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Radio-Electronics

THE MAGAZINE FOR NEW IDEAS IN ELECTRONICS

INTELLIGENT THERMOSTAT

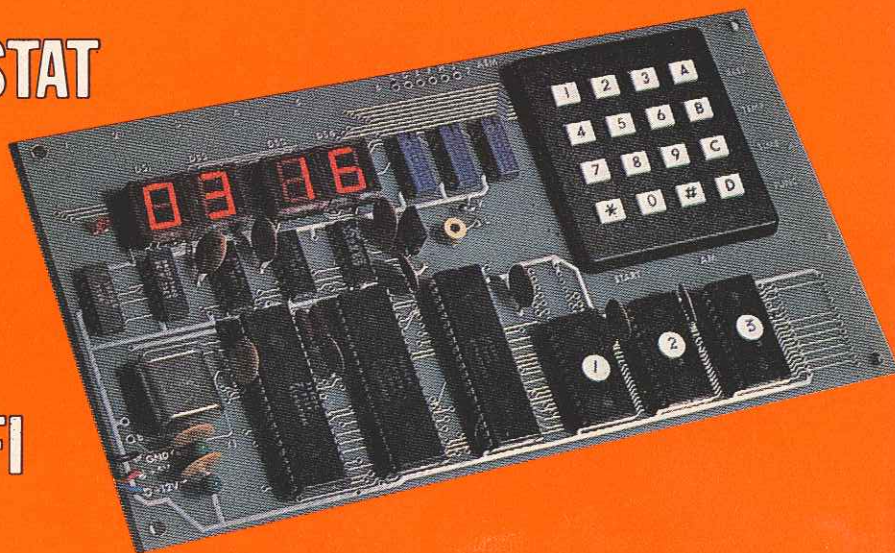
Cuts heating bills

VIDEODISC PLAYER

Look at the circuitry

CAR STEREO GOES HI-FI

Special roundup report



SWITCHING POWER SUPPLIES

How to roll your own

R.E.A.L. SOUND LAB

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nickel cadmium cells will provide about 10 hours of continuous operation. With the optional battery eliminator, you now have an AC-powered bench instrument. Sabtronics recommends that if you use the AC supply, alkaline cells should be removed from the meter.

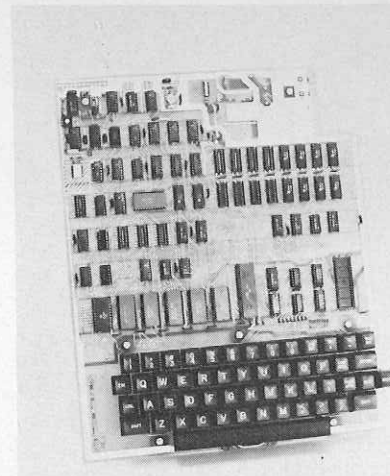
We used the 2010A on our bench for a period of two weeks and found that it is really a first-rate instrument. All measurements were easily handled and were accurate as verified by other instruments in our lab.

As a general-purpose, 3 1/2-digit digital multimeter, the model 2010A qualifies as a first-rate unit. The only recommendation we would make after using it is that the THP-20 probe is really a must. It adds to the price, of course, but once you have used it, you won't want to do without it. The 2010A costs \$99.50.

Accessories for the model 2010A include the touch and hold probe, THP-20—\$18.00; a high, voltage probe, HVP-30—\$29.95; battery eliminator charger for a 110-120 volt operation, AC-115—\$7.50; battery eliminator charger for a 220-volt operation, AC-230—\$9.50; and a set of nickel-cadmium rechargeable batteries rated at 1200 milliampere hours—\$17.00. If you are looking to buy a new digital multimeter, the model 2010A should certainly be one of those considered before making that purchase. **R-E**

Ohio Scientific Superboard II

THE MANUFACTURER DESCRIBES THIS UNIT as "a major breakthrough in small computer technology that dramatically reduces the cost of personal computers." That quote is accurate. How else, for \$279, could anyone own a



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computer with all the features found in Superboard II?

Superboard II is a single-board computer without a case. It is built around a 6502 microprocessor and comes with 8K Microsoft BASIC in ROM. It also includes 4K of static RAM that can be easily expanded to 8K. There is a 53-key keyboard with upper- and lower-case letters and user programmability.

