCLOCK, CLOCKSL1, CLOCKSL2, CLOCKSL3 - These clock drivers
attach to one of the device drivers. The CP/M UR1: (User
Defined Reader 1 vector) is stolen to point to the clock
driver. Each driver is identical except for slot and memory
location.

The BASIC interface is as follows:

```
    CLOCK = PEEK (&HF38C) + 256* PEEK (&HF38D) - 65536
    T$ = SPACE$(19)
    CALL CLOCK (T$)
```

●   Location F38C (HEX) points to the driver entry point.

●   T$ contains the clock string after the call to the clock.

Machine language calls use the same entry point. The string
length may be altered by CLOCK; see the examples on the
following page.

CP/M SYSTEM EXAMPLES

The following examples provide detailed instructions for
connecting peripheral devices to the CPS Card in a CP/M
environment. These examples assume that the user has a single
disk drive system, the CPS Card is installed in Apple I/O slot 1,
and the Microsoft Z80 Card is resident in I/O slot 7.

<u>Serial Printer + Clock</u> Perform the following steps to connect a
serial printer and clock. This procedure assumes that the user
has set the printer device parameters (hardware and software) for
proper operation. Refer to the CPS Reference Manual for addition-
al information.

1. Turn the system power ON and boot the CPS Multifunction BASIC
    diskette (MCI PN 12-00215).

2. Type **RUN SETUP** and press the RETURN key. This will display
    the Setup File Primary Menu .

3. Enter 3 to display the Set Device Parameters Group Selection
    Menu.

4. Enter 1 to display the Clock Input Format frame and select
    clock format 2 (enter 2) and press the RETURN key.

5. Exit the Group Selection menu by pressing the RETURN key.

6. Exit the Primary Menu by typing 9.

7. Remove the 12-00215 diskette and boot the Microsoft^{tm} CP/M
    diskette. The APPLE II CP/M
                    A>
    prompt will appear on the monitor.

8. Type   **MBASIC CONFIGIO** and press the RETURN key. A CAN YOUR
    APPLE DISPLAY LOWER CASE? Y/N? prompt will appear on the
    monitor.

9. Type Y or N as appropriate; this will display the I/O Config-
    uration Program menu.

10. Enter option 3 (Load User I/O Driver Software). This will
    display the SOURCE FILE NAME ? prompt.

11. Remove the Microsoft CP/M diskette and insert the working
    copy of the CPS CP/M diskette (MCI 12-00417).

<center>NOTE</center>

> Produce a working copy of the 12-00417 disk-
> ette. If it is damaged, another working copy
> can be produced.

<center>11</center>

12. Enter **SERPRINT** and press the RETURN key. Loading and opera-
    tion complete prompts will be momentarily displayed and then
    the program will return to the I/O Configuration Program
    Menu.

If the CPS Clock is to be used in conjunction with the serial
printer, perform steps 13 and 14.

13. Enter option **3** from the Configuration I/O Program menu. This
    will display the SOURCE FILE NAME? prompt.

14. Type **CLOCKSL1** and hit the RETURN key. Loading and operation
    complete prompts will be momentarily displayed and then the
    program will return to the I/O Configuration Program Menu.

If the Serial Printer Configuration is to become a permanent part
of your CP/M system, perform the following steps to save the
SERPRINT (and CLOCKSL1) driver on the Microsoft CP/M diskette.

15. Enter option **4** from the I/O Configuration Menu. This will
    display the READ OR WRITE prompt.

16. Type **W** this will display the DESTINATION DRIVE (A:-F)?
    prompt.

17. Remove the MCI 12-00417 diskette and insert the Microsoft
    CP/M diskette.

18. Type **A:** and press the RETURN key.

The program will return to the I/O Configuration Program menu.
The driver is now resident on the Microsoft CP/M diskette. It
will be loaded when you boot the Microsoft diskette.

To return to the CP/M System perform the following steps:

19. Type **Q** to quit the I/O Configuration Menu. This will
    display an OK prompt on the Apple monitor (indicates the CP/M
    BASIC mode).

20. Verify that the Microsoft CP/M diskette is installed in the
    disk drive, then type **SYSTEM** and press the RETURN key.

The system is now running in the CP/M environment, an A>is
displayed on the Apple monitor. Any commands typed on the Apple
keyboard will go directly to CP/M.

Parallel Printer + Serial Console + Clock Perform the following
steps to connect a parallel printer, serial console and clock.

This procedure assumes that the user has set the printer and
console device parameters (hardware and software) for proper
operation. Refer to the CPS Reference Manual for additional
information.

1. Turn the system power ON and boot the CPS Multifunction BASIC
    diskette (MCI PN 12-00215).

2. Type RUN SETUP and press the RETURN key. This will display
    the Setup File Primary Menu .

3. Enter 3 to display the Set Device Parameters Group Selection
    Menu.

4. Enter 1 to display the Clock Input Format frame and select
    clock format 2 (enter 2) and press the RETURN key.

5. Exit the Group Selection menu by pressing the RETURN key.

6. Enter 4 from the Primary Menu; this will display the Set Slot
    Assignments menu.

7. Enter 3 this will display the Device Menu for slot 3.

8. Enter S this will establish (phantom) slot 3 for the serial
    console. The program will return to the Set Slot Assignments
    menu.

9. Press the RETURN key to exit the Slot Assignments Menu.

10. Type 9 to exit the Primary Menu.

                            NOTE

        You may wish to save this setup file by selecting
        option 2 of the Primary Menu.

11. Remove the 12-00215 diskette and boot the Microsoft^{tm} CP/M
    diskette. The APPLE II CP/M
                        A>
    prompt will appear on the monitor.

12. Type   MBASIC CONFIGIO and press the RETURN key. A CAN YOUR
    APPLE DISPLAY LOWER CASE? Y/N? prompt will appear on the
    monitor.

13. Type Y or N as appropriate; this will display the I/O Config-
    uration Program menu.

14. Enter option 3 (Load User I/O Driver Software). This will
    display the SOURCE FILE NAME ? prompt.

15. Remove the Microsoft CP/M diskette and insert the working
    copy of the CPS CP/M diskette (MCI 12-00417).

16. Enter **PARPRINT** and press the RETURN key. Loading and
    operation complete prompts will be momentarily displayed and
    then the program will return to the I/O Configuration Program
    Menu.

17. Enter option 3 (Load User I/O Driver Software). This will
    display the SOURCE FILE NAME ? prompt.

                            NOTE

        Produce a working copy of the 12-00417 diskette. If
        it is damaged, another working copy can be produced.

18. Enter **SERCONSL** and press the RETURN key. Loading and opera-
    tion complete prompts will be momentarily displayed and then
    the program will return to the I/O Configuration Program
    Menu.

                            NOTE

        The user interface is still the Apple keyboard and
        monitor at this point.

If the CPS Clock is to be used in conjunction with the parallel
printer, perform steps 19 and 20.

19. Enter option 3 from the Configuration I/O Program menu. This
    will display the SOURCE FILE NAME? prompt.

20. Type **PARCLOCK** and press the RETURN key. Loading and oper-
    ation complete prompts will be momentarily displayed and then
    the program will return to the I/O Configuration Program
    Menu.

                           CAUTION

        The peripheral device I/O configuration is not
        complete at this point. Do not select option 4
        (SAVE) yet.

21. Type Q from the I/O Configuration menu. An OK prompt will be
    displayed on the Apple monitor.

22. Verify that the MCI 12-00417 diskette is installed in the
    disk drive and that the external console is ready to accept
    data.

23. Type (from the Apple keyboard) **RUN "EXCONSL"** and press the
    RETURN key.

24. The external console should reply with the following prompt:
    CONSOLE DRIVER RE-PATCHED
    BREAK IN 200
    OK

At this point all commands must be entered from the external console.

25. Re-insert the Microsoft CP/M diskette and type
    RUN "CONFIGIO" and press the RETURN key.

26. The I/O Configuration Program menu will be displayed on the external console CRT. Redefine the following parameters (if needed):

    o Configure the external terminal (Option 1) to establish any special characteristics (clear screen, cursor movement etc.)

    o Redefine (or delete) unique Apple keyboard character requirements via option 2.

If the Printer-Console Configuration is to become a permanent part of your CP/M system, perform the following steps to save the PARPRINT (and PARCLOCK) and SERCONSL drivers on the Microsoft CP/M diskette.

27. Enter option 4 from the I/O Configuration Menu. This will display the READ OR WRITE prompt.

28. Type W this will display the DESTINATION DRIVE (A:-F)? prompt.

29. Verify that the Microsoft CP/M diskette is resident in the disc drive.

30. Type A: and press the RETURN key.

The program will return to the I/O Configuration Program menu. The drivers are now resident on the Microsoft CP/M diskette. They will be loaded when you boot the Microsoft diskette.

To return to the CP/M System perform the following steps:

31. Type Q to quit the I/O Configuration Menu. This will display an OK prompt on the external monitor (indicates the CP/M BASIC mode).

32. Verify that the Microsoft CP/M diskette is installed in the disk drive, then type SYSTEM and press the RETURN key.

The system is now running in the CP/M environment, an A>is displayed on the external monitor. Any commands typed on the external keyboard will go directly to CP/M.

Parallel Printer + Serial Remote + Clock   Perform the following steps to connect a parallel printer, modem and clock.

This procedure assumes that the user has set the printer and modem device parameters (hardware and software) for proper operation. Refer to the CPS Reference Manual for additional information.

1. Turn the system power ON and boot the CPS Multifunction BASIC diskette (MCI PN 12-00215).

2. Type **RUN SETUP** and press the RETURN key. This will display the Setup File Primary Menu .

3. Enter **3** to display the Set Device Parameters Group Selection Menu.

4. Enter **1** to display the Clock Input Format frame and select clock format 2 (enter **2**) and press the RETURN key.

5. Exit the Group Selection menu by pressing the RETURN key.

6. Enter **4** from the Primary Menu; this will display the Set Slot Assignments menu.

7. Enter **2** this will display the Device Menu for slot 2.

8. Enter **S** this will establish (phantom) slot 2 for the serial modem. The program will return to the Set Slot Assignments menu

9. Press the RETURN key to exit the Slot Assignments Menu.

10. Type **9** to exit the Primary Menu.

<center>NOTE</center>

You may wish to save this setup file by selecting option 2 of the Primary Menu.

11. Remove the 12-00215 diskette and boot the Microsoft[tm] CP/M diskette. The APPLE II CP/M
                   A>
    prompt will appear on the monitor.

12. Type   **MBASIC CONFIGIO** and press the RETURN key. A CAN YOUR APPLE DISPLAY LOWER CASE? Y/N? prompt will appear on the monitor.

13. Type **Y** or **N** as appropriate;, this will display the I/O Config-uration Program menu.

14. Enter option **3** (Load User I/O Driver Software). This will display the SOURCE FILE NAME ? prompt.

<center>16</center>

15. Remove the Microsoft CP/M diskette and insert the working copy of the CPS CP/M diskette (MCI 12-00417).

NOTE

Produce a working copy of the 12-00417 diskette. If it is damaged another working copy can be produced.

16. Enter **PARPRINT** and press the RETURN key. Loading and operation complete prompts will be momentarily displayed and then the program will return to the I/O Configuration Program Menu.

17. Enter option **3** (Load User I/O Driver Software). This will display the SOURCE FILE NAME ? prompt.

18. Enter **SERREMOT** and press the RETURN key. Loading and operation complete prompts will be momentarily displayed and then the program will return to the I/O Configuration Program Menu.

Steps 19 and 20 will enable the user to access the remote device directly from CP/M BASIC.

19. Enter option **3** (Load User I/O Driver Software). This will display the SOURCE FILE NAME ? prompt.

20. Enter **SREMOTBS** and press the RETURN key. Loading and operation complete prompts will be momentarily displayed and then the program will return to the I/O Configuration Program Menu.

If the CPS Clock is to be used in conjunction with the parallel printer, perform steps 21 and 22.

21. Enter option **3** from the Configuration I/O Program menu. This will display the SOURCE FILE NAME? prompt.

22. Type **CLOCKSL1** and press the RETURN key. Loading and operation complete prompts will be momentarily displayed and then the program will return to the I/O Configuration Program Menu.

If the Printer-Modem Configuration is to become a permanent part of your CP/M system, perform the following steps to save the PARPRINT (and CLOCKSL1) and SERREMOT drivers on the Microsoft CP/M diskette.

23. Enter option **4** from the I/O Configuration Menu. This will display the READ OR WRITE prompt.

24. Type **W** this will display the DESTINATION DRIVE (A:-F)? prompt.

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25. Remove the   MCI 12-00417 diskette and insert the Microsoft
    CP/M diskette.

26. Type A: and press the RETURN key.

The program will return to the I/O Configuration Program menu.
The drivers are now resident on the Microsoft CP/M diskette. They
will be loaded when you boot the Microsoft diskette.

To return to the CP/M System perform the following steps:

27. Type Q to quit the I/O Configuration Menu. This will
    display an OK prompt on the Apple monitor (indicates the
    CP/M BASIC mode).

28. Verify that the Microsoft CP/M diskette is installed in the
    disk drive, then type SYSTEM and press the RETURN key.

The system is now running in the CP/M environment, an A>is
displayed on the Apple monitor. Any commands typed on the
keyboard will go directly to CP/M.

ADDITIONAL CPS - CP/M PROGRAMS

The MCI 12-00417 diskette includes both source and object code
for the following programs. All programs will run under either
GBASIC or MBASIC.

