

ANNE v2.1.0

John Elliott

30th August 2002

Abstract

ANNE is an Amstrad PcW16 emulator for UNIX and Windows. It only emulates the PcW16; use JOYCE for other PCW / PcW models.

Contents

1	Introduction	4
1.1	Copyright	4
1.2	What ANNE does	4
1.3	What's new?	4
1.4	Concepts	4
1.5	Compiling ANNE	5
1.6	Known bugs	5
1.7	Internet resources	6
2	Setting Up	6
2.1	Directory organisation	6
2.1.1	Under Windows	6
2.1.2	Under UNIX	6
2.2	Running ANNE for the first time	6
2.2.1	You will need:	6
2.2.2	The ANNE command	7
2.2.3	Adding boot ROMs	7
2.3	Running ANNE for the second and subsequent times	7
3	In Use	7
3.1	What is emulated	7
3.2	What is not emulated	8
3.3	How the disc drive is handled	8
3.3.1	Ejecting a disc	8
3.3.2	Command-line options	8
3.3.3	Non-floppy discs	8
3.4	What if the speed is wrong?	9
3.4.1	If ANNE is too slow	9
3.4.2	If ANNE is too fast	9
4	Peripherals in ANNE	9
4.1	The keyboard	9
4.2	The Mouse	10
4.3	The disc drive	10
4.4	The LocoLink interface	10
4.4.1	LocoLink to a real computer (requires Linux)	10
4.4.2	LocoLink to another emulator	10
4.4.3	Socket types and names	10
5	The ANNE Menu	11
5.1	The Debug Menu	11
5.2	The Disks menu	12
5.2.1	The Disc Management menu	12
5.3	The Settings menu	12
5.3.1	Disc drives	12
5.3.2	Extra drives	13
5.3.3	Memory	13
5.3.4	General options	13

5.3.5	Mouse	13
5.3.6	Video	14
5.3.7	Printer	14
5.3.8	Save settings	14
6	ANNE Utilites	14
6.1	ANNEDRV	14
6.2	DDJOYCE.PRL	15
6.3	DOSDIR	15
6.4	EMULIOS.RSX	15
6.5	EXPORT	16
6.6	IMPORT	16
6.7	QUIT	17
6.8	REDIR	17
6.9	VGA and VGACOM	17
7	ANNE utilities (PC hosted)	17
8	Recent Changes	18
A	For UNIX system administrators	18
B	Keyboard codes	18
C	Acknowledgements	21
C.1	Previous versions of JOYCE also owed much to:	22

1 Introduction

1.1 Copyright

Copyright 1997,2001-2 John Elliott. Parts copyright 1994, 1995 Ian Collier. ANNE can be distributed freely under the conditions of the GNU General Public License (sic) - see the file COPYING.

1.2 What ANNE does

ANNE emulates a PcW16 computer - an 8-bit computer intended by Amstrad as a word processor, and manufactured around 1996.

1.3 What's new?

This is the first release of ANNE. It is called version 2.1.0 because it's built from the same codebase as JOYCE v2.1.0, which emulates earlier PCW models.

1.4 Concepts

When moving from a PcW to an emulator, the biggest change you have to accustom yourself to is the way that ANNE handles discs. Real PcW16s use real floppy discs¹; you use the recovery disc to reload the system after a crash, a data disc to save your work on, and so on.

It is possible for ANNE to use real disc drives in the same way that a PcW does. However this is pretty slow and awkward; since the PC's got a hard drive, you might as well use it.

Disc image files

Each floppy disc is read into the PC's hard drive and stored as a "disc image file". This is a one-time process; once the disc image files are created, the discs themselves are no longer needed.

Disc image files have a number of advantages:

1. They are much faster than real floppy discs.
2. You don't have to be shuffling a stack of floppies every time you want to use ANNE.
3. If you want more discs, you don't have to go to the shop to buy them. You just create more disc image files.

By convention, these have names ending in ".dsk". So instead of having a "manuscripts" disc, you would have a disc image file called "manuscripts.dsk". To normal UNIX or Windows software, "manuscripts.dsk" is just one file, but PcW programs see it as a disc with any number of PcW files on it.

