

### *Instructions*

The Acorn User Graphics Utility disc, referred to in this text as the "40 track disc", can be read directly on a 40 track disc drive or a 40/80 track switchable drive set to 40 tracks. If you have an 80 track disc drive then you will need to copy the contents of the 40 track disc to a blank, formatted 80 track disc (unless you have a BBC B+ or Master - see below). A program called COPY40 is provided on the Acorn User listings disc to do the copying for you. Remember - you only need COPY40 if you cannot read the 40 track disc directly on your drive.

If you need to transfer the programs to an 80 track disc then follow the instructions below. (Please read all of the points before attempting to copy the disc.)

1. Format an 80 track disc ready to take the programs.
2. If you have a dual disc drive, place the 40 track disc into drive 0 and the 80 track disc into drive 1. If you have a single drive, insert the 40 track disc and swap discs when told to.
3. Type: \*DRIVE 0 <RETURN>, then CHAIN "COPY40" <RETURN>
4. The copying program will ask you which drives the 40 and 80 track discs are located in. Enter these numbers, pressing the RETURN key after each.
5. If you have dual disc drives the process will be completed automatically. If you have a single drive then swap the 40 and 80 track discs over as instructed by the copying program.
6. The prompt (">") will appear when the 80 track disc is ready to use.

Note: Owners of the BBC B+, BBC 128k or Master 128 can read this 40 track disc on an 80 track drive by typing:

\*DRIVE 0 40 <RETURN>

before starting. The transfer program COPY40 will not function correctly on these machines.

### *Running the programs*

This disc contains an index program. Press Shift-Break (i.e. press SHIFT, press BREAK, release BREAK then release SHIFT) or type:

\*RUN !BOOT <RETURN>

to load and display the index.

### *Disc Contents*

This disc contains:

- \* 16 stand-alone machine-code utilities
- \* An advanced Teletext Editor
- \* Several Useful Basic Procedures
- \* An Easy-to-adapt Disc Header and Index

## *Stand-Alone Utilities*

The following utilities are included:

- \*XFLIP ... reflect area in x direction
- \*YFLIP ... reflect area in y direction
- \*ROTATE ... rotate area through 180 degrees
- \*BOXSAVE ... save an area of the screen
- \*BOXLOAD ... load a saved area
- \*BCOPY ... copy an area of the screen
- \*BMOVE ... move an area of the screen
- \*CHCOL ... change a colour within an area
- \*SWAPCOL ... swap two colours within an area
- \*SVPIC ... save a screen in compacted form
- \*QSVPIC ... a speedy version of \*SVPIC
- \*LDPIC ... reload a compacted screen
- \*COLFILL ... a colour-fill routine
- \*CONV21 ... convert a mode 2 screen to mode 1
- \*CONV20 ... convert a mode 2 screen to mode 0
- \*CONV10 ... convert a mode 1 screen to mode 0

All of these utilities are written in machine-code and so can be called up by using a simple \* command. For example, the colour-filling routine can be called with a command like:

```
*COLFILL 100,200,2
```

This will fill an enclosed area, starting with the point (100,200) and using colour 2. More details about the exact syntax of each graphics command are given below.

Many of the utilities require parameters - numbers or names following the \* command. For example, the utility \*XFLIP requires 4 parameters and so you would need to enter a command something like:

```
*XFLIP 100,200,500,600
```

When numbers are required as parameters, the values needed are those used by standard BBC Basic commands such as MOVE or DRAW. So x co-ordinates should be in the range 0-1279 and y co-ordinates should be in the range 0-1023.

For example, the utility "XFLIP" reflects an area of the screen horizontally. The easiest way of using "XFLIP" is with a command such as:

```
*XFLIP 100,150,400,500
```

which can either be typed in directly or included as a line in a Basic program. In this case, the area that will be reflected will have a bottom left-hand corner at position (100,150) and a top right-hand corner at (400,500).

### *Technical Note*

Most of the stand-alone utilities on this disc load in at address &900. If you have a second processor connected and in operation, they will be loaded in the I/O processor memory - that is - into the BBC rather than the second processor. None of

these utilities exceeds 512 bytes in length. This means that they occupy the memory used as cassette and RS423 workspace.

If you experience problems using the utilities, this may be because a ROM in your micro or a piece of hardware attached to your micro is using the memory from &900 to &AFF. In this case, the ROM or hardware should be disabled.

Some of the utilities on this disc (namely COLFILL, BSWAP, CONV20, CONV21 and CONV10) are loaded at &1200. For this reason, the utilities named will not work if you are writing to or reading from disc files. In particular the Basic commands BPUT, BGET, INPUT' and PRINT' will corrupt the memory from &1200 onwards and will cause those utilities named to malfunction. The memory from &70 to &8F is also used by the utilities on this disc.

