

Kaypro '84 Series Real Time Clock Parts Kit

The Kaypro real time clock parts kit contains the parts that Kaypro left off of many of the '84 series main boards. Some of the Kaypro main boards may have some of these parts installed, so do not worry if you do not need all of them. You may find boards with all of the resistors, capacitors, and even chip sockets installed, or only empty solder pads at each location.

If you have a board that does not have any of these components installed, you will probably need to remove solder from the mounting holes on the board. This portion of the job requires a moderately advanced level of skill to do without damaging the board. If you do not have the skill, correct tools, or a friend that can help you, please do not attempt to complete the installation. Please return the kit for a refund or send the kit and your board and we will do the installation for a fee of \$15.00. We feel that it is always better to stop while you are ahead, than to get involved in a lot of repairs.

The kit also contains a disk with two programs, TIME.COM and SETCLOCK.BAS. Both of these are Kaypro distribution programs that may have come with your original system disk. There are also other programs and operating systems available to make use of your real time clock. We distribute a replacement operating system that replaces CP/M, called QP/M, which use the real time clock to time/date stamp your diskette files each time a file is modified. There are also a number of other public domain and commercial packages available that do the similar things. We also have a replacement ROM set called the KayPLUS ROM that uses the real time clock to determine disk drive time outs, and CRT screen blanking.

The real time clock chip is a MM58167A, manufactured by National Semiconductor. If you want to develop your own applications for the clock, data sheets and programming examples are available from National. The real time clock is located at I/O ports 20, 22, & 24. The real time clock is accessed through a Z80-PIO which handles the latching and status of the clock chip. Port 20 is used for register select and interrupt status, 22 is the PIO control port, and 24 is the PIO data port. The registers bits function as follows:

- bit 0 - least significant register select
- bit 1 - register select
- bit 2 - register select
- bit 3 - register select
- bit 4 - most significant register select
- bit 5 - not used
- bit 6 - RTC interrupt output
- bit 7 - RTC standby interrupt input

Parts list:

Part	Qty	Location	Description
40 pin socket	~1	U35	PIO socket
24 pin socket	~1	U36	RTC socket
Z80A-PIO	~1	U35	PIO IC
MM58167	~1	U36	RTC IC
74LS138	~1	U27	IC
74LS74	~1	U66	IC
74LS02	~1	U37	IC
74LS04	~1	U46	IC
5.1K	~1	R36	resistor (green,brown,red)
10M	~1	R34	resistor (brown,black,blue)
200K	~1	R35	resistor (red,black,yellow)
1N4152	~2	CR6,CR7	diodes
20pF	~2	C64,C65	capacitors (20K)
.1mF	~1	C54	capacitor (104)
32,768 Hz	~1	Y4	crystal
BR-2/3A	~1	BT1	battery

Tools required:

Temperature controlled or 25 watt soldering iron, solder sucker or braid, thin nosed pliers, phillips screw driver

Installation:

1. Remove cover from Kaypro, and remove main board from cabinet. Note locations of connectors for reinstallation later.
2. If soldering is needed, remove RF shield from back of board.
3. Remove solder from filled holes where components will be mounted. Use solder sucker or braid carefully, so that traces are not damaged.
4. Solder sockets and IC's into board. Note that dots and notches line up with notches marked on the board, so that pin 1 is in the correct position on each.
5. Solder resistors, capacitors, and diodes into board. Banded ends of diodes will match bands marked on the board. The resistors and capacitors do not need any particular orientation.
6. Install crystal at location Y4. Leave about 1/8 to 1/4" extra leads on the top of the board so that the crystal can flex a small amount without breaking off.
7. Install battery, making sure that the + and - ends are properly oriented. Use the mounting holes that match the approximate

outline of the battery.

8. Clean and check the bottom of the board carefully for shorts and solder splashes. Cut off excess length on leads.

9. Install socketed IC's.

10. Replace RF shield on the bottom of the board.

11. Reinstall main board in cabinet and hook up cables.

12. Test the RTC by booting up your system and running the TIME program. It should set the clock, and correctly show the time each time that it is run.

13. Reinstall all screws and replace cover.

This completes the real time clock installation.