# Kaypro Column

## By Dave Thompson

William Fankboner stirred up a good deal of controversy with his letter in Issue #21. A number of folks suggested that if he didn't like our documentation, then he should do something about it.

Well, he did. Very nicely, I might add. Figure 1 is a copy of the illustration that he drew to show the II to 4 modifications. We have put it in the latest Pro-8 manual and we are publishing it here.

**Is It A II-83?**

Before you start digging into your board, make sure your Kaypro II-83 is really a II at heart. Remove the top from your Kaypro and look closely at the board. There will be two 20-pin ICs with paper stuck on top. The one nearest the front of the computer will be marked 81-149 or 81-232. 81-149 means you have a II board. 81-232 means you have a 4 board. (If you have neither, then you have an 84 board.)

If you have a 4-83 board you don't need to modify or purchase anything to use two 390K drives (double-sided, double density). Just get a formatter from someone who has a 4-83, and you are on your way. Or you can purchase a Pro-8 ROM and run any mix of single-sided, double-sided, or quad density disks. If you purchase or build a decoder board, then you can use three or four drives rather than just two. (See our ad for info on the Pro-8 version 2. Dana's made it even better.)

If you have a II-83 board (81-149) you'll need to do the II to 4 upgrade before you can use the Pro-Monitor 4 or the Pro-8. We have the 74S04 ICs for $1.50 each, postpaid.

**5MHz Revisited**

This is another spot where a picture is worth at least a thousand words. Most people who are planning on speeding up their 83 Kaypro II or 4 get a plug-in board from someone, and off they go. The boards usually cost between $75 and $100.

Otherwise you can add the jumpers shown in Figure 2 (or Figure 3 if you are unsocketed) and spend your money on a faster ROM (only needed if you really have a II, see above) and Z80B. We have the Z80Bs for $12. For a faster ROM you have your choice of the Pro-Monitor II, Pro-Monitor 4 (if you have a 4 or are doing the II to 4 upgrade in Figure 1), or Pro-8.

**Double Duty**

A lot of folks do the speedup and the Pro-8 at the same time, since the Pro-8 ROM is a fast part. I highly recommend that you do the II to 4 upgrade (if necessary) first. Connect your board to the power supply, drives, etc. to check out your work.

Once you've verified that the Pro-8 is running, then do the speedup. If there's a problem, you won't have to check both mods to find it.

One part of the speedup that many people leave out (including the speedup kit manufacturers) is the CAS-MUX change. You could do the CAS-MUX change even if you aren't speeding up your system. Your Kaypro will run more solidly at 2.5MHz after this simple change.

**IBM's Kaypro Clone**

I understand that at a Washington, D.C. show during the first week of March, Kaypro displayed its 286i AT clone. IBM had a very large booth, but no ATs to demonstrate. Some people (wise guys, no doubt) stopped at the IBM booth asking to see the Kaypro clone. IBM didn't see any humor in the question, no humor at all. However, the story is definitely generating some chuckles around Kaypro.

A lot of anxious people placed orders for the 286i contingent on delivery within 90 days. It seems they had tried placing orders with IBM, but the delivery dates were too far out (and who knows if an IBM will work—what with their reputation and all . . . ).

The rumor I'm hearing is that IBM has warehouses full of XTs because sales of the 8088 system with a winnie died when the AT was announced. So, hoping to clean out the XTs, IBM stopped shipping the hard disk version of the AT. But dealers were adding winnies to the floppy-based ATs, so the XTs still sat.

Finally, IBM simply shut down all AT shipments in hopes that within nine months the XTs will disappear. Those warehouses full of XTs might be just the medicine for Kaypro's financial ills.

**286i**

Speaking of Kaypro's AT clone, I thought you'd like some details. The 286i retails for $4550. It comes with 512K of RAM expandable to 15 meg. (Yeah, I know, there is absolutely no way anyone could ever use or afford 15 meg of RAM, but then I felt that way about 256K just a year ago.) The system comes with color graphics standard (it's not standard on the AT), MicroPro software, and 8 slots, 5 of them empty.

It comes with two floppies, 1.2 meg each. The drives can supposedly read 360K disks, but as far as I understand they can't write them. A number of shops have started offering to "upgrade" your AT to 360K drives so you'll have total compatibility with PCs and all those warehoused XTs.

The 286i comes with a built-in hard disk controller card. Kaypro is refusing to get into the hard disk battle, so it is letting you add your own. I'll be taking a look at the drive market to see if there are any reasonably priced drives that are also dependable.

I saw Kaypro's AT clone at the West Coast Computer Faire and was surprised at how close a copy it is to the real AT. If you saw both of them with their lids off, you'd be excused for not knowing which one was which. The physical design of the 286i appears identical to the AT.

Kaypro has already shipped about 500 units (as of early April) with major shipments scheduled for June 1.

**Kaypro Sales**

Kaypro sales says that its number one product (about 60-70 per day) is the 2X Business Pack. The second most popular product is the K16. They announced that the K16/2 (has two 360K floppies, no winchester) is $2550 vrs. about $3200 for the K16 with one floppy and a 10 meg winnie.

**K16 Problems**

A number of K16s, both winchester and floppy based units, have video circuits that go to lunch on random occasions (we're not talking short coffee break here). Those displays that are flaky appear to be very sensitive to static elec-

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tricity. If you shuffle across the rug and touch any part of the K16—keyboard, cabinet, printer cable—the screen image disappears.

Kaypro purchased a static zapper and installed it at the end of the assembly line. Now that they're zapping all assembled units, it should stem the flow of defective ones.

If you have the problem, as MicroSphere did, Kaypro will send you a new video board. That swap didn't totally cure MicroSphere's K16, but it made the unit a lot less sensitive to static, and the screen doesn't go away nearly as often.

**Kaypro 2000**

Just when you thought that Kaypro had released all their new systems they surprise you with another (actually, this is one they've been working on for well over a year, so I can't say I'm too surprised).

Anyway, this one is an 11 pound system that's very similar to the Data General. Like the Data General it has the Citizen 3½ inch drive and an 80 by 25 LCD display. It runs 123 and flight simulator and comes with the Star Burst software package (whatever that is). Screen contrast (a real problem for the LCD units) is supposed to be better than on the early Data General displays.

The 2000 comes with batteries (4 hrs. per charge), charger, 256K of RAM, and a removable keyboard for $1995.

They are finishing up a separate base unit that will include a power supply, standard video, and a 360K 5¼" drive, and they will also offer a built-in 1200 baud modem.

**84 Video Fix**

The Kaypro 2-84 and 4-84 have a very slow video scroll because the processor is readdressing video RAM every time it sends it a character. This is slow. So slow, in fact, that some can't display serial data at 1200 baud without dropping characters. Plus, an original Kaypro II running at 4MHz is a lot snappier than the new 2s because the new processor is spending so much of its time dinking around in screen memory. (Let's see now, tell the 6845 that I'm going to send a character to RAM, send a couple bytes of address, and send the character. Now tell the 6845 that I'm going to send a character to RAM . . . )

However, the 6845 video controller (or pin compatible 6545) is very smart. It knows how to automatically increment the video RAM address so the processor can dump characters into video RAM just as fast as it can output them. So why didn't Kaypro take advantage of this feature? Bad timing.

Some video controllers work just fine in this auto-increment mode. Others get out of step, seem to lose track of what the processor is doing, and characters start showing up in strange places. It's this timing problem that Kaypro was trying to avoid when they wrote the very slow video code.

Remember the slow disk write code on the old II-83 and 4-83? That was another example of a hardware timing problem that they tried to solve by slowing down the software. They fixed the hardware with the modification to U87 (see issue #11), but the only way to get around the slow code is with a Pro-Monitor.

Anyway, there is still a video timing problem on the 84 boards, which makes the choice of video controller very important. On the Pro-884 Max ROM we give you a choice of fast or slow video. If your controller and processor work well together, then you can use the fast video (the system acts like it's running 10MHz). If not, then you use the slow. You'll see garbage on the screen if fast doesn't work (though the file you are editing will be clean).

With all this in mind, you'll understand why I was excited when Chuck Weingart called to say he had fixed his garbagy video. Cold.

He replaced his original 6845 with a faster 6545A. Then he replaced the Z80A with a Z80B. Separately, neither helped, but together they work flawlessly. No guarantees, of course, but when you see how responsive the Kaypro becomes with the fast scroll you'll understand what drove Chuck to find a solution.

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*Figure 2*

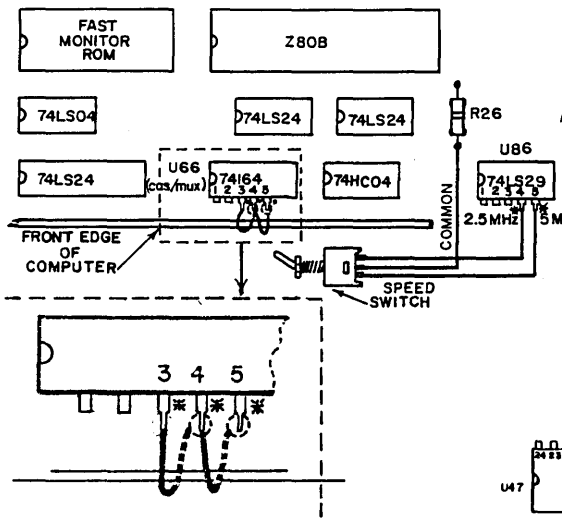



*Figure 3 - If U66 is soldered*

*Figure 1 - Kaypro II To Kaypro 4 Upgrade*
*(Make these changes if your original monitor ROM is marked 81-149.) Heavy solid lines show the three jumpers you need to add on the top of the board. The dotted line is a jumper that goes underneath the board from U73 pin 6 to J6 pin 32. There are asterisks (*) next to the three pins that must be pulled up before you connect jumpers to them. (Don't forget to change U73 from a 74LS04 to a 74S04.).*