If you intend to use one of the utilities several times in your program, it will be quicker to load it in once and then call it when needed using the Basic command CALL. For example, if you intend to use \*ROTATE more than once in a program, your program should contain the following line at the start:

```
10 *LOAD ROTATE
```

The parameters for any utility should be placed in memory locations &70 upward. Two bytes are used for each parameter. Thus the command:

```
*ROTATE 200,300,600,700
```

can be replaced with:

```
!&70=200:!!&72=300:!!&74=600:!!&76=700:CALL &900
```

#### *Note for second processor users*

The alternative method of use that has just been described is not available to second processor users. They should switch off their second processors, or use the utilities as straight \* commands.

#### *Summary of stand-alone utilities*

Utility: \*XFLIP

Example: \*XFLIP 100,200,700,600

Function: reflect a screen area in the x direction. The first two parameters are the x and y co-ordinates of the bottom left-hand corner of the area. The last two are the co-ordinates of the top right-hand corner.

Alternative method of use:

```
*LOAD XFLIP
```

```
!&70=100:!!&72=200:!!&74=700:!!&76=600:CALL &900
```

Utility: \*YFLIP

Example: \*YFLIP 100,200,700,600

Function: reflect a screen area in the y direction. The first two parameters are the x and y co-ordinates of the bottom left-hand corner of the area. The last two are the co-ordinates of the top right-hand corner.

Alternative method of use:

```
*LOAD YFLIP
```

```
!&70=100:!&72=200:!&74=700:!&76=600:CALL &900
```

Utility: \*ROTATE

Example: \*ROTATE 100,200,700,600

Function: rotates a screen area through 180 degrees. The first two parameters are the x and y co-ordinates of the bottom left-hand corner of the area. The last two are the co-ordinates of the top right-hand corner.

Alternative method of use:

```
*LOAD ROTATE
```

```
!&70=100:!&72=200:!&74=700:!&76=600:CALL &900
```

Utility: \*BOXSAVE

Example: \*BOXSAVE 100,200,700,600 Fred

Function: saves a screen area to disc with a specified file name. The co-ordinates are as for \*XFLIP and should be followed by a valid filename.

Alternative method of use:

```
*LOAD BOXSAVE
```

```
DIM name% 50
```

```
!&70=100:!&72=200:!&74=700:!&76=600
```

```
$name%="Fred":X%=name%.Y%=name% DIV 256:CALL &900
```

Utility: \*BOXLOAD

Example: \*BOXLOAD 200,300 Fred

Function: reloads a screen area from disc with a specified filename. The co-ordinates specify the bottom left-hand corner of where the area is to be loaded.

Alternative method of use:

```
*LOAD BOXLOAD
```

```
DIM name% 50
```

```
!&70=200:!&72=300:$name%="Fred"
```

```
X%=name%.Y%=name% DIV 256:CALL &900
```

Utility: \*COLFILL

Example: \*COLFILL 200,300,15

Function: fill an enclosed screen area. The first two parameters are the start point. The last is the tone to be used and should be in the range 0-27.

Alternative method of use:

```
*LOAD COLFILL
```

```
!&70=200:!&72=300:!&74=15:CALL &900
```

Utility: \*SVPIC  
Example: \*SVPIC Picture  
Function: saves the current screen in compacted form. Note that this may take several minutes for a high resolution screen.

Utility: \*QSVPIC  
Example: \*QSVPIC Picture  
Function: similar to \*SVPIC but operates much faster. The penalty paid is that the compacted file may not be as small as one created with \*SVPIC.

Utility: \*LDPIC  
Example: \*LDPIC Picture  
Function: reloads a compacted screen, changing the screen mode and colours as required. The compacted screen may have been created with either \*SVPIC or \*QSVPIC.

Note: \*LDPIC can corrupt a long program in memory if it is used to load a high resolution screen so should be used with care!

Utility: \*CONV21  
Function: converts a mode 2 screen into mode 1. Mode 1 should be selected, the screen loaded and then \*CONV21 called. For example, to convert the mode 2 screen "SCREEN2" into mode 1 use:

```
MODE 1
*LOAD SCREEN2 FFFF3000
*CONV21
```

Utility: \*CONV20  
Function: converts a mode 2 screen into mode 0. Mode 0 should be selected, the screen loaded and then \*CONV20 called. For example, to convert the mode 2 screen "SCREEN2" into mode 0 use:

```
MODE 0
*LOAD SCREEN2 FFFF3000
*CONV20
```

Utility: \*CONV10  
Function: converts a mode 1 screen into mode 0. Mode 0 should be selected, the screen loaded and then \*CONV10 called. For example, to convert the mode 1 screen "SCREEN1" into mode 0 use:

```
MODE 0
*LOAD SCREEN1 FFFF3000
*CONV10
```

Utility: \*BCOPY  
Example: \*BCOPY 700,600,800,900,100,200  
Function: copies a screen area. The first 4 parameters describe an area as for \*XFLIP. The last 2 specify the bottom left-hand corner of where the area is to be copied.

