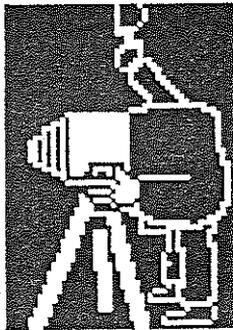# THE SNAPSHOT PRINTERRUPT

Printer Utility Software by Andy Beveridge and Bob Sather

darkStar
SYSTEMS

The Contents of this Manual are Copyright 1984
by Dark Star Systems Ltd.
78 Robin Hood Way, Greenford, Middlesex UB6 7QW, England

(C) 1984
Norah Arnold

Contents

The SHUTTLE from Dark Star Systems

1. Overview

The Snapshot Printerrupt gives you the power to suspend any copy-protected or unprotected program, print its display and then resume running it from the point of interruption. This can be achieved with virtually any dot-matrix printer and interface (serial or parallel) for the Apple II, II+, //e and compatibles.

The Printerrupt software is resident in the Snapshot card and runs independently of the computer's main memory. It offers the following advantages over conventional graphics handling printer cards and screen-dump software utilities.

Description	The Printerrupt	The Others
Utility	All features avilable at the touch of a button while a program runs. Interrupted program can be resumed even if it's protected	Work with text and graphics files only
Operating Systems Supported	Supports all Apple-compatible operating systems including DOS, ProDOS, CP/M & PASCAL	Limited by CP/M and Pascal or restricted to DOS 3.3 or ProDOS
Features	Menu driven	Software utilities, sometimes - graphics cards, never
	All screens visible and printable	No
	Independent scaling of both horizontal and vertical axes up to 8 times	No
	Shading	Some do, most don't
	Rotate left and right	No
	2 Hi-Res screens printable side by side	Sometimes, but very restricted
	Cropping of both text and hi-res graphics	No
	80-col. screens produced by Videx, Vision 80 and Apple //e can be dumped.	Support screen dumps from //e 80-col. card only (if at all)

Description	The Printerrupt	The Others
Features	Can use every density available on all supported printers	Usually support only "Epson-lookalike" dot densities
	Print-out can be very easily positioned any-where on the paper	Sometimes offer left- and right-justification
	Auto-centering works regardless of cropping, rotation, scaling and density selected	No
	Aural and visual warning if screen-image too large for printer	No
	Can be configured for any dot-matrix printer (with bit-image) and interface card	No

Need we say more?

2. Getting Started

It seems to be axiomatic in the world of personal computing that manuals are read only as a last resort. While we make every effort to ensure that our products are as easy to use as possible, this manual does contain essential information and you should have it close by when you get your first "hands-on" experience with the Printerrupt.

We have made no attempt to explain how your computer handles screen-data and its output. If you don't know what is meant by "Page 1" and "Page 2" or you are unaware of the distinction between "hi-res" and "lo-res" graphics, investigate what your computer manual has to say on the subject. Likewise, if you haven't looked at your printer manual since the day you bought it, you should find out what your printer is and is not capable of before you try out the Printerrupt.

This manual assumes that you have already installed your Snap-shot card in your computer. If you have not, please do so before proceeding further. (If necessary, refer to the installation instructions which accompany the Snapshot card.)

Before using any program, it is important to back it up if possible. Your Printerrupt disk is not copy-protected in any way, so the first thing to do is copy it using the "COPYA" program on your DOS System Master, or a similar copying utility.

If you have 2 drives, you can use the copy program supplied with the Printerrupt. Boot up your DOS System Master and then replace it with the Printerrupt disk in Drive 1. From Basic, you can call up a program on the Printerrupt disk which is similar to the COPYA utility on Apple's DOS 3.3 System Master. To do so, type BRUN DISKCOPY <RETURN>.

Incidentally, it's worth noting for future reference that when-ever single-key keyboard commands are referred to in this manual, they are written between the "<" and ">" symbols - like <RETURN> in the previous paragraph - to differentiate them from instructions which you are required to type in full.)

Your screen should now be displaying something like this:

INSERT SOURCE DISK IN SLOT 6 DRIVE 1

INSERT TARGET DISK IN SLOT 6 DRIVE 2

FORMAT TARGET DISK? (Y, N, Q)

Your "source" disk, in this case, is the Printerrupt disk and this is already in place in Drive 1. Place a blank or

unimportant used disk in Drive 2 and press "Y" to start copying.
We recommend that you make at least 2 backups to start with.

The reverse side of the Printerrupt disk contains some sample
pictures and a program to Load them in with. Although none of
these files is essential, you will certainly find them useful
for practicing with the Printerrupt's graphics features. For
this reason, you will find it worth your while to backup the
other side of the Printerrupt disk as well.

When you have made your copies, put your original disk away for
safe keeping. Now, put a backup of the Printerrupt in drive 1
and boot it up for configuration to your system.

The Printerrupt Configuration System:

Whenever you boot up a Printerrupt disk for the first time, the
configuration program will run automatically. Once you have
entered details of your system and that information has been
saved to disk, the Printerrupt will automatically load itself
into your Snapshot card each time you boot it. If, in future,
you wish to alter your configuration, boot the disk, depressing
<ESC> when prompted. You can then reconfigure the Printerrupt as
necessary.

80-Column Card Configuration:

When the Printerrupt first boots, your screen should display
something like this:

        PRINTERRUPT CONFIGURATION SYSTEM VER 1.0
        ===

        1)   //E 80 COLUMN CARD
        2)   VIDEX VIDEOTERM
        3)   VISION-80
        4)   M & R SUP"R"TERMINAL

        WHICH TYPE OF 80-COL CARD ?

If you don't have an 80-Column card, select any one of the
options shown. Your Printerrupt will still function correctly so
long as you don't try to crop or print a screen when the menu
"default" is set to 80-Columns.

For those of you who are new to computing terminology; when we
refer to a "default setting", we mean something that is assumed
by our software until you change it. For example, when you boot
a disk, the "default drive" on the Apple is Drive 1, Slot 6.

If you own an Apple //e, the chances are you have an Apple //e
80-Column card. By that, we mean any 80-Column card (with or

without extra RAM on board) which sits in the //e's auxiliary
slot 3. If yours is one of these (it doesn't have to be made by
Apple), press 1 <RETURN>.

Apple II+ and compatible owners are likely to have one of the
others. If your 80-Column card is none of these, you shouldn't
worry too much. Most 80-column cards are copies of either the
Videx Videoterm, the M & R Sup'R'Term or the Vision-80. Try
configuring for one of them and, if you find later that the
Printerrupt doesn't handle 80-Column screens properly, give the
others a try. If none of the options appears to work
satisfactorily, get in touch with the people at Dark Star
Systems' Technical Department who will be very pleased to help
you out if it's within their power.

Printer Card Configuration:

Having selected your 80-Column card type, you will be confronted
with a much longer list. This one contains the names of the most
popular printer cards. The cards are listed by manufacturer in
aphabetical order, the type (parallel, serial, IEEE etc.)
following the maker's name where applicable.

Find your card from the list and select it in the same way as
you did your 80-Column card.

We have done our best to determine the characteristics of as
many brands of printer card as possible. However, there are
bound to be some out there that we have never heard of. If yours
is one of those, you obviously won't find it on our list. Even
so, it's not a bad idea to experiment by selecting another card.
We're not suggesting that you go through the entire list one by
one, but trying the Apple parallel card and Orange Micro's
"Grappler" card in particular may pay dividends. (Many branded
and non-branded printer cards are direct copies of one or the
other of these two.)

If you've tried the alternative printer card selections and you
still can't get the Printerrupt to work, you can take advantage
of a unique service offered by Dark Star Systems:

1. Make sure your Printer card is in slot 1. If, for some
reason, you normally operate it from another slot, please put
it in slot 1 for the purpose of this exercise.

2. Turn your computer off and on again to boot up one of your
Printerrupt disks and use <CTRL><RESET> to bring up the "]"
cursor).

3. Type RUN ROMGETTER <RETURN> and follow the instructions as
they appear on-screen. You will be asked to enter the name of
your printer card. Enter the name of the manufacturer first,
then any other identifiers, then <RETURN>.

4. The ROMGETTER program will now save your printer card's operating software to disk. This should give us enough information to support your configuration. Once ROMGETTER has done its job, return the disk with a brief explanatory note to the Dark Star Systems Technical Department. After short while, you will receive your Printerrupt disk back again with your printer card added to the list.

Owners of the CPS Multifunction card from Mountain Computer Inc. should note that the Printerrupt will assume that it has been set to mimic a parallel card in slot 1 (as recommended in the CPS manual).

If you own the Apple Super Serial card, bank switches 1 and 2 should be set as follows:

```
SW1 (reading from left to right) OFF OFF OFF ON OFF ON ON
SW2 (reading from left to right) ON OFF OFF ON ON OFF OFF
```

Printer Configuration:

We now come to the last (but not the least) of the pieces of your equipment for which the Printerrupt needs to be configured - the printer. As you can see, quite a few different brands and models are supported. Again, if you don't see your printer in our list, don't worry. Take a look at the summary of commands in the manual which came with your printer. If the command for selecting graphics is <ESC> K, then you are almost certainly the proud owner of one of the galaxy of Epson compatibles. In this case, selecting the Epson MX option from our list should work fine, but (if you're lucky) you may have the enhanced capabilities of an FX-lookalike, so try that option first.

It should be emphasized here that the Printerrupt's graphics features will only work with printers which are capable of handling "bit-image" graphics: i.e. able to print a single dot at a specified location. (If your manual doesn't mention graphics, you haven't got them.) Owners of text-only printers can select any of the options in our list.

We know that somebody out there is going to own a printer which they purchased at the dawn of time (around 1980) or which has only been on the market since last week. If you are that somebody and all else fails, do not despair! Obtain a photo-copy of the command summary from your printer manual (usually about 3 pages) and send it along with a Printerrupt disk to the geniuses at our Technical department. They'll make the disk good for your printer and send it right back to you.

Users of the Apple Imagewriter driven by the Super Serial card should set bank switches 1 and 2 on the printer as follows:

```
SW1 (reading from left to right) OFF OFF ON OFF OFF OFF ON ON
SW2 (reading from left to right) OFF OFF ON ON
```

Default configuration values:

After making the appropriate selections for your 80-Column card, printer card and printer, a list of the Printerrupt's default settings will appear. For the vast majority of you, these defaults will be suitable as they stand. We recommend that you leave them as they are for the moment (unless you have a wide-carriage printer), because the tutorial in the following sections will assume that most of these default settings still hold good. When you are used to using the Printerrupt, you may find that there are certain aspects of its operation that you would like to change. That's the time to reconfigure it to your personal taste. For now, just press <RETURN> to accept the defaults (or change the carriage-width setting as appropriate).

If you want to make changes, press the number of the option(s) which you're not happy with and you will be prompted for new values. Here's a brief description of each option:

1) PRINTER SLOT - Virtually all commercial software which utilises a printer assumes your printer card is situated in slot 1. However, we realise that Printerrupt owners are an adventurous lot and there are going to be some of you that have an extra printer card in a different slot. If that's you, here's your chance to let the Printerrupt know you want it to use that card, not the one in slot 1.

2) CARRIAGE WIDTH - If you own a wide carriage printer like the Epson FX-100, you will want to let the Printerrupt know about it. Most wide carriage printers print up to 136 characters per line, so substitute 136 (or whatever) for the current default of 80.

3) REPEAT DELAY - This setting determines the speed at which you can crop areas of the text or graphics screens. When cropping, you can "turbo-charge" the cursor by holding down the "fast repeat key". It is this key's rate of repeat which can be altered here. In general use, we have found that the current default setting of 32 is the optimum. If you like, you can set it to any number between 1 and 255. (The lower the number, the faster the repeat rate.)

4) CROP KEYS - The keys which control the cropping cursors are very likely to be the same as those that control cursor movement in your other programs. You may wish to use alternatives to the keys we have dedicated to this purpose - you might have a numeric keypad, for example - and we have therefore made it easy for you to do so.

Select this option and you will be prompted for each cursor control key in turn. If you only want to change one or two of the default keys, just type the key that's listed when you are prompted for one that you would like to remain the same.

N.B. - In general, the Printerrupt is pretty good at spotting

mistakes if you happen to make them. In this case however, it will accept a key for one cursor direction even if you have designated the same key for another. Unfortunately, there's no way around this without restricting your choices, so be sure that your new list contains no repetitions.

5) AUTO LINEFEED - Most commercial programs assume that the printer does not append its own linefeeds to carriage returns. If for some reason you have configured your printer so that it does append its own linefeeds, you should switch the Printerrupt's auto-linefeed OFF. Selecting this option will do just that. Selecting it again will toggle it ON again.
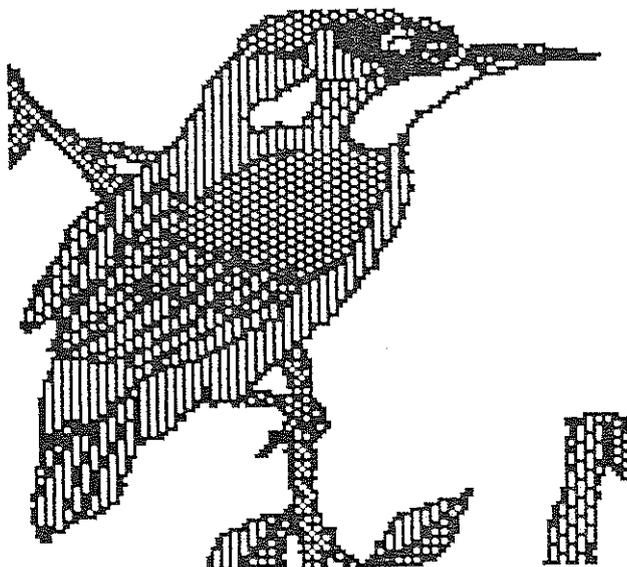
(C) 1984
Norah Arnold

3. Exploring the Printerrupt Menus

Once details of your configuration have been saved to its disk, the Printerrupt will ask you to tell it which slot the Snapshot card is in. Enter the appropriate number and you will be asked to press the Snapshot trigger. As soon as you do so, the Printerrupt menus will appear on-screen.

Let's take a moment to examine the screen before we continue. As you can see, it's divided fairly equally into two halves by a broken line which runs across its width. The top half of the screen is occupied by a tidy-looking list of options. We will refer to these options in future as the "Main Menu".

At first glance, the bottom half of the screen will appear to be comparitively chaotic and, if you're not used to printing utilities, quite baffling. No matter. As you'll soon discover, it's not as complicated as it looks. We will refer to this half of the screen as the "Default Menu" for the purposes of this tutorial.

Moving around the Main Menu:

Looking at the Main Menu, you will notice that the first option - the "BOOT A DISK" option - is illuminated by a cursor. Try pressing the left-arrow key (i.e., the <- key) and see what happens. The last option from the Main Menu - the "RESUME PROGRAM IN MEMORY option - should now be illuminated. Press the left-arrow key a few more times and note how, each time it is pressed, a different option is highlighted. The right-arrow key sends the cursor in the opposite direction.

Selecting an option from the Main Menu:

Now you know how to move around the Main Menu, selecting one of its options is easy. You simply press <RETURN>. It's of no importance where the cursor happens to be right now, try pressing <RETURN>. Depending upon which option you selected, you'll find either that the Menus have disappeared altogether or the cursor has vanished from the Main Menu.

Returning to the Main Menu:

Ignore what's on the screen for the moment and press <ESC>. If the menus don't reappear, press <ESC> again. Whenever you have selected an option and you want to return to the Main Menu, just press <ESC> once or twice. The reason why you sometimes have to press <ESC> two times before you can get back to the Main Menu will become clear later.

