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HARD DRIVE TYPES

I have written about hard drives before in this series (No. 10 on buying a hard drive, and No. 14 on how they work), but my friend Tom (WB9LNL) suggested that it would be helpful to review the types. A listing of types sounds like alphabet soup: MFM, RLL, IDE, ESDI, SCSI. Furthermore, there are even sub-types: SCSI and Fast-SCSI, IDE and EIDE. Most hams don't care about most technical details and differences between the types; what they want to know is will they work in that old reliable clunker they use for packet? So let us explore that aspect, so you know what to look for at the next swapfest. Even before that, though, a bit about cost.

The July 1995 issue of Computer Shopper contained many ads for 540 megabyte hard drives for around $180. That is no typo - 540 megs for $180. By the time you read this, the price will have gone lower. Even more astounding, I recently read a statement from an officer of a company that manufactures hard drives indicating that prices to consumers will be about 10 cents a megabyte by January 1996. If true, you will be able to purchase a 1-gigabyte (that translates to 1,000 megabytes!) hard drive for about $100 within less than 6 months! Wow! One caveat, though. It probably won't work with your old XT. At any rate, keep those cost factors in mind when that guy at the swapfest wants $50 for that 40 meg drive you have been eyeing.

Also keep this in mind: a hard drive must connect to a controller card inside your computer. If you are replacing an existing hard drive, you MUST replace it with the same type unless you also change the controller card. Thus, if your machine has an MFM drive, you cannot replace it with an ESDI, RLL, and so on (there is one exception to this rule, but we will ignore it). How do you tell what type is in your machine now? Pop the cover and examine the hard drive. Somewhere it will have a manufacturer's name and model number. Then look it up, or if you don't have the resources to do so, drop me a note via packet, snailmail or email, and I will be happy to tell you everything you want to know and some things you probably don't, about your drive. You also might be able to deduce the type from the information that follows.

If your machine is an XT, the only ROUTINE choice you have is MFM or RLL. If you happen to come across an 8-bit IDE controller card, you will be able to use an IDE drive, but don't count on it. On the other hand, you might get lucky at the next swapfest.

Here is a listing of the common types of controllers with some hints on their identification based on the type of cables that go from them to the hard drive they control.

MFM (Modified Frequency Modulation), RLL (Run Length Limited) and ESDI (Enhanced Small Device Interface). All three of these drive types are connected to the controller card by two cables, a 20-conductor data cable and a 34-conductor control cable. If there are two drives in the computer, then three cables will be present; a single 34 conductor control cable which will go to one drive and then continue to the second (called a "daisy chain" arrangement), and two 20 conductor data cables, each of which goes to a separate hard drive. As an aside, don't ever fall in the trap of mixing up a 34-conductor hard drive control cable with the similar 34-conductor floppy drive cable. If a twist is present, the floppy drive cables have a seven-conductor twist while hard drive cables have a five-conductor twist. Take a look; you'll see the twist near the end of the cable.

IDE (Integrated Drive Electronics) is probably the most popular drive in use today. They are inexpensive and fairly reliable. The card that is used with IDE drives is really not a controller card; the official name for it is an "adapter card", because it serves mainly as a convenient connection between the hard drive and the computer. Essentially all of the controller functions for this type of drive are contained right on the hard drive itself, as suggested by the name. This drive type is connected to the adapter card by a 40-conductor cable; if two drives are present, they will be daisy chained on the same physical cable.

SCSI (Small Computer System Interface, pronounced "skuzzy") is a flop over from Apple Computers, where this interface allowed plugging in several types of devices to the otherwise inaccessible machines (early Apples had no expansion slots). These have either 50 or 68 conductor cables between the drive and the "interface" card.

In summary:

CONNECTION BETWEEN HARD DRIVE AND CONTROLLER/ADAPTER/INTERFACE CARD	**HARD DRIVE TYPE**
At least 2 cables present; 20 and 34 conductor	MFM, RLL or ESDI
One cable, 40 conductor	IDE
One cable, 50 or more conductors	SCSI

Well, that should get you started on your quest. You should be cautioned, however, that even if you replace a hard drive with an exact replacement, it might not work! For example, if you put a Seagate 40 megabyte MFM drive in your XT computer to replace a dead drive of the exact same brand and model, the new one may not work if it was low level formatted in a 286 machine! Frustrating. Indeed, the only way to get it to work is to redo the low level format in your XT. However, once that is done, it should work just fine.