There is a Kansas City standard audio tape cassette interface, a full machine code monitor and I/O utilities in ROM. The direct access video display has 1K of dedicated memory, upper case, lower case, graphics and gaming characters. Screen resolution is up to 256 X 256 points. A TV with overscan, used as a

monitor, can display about 24 rows of 24 characters. A TV that does not have overscan when used as a monitor will display 30 X 30 characters.

The video output of the Superboard II can be directly connected to the video circuitry of a TV monitor, or through an "illegal" RF modulator, to the antenna input of any TV set.

Extras available optionally for Superboard II include an expansion board with 24K static RAM, a dual minifloppy interface, a port adapter for printer and modem and an OSI (Ohio Scientific, Incorporated) 48-line expansion interface. There is also an assembler/editor and extended machine code monitor.

For those not-so-hardy experimenters who would like to get a Superboard II in a case with a power supply, Ohio Scientific also has available the Challenger 1-P. It consists of the Superboard II plus a power supply and a case. It costs \$349.00.

To get our Superboard II into operation all we had to do was hook up a +5-volt-DC, 3-amp power supply and connect the video output to our handy video monitor. With the power on "READY" immediately appeared on the monitor screen. We put Superboard II through its paces using preprogrammed material provided by OSI, and entertained everyone with some fascinating video games, balanced our checkbook and set up a household budget.

The cassette interface worked well and loading a program was no problem at all. The advanced BASIC provided all the scientific math functions we needed, and we discovered that you can even use Superboard II for complex problem-solving without doing any programming; simply operating it like a complex calculator.

The built-in BASIC is just as good as you would expect from Microsoft. For the user who does not want to do any programming, there is a lot of software already available that takes care of the applications for you.

When you compare Superboard II to other systems, you soon find that a less expensive way of getting started in the personal computer area with equivalent features is hard to come by. The graphics available permit some really dramatic effects.

The fact that the system can be easily expanded to include a floppy means that while you are starting out with a low-cost minimal system, you don't have to throw it away when you are ready to go on to more complex computer functions. Everything is there that you need; you simply build onto what you already have. You don't have to worry about trading off existing equipment to get the system that will really do what you want it to do. At \$279, Superboard II (Ohio Scientific, 1333 S. Chillicothe Dr., Aurora, OH 44202) is a tough act to follow. **R-E**

Continental Specialties Corp. Model Max 50 Frequency Counter

CONTINENTAL SPECIALTIES CORPORATION (70 Fulton Terrace, P.O. Box 1942, New Haven, CT 06509) is well-known for its bread-boards and other goodies.

The company also manufactures a line of test equipment. One of the latest is the model Max 50 50-MHz frequency counter. This instrument has a 50-Hz to 50-MHz frequency range. It's amazingly compact—no larger than



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a hand calculator.

There is only one switch, and it handles power on-off. Everything else is automatic. Powered by a 9-volt battery for portable use, the counter can also be used with a plug-in AC adapter on the bench. There are three jacks on top of the case. A short whip antenna screws into the middle one. This makes it very handy for checking CB transmitters and other kinds of two-way radios. The manual states it will show stable readings within four feet of a CB antenna. In actual tests, we found that it locked in at distances up to eight feet on a standard CB radio.

The right-hand jack is for use with a

shielded test cable that comes with the unit. This can be used for audio testing, since it has a 1.0-megohm input impedance. This input is protected by diodes. It can also be used for frequency checking at test points in PLL's, etc. The manufacturer claims a 30-mV sensitivity, and again it seems to exceed specifications. Because of its wide frequency range, the model Max 50 can also be used for checking such ultrasonic units as depth sounders, fish finders and different kinds of digital circuitry. The input can handle 100 volts peak from 100 Hz to 1 kHz, and 50 volts peak to 50 MHz.

The readout is a full six digits and uses magnified LED's. These LED's are pulsed to allow a great apparent brightness. The display is multiplexed to keep battery drain at a minimum. When the unit is turned on, the two decimal points light up—the right one is for kHz and the left one is for MHz. Lead-zero blanking is provided, which means that all zeros to the left of the first non-zero digit are blanked. This feature makes the display much easier to read.

The manual contains a full description of the circuitry. Most of this circuitry is contained on a 40-pin LSI IC. The timebase is a crystal-controlled oscillator with a 3.58-MHz crystal. An accuracy of ±3 PPM is claimed. We measured it against a much larger and more expensive frequency counter and it checked out fine. A trimmer adjustment is provided if the unit ever needs calibration. The stability is excellent, and is given as better than 0.2 PPM °C.

The model Max 50 comes in a leatherette carrying case, with a space provided for the test cable and whip antenna, plus a belt loop.

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