DISPLAY.BAS

This program enables the user to display the time (CP/M
environment) on the screen. The time string is updated once each
second.

                              NOTE

          In order for the DISPLAY.BAS program to
          operate properly, the following must have been
          set (via the CPS BASIC Setup Program):

               ●   The Clock time

               ●   Clock Format 2

          For additional information refer to the CPS
          Multifunction Card Reference Manual.

To display the time on the monitor type MBASIC DISPLAY (the
porgram is resident in disk drive A). If the program is resident
on a diskette in drive B type   MBASIC B:DISPLAY.   To exit the
time string simultaneously press the CTRL and C keys.

LIST.BAS

The LIST.BAS program is the listing utility. It provides the file
name, page number, and time/date stamp at the top of each page of
the listing. It also performs automatic paging (skips over the
paper fan-fold perforations). Tabs (CTRL I) are expanded to span
8-columns.

The files to be listed must have an ASCII format. Listings of
BASIC program files should be converted to ASCII format by use of
the A option with SAVE (refer to the Microsoft CP/M Manual for
additional information).

Verify that the following conditions are met before attempting to
perform a list operation:

- The printer is connected (via phantom slot or CPS Card)
  to Apple I/O slot 1.

- Printer software and hardware device parameters (baud
  rate, auto linefeed, line length, paging etc.) are set.
  Refer to the CPS Hookup Guide and the printer
  maintenance manual for additional information.

- CPS Clock Format 2 has been selected (refer to the CPS
  Multifunction Operating (Reference) Manual for addi-
  tional information.

To list a file when LIST.BAS is resident in drive A type:

   MBASIC LIST

When the prompt FILE TO PRINT? appears, enter the filename and
press the RETURN key.

                          NOTE

        If the LIST.BAS is resident in drive B type:
           MBASIC B:LIST

        To list multiple files type **RUN** when the
        OK prompt is displayed on the monitor, then
        enter the next filename after the FILE TO
        PRINT? prompt appears.

EXCONSL.BAS & APPLESCR.BAS

These programs enable the user to switch between an external
keyboard/monitor and the Apple keyboard/monitor.

Verify that the following conditions are met before attempting to
perform a switch:

- The external console is connected (via phantom slot or
  CPS Card) to Apple I/O slot 3.

- Console software and hardware device parameters (baud
  rate, auto linefeed etc.) are set. Refer to the CPS
  Reference Manual and the console maintenancemanua for
  additional information.

- The SERCONSL driver has been loaded (via CONFIGIO) into
  the BIOS patch area.

From the Apple enter: MBASIC EXCONSL

NOTE

If EXCONSL.BAS is resident in drive B enter:
MBASIC B:EXCONSL

Keyboard input and display output is directed to the external
console.   The message: CONSOLE DRIVER RE-PATCHED will be
displayed on the external CRT.

From the External Console keyboard enter: MBASIC APPLESCR

NOTE

If APPLESCR.BAS is resident in drive B enter:
MBASIC B:APPLESCR

Keyboard input and display output is directed to the Apple.   The
message: CONSOLE DRIVER RE-PATCHED will be displayed on the
monitor.

DOWNLOAD.COM

This utility enables the user to transfer CP/M files from another
computer via the CPS Multifunction Card. I/O slot 2 (serial
remote) and its associated driver, SERREMOT, are required to use
the download utility.

NOTE

The DOWNLOAD.COM utility supplied on the Microsoft Z-80
diskette is not compatible with the CPS Multifunction
Card. TheMicrosoft Download utility uses the Apple
Communications Interface or the CCS7710A serial card.

Refer to the Z-80 Softcard Volume II part V for instructions on
initiating the download. Use the DOWNLOAD.COM utility resident on
the 12-00417 diskette in lieu of the one supplied on the Micro-
soft diskette.

ACCESSING THE CLOCK or REMOTE DEVICE FROM BASIC

Both the CPS Clock and a modem can be accessed from MBASIC using
the techniques outlined below.

CLOCK STRING

To access the clock string from MBASIC perform the following.

1.   Determine the location of the clock routine (the variable
     CLOCK is at this location) by entering:

     (statement number) CLOCK = PEEK(&HF38C)+256* PEEK
                        (&HF38D)-65536

2.   Place the time string into T$ by entering:

     (statement number) T$ = SPACE$ (19): CALL CLOCK (T$)

T$ should not be set to a string literal (or to another string
variable). T$ must be set to a string expression and should have
a minumum of 19 characters when CLOCK is called.

