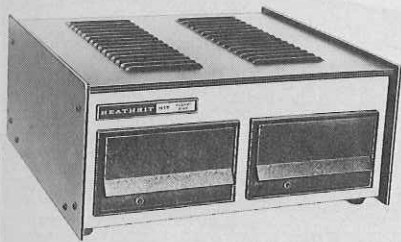


equipment reports

Heath Model H17 Floppy-Disc System



CIRCLE 50 ON FREE INFORMATION CARD

OWNERS OF HEATH'S MODEL H8 COMPUTER CAN now increase the versatility of their system with Heath's new model H17 floppy-disc system. A floppy-disc system provides a quick method of program storage and retrieval. The advantages over a cassette system include loading and storage of programs in seconds rather than minutes, deleting and updating program and data files, cataloging of files, and more.

The Heath Company's Dept. 570-070, Benton Harbor, MI 49022) H17 floppy-disc system consists of a factory-assembled control board that plugs into the H8 bus and is connected via a ribbon cable to a Wangco model 82 5 1/2-inch drive. The drive is housed in a cabinet that contains a power supply capable of powering a second drive. The cabinet also contains a cutout for an optional second drive.

Each 5 1/2-inch hard-sectored disc is divided into 40 tracks, and each track is subdivided into 10 sectors for a total storage capacity of 102,400 bytes-per-disc. The model 82 drives have a 30-ms track-to-track step-time specification, although some drives will operate much faster. Both drive units in my system operate reliably at a track-to-track step time of 8 ms. As Heath carefully points out, the track-to-track step time is not the same as the random-sector access time, which is the actual time required for the read/write head of the drive to get to a sector once it is requested. A track-to-track step time of 8 ms translates into an average track-to-track step time of 104 ms. Since the disc rotates (at 300 rpm), there is an

additional average time of 100 ms for the sector to come under the read/write head. So, the average random-sector access time is 204 ms. Once a sector on the disc is accessed, data is transferred between the drive and the controller board one bit at a time at a serial rate of 16,000 bits-per-second. To reference this speed, the H17 will load Extended Benton Harbor BASIC in about 2 seconds. Heath's standard 1200 baud cassette interface requires about 2 minutes.

Software

Software is required for a floppy-disc system to function. This software is called an operating system, and Heath supplies its own brand called HDOS. The operating system handles such functions as controlling the drive motor, positioning the read/write head, locating specific data on the surface of the floppy disc, creating files, transferring data, etc. It also provides communication with the user via command instructions.

After initially applying power to the system, HDOS must be "booted." Booting is the process of loading only those segments of HDOS that will enable the system to function. For example, one such portion, called the monitor, decodes the various commands and transfers control to the appropriate software segment to carry out the command. After the command is executed control returns to the monitor. Various other segments of HDOS are loaded into the H8 when necessary.

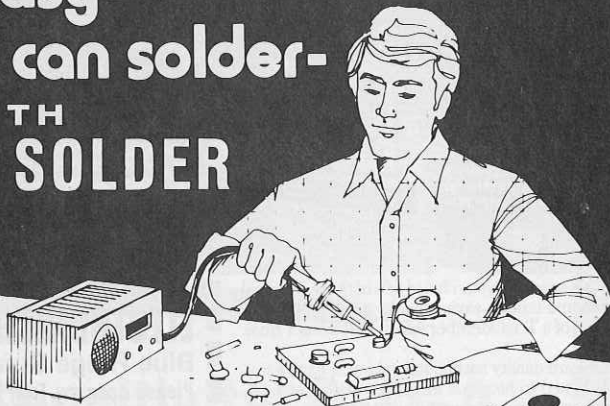
When HDOS is booted, the monitor program is automatically located in the upper address space of the H8 memory and occupies 2.4K. The other segments of HDOS are located in the lower address space of memory and occupy approximately 9K. Therefore, HDOS requires a total of approximately 12K RAM to operate. If you plan on using a BASIC interpreter, then you will need additional memory to support the BASIC, plus whatever "user" memory you require for your programs.