One consequence of this is that the PcW16's floppy drive has nothing to do with your PC's real floppy drives. You can be working with a "disc" in the PcW's drive even when there's nothing in your real floppy drive(s).

Converting your PcW discs to disc image files is covered in section 2.

¹The PCW16 design allowed a hard drive interface to be added. ANNE does not emulate this.

ROMs

A real PcW16 has 1 megabyte of flash ROM, which holds the contents of the Cabinet, the built-in software, and the user settings. In the case of a program crash, the contents of the flash ROM could be lost, forcing a time-consuming reload from the recovery disc and data backups.

ANNE doesn't just use one flash ROM - it allows you to choose from several. One (called "Previous session") is automatically saved when you leave ANNE; another ("Empty system") is created when the recovery disc is first read in. It is possible to save others at any time; for example, if you have a Cabinet full of documents, you can save a copy of the ROM, and revert to that later if something goes wrong.

The MENU key

ANNE requires a Windows-style keyboard with a Menu key. On most keyboards, Menu is between AltGr and Ctrl, to the right of the space bar.

1.5 Compiling ANNE

If you have downloaded ANNE as a binary for your platform (eg: the full Windows install, or an RPM), you can skip this section.

To compile ANNE, you will need:

- SDL, the Simple DirectMedia Layer: <<http://www.libsdl.org>>. You need version 1.0.8 or later.
- libxml, the xml parser used by GNOME <<http://www.libxml.org/>>. ANNE was tested with version 1.8.9.
- libpng, the image library. <<http://www.libpng.org/pub/png/>>. You need version 1.0.6 or later.

You should be able to compile with the normal `./configure; make; make install` sequence.

To cross-compile ANNE for Windows, you need the XMINGW32 cross-compiler pack from <<http://www.libsdl.org>>, and MINGW32 versions of the above libraries.

1.6 Known bugs

This version of ANNE contains, or is thought to contain, the following bugs:

- Portability. I have no reports of ANNE compiling on other systems than Linux boxes.
- The serial port support is untested. It is possible to use QTERM under CP/M, but the SIO device driver (SIO.FID) has not been tested.
- The emulated PcW hangs if, from the front screen, you click 'Help' then 'Index'.

1.7 Internet resources

The latest versions of ANNE- and any future updates - will be downloadable as part of the JOYCE suite, from <http://www.seasip.demon.co.uk/Unix/Joyce/>.

Announcements of new ANNE releases, if any, will be made to the newsgroup [<news:comp.sys.amstrad.8bit>](mailto:news:comp.sys.amstrad.8bit). It is also on-topic to discuss ANNE in this newsgroup.

2 Setting Up

2.1 Directory organisation

2.1.1 Under Windows

ANNE uses the same directories as its sister emulator JOYCE. These comprise two directories - a “system” directory common to all users (eg, “C:/Program Files/Joyce/lib” and a “user” directory (eg: “C:/My Documents/Joyce”). Each of these directories will have subdirectories called `Boot` (boot files and boot disc images) and `Disks` (all other disc images). In the remainder of this document you will see directory names which look like “~/Joyce/Boot”; you should take the “~” to stand for the “My Documents” directory.

If you don’t want ANNE to put its files in “My Documents”, then you can override it. In ANNE, press [f9] for the menu, [f6] for settings, and select “General”. Then enter the new directory name, and press RETURN. You will need to copy the “Joyce” directory from “My Documents” to the new directory you specified.

2.1.2 Under UNIX

JOYCE uses two directories - a “system” directory common to all users (by default, `/usr/local/share/Joyce` - see Appendix A) and a “user” directory for each user (by default, `~/Joyce`). Each of these directories will have subdirectories called `Boot` (boot files and boot disc images) and `Disks` (all other disc images).

2.2 Running ANNE for the first time

2.2.1 You will need:

- A version of ANNE that installed correctly.
- A screen capable of 800x600x256 graphics. ANNE may well be faster in 256 colour mode than in (say) 16-bit mode.
- One of the following:
 - A PcW16 rescue disc;
 - A disc image of the PcW16 rescue disc, that you previously generated;
 - The rescue disc in .CFI format from Cliff Lawson’s web page: <http://web.ukonline.co.uk/cliff.lawson/files>

2.2.2 The ANNE command

Under Windows, ANNE should be run from the Start Menu. Under UNIX, the command to use is either “xanne” (to run in a window) or “xanne -f” (to run full screen). Other command line options are given in section 3.3.2.

2.2.3 Adding boot ROMs

The first time ANNE is started, it will detect that no boot ROM is present. You will be asked to provide it with a rescue disc.

The next menu that appears asks you for the location of the rescue disc to use.

- If you are using real floppies, then select the correct drive (A: or B:).
- If you are using a pre-prepared DSK file, choose the correct file.
- If you are using a .CFI file, choose the file and then select “Advanced”. On the menu that appears, select “.CFI - compressed raw”.

Next select “Continue”. If all goes well, the boot ROM will now be created and the boot menu will appear. The only usable option will be “Empty system (Boot ROM only)” so select that.

You should then see the PcW16 memory test, followed by the “Fatal OS checksum error” message. Use the ANNE menu (see below) to insert the rescue disc again, and click the “power switch” icon.

When the OS install is complete and you have entered your user details, use the ANNE menu to save the current system as a boot ROM (f2=Disc; Disc management; Save current ROM as boot ROM). Call it something like “Full system”.

2.3 Running ANNE for the second and subsequent times

When ANNE has been set up, it will display a boot menu when started. The menu will offer the following options:

Previous session The ROM saved when you last used ANNE. You would normally choose this option, unless the session has been corrupted by a program crash or you want to load an alternative ROM.

n. title ROMs that have been saved at earlier points. There will usually be one called “Empty system”, representing the state of the system just before the recovery disc is loaded.

Other... Load a ROM from a disc file.

3 In Use

3.1 What is emulated

- The Z80.
- 2MB of memory and 2MB of Flash ROM.
- The screen.

- The keyboard.
- The real-time clock
- A Centronics-only printer interface. You can print to a disc file or a UNIX command (eg, “lpr” for direct printer output).
- The mouse (either attached to a COM port, or directly driven). You will need a three-button mouse for the full effect.
- The serial ports (emulation of these is rather sketchy)
- The beeper.
- The LocoLink interface (over the parallel port).

3.2 What is not emulated

- The optional hard drive.

3.3 How the disc drive is handled

The basic concept of disc image files was described in section 1.4. There are several subtleties to be aware of:

3.3.1 Ejecting a disc

To eject a disc, press the MENU key for the ANNE menu, then [f2] (Disc). If there is a disc in the PCW16’s drive, you can eject it by selecting the corresponding “eject” option. Remember that ejecting discs from ANNE’s emulated drive doesn’t have anything to do with whatever floppy drives are actually fitted to the PC.

3.3.2 Command-line options

If you want ANNE to start with a disc in its emulated drive, then use -A with a filename:

```
xanne -A documents.dsk
```

will start up with "documents.dsk". in the drive.

To start up without asking which boot ROM to use, use the -E option with a filename:

```
xanne -E bootfile.rom
```

3.3.3 Non-floppy discs

The following JOYCE utilities have not been tested on ANNE. Some may work.

- ANNEDRV.FID gives the emulated PcW16 a hard drive (available only under CP/M). It uses a similar "disc image file" system to the floppy drives, but the image files can be up to 8Mb in size.

- REDIR.COM allows you to use one or more UNIX directories as CP/M drives. It requires CP/M. This avoids the problem that the host PC can't see "inside" image files without extra software.
- IMPORT.COM and EXPORT.COM will copy single files into or out of the ANNE environment. They require CP/M.

All these utilities are on the file ANNEUTIL.DSK. You can get at them with a command something like:

```
xanne -A=/usr/local/lib/Joyce/Disks/anneutil.dsk
```

and then start CP/M using "Run external program". REDIR.COM and its companion programs are in Group 1; the others are in Group 0.

3.4 What if the speed is wrong?

3.4.1 If ANNE is too slow

One solution is to increase the CPU speed. Press [MENU], then [f6] and select 'General'. Then enter the new speed.

It may also be possible to improve the performance of ANNE by changing the video refresh frequency. This is normally 12, but it can be reduced to improve performance. If it is reduced to 3.75, for example, then programs may appear a little jerky, but ANNE should run at its full speed.

To change the video refresh frequency, start ANNE. At the opening screen, press [MENU], then [f6] and select 'Video'. Then enter the new frequency and press RETURN.

3.4.2 If ANNE is too fast

The built-in speed regulation in ANNE should stop it running too fast. Possibly you could reduce the overall speed: press [MENU], then [f6] and select 'General'. Then enter a new speed.

4 Peripherals in ANNE

4.1 The keyboard

The keyboard is laid out to match the PcW16's own keyboard - a UK-layout 102-key arrangement. The following keys have different captions on the PcW16:

[This is for a UK keyboard with XFree86. Other X servers may behave differently].

PC key	PCW key	Notes
ESC	STOP	^C under CP/M
F9	Blue	
F10	Yellow	
F11	Green	
F12	Red	
Scroll Lock	UNDO	ESC under CP/M
Pause	Help	
Alt	Task	

4.2 The Mouse

The PcW16 uses a Mouse Systems type mouse, connected to its second serial port (referred to by ANNE as COM3:). ANNE can emulate the mouse as either:

- No emulated mouse.
- Serial mouse on COM1 (the mouse is in the wrong socket)
- Serial mouse on COM3 (the mouse is in the right socket)
- Update ROSANNE directly (the ROSANNE mouse coordinates are updated directly, which produces much better results than the emulated serial mouse options)

To choose which emulation is selected, press [MENU] in ANNE; then [f6] for Settings, and choose Mouse.

It is possible to use ANNE with a real PcW16 (or compatible) mouse - any serial mouse that uses the MouseSystems protocol should be suitable. To do this, choose 'No emulated mouse', plug the mouse into a serial port, and set the PcW16's COM3 to use that port.

4.3 The disc drive

Instead of a real disc drive, ANNE works with "disc image files" on the computer's hard drive. These are fully described in sections 1.4 and 3.3.

4.4 The LocoLink interface

ANNE allows two forms of LocoLink communication (only one under Windows, though). In each case, you must have suitable software (LocoLink or PcWLink).

4.4.1 LocoLink to a real computer (requires Linux)

- ANNE will act as the master. Connect the parallel port of your Linux box to the other computer (if it's another PC, use a LapLink cable; if it's a PcW, use the original LocoLink cable). Go into the settings for the printer port, and set it to "Output to parallel port". Then select the appropriate parallel port (normally /dev/parport0 or /dev/parport1).

4.4.2 LocoLink to another emulator

- Go into the settings for the printer port and set it to "output to Socket". On the screen that appears, select the correct socket type and name (see below) and ensure the "Client (Normal)" option is ticked.

4.4.3 Socket types and names

UNIX domain sockets (not supported on Windows) can be used to communicate with other emulators on the same computer. They work pretty much like normal files, and their names are normal filenames; so, for example, one might be called "/tmp/locolink.socket". When you are establishing a link, it is important that both ends are using the same socket name.

TCP/IP sockets can be used to communicate with other emulators not only on the same computer, but across a network or the Internet. However, JOYCE does not perform any security checks on socket connections, so I strongly recommend that you do not use TCP/IP sockets while connected to the Internet.

For a LocoLink master, the name of a TCP/IP socket is formed “host:port” - for example, “localhost:8256”, “127.0.0.1:8512” or even “www.somewhere.com.invalid:8080”.

5 The ANNE Menu

If you press the Menu key, a menu will appear at the top of the screen. It offers the following options:

- ESC=return to ANNE

Leaves the menu system.

- f1 = Help

Display the keyboard layout onscreen.

- f2 = Discs

Options for the floppy drive. Use this to "insert" and "eject" discs, to read floppy discs into the ANNE environment, and to modify boot ROM settings. It brings up the Discs menu below.

- f5 = Reboot

Simulates turning the PcW off and then on again.

- f6 = Settings

Settings for all aspects of the emulator. The Settings menu will appear.

- f7 = Debug

Display the Debug menu (5.1).

- f10 = Quit

Leave ANNE. You will be asked for confirmation.

5.1 The Debug Menu

There are four options here, intended mainly for advanced users or ANNE developers.

- “Debug mode” puts the system in debug mode. This doesn’t do a lot.
- “CPU state” displays the values of the Z80 registers.
- “RAM dump” writes out the contents of RAM to a file in the current directory called “anne.ram”. This is not a full snapshot facility; memory dumps can’t be reloaded, and they don’t contain CPU state.
- “Power switch” simulates the power switch being pressed or released.

5.2 The Disks menu

The Disks menu displays the status of the floppy drives, and allows you to eject or insert discs. Each drive has three lines in the menu:

1. The first line reads either “Drive A: (Ejected)” or “Drive A: (*Filename*)”. This shows whether there is a “disc” (.DSK file) in the drive or not.
2. The second line reads either “Eject” or “Insert...” depending whether there’s a disc in the drive. “Eject” ejects the current disc (.DSK file); while “Insert...” brings up a window asking for the file to insert. You can also “insert” a real floppy drive; this allows the emulated PcW to access a real drive directly (if slowly).
3. The bottom line for each drive reads “Read only”. If there is a tick beside it then the write protect holes on the disc have been opened and it cannot be written to.
4. If you select “Disc management...” then a menu appears allowing you to read in extra floppy discs, or convert .DSK files back to real discs.

5.2.1 The Disc Management menu

There are six options:

1. Add a boot ROM from a file - Reads in a boot ROM and adds it to the opening menu.
2. Save current ROM as boot ROM - Saves the current ROM file and adds it to the opening menu.
3. Rename a boot ROM - Allows you to change the caption associated with a boot ROM.
4. Delete a boot ROM - Removes a boot ROM from the opening menu. Use this option with caution!
5. Convert floppy to ANNE.DSK file - Read in a normal (data) disc, storing the new disc image file in the “user discs” directory.
6. Write .DSK file back out to floppy - Convert a disc image file (either normal or start-of-day) back to a floppy disc.

5.3 The Settings menu

Choose the item of hardware for which you want to make changes. Note that if you make a change such as disconnecting or connecting an interface, the emulated PcW may not pick it up until the next reboot.

5.3.1 Disc drives

Note: The menus in this section only allows you to create configurations that could exist on a real PcW16. By manually editing `~/Joyce/annehw.xml`, you can create “impossible” configurations, such as a system with two floppy drives (CP/M and Rosanne won’t detect the second one.) If the configuration is “impossible”, the menus will look different as they attempt to accommodate the changes.

The settings in this menu are:

Drive A: settings:

This brings up its own menu, allowing you to set what type of disc drive is attached to the PcW. The default type (“720k 3.5”) in fact supports 1440k disc images as well. If you want to emulate 5.25” drives or anything else unusual, select “other” and manually enter the drive type, the number of cylinders² it can access, and whether it’s single or double-sided.

5.3.2 Extra drives

This menu allows you to set up drives C: - L: and N: - P:. Obviously these drives don’t exist on real PcW16s, but they can on an ANNE system, though only under CP/M. You will need to have a copy of ANNEDRV.FID on your start-of-day disc for these drives to become available - see section 6.1.

For each drive, you can set it up in three ways:

- As direct access to the PC’s floppy drives.
- As a floppy drive that accesses a standard disc image file, just like the emulated A: drive.
- As a hard drive with 8Mb of storage. The hard drive will also be stored on a .DSK file, but this .DSK file will not be usable in emulated floppy drives.

To set up a drive, choose it from the list. Then choose or enter the filename and drive type, as listed below:

Type of drive to use	Choose file	Choose option
Floppy drive A: or B:	A: or B:	floppy drive
Floppy drive using standard image file	.DSK file	floppy drive
Hard drive using special image file	.DSK file	hard drive

5.3.3 Memory

This allows you to set the memory size of your emulated PcW. If your computer is running very low on memory, the “Current memory size” may be less than requested.

By default, ANNE uses maximum values - 2Mb of Flash ROM and 2Mb of RAM. If you want it to behave like a real PcW16, set both of these to 1Mb.

5.3.4 General options

This screen allows you to choose the speed at which ANNE should run.

5.3.5 Mouse

The mouse settings available here are:

- Emulation mode: No mouse, Mouse on COM1:, Mouse on COM3: and Update ROSANNE directly (see section 4.2).

²The drive documentation may call this figure the number of tracks rather than the number of cylinders. Either way, it’s usually 40 or 80.

5.3.6 Video

The Video settings allow you to change:

- “Video refresh” - the number of times per second that the screen is redrawn. You can go up to 50Hz (ie, the screen is redrawn 50 times a second) or down to 0.01Hz (the screen is drawn once every 10 seconds). The default setting in ANNE is 12Hz, which is fine for nearly all programs.
- The beeper is usually emulated using the PC’s sound card. You can also have it manifest as a red flash of the screen (“Visual Beeper”) or silence (“Disable beeper”).
- Whether the PcW has a colour monitor (the default), a monochrome white monitor (like the real PcW16) or a monochrome green monitor.

5.3.7 Printer

The following settings are available for the parallel printer port:

- CONNECTED/DISCONNECTED: Is the printer connected to the PcW?
- OUTPUT TO FILE: Output goes to a disc file. When you select this option, you are asked for the filename to send the output to.
- OUTPUT TO UNIX COMMAND: Output goes to a UNIX pipeline. You can use this to send output to the UNIX printing system (enter “lpr” here, with any appropriate options).
- OUTPUT TO PARALLEL PORT : Output goes to a real live parallel port, with no processing. This can be used to LocoLink to a real PcW.
- OUTPUT TO SOCKET: Output is sent to another process, over a socket. This can be used to LocoLink to an emulated PcW (using JOYCE v2.1.0).
- Under Windows, you also get the option to send data to LPT ports.

5.3.8 Save settings

If you do not save the settings, they will remain in force only for the duration of your current ANNE session. The settings will be saved to the file `Joyce/annehw.xml` in your home directory.

6 ANNE Utilites

The following utility programs are supplied with ANNE. They are designed to access features of the emulator which have no equivalent on a real PcW. You will find them on the disc image “utils16.dsk”.

6.1 ANNEDRV

ANNEDRV.FID is a file which is used to add one or more extra disc drives to CP/M running within ANNE. The first of these drives will usually be drive C:.

Unless the settings are changed (see section 5.3.2) the drives will be set up as 8Mb hard drives, called `~/Anne/Disks/c.dsk`, `~/Anne/Disks/d.dsk`, etc. The

6.2 DDJOYCE.PRL

NOTE: DDJOYCE will not function in this version of ANNE.

DDJOYCE is new in v1.20. It is a GSX driver for the host PC's graphics screen, allowing high-resolution colour graphics to be used from CP/M.

To use it, edit your ASSIGN.SYS file. Remove the entry which reads

```
01 @:DDSCREEN
```

and replace it by

```
01 @:DDJOYCE
```

It has not been possible to test DDJOYCE against the three GSX applications I know of (DRAWMON, DR Draw or DR Graph) and I would be interested to hear of any issues with these programs.

6.3 DOSDIR

DOSDIR displays the contents of a directory in the host filesystem (the name DOSDIR is for compatibility with MYZ80). Syntax is:

```
DOSDIR
or DOSDIR {x:/path/}filespec
```

Note that if you include a path you must include a filename. The command

```
DOSDIR C:/IMAGES/          is invalid, but
DOSDIR C:/IMAGES/*. *      is valid.
```

To get lower-case commands, use:

```
A>DOSDIR \
DOSDIR>/usr/local/bin/*
```

6.4 EMULIOS.RSX

EMULIOS allows Digital Research Logo to use the 800x600 screen.

To set it up, use the following commands (under CP/M):

```
PIP EMULOGO.COM=LOGO.COM
GENCOM EMULOGO
GENCOM EMULOGO EMULIOS
```

- Then EMULOGO.COM will behave as LOGO.COM, but using the 800x600 screen.

The following commands will behave differently:

setpc Allows a number from 0 to 255

setbg Allows a number from 0 to 255

savepic The .PIC file saved is in Windows BMP format, and can be exported, renamed to .BMP, and loaded by paint programs.

loadpic The .PIC file loaded must be in Windows BMP format and have 256 colours, but its size does not have to be 800x600.

6.5 EXPORT

EXPORT will write CP/M files out as UNIX files. It respects exact file sizes.

The syntax is:

```
EXPORT cpmfile { [O] }
EXPORT unixfile=du:cpmfile { [O] }
```

The first form of the command produce a UNIX file with the same name as the CP/M file.

The second form creates a UNIX file with a name that may be different from the CP/M name.

Beware: because the CP/M CCP renders all filenames into uppercase, it's very unlikely you'll be able to pass directory names to EXPORT; if you say

```
EXPORT /home/fred/cpmfile
```

EXPORT.COM will see "/HOME/FRED/CPMFILE", which probably won't exist. To get

round this, use:

```
A>EXPORT \
EXPORT>/home/fred/cpmfile
```

6.6 IMPORT

IMPORT will read UNIX files into the CP/M filesystem. It sets exact file sizes.

The syntax is:

```
IMPORT {/path/}hostfile { [O] }
IMPORT du:=/path/hostfile { [O] }
IMPORT du:cpmfile=x:/path/hostfile { [O] }
```

The first form imports the named file (or files) to the current drive and user area.

The second form imports the file (or files) to the specified drive and user area, keeping the original name(s).

The third form imports the files, changing their name(s) to match the provided CP/M filename(s).

If the [O] option is present, existing CP/M files with the same name as an imported file will be overwritten without asking. Otherwise you are asked for confirmation.

Both filenames may include wildcards, and the second and third forms can include CP/M driveletters and user numbers:

```
A: IMPORT \
IMPORT>2F: *.ASC=/usr/doc/*.txt
```

will import all the .txt files in /usr/doc to drive F, group 2.

Filenames are expanded case-sensitively, so you will normally need to use the backslash, as above, to get lower-case letters into the command line.

6.7 QUIT

Syntax:

```
QUIT { number } { [O] }
```

QUIT will exit ANNE. With no parameters, it will check whether there are files on drive M: which may need saving, and if there are it will ask for confirmation.

The number parameter is the error level which ANNE should return. If there is no number parameter, ANNE returns 98.

The [O] option disables the M: drive check and quits immediately.

6.8 REDIR

REDIR allows you to use one or more PC directories as drives under CP/M. See the separate file REDIR.DOC for more information.

6.9 VGA and VGACOM

VGA.FID allows CP/M programs to make direct use of the PC screen and keyboard. This gives more text on the screen and faster output.

Once VGA.FID has loaded, type VGACOM ON to activate it, and VGACOM OFF to deactivate it.

Your PcW screen will now be 100 columns x 36 lines. Nearly all the normal PcW escape codes are supported, which should enable character-based programs to be run. Since screen output is now being done by the host PC's processor, you should notice an improvement in speed.

The following escape codes work differently in the 800x600 VGA mode:

ESC b / ESC c set colours (so the numbers in the PALETTE command actually have meaning).

ESC y sets 32x90 mode.

ESC z sets 36x100 mode.

7 ANNE utilities (PC hosted)

If you don't want to use ANNE's own methods for converting between disc files and image files, you can also use the DSKTRANS program, which is installed with ANNE.

The command to use is either:

```
dsktrans /dev/fdn dskfile  
- Floppy disc to image file
```

or

```
dsktrans dskfile /dev/fdn -otype floppy  
- Image to floppy disc.
```

DSKTRANS isn't as versatile as CPCTRANS (for example, it can only handle discs in recognisable PcW or +3DOS formats) but it doesn't need telling what sort of disc it is using, and it is a native (not DOS-hosted) program.

8 Recent Changes

- This is the first version of ANNE to be written.

A For UNIX system administrators

First and foremost, *don't run ANNE as the root user!* ANNE gives the PcW programs within it various methods to access the host filesystem; it is entirely possible that a malicious PcW program running within ANNE could damage important UNIX files.

It is possible to set up a system-wide installation of ANNE with default settings, boot discs and other discs. To do this, first set up the desired configuration as a normal user. Then copy the following files:

- From `~user/Joyce` to `/usr/local/share/Joyce`: `annehw.xml`
- From `~user/Joyce/Boot` to `/usr/local/share/Joyce/Boot`: `anne*.rom` and `annebt.xml`
- From `~user/Joyce/Disks` to `/usr/local/share/Joyce/Disks`: Any other `.dsk` files that should be common.

This will then become the default configuration on your system. Users will still be able to change settings or add additional discs; these will be saved to their local configuration directories.

B Keyboard codes

Note that many of these keys don't exist in a standard PC keyboard. For example, the PC keyboard has no “\$” key (it uses SHIFT + 4 instead) so assigning codes to that key will have no effect.

Code	Key
8	Backspace
9	Tab
12	Clear
13	Return
19	Pause
27	Escape
32	Space
33	!
34	“
35	#
36	\$
38	&
39	,
40	(
41)

42	*
43	+
44	,
45	-
46	.
47	/
48	0
49	1
50	2
51	3
52	4
53	5
54	6
55	7
56	8
57	9
58	:
59	;
60	<
61	=
62	>
63	?
64	@
91	[
92	\
93]
94	^
95	_
96	'
97	A
98	B
99	C
100	D
101	E
102	F
103	G
104	H
105	I
106	J
107	K
108	L
109	M
110	N
111	O
112	P
113	Q
114	R

115	S
116	T
117	U
118	V
119	W
120	X
121	Y
122	Z
127	Del
256	Keypad 0
257	Keypad 1
258	Keypad 2
259	Keypad 3
260	Keypad 4
261	Keypad 5
262	Keypad 6
263	Keypad 7
264	Keypad 8
265	Keypad 9
266	Keypad .
267	Keypad /
268	Keypad *
269	Keypad -
270	Keypad +
271	Keypad ENTER
272	Keypad =
273	Up arrow
274	Down arrow
275	Right arrow
276	Left arrow
277	Insert
278	Home
279	End
280	Page up
281	Page down
282	F1
283	F2
284	F3
285	F4
286	F5
287	F6
288	F7
289	F8
290	F9
291	F10
292	F11
293	F12

294	F13
295	F14
296	F15
300	Num lock
301	Caps lock
302	Scroll lock
303	Right shift
304	Left shift
305	Right control
306	Left control
307	Right Alt
308	Left Alt
309	Right Meta
310	Left Meta
311	Left Windows
312	Right Windows
313	Mode / Alt Gr
315	Help
316	Print screen
317	SysRq
318	Break
319	Menu
320	Power
321	Euro

C Acknowledgements

This version of ANNE could not have been written without:

- Ian Collier, who wrote the "xz80" emulator. The Z80 emulator in ANNE is based on the one in xz80.
- Richard Clayton, who supplied vital information on the interactions between the XBIOS and the hardware.
- Cliff Lawson, who made the PcW hardware specification public.
- Richard Fairhurst and Jacob Nevins, who provided hardware information.
- The many authors of Linux, GNU, gcc, SDL, libpng and libxml.
- The MICO authors who created the mini-STL.
- Frank D. Cringle, who wrote the Z80 emulator test suite in YAZE.
- David Cantrell, for his posting on comp.sys.amstrad.8bit describing the use of PostScript in printer emulation.
- Matthew Gomez, who suggested some of the colour names in the custom colour menu.

- Kevin Thacker, who wrote the PCW16 driver for MESS. I haven't used any MESS code, but it helped a lot knowing what hardware was being used.

C.1 Previous versions of JOYCE also owed much to:

- Marat Fayzullin, who wrote the original Z80 emulation code. However, none of this code now remains in ANNE, because it is not compatible with the GPL.
- Ian Macdonald, who tested JOYCE for DOS.
- The authors of DJGPP, GRX20 and DRDOS.
- Samuel Vincent, the author of the SVAsync library.
- Martynas Kunigelis, on whose DJGPP keyboard driver I based that of JOYCE for DOS.