NOTE

The length of T$ will be set by the call. T$
length is 18 for CPS Clock format 1. T$ length
is 19 for CPS Clock format 2. Refer to the CPS
Multifunction Reference Manual for additional
clock format information.

T$ is not continuously updated unless repeated calls are made
e.g. CALL CLOCK(T$) is repeatedly executed. Refer to the
DISPLAY.BAS program listing for additional information.

REMOTE DEVICE ACCESS

To access a modem from MBASIC perform the following:

1. Load the SREMOTBS driver (via CONFIGIO)

2. Setup the proper entry points from MBASIC by entering:

    (statement number) DEF USRO = &HF260:RMIN = &HF26B:
                           RMOT = &HF276

3. Establish the modem input character ready status by entering:

    (statement number) S = USRO(0)

    where S = -1 if a character is ready
          S = 0 if not ready

                        NOTE

        USRO can also be used as a test value as follows:
        (statement no.) IF USRO(0) THEN (READY) ELSE (NOT READY)

4. Place one character into C$ by entering:

    (statement number) C$ = SPACE$(1): CALL RMIN(C$)

    RMIN waitsfor the input character (if it's not immediatly
    available).

                        NOTE

        C$ can not be set to a string literal or to
        another string variable. C$ must be set to a
        string expression. C$ should contain a mini-
        mum of 1 character when RMIN is called. In
        thiscase the length of C$ would be set to 1.

5. Output one character from the string Q$ by entering:

    (statement number) CALL RMOT (Q$)

                        NOTE

        To output the entire Q$ string enter:

        (statement no.) FOR K = 1 TO LEN(Q$):R$ = MID$(Q$,K,1):
                           CALL RMOT (R$): NEXT K

6. To output a string literal or expression (e.g. X) enter the
    following:

    (statement number) R$ = "X": CALL RMOT (R$)
    The string literal X will be output to the remote device.
    Only the first character will be output.

ADVANCED PROGRAMMER'S INFORMATION

This section contains information on CPS - CP/M drivers (Table 5)
and the CP/M Card Type Table.

Table 5   Driver Information

	Apple I/O Slot # Used	BIOS Patch #	Hex Address Range (Z-80)	CP/M Vectors Modified
PARPRINT	1	1	F200-F235	LPT: output
SERPRINT	1	1	F200-F264	LPT: output
SERREMOT	2	2	F280-F2F8	UR1: input UP1: output
SREMOTBS	-	1	F260-F27E	UR1: input [1] UP1: output [1]
SERCONSL	3	2	F280-F2F8	UC1: input [2] UC1: output [2]
PARCLOCK	1	1	F238-F27B	UR1: input [3]
CLOCKSL1	1	3	F300-F343	UR1: input [3]
CLOCKSL2	2	3	F300-F343	UR1: input [3]
CLOCKSL3	3	3	F300-F343	UR1: input [3]

[1] SREMOTBS sets the same values for these vectors as
SERREMOT, i.e. the vectors will point into   SERREMOT
if the latter has been loaded.

[2] The CRT: input, output, and status vectors may be set
to point to SERCONSL by use of the BASIC program
EXCONSL.BAS; using APPLESCR.BAS reverses the changes
made by EXCONSL.BAS to the CRT: vectors, but the UC1:
vectors are left alone.

[3] Clock drivers conform to MBASIC calling protocol,
rather than the CP/M protocol.

ALTERATIONS TO THE CP/M·CARD TYPE TABLE

When CP/M is first booted, the Card Type Table is set up according to the type of cards found in the Apple's I/O slots.   The Card Type Table is located at 0F3B9H-0F3BFH, with one byte used for each of the slots 1 - 7.

In the case of the CPS card, the Card Type Table entry is set to 1 (undefined card type) for each slot used by the CPS card. This applies to both the actual slot in which the CPS card resides and to any phantom slots selected by the CPS card.

However, these table entries may be modified by the CPS drivers. In particular, the three drivers SERPRINT, SERREMOT, and SERCONSL will modify the entries for slot 1, slot 2, and slot 3 (0F3B9H, 0F3BAH, 0F3BBH), respectively. Each of these drivers will perform the modification when first called.   In each case, the modification consists of replacing the entry value of 1 (undefined card type) with a 3 (serial card type).

This alteration has several implications. In particular, the serial external console (SERCONSL driver) will be generally recognized as an 80-column device by a number of programs which examine the Card Type Table entry for slot #3 (0F3BBH).

In addition, the BASIC routines EXCONSL.BAS and APPLESCR.BAS will force the entry for slot #3 back to a 1. In the case of EXCONSL.BAS, this causes the SERCONSL driver to be reinitialized, at which time the entry for slot #3 will be set to 3.

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