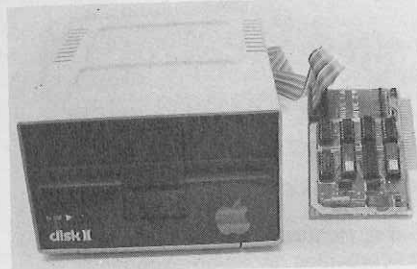


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the length of the horizontal line. The pattern will get smaller as you switch from HI to LOW on the RANGE switch. If the pattern becomes too small, just reset the horizontal calibration and vertical gain controls. The size makes no difference.

This is a simple but handy instrument that can be very accurate when used properly. It doesn't take long to set up, and it is priced at \$54.95. **R-E**

Apple Disk II Floppy Disc System



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OWNERS OF THE APPLE II COMPUTER (APPLE Computer, Inc., 10260 Bandy Drive, Cupertino, CA 95014) now have an alternate to their cassette tape system for saving programs and data. The *Disk II* system allows fast, reliable storage on standard 5¼-inch minifloppy dis-

ettes. Up to 14 disc drives can be connected to the Apple II for access to nearly 1.6M bytes of data. The DOS (Disc Operating System) is activated via a PROM-based bootstrap loader and master diskette supplied by Apple. The DOS adds the following commands: OPEN, CLOSE, READ, WRITE, SAVE, LOAD, EXEC, RUN, APPEND, RENAME, POSITION, VERIFY, CHAIN, LOCK, UNLOCK, DELETE, MON, NOMON, MAXFILES, CATALOG, INIT, BSAVE, BLOAD, BRUN, FP, and INT.

The *Disk II* consists of a controller card that plugs into one slot of the Apple II motherboard, a modified Shugart SA-400 disc drive, a system software diskette, a blank diskette and instructions. The packaging of the drive is excellent; the color-coordinated steel cabinet fits nicely on top of the computer. One controller card handles two drives; so up to a maximum of seven controllers can be used. Each drive is then referred to by its number, D, and by its controller's slot number, S (e.g., D1 and S6). Once a drive has been accessed, these values default to that drive until they are explicitly changed. Included on the software diskette is a game program, ANIMALS that demonstrates very nicely how the disc can be used to store data.

Using the *Disk II* is a breeze. Programs save and load by name, and about 10 times faster than by cassette. Thus, to store a program on the disc, you simply type SAVE <file name>, where <file name> is any name you select for the program. The DOS automatically keeps a directory of all files; these files can be seen by using the CATALOG command. The CATALOG command also shows the nature of the file (BASIC, Applesoft, machine code, or text),

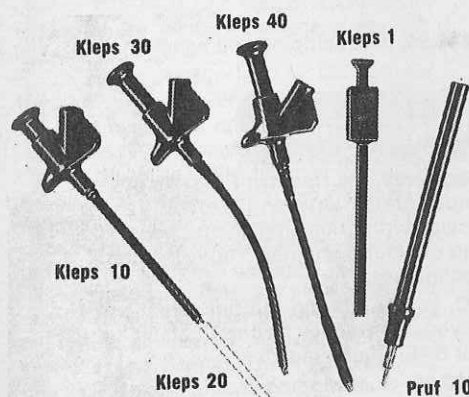
whether the file is protected, and also gives you some indication of the file length. Using the LOCK command protects files from accidental change or deletion.

The command list gives a fairly good indication of the power of the disc system. Particularly noteworthy are the EXEC, FP and INT commands. The EXEC command is similar to a RUN command except that the indicated file may contain entries not normally allowed in a BASIC program; for example, the HIMEM: command used to run many programs (i.e., the Apple Startrek game). Normally, such a program must be loaded into the computer and a HIMEM: command issued to set memory pointers correctly before it is run. Using the EXEC command allows such a program to be run from the disc just like any other program.

Another good feature of the disc is that the floating-point BASIC (Applesoft) is always handy and can be loaded within 8 seconds. For convenience, the commands FP and INT are used to switch between BASIC's. When a program is loaded from the disc, the computer checks which BASIC it was written in, and then loads Applesoft (or selects the Applesoft firmware card when installed) if necessary. Incidentally, this Applesoft is actually Applesoft II, an improvement over the original version. The DOS also allows a program to begin executing immediately after booting for a turnkey type of operation.

The DOS however has two flaws; its inability to CHAIN Applesoft programs, and the lack of any password security for files. While this last feature is of little value to most home-computer hobbyists, it is very important in

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multiuser systems such as schools or businesses (where many Apple II's are currently found). Without such file security, a programmer could inadvertently (or even purposely!) change or destroy another programmer's files. Since the DOS resides in RAM, undoubtedly Apple and other computer companies will supply improved versions in the near future.

Overall, the *Disk II* performed very well. I have transferred all my programs from tape to disc, which quickly filled up more than six diskettes (over 600K bytes), and the disc has operated flawlessly. Indeed, the *Disk II* appears to be up to the high standards that the company has shown in the Apple II computer.

The *Disk II* costs \$595, including the controller card. Additional drives (without controller) cost \$495. It should be noted that due to high demand, delivery may be quite slow for a while. **R-E**

Realistic Model DX-300 Receiver



CIRCLE 104 ON FREE INFORMATION CARD

AFTER A PROLONGED PROMOTION PERIOD, Realistic (Radio Shack) has now made available its newest entry into the hobby listening market: the *model DX-300* general-coverage receiver.

This receiver is continuously tuneable from 10 kHz through 30 MHz and features a large, bright digital-frequency display, a frequency synthesizer and triple conversion. Specifications include: a shortwave sensitivity better than 1 mV; an image ratio 70-80 dB down; AM/LSB/USB/CW detection modes; a selectivity of ± 3 kHz (-6 dB) and (± 70 dB); and less than 1-kHz drift after a one-hour warmup period.

The receiver's appearance is exceptionally attractive with a military black finish, aluminum knobs and colorfully illuminated dials.

Since we are aware that packaging is an important part of salesmanship, we were eager to test the receiver to see whether its looks were deceiving. Our first reaction was one of disappointment. The drift rate on the sample receiver we tested was very rapid; it was virtually unusable in the single-sideband or continuous-wave modes until after a lengthy warmup period (the specifications warn the user of this).

Proper adjustment for each frequency range (it tunes in 1-mHz increments) is cumbersome: After the frequency range to be tuned is selected, the megahertz dial ring must be tuned for best signal, and then the preselector must be tuned.

Although the importance of proper adjustment of the megahertz tuning knob is not emphasized in the manual, the setting of this knob is *crucial* to acceptable performance.

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