To boot HDOS, simply set the H8 program counter to 030 000 using the octal keypad on the H8 front panel and execute GO. HDOS will respond by printing ACTION? (BOOT) on the CRT terminal. To boot HDOS, simply type B on the terminal keyboard. After HDOS is loaded it will respond by identifying itself. It will then ask for the current date by printing DATE (DD-MM-YY)? After entering the current date and hitting the carriage return, HDOS is up and running. From now on, HDOS responds with a prompt character to indicate that it is ready to accept commands. There is a wide variety of commands available with HDOS. Among these commands is SYSGEN, which permits you to copy the minimal operating system onto a blank disc. You can use the COPY TO-FROM command to copy additional programs to this disc and store the original

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EQUIPMENT REPORTS

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nal disc away for safekeeping. A PIP command (Peripheral Interchange Program) is included and is used to copy a file from one disc drive or peripheral device to another. Other commands include SYSHELP, which lists all the valid system commands; DELETE, which erases specific files from the disc; RENAME, which changes the name of a specified file; CAT, which lists the files contained on the disc; and other commands.

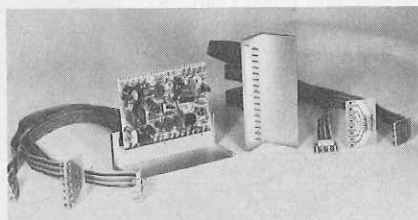
Among the many commands and features of HDOS, one in particular struck me as being interesting and unusual. This is a diagnostic routine called TEST 17. After executing this command, you can check the rotational speed of the disc drives. The normalized drive speed is displayed on the LED's on the front panel of the H8 as a decimal number, which should be as close to 1.000 as possible. Since the rotational speed tolerance is 1 percent, any number between 0.990 and 1.010 is acceptable. If it is out-of-tolerance, it can be trimmed by adjusting a pot on the drive assembly itself. Another test that can be performed under TEST 17 is a general checkout. Under this test, a specific bit pattern will be recorded on each sector of the disc and then read back. This test is automatically performed three times, and is intended to check the read/write head and the track seek mechanism. There is also a media check that locates all the bad sectors on the disc (if there are any) and a routine for minimizing the track seek time of the drive being tested.

Other commands are also available that are associated with the operation of the disc

system. For example, if you have various BASIC programs already stored on cassette tape, you can use BASCON to convert these programs into files that can be stored on the disc. If you have text files stored on cassette tape, you can use TXTCON in a similar manner to convert these into disc files. A ONECOPY command is included that allows you to copy files from one disc to another in a system that has only one drive. In addition to HDOS, the software disc also contains BASIC, BUG-8, HASL-8 and TED-8.

Overall, HDOS is a versatile operating system. The H17 disc system which sells for (\$695.00 including software) will greatly increase the versatility of your H8 system. **R-E**

Sylvania Module Extension Cable Kits



CIRCLE 141 ON FREE INFORMATION CARD

MANY YEARS AGO, WHEN SETS AND CIRCUITS (and I) were much simpler, I used extension cables a good deal. These cables let me get the chassis out onto the bench where I could actually get at it. When I started troubleshooting my first modular TV set, I thought it would be great if we had a set of extension cables so that

we could get each module out where we could get at it . . . since many of us repair such modules, especially larger ones.

Evidently, someone was listening! Sylvania has come up with module-extension cable sets; one of these fits Zenith modules, the other, RCA modules. The Zenith cable set is called the TV Module Extension Kit P/N KZ-2. It will fit 19 Zenith chassis, including the 17EC45, 19EC45, 23EC45, and several others. This set consists of six cables and two special brackets (plus pins) and can be used with 10 different Zenith modules.

The instructions state: "Each Zenith module listed has an even number of pins (8, 12 or 16) on one end and an odd number (7, 11 or 15) on the other. Each bracket has two four-conductor cables and a larger one. One with 7 conductors, the other with 8. By selecting the right cables and plugs, any of these modules can be hooked up correctly." A complete instruction sheet comes with each set, listing the modules and chassis with which it can be used. A special data sheet is also included showing the Sylvania ECG part number semiconductor for the original component used in each module.

The RCA extension cable set is the TV Module Extension Kit P/N KRX-5, with five separate cables for use with the RCA Accu-Color chassis from the model CTC-41 through the model CTC76. Three of the cables have six contacts each, and the two remaining cables have 12 contacts. By choosing the right combination of contacts, any of the 15 modules listed in these chassis can be hooked up. Full hookup data and instructions are provided, as well as a list of ECG replacement semiconductors.

Both extension cable sets use flat multicon-
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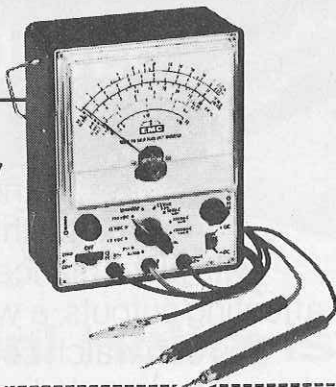
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