Alternative method of use:

```
*LOAD BCOPY
!&70=700:!&72=600:!&74=800:!&76=900
!&78=100:!&7A=200:CALL &900
```

Utility: \*BMOVE

Example: \*BMOVE 700,600,800,900,100,200

Function: moves a screen area. \*BMOVE is similar to \*BCOPY but the area copied from is left black.

Alternative method of use:

```
*LOAD BMOVE
!&70=700:!&72=600:!&74=800:!&76=900
!&78=100:!&7A=200:CALL &900
```

Utility: \*BSWAP

Example: \*BSWAP 700,600,800,900,100,200

Function: swaps two screen areas. The first 4 parameters describe an area as for \*XFLIP. The last 2 specify the bottom left-hand corner of the second area with which the first is to be swapped.

Alternative method of use:

```
*LOAD BSWAP
!&70=700:!&72=600:!&74=800:!&76=900
!&78=100:!&7A=200:CALL &900
```

Utility: \*CHCOL

Example: \*CHCOL 100,200,700,800,1,2

Function: changes one logical colour to another within a specified area. For example, if the command above were to be used in mode 1, all red pixels would be changed to yellow.

Alternative method of use:

```
*LOAD CHCOL
!&70=100:!&72=200:!&74=700:!&76=800
!&78=1:!&7A=2:CALL &900
```

Utility: \*SWAPCOL

Example: \*SWAPCOL 100,200,700,800,1,2

Function: swaps two logical colours to within a specified area.

Alternative method of use:

```
*LOAD SWAPCOL
!&70=100:!&72=200:!&74=700:&76=800
!&78=1:!&7A=2:CALL &900
```

### *DIY Disc Header*

On this disc you will find a machine-code program called HEAD. It is the Dodo-style

Acorn User disc header and the version on this disc can be tailored for your own needs. Two strings are required - a short one of 10 characters which will be displayed in large letters and a long one of 23 characters which will be revealed by the dodo.

For example, the header for this disc was produced using the command:

```
*HEAD Acorn User Graphics Utility Disc
```

The first ten characters - "Acorn User" - are displayed in giant type. The rest are revealed by the dodo.

Once the dodo has finished his cross-screen flight, the program "INDEX" will be loaded and run. If you use the header, ensure you have an index program called "INDEX" saved on your disc.

The index program on the Acorn User Graphics Utility Disc can also be easily adapted for your own use. Simply change the DATA statements at the end. The first DATA statement contains the disc title. DATA statements should then be added for all the programs you want to include in your index.

For each program on the disc, a DATA statement containing four strings should be included. This must contain the following information in the following order:

- 1 ... Name to be shown on screen
- 2 ... Filename of program
- 3 ... Brief details of program
- 4 ... "C" if the program is in Basic, "R" if it is machine-code

The list must be terminated with:

```
DATA**
```

So, for example, your data statements may look like this:

```
8000 DATA "Program Disc 1"  
8010 :  
8020 DATA "Aardwolf Attack","AW1","This is a really good game what I wrote","R"  
8030 DATA "Instructions","INSTR","Detailed instructions on how to play Aardwolf Attack",C  
8040 :  
8050 DATA **
```

### *Teletext Editor*

The Acorn User Teletext Editor can be used to create colourful mode 7 screens which can be saved onto disc. It is a machine code program and can be run by typing:

```
*7EDIT
```

The editor is menu-driven and so should be easy to understand. Simply press the key shown for the option required. Your screen may consist of text, graphics or a mixture. The text and graphics modes are selected with the 4 and 5 keys from the main menu. Holding down key f0 in either of these modes will provide a list of the keys to use.

### *Basic Procedures*

A demonstration program containing some useful Basic procedures is included on this disc. It is saved as "PROC". The procedures are all preceded by REM statements which describe how they are to be used.

To run the demonstration either select it from the index or type:

CHAIN"PROC"

*Files on this disc*

!Boot	Boot file for Shift-Break
COPY40	40-80 track disc copier
SCREEN1	Demo mode 1 screen
SCREEN2	Demo mode 2 screen
INDEX	Main index program
HEAD	Adaptable disc header
INSTR	Instructions index
HINSTR	Instructions programs
TINSTR	
UINSTR	
7EDIT	Teletext Editor
XFLIP	Utilities
YFLIP	
BCOPY	
BMOVE	
BSWAP	
COLFILL	
CONV20	
CONV21	
CONV10	
ROTATE	
LDPIC	
SVPIC	
QSVPIC	
BOXSAVE	
BOXLOAD	
CHCOL	
SWAPCOL	
UDEMO	Demonstration of utilities
PROC	Demonstration of Basic procedures
PROP	Code for proportional printing

*Important*

This disc is not protected in any way and you are strongly advised to make a personal back-up copy, keeping the original in a safe place. Back-ups are for personal use only - it is illegal to distribute copies of this disc to other parties without the prior consent of Acorn User.

*Schools*

Schools may make as many back-up copies of this disc as required for use solely within the grounds of the purchasing school. We simply request that the school ensures that it has a subscription to Acorn User and the Acorn User Monthly disc.