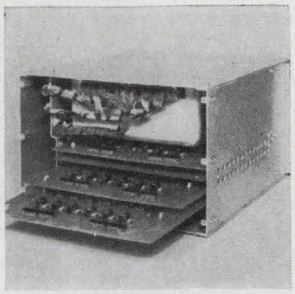
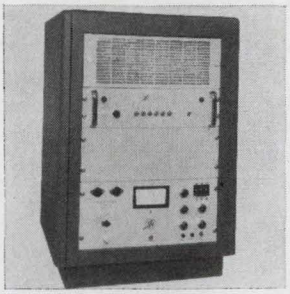
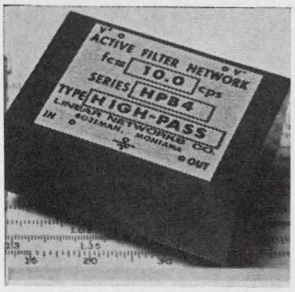
New Subassemblies Review



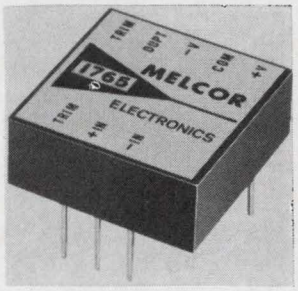
Compact, 8 K x 40 random access core memory series 500 has a 2 μsec full cycle speed and features an 800 nsec access time. Only 19 x 11 x 5¼ in., the memory contains 3 circuit module types. All modules and the memory stack are plug-in units that can be replaced quickly. The system is designed for commercial use. Sanders Associates Inc., 95 Canal St., Nashua, N.H. [381]



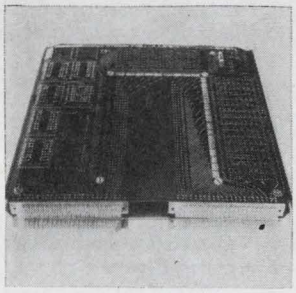
Amplifier system M402 is suitable for driving broadband antennas in testing rfi susceptibilty. Capable of pumping 50 to 100 w of power into a 50-ohm load over a frequency range of 10 khz to 220 Mhz (nearly 15 octaves), without tuning or bandswitching, it creates the fields required by MIL-STD-826A and -461. Instruments for Industry Inc., 151 Toledo St., Farmingdale, N.Y. [382]



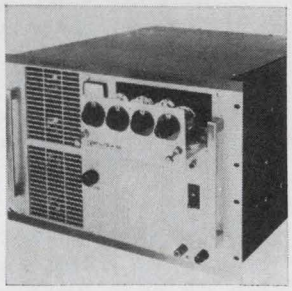
Active high-pass filter networks series HPB4 features the 4-pole Butterworth gain and phase frequency response characteristic. Attenuation over the operating temperature range of −40° to +71° C is 3±0.5 db at cutoff frequency and 24±2 db at one-half cutoff frequency. Standard cutoff frequencies are from 1 to 1,000 hz. Linear Networks Co., Box 1103, Bozeman, Mont. [383]



Low drift, FET input operational amplifier 1765 features high common mode rejection ratio, high power bandwidth, and high slew rate. It can be operated over a wide range of supply voltages and has an output swing of up to ±21 v. Applications include control instrumentation and data logging. Melcor Electronics Corp., 1750 New Highway, Farmingdale, N.Y. [384]

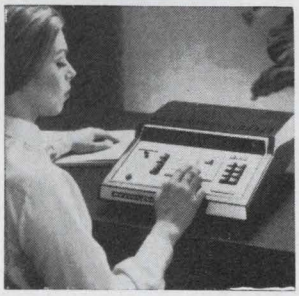


Ferrite memory core stack has a capability of 4,096 words with 16 or 18 bits/word and a fast 1.2 μsec cycle time. It was developed for small-scale, low-cost, computers intended for process control data terminal applications. It contains 65,536 individual 30-mil ferrite cores in the 16 bit/word configuration. Data-Ram Corp., Route 206, Princeton, N.J. 08540. [385]



Power source model 1000 delivers 0-1,000 va, single phase. Units may be stacked for 2- or 3-phase operation. The basic unit is a power amplifier that will accept any of 40 interchangebale plug-in oscillator modules. These provide fixed or variable output ranging from 45 hz to 5 khz accurate from ±0.1 to ±0.0001%. Elgar Corp., 8046 Engineer Road, San Diego, Calif. [386]

SSB transceiver CA-34 features automatic programming with simplified controls for ease of operation by nontechnical personnel. It is a 100-w unit developed as a multipurpose radio communications system for aviation ground stations. It will operate efficiently under temperature extremes from −30° to +65°C. Communication Associates Inc., 1208 Third Ave., New Hyde Park, N.Y. [387]



Electronic calculators series C3000 bring silent, instantaneous computing power to the desk top. The C3350, top model in a series of four, which can automatically extract a square root in less than ⅓ sec, features 2 independent core storage memories. Each memory provides 16 digit, 8 decimal storage capacity with minus total. Burroughs Corp., Detroit, Mich. 48232 [388]

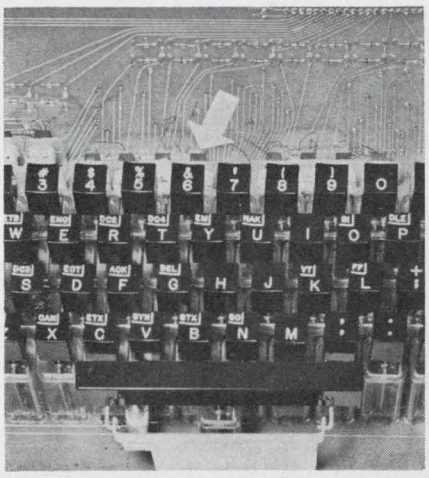
New subassemblies

Keyboard with Ascii output costs $500

Unit uses 13 magnetic cores instead of diodes to generate the 128 symbols of the American Standards Association code

Cross-country conversations between computers, displays, and other systems are now commonplace. What isn't so common is the language these devices speak and understand. And the keyboards used for computer communications are as diverse—and customized—as the languages.

The closest thing to a universal language is the code developed by the American Standards Association for digital systems communications. Called Ascii—American Standard Code for Information Interchange—it has 128 symbols, each



Split. Arrow indicates core with metal conductors passing through it.

made of seven coding bits and one parity bit.

Those who have adopted Ascii usually build their own keyboards or have them custom-made. But if, as seems likely, the Government adopts Ascii as its standard, other companies will be clamoring for off-the-shelf equipment. With this in mind, the Navigation Computer Corp. has developed the 1067, an Ascii keyboard with a base price of $500.

Key to the core. The 1067 works the same as most other digital-output keyboards. It has a driving circuit, coding matrix, and buffer. Push a key and a switch closes, connecting the driver to the matrix. The path the driver current takes through the matrix is determined by the key that's pushed and whether or not a shift key is depressed. The matrix output, specifically associated with the pushed key, goes to the buffer where it's shaped for transmission.

The matrix of most keyboards is a diode array. But Navigation Computer engineers found they would need 225 coding diodes to produce all the Ascii symbols—a number that would mean high production costs and poor reliability.

So out came 200 diodes and in went nine magnetic cores, one for each of the eight bits of a symbol and one for a strobe signal. Each core comes in two pieces. Navigation Computer engