# Amstrad XTs: Hardware Compatibility 2

(Using non-Amstrad peripherals on Amstrad XTs)

## Monitors

### PC1512

The PC1512 is pretty much stuck with its built-in CGA graphics and its own CGA monitor. It is not possible to disable these and replace them with anything better. The only possible enhancement is to add a second graphics card and monitor; and because of the limitations of the PC design, the second card will almost certainly be monochrome (the exception is the Hercules InColor). You can either:

- Add an MDA, Hercules or Hercules InColor video card (with a suitable monitor). I have tested this and it works well as a secondary display; if you have working clock batteries you can even use NVR.EXE to set the additional card as the primary display, and replace the PC1512 monitor with a PC1640 PC-MD or PC-ECD display attached to the card.
- Add an 8-bit EGA card and a suitable mono monitor. You will only be able to use it for monochrome text mode and 640x350 monochrome graphics mode. I have tried this with an ATI EGA Wonder and it works, though trying to use GEM in the EGA high-resolution mode is a bit iffy (I may have been using the wrong driver). The EGA card automatically takes over the text display so you don't need to change anything in the NVR.
- Add an 8-bit VGA card and a VGA monitor. This worked with an 8-bit Paradise VGA card (which supported the same modes as a mono EGA); it may not work with other VGA cards. The Paradise card can also do MDA and Hercules emulation, and 132-column text modes.
- Silly suggestion: If you can find an IBM Professional Graphics Controller and switch the CGA emulation off, it may work as the second card in a PC1512; I haven't tried this, so you're on your own. This would only be useful if you had special software with support for the PGC.

### PC1640, PC20, PC200, PPC512, PPC640

These computers are compatible with EGA, CGA or MDA monitors (though only the PC1640 can actually display in EGA modes). All you have to do is plug the monitor in and set the correct DIP switches. Since the PC1640 gets its power from the monitor, it still needs the old monitor hanging around.

You can also disable the internal graphics adaptor and use an add-on graphics card (8-bit VGA or similar). Again, on the PC1640 you still have to leave the old monitor plugged in. The portables don't take normal expansion cards, so unless you have a third-party expansion unit (Dovetail DST used to advertise one) you won't have any way of fitting the add-on card.

You might be able to use a VGA monitor without replacing the graphics card, by getting hold of a suitable scan doubler. But since these can cost a couple of hundred pounds, buying one for an old XT seems a little excessive.

### PC2086, PC3086, PC5086

Any VGA-compatible monitor should work. The video chipsets can go up to 800x600 resolution.

# Floppy drives

### PC1512, PC1640

You can replace the existing 360k 5.25" drives in a PC1512/PC1640 with similar drives, or with 3.5" drives, using suitable adaptors for the power and data connectors.

- If you are replacing drive A:, the replacement drive must have jumpers or switches so it can be configured as A:. Modern PC drives omit these.
- The drive does not need to support the "Ready" signal. On the PC1512, this signal is optional; the motherboard link LK8 may be connected if the drives both support it, or left disconnected if they don't. On the PC1640 the link does not exist and the ready line is always ignored.
- The B: drive can be replaced with a standard 1.4Mb drive; I have done this using a Sony MPF920. It will only work with 720k discs rather than 1.4Mb, though.

Some 3.5" drives that I have used successfully as A: in a PC1512 are:

- A Chinon FZ-354.
- A Matsushita JU-253 (Drive A: from a PPC640)
- A 3.5" drive on which I can find no manufacturer's name, sold for use as a PC1512/1640 drive. It looks very similar to the PC200's Citizen OSDD-48A.
- Another nameless 3.5" drive, cannibalised from a BBC Micro.

### PPC512, PPC640, PC20, PC200

These PCs use 3.5" drives, so adaptors are not necessary, but otherwise the same considerations apply - drive A: needs to have its ID set to 0 using jumpers, and drive B: (PPC512/640) can be a standard 1.4Mb unit (though only 720k discs will work in it).

The 3.5" drive in the PC20 / PC200 appears to have a standard pinout, but I've never tried replacing one so I don't know what the outcome would be. It does not have a cable twist, so the same caveat about jumpers/switches applies.

The PC20 and PC200 have an external floppy drive connector. This supports 360k and 720k drives. The connector itself is a 36-way Centronics socket, with pin 1 of the socket corresponding to pin 1 of the drive data lead. There's also a 'power out' socket whose pinout I don't know.

## PC2086

The PC2086 floppy hardware is similar to the PC20/PC200 (including the external drive socket), but its controller also supports high-density floppy drives. It's quite simple to set up a 1.4Mb drive B:; a 1.4Mb drive A: would be possible using a 1.4Mb drive with selection jumpers.

Drive types are set using the DEVICE utility, in a similar way to the PC3086 (see below).

## PC3086

The PC3086 supports 5.25" and 3.5" drives. As with the other PCs, the floppy cable does not have a twist; but unlike the other PCs, the floppy cable can itself be replaced with a normal (twisted) cable. Therefore you can either switch jumper settings, or replace the cable.

The DEVICE utility allows drives to be set up as 360k, 720k or 1.4Mb. This is set up using the DEVICE command:

```
DEVICE SETFD /D:0 /T:0 -C
        Set drive A: as 360k, no changeline.
DEVICE SETFD /D:0 /T:1 +C
        Set drive A: as 720k, with changeline.
DEVICE SETFD /D:0 /T:2 +C
        Set drive A: as 1.4Mb, with changeline.
```

I have experimented with replacing the original cable in a PC3086 with one with a twist, and using a high-density drive (TEAC FD-235HF) as drive A:. This works, but the drive activity light remains permanently on. The reason for this is that the twisted cable swaps both DRIVE SELECT and MOTOR ON lines; whereas what's really wanted for a PC3086 is one that only swaps the DRIVE SELECT line.

## PC5086

The PC5086 floppy drive is a Citizen unit with a single 26-way cable for both data and power. This is probably the same drive that's used in later-model PCWs. It does mean that the drive can't be replaced with a standard one, unless you also fit a new floppy controller (see below).

## High Density

PCs other than the PC2086, PC3086 and PC5086 have a built-in floppy controller, whose data separator won't allow high density (1.4Mb or 1.2Mb) discs. The built-in controller can't be disabled so that an add-on controller can be used instead. There are two possibilities for escape:

- A secondary floppy controller at a different address, with its own driver.
- A floppy drive that uses some other kind of interface (parallel or SCSI). For example, if an Iomega/Insite Floptical drive (not the same thing as a Zip Drive) is connected to a PC1512, it will become a 1.4Mb drive A:; the existing drive then becomes drive B:.

The PC2086, PC3086 and PC5086 also have built-in floppy controllers, but these do support high-density drives. However, the PC5086 has a laptop-ish 26-way cable. If you can't find another drive with a similar cable, you'll need to get hold of a floppy controller on a plug-in card, and use that. The built-in controller automatically disables itself if an add-on is plugged in.

## Hard Disks

### PC1512, PC1640, PC20, PC200, PC2086

Cliff Lawson gives a couple of ideas - either use an XT-style hard drive, or (if you can find one) an 8-bit IDE controller and drive. There is a third possibility, which is to find an 8-bit SCSI controller and drive. For instance, the Future Domain TMC-885 or TMC-850 (with caveats) cards will work in an 8-bit slot. For some reason 8-bit SCSI controllers seem to be a little easier to find than 8-bit IDE controllers. However, do make sure the controller is a proper one with a boot ROM, not a cut-down card that only supports (for example) scanners. Also avoid QIC cards, which look like SCSI cards but aren't.

TMC-850 note: There are at least two different versions of the TMC-850 BIOS chip. Version 8.4 does not allow an Amstrad XT to boot from a SCSI hard drive, while the earlier 8.2 does.

### PPC512, PPC640

For a PPC laptop, you'd need a drive specifically designed for the PPC - the only one I'm aware of is the Stratum Sprint. It's extremely unlikely that you would be able to find one of these unless you bought a PPC with the drive already fitted, since the connection between the hard drive controller and the PPC motherboard is soldered. By the same token, if you managed to obtain such a drive, you'd need to solder it in yourself.

Another hard-to-find (or build yourself) possibility is a docking station; plug the hard drive into one of the ISA slots in the docking station, as for the PC1512 etc. above.

It might be easier to find a parallel port device, such as a Zip drive or a Datawise Quickdrive, though such devices wouldn't be able to boot the PPC.

### PC3086, PC5086

On a PC3086 or PC5086, you need an XT-mode IDE drive. A normal ATA drive is not suitable unless it has jumpers or switches to select XT mode. On the PC5086, the drive must also be a half-height drive to fit in the case, and have a small 3-pin power connector.

If you can't find a suitable drive, disable the built-in hard drive controller (on the PC5086, remove the jumper on LK7; on the PC3086, remove the jumper on LK953 and move LK952 to pins 2 and 3) and proceed as for one of the older PCs.

# Keyboards, mice, joysticks, lightpens

PC keyboards can't be used on any Amstrad XT except possibly the PC5086. The 5086 needs an XT-compatible keyboard with a PS/2 connector.

Serial mice will work, though on the older machines you'll need a 9-to-25 pin adaptor to make the mouse fit in COM1 (don't try to plug it into the mouse port!). You'll also need to replace the MOUSE.COM with one which supports a serial mouse. The PC5086 may also support standard PS/2 mice.

The PC1512 / PC1640 joystick socket uses the Amstrad CPC pinout. Just about any joystick from an 8-bit micro (except the Sinclair SJS1/SJS2) will work with this socket.

The PC20 / PC200 have a standard analogue joystick socket which is compatible with modern PC joysticks.

The PC1512, PC1640 and PPC have 6-pin lightpen sockets on the motherboard. If you can find a PC lightpen from the 1980s, it may work with such a socket.

# CD-ROM Drives

It is not possible to use the usual (ATAPI) CD-ROM drives used in most computers. It probably isn't feasible with drives attached to sound cards either, unless you can find an 8-bit soundcard with a builtin CD-ROM controller. It *is* just about possible using SCSI - there is a [separate page](#) on doing this. It may also be possible with a parallel port CDROM drive, if you can find one. I haven't tried this so in that case you're on your own.