Switching to the Default Menu:

Its now time to take a look at the Default Menu. Move the cursor
so that it illuminates the "CHANGE DEFAULTS" option. Now, press
<RETURN>. You'll notice the cursor has disappeared from the Main
Menu. This signifies that you're now in the Default Menu.

Take a look at the top line - the DEFAULTS: GRAPHICS/TEXT/MIXED
option. It should be bracketed by the "[" and "]" cursors. These
cursors are used to move between the default options by pressing
the left- and right-arrow keys in exactly the same way as you
did the Main Menu options. Try it.

Changing defaults:

Once you've travelled around the Default Menu a bit, move the
cursors so that they bracket the topmost option again. The word
"GRAPHICS" should be illuminated by a cursor. Press the <SPACE>
bar a number of times and note how the cursor moves along the
line, highlighting each word in turn. Try the same thing with a
few of the other options, moving from one to the other using the
arrow keys.

What you're doing here is setting new defaults. It doesn't
matter too much at this stage what effect all this is going to
have on the Printerrupt's operation; it's more important that
you get to know your way around the menu.

The Form Position Indicator (FPI) option:

By now you may have discovered that the bottom line of the
Default Menu not only appears different to the other options, it
also behaves diferently when it is selected. Move right along to
it now. You know when you're on it because the bracket cursors
disappear and the solid cursor which takes up over half the line
begins to flash. This flashing cursor represents the position of
what's on the screen in relation to the paper in your printer.
We call this option the "FORM POSITION INDICATOR" and, for the
sake of brevity, we'll refer to it as the "FPI" from now on.

Switching back and forth between the two menus:

If you go to any of the other options in the Default Menu and
press <ESC> or <RETURN>, you will find yourself back in the Main
Menu with the CHANGE DEFAULTS option illuminated. Press <RETURN>
again and you're back in the Default Menu. If you go to the FPI
now and press <RETURN>, nothing will happen. In order to get
back to the Main Menu from the FPI option, you must first use
the arrow keys to move to one of the other options in the
Default Menu, then press <RETURN>.

Let's just summarize what we learned in the last section:

1. You move to an option from either menu with the left- and
   right-arrow keys.

2. You select an option from the Main Menu by pressing
   <RETURN>.

3. You select a default in the Default Menu by pressing the
   <SPACE> bar.

4. You switch from the Main Menu to the Default Menu with the
   "CHANGE DEFAULTS" option.

5. You return to the Main Menu by pressing <ESC> once or
   twice.

You should now be familiar with the way in which the various
options from both Printerrupt menus are selected. The next thing
to do is make a straight-forward, no-frills screen dump to your
printer to ensure that everything is in order. (A "screen dump"
is simply the transfer of data from that part of your computer's
memory which controls the screen to another medium - in this
case, your printer.)

If you're not already in it, get back to the Main Menu and
select the BOOT A DISK option. This is the means by which the
Printerrupt allows you to boot a disk without clearing Snap-
shot's memory. You should never use any other method to boot up
a program which you want to interrupt and resume.

(You will find this method of booting invaluable if, like us,
you use the combination of a printer buffer and a CP/M word-
processor. You can't normally switch to a ProDOS or DOS 3.3
program while your buffer is sending a CP/M file to the printer
without clearing it with a reset. With the BOOT A DISK option,
however, you are able to switch to another operating system
without disturbing the contents of the buffer.)

Remove the the Printerrupt disk from drive 1 (if you haven't
already done so) and choose a program which will generate a
graphics screen that you can practice on. Any program will do,
but for the sake of speed you may like to use the sample
pictures from the reverse side of the original Printerrupt disk.
(You'll find a full description of our fast version of DOS in
Appendix 1.) For the purposes of this tutorial, we'll assume
that you're using these pictures.

Insert the Printerrupt disk reverse-side up in drive 1 and press
the number of the slot in which the disk drive controller sits.

(We don't take anything for granted.) The disk will boot and, when you press the <SPACE> bar as prompted, the screen will display a list of pictures entitled, "ROCKET", "KINGFISHER", "BEARS", etc. Press "1" to load in the picture of Stephenson's Rocket. Don't worry for the moment if you can't see all of the picture.

Now, press the Snapshot trigger to bring the Printerrupt menu back on-screen and select the next option ("VIEW VIDEO MODES"). This one lets you tell the Printerrupt which screen to print. Use the <SPACE> bar to "flip" through the various graphics and text screens until you come to one that looks something like Figure 1 (opposite). When you have the full picture on-screen, press <ESC>. You will now be back in the menu and the first two default options will be set to GRAPHICS and PAGE 1.

Assuming that your experiments have left them in some disarray, check them against the following list of defaults (all of which should be illuminated):

```
        DEFAULTS: GRAPHICS
                  PAGE 1
        GRAPHICS: HORIZ
                  NORMAL
                  NO-SHADE
       HOR. SCALE 1
       VERT SCALE 1
                  NO-MIX
        DENSITY: 0
```

Now, check that your printer is loaded with paper and that it's "on-line". Select "DUMP TO PRINTER" and - voila! - your first Printerrupt screen dump. (On the other hand, if nothing happens, satisfy yourself that everything is connected and switched on that should be, and try again. If your printer still doesn't respond, the Printerrupt disk is not properly configured.)

So far you've put a lot of work into obtaining a very ordinary graphics print-out. We'll now examine those menu options which will enable you to achieve far more spectacular results. (There are some examples of methodology in the Appendices, but the best way to get to know what effect various combinations of Printerrupt options will have is to make your own experiments. Be warned - playing with the Printerrupt can be addictive and cost you dear in printer ribbons.)

Cropping the screen:

Selection of the "CROP SCREEN" option will bring the default graphics-, text- or mixed graphics and text- page on-screen. In each corner of the screen is a flashing cursor. If you're working on a graphics screen, each will be "L" shaped and angled in relation to its fellow cursors in such a way that the four together form the corners of a "box". A text screen will be

(C) 1984 Norah Arnold

Stephenson's "Rocket" -1829
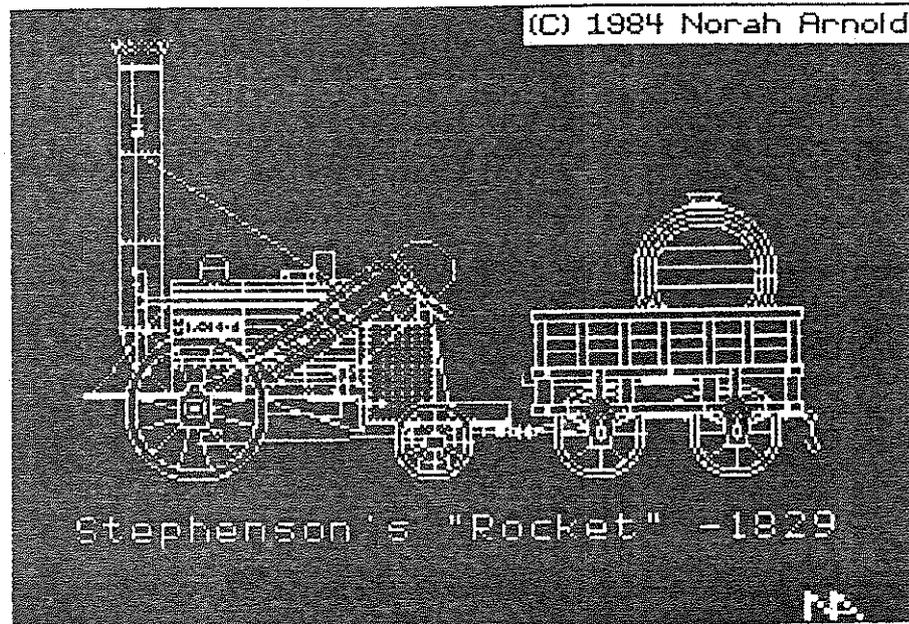
Figure 1.

"boxed" similarly, but with standard text-mode cursors.

It is the box formed by the cursors which enables you to "home-in" on a particular area of the screen for printing and to crop the remainder. The box is manipulated according to the type of key-board you have.

Default cropping keys on the Apple II+ (and look-alikes):

Assuming you haven't reconfigured them, the default cropping keys on the Apple II/II+ are as follows:

J - moves left and right sides of box to the left.
K - moves left and right sides of box to the right.
I - moves top and bottom sides of box upwards.
M - moves top and bottom sides of box downwards.

Left-arrow - lets you move left and top sides of box.

Right-arrow - lets you move the right and bottom sides.

F - re-enlarges box to full-screen size.

<SHIFT> - is the fast repeat key. (Requires Shift Modification.)

Default cropping keys on the Apple //e:

Left-arrow - moves left and right sides of box to the left.
Right arrow - moves left and right sides of box to the right.
Up-arrow - moves top and bottom sides of box upwards.
Down-arrow - moves top and bottom sides of box downwards.

T - lets you move left and top sides of the box.
B - lets you move right and bottom sides.

F - re-enlarges the box to full-screen size.

Open Apple - is the fast repeat key.

Operating the "cropping-box":

When you first select the CROP SCREEN option, you will find that
you are able to move only the top and left sides of the cropping
box. Press B (or the right-arrow key if you have a II+) and you
can move only the bottom and right sides. To return to top- and
left-side control, press T (or left-arrow on the II+). This
system will probably take a bit of getting used to, so it would
be a good idea for you to practice it for a while before doing
anything else. (If you can't get on with the default keys, you
can select alternatives by running the configuration program
again.)

You may occasionally be startled by bursts of laser-cannon fire
as you move a side of the cropping box. There's no need to raise
your shields, the noise just indicates that the side you're
moving has collided either with its opposite number or with the
edge of the screen.

Once you are comfortable with the manipulation of the cropping
box, try out the fast repeat key. To use it, just press the key
which selects the direction in which you want a side to move
once only. Then, depress the fast repeat key until that side is
in the required position. (If you are a II+ owner and you don't
have the modification which allows the entry of lower-case text
with the shift key, you'll just have to settle for the speed
afforded by the <REPT> key. A wiser move would be to order a
shift key mod from Dark Star Systems - it's one of the few items
of computer equipment that is both essential and cheap!)

Again, you can alter the speed of the fast repeat key if you
find that it's too fast or too slow by running the configuration
program.

If, for some reason, you want to crop sections of a mixed
graphics and text screen which you have selected with the VIEW
VIDEO MODES option (or set manually within the Default Menu),
you will only be able to crop the graphics portion while both
modes are on-screen. If you want to crop the text, you will have
to switch to the appropriate text screen in order to set the

position of the text cropping box. Then you will need to revert
to the "mixed" setting for the screen-dump. (Bear in mind that
it is only the bottom four lines of a text screen which will
print out when you're in the mixed screen mode.)

Setting up the printer:

By selecting the "SETUP PRINTER" option you are enabled to use
different printer facilities before you dump the screen. For
example, you may wish to print paragraphs of a text screen in
varying densities or fonts. Using the cropping box to select a
paragraph for printing and then assigning the desired printer
control code with the SETUP PRINTER option is how it's done.

Whether or not you find this feature useful depends upon your
needs. We use it ourselves in cases where we wish to include
graphic representations of data or sections of spreadsheet
between chunks of text. It is useful to be able to label the
graphics with text or print the spreadsheet text using a font
which visibly sets it apart from the main body of the document.

You will find your printer's command codes summarized in its
manual. The SETUP PRINTER option will accept a combination of up
to 255 command codes in theory but, in practice, you're unlikely
to need to enter more than a few at a time. If you do need to
enter more than one, there's no need to separate them in any
way. Just enter each code one after the other. When you have
finished, press <RETURN>. This will tell the Printerrupt to
accept the codes and return you to the menu. If you decide that
you don't want to set up the printer after all, press <ESC>
twice. (The Printerrupt will register the first <ESC> as part of
a command string, the second <ESC> as a signal to return to the
menu.)

The Default Menu:

You will be aware by now of the function of the CHANGE DEFAULTS
option. Lets take a closer look then at what the Default Menu
has to offer.

GRAPHICS/TEXT/MIXED and PAGE 1/PAGE 2/80-COL - are, in general,
more indicators than selectable options (although you can of
course use them for selecting screen pages if you want to). They
will automatically indicate that page which you have selected
under the VIEW VIDEO MODES option. However, unless you own an
Apple //e, you won't be able to VIEW a mixed high-res graphics
and 80-column text screen. In the unlikely event that you do
need to print a screen of this type, you will have to tell the
Printerrupt by setting these defaults manually.

HORIZ/ROT.LEFT/ROT.RIGHT - sets the angle of rotation of the
printed screen. The first option is the default 180° position.
ROT.LEFT and ROT.RIGHT turn the screen through 90° anti-

clockwise and 90° clockwise respectively. Remember that when you rotate it, what was vertical on the screen will appear to the FORM POSITION INDICATOR as the horizontal scale and this will warn you if it is too wide for the printer carriage.

NORMAL/INVERSE - allows you to switch to an inverse image of the screen and back again; i.e. swap from black on white to white on black. Note that the INVERSE setting will give a more faithfull rendition of the screen's appearance on paper since, in the NORMAL mode, a dot which is printed on paper as black on white appears on the screen as white (or amber, or green or whatever) on black.

NO-SHADE/PRE-SHADE/POST-SHADE - enables you to replace large areas of black or white with "grey" shading. The degree of shading achieved in each case will depend on the print density which you select (see the DENSITY option described below). The higher the density, the darker the shading.

Whether that area which would otherwise be be printed as black or that area which would be printed as white is the one that gets shaded depends on the NORMAL/INVERSE setting which you select. Confusing huh? The concept is best illustrated by looking at the examples in Figure 2 and comparing them against the table printed below.

Figure 2 examples:	A	B	C	D
NORMAL/INVERSE set to:	NORMAL	NORMAL	NORMAL	INVERSE
Shading set to:	NO-SHADE	PRE-SHADE	POST-SHADE	PRE-SHADE
Black area prints as:	BLACK	BLACK	SHADED	WHITE
White area prints as:	WHITE	SHADED	WHITE	SHADED

When using the shading option, bear in mind that fine detail may be lost if the vertical scale is not set to more than 1.

The difference between "POST-SHADE" and "PRE-SHADE", by the way, is determined by whether the shading is executed before or after the computer inverts the screen-data which it sends to the printer.

"HOR. SCALE" and "VERT SCALE" - are the options which allow you to independently expand the height or the width of the graphics screens. The size of printed text is regulated by the printer and can only be affected by the Printerrupt through the SETUP PRINTER option. (Some of the early Apple-compatible word processors use hi-res graphics to generate text. If you happen to own one of these, this option can of course be used to set the size of its text.)

a)   b)

c)   d)

Figure 2.

As you can see, you are given the option of expanding the horizontal scale in single steps up to 8 times. With the vertical scale, however, you have the option only of expanding 2, 3, 4 or 8 times. The reason for the omissions is not so much that expansion of the height of the screen by 5, 6 or 7 times is not possible, it is just that your computer's central processor is not capable of performing the necessary calculations fast enough to avoid long delays if you were to select any of those settings. Far be it from us to put any unnecessary strain on you or your micro!

NO-MIX/XOR/OR/AND/DOUBLE - lets you print both hi-res graphics screens (Pages 1 and 2) together in a variety of ways. Let's suppose that both pages are split down the middle, Page 1 having black on the left and white on the right and Page 2 black at the top and white at the bottom. (Remember that when they're printed out, what's white and black on the screen will be reversed on paper.)

NO-MIX - would print either one page or the other depending upon which one you had selected from the VIEW VIDEO MODES option (or from the Default Menu).

XOR - compares the positions of dots on both screens and tells the printer to print a dot from Page 1 just so long as there is no dot in the same location in Page 2 and vice versa. If XOR is selected then, a "checkerboard" effect is achieved by the mix of the two pages. (See Figure 3, A.)

OR - will print all the dots from both pages and a mixture of the two example pages under this option will therefore give you a rectangle of dots with the upper left quarter in white. (This is the only area common to both pages without dots. See Figure 3, B.)

AND - compares Page 1 and Page 2 and instructs the printer to print a dot only if it appears in the same position in both pages. Setting AND will therefore give us a white rectangle with the lower right quarter in black. (This is the only area common to both pages with dots. See Figure 3, example C.)

DOUBLE - prints Pages 1 and 2 side by side. (See Figure 3, D.) Which page is printed leftmost depends upon whether the GRAPHICS default option is set to Page 1 or Page 2.

The examples we have used are meant only to help you understand the concept of the NO-MIX/XOR/OR/AND/DOUBLE option. Obviously, you can use it for much more interesting purposes. For example, you might have one section of data represented by a pie chart on Page 1 while another section is represented by a histogram on Page 2. Many business graphics programs won't allow you to create more than one type of chart on a single screen and thus limit your presentation options. Use NO-MIX/XOR/OR/AND/DOUBLE however, and you can print out both pie-chart and histogram together in a variety of ways to excellent effect. Experiment!

DENSITY - is your means of telling the printer how close to each other you want it to print the dots. The higher the density, the closer together the dots will be printed and the darker the resulting picture. The progressive closing of the gap between each dot will gradually reduce the size of the print-out, but you can compensate for this by expanding the horizontal and vertical scales accordingly.
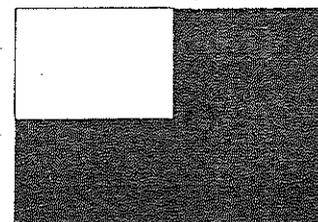
The table below shows the progressive effect of the Printerrupt density settings on Epson's FX-80 and its many clones.

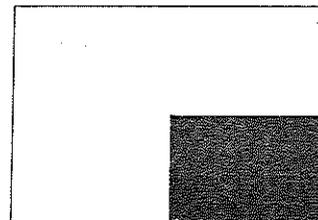| Density	Max. dots per line	Description
0	480	Normal single density
1	576	Plotter Graphics (1:1 ratio)
2	640	CRT Graphics I
3	720	CRT Graphics II
4	960	Double Density
5	960	Double Speed Double Density
6	1920	Quad Density

a)
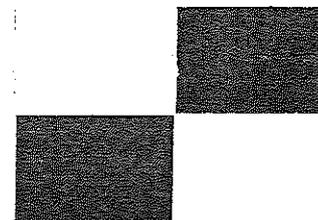
b)

c)

d)

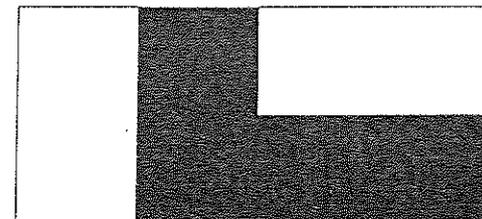Figure 3

NORMAL/OVERSTRIKE — Printerrupt users who configure their disks
for the Apple DMP, the Apple Imagewriter, and Epson-compatible
printers will benefit from this additional GRAPHICS default
option. Selection of the OVERSTRIKE mode will cause supported
printers to make 2 passes of the print-head for each line
printed. The second pass fills in the gaps left by the first
pass and effectively removes the "pin-stripes" which usually
occur within black areas of graphics dumps.

Note that a combination of double horizontal scaling, double
density and overstrike modes creates a very high quality
graphics print-out with much better contrast than normal
"enhanced" dumps. Such a combination is ideal for producing
graphics for presentation or photo-copying.

The selection of the overstrike mode also gives a darker shading
effect if used in combination with the PRE- or POST-SHADE
options.

FORM POSITION INDICATOR - is the option which tells you where
the image you are going print is positioned relative to the
paper loaded in your printer. It will respond automatically when
any changes are made to the Graphics defaults and if, by setting
those defaults, what you want to print becomes too wide for the
paper, the cursor that represents the screen image will flash
and your computer will bleep. The FPI will not prevent you,
however, from printing an image which is too wide; it will
merely instruct the printer to ignore everything which doesn't
fit. The FPI is an intelligent little animal that takes into
account the carriage width of your printer (see the
configuration section), cropping, rotation, scaling and density
when it makes its calculations.

The FPI does more than register the effect on the screen-width
of the defaults you select. You can actually select it as an
option and manipulate the cursor to affect the position of the
print-out manually. You can do this by moving to the FPI and
pressing the "<" and ">" keys (there's no need to press <SHIFT>
as you do so) or the "C" key.

       <   moves the FPI to the left

       >   moves the FPI to the right

       C   centres the FPI

Note that the FPI doesn't use single-dot tabbing because that
would take up too much buffer space. Instead, it measures in
increments of one text-space. For this reason, if the width of
an image is made up of an odd number of text-spaces, it will be
tabbed only to an accuracy of one text-space by the FPI's auto-
centering.

Remember that you can't return to the Main Menu directly from
the FPI; you must first move to another Default Menu option.

Resuming the program in memory:

Once you have dumped your screen to the printer, you will
probably wish to resume running the program which generated it.
For Apple //e owners, this is accomplished simply by selecting
the "RESUME PROGRAM IN MEMORY" option. If, on the other hand,
you have a II+ (or compatible), you will need to tell it what
the screen looked like at the time of interruption by using the
"SET RESUME VIDEO MODE" option. This works in exactly the same
way as the VIEW VIDEO MODES option; i.e., you flip through the
screens until you come to the right one, and then press <ESC> to
select it. Having set the resume mode, you can then go on to the
"RESUME" option and carry on with your program.
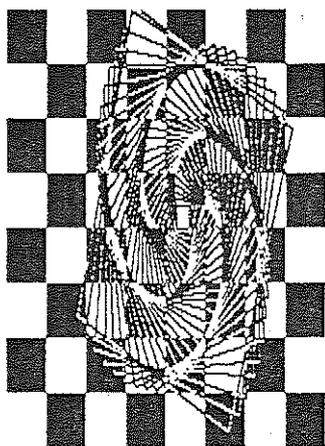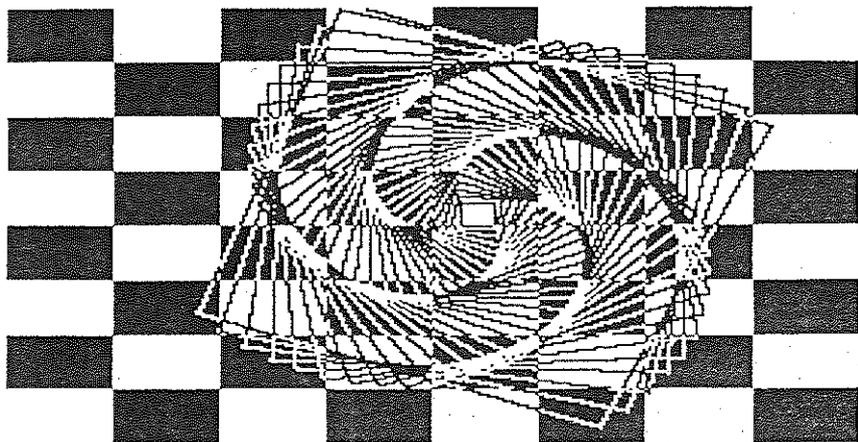
5. Appendices

Appendix 1. DS-DOS

DS-DOS (yes, we know it's pretentious) is used on both sides of the Printerrupt disk to speed up loading and configuration. It is much faster than DOS 3.3 for many operations and you are welcome to use it with your own applications if you so desire. To help you decide whether or not it might be of use to you, here's a brief description of what DS-DOS can and cannot do:

Unlike many of the other "fast" versions of DOS, there is no loss of reliability when writing to disk. DS-DOS will verify what is saved in the same way as standard DOS.

The DOS 3.3 "CHAIN" command (which doesn't function in Applesoft anyway) has been replaced by "TLIST". Typing TLIST <FILENAME> <RETURN> will dump the contents of the named text file to the current output device (usually the screen). If you wish to interrupt the dump, press the <SPACE> bar. Pressing <RETURN> will resume the dump and <ESC> will abort it and return you to command level. TLIST will come in handy for programmers who need to check their configuration text files and people who want to see what's in an old text file without the time-wasting chore of loading it into their word processor's text buffer.

<CTRL> S will not interrupt a DS-DOS CATALOG listing. If you want to do that, just press the <SPACE> bar as you do to interrupt TLIST. <RETURN> continues a CATALOG listing and <ESC> aborts it.

The INIT command is not present in DS-DOS. If you want to transfer it to a blank disk, you will have to use one of the following procedures:

a) Use a Bit-Copier to copy the first three tracks of the Printerrupt- to a blank- disk;

b) Use the "COPY DOS" option from a commercially-sold copy program;

c) Copy the entire disk with DISKCOPY or COPYA and then DELETE all the unwanted files.

Appendix 2. The Sample Pictures

The reverse side of the Printerrupt disk contains several sample pictures which may be accessed from the program which loads at boot-up. These pictures are included with the Printerrupt _for practice purposes only_ and all rights for their use are reserved by the artists.

The number of pictures available may vary according to how
generous we are feeling when we get your order, but you will
always have at least five to choose from. These five are all the
work of Norah Arnold. Norah is a teacher who first became
interested in computing while studying for her BA Honours Degree
during the early 1970s. Having joined the British Apple Systems
User Group shortly after its foundation, she takes an active
part in the Herts and Beds Local Group and was national Chairman
during 1982/83.

Norah's main interest has been graphics on the Apple II and,
more recently, the Macintosh. She has accepted commissions from
several companies and her work has been shown at many major
computer shows. If you share Norah's enthusiasm for graphics,
she can be contacted at the following address:

> 59 Seabrook
> LUTON
> Beds LU4 OEJ
> England

Appendix 3. Emulating the "enhanced-print" effect

Many owners of graphics-handling printer cards will be familiar
with the so-called "enhanced" effect. This will print a picture
of double the normal density, but with no loss of size. Enhance-
ment of this kind can be achieved with the Printerrupt by setting
the HOR. SCALE to 2 and the VERT SCALE to 1 while the DENSITY
option is set to double. (The actual number selected to get
double density is dependent upon which printer you own.)

Appendix 4. Aborting a screen dump

If, during a dump, you decide that the Printerrupt's settings
are incorrect or unsuitable, you may save your time, paper and
printer ribbon by pressing <ESC>. This tells the Printerrupt to
stop whatever it is doing and return to the Main Menu. To stop
the print-out effectively, you must also empty the printer's
buffer, usually by switching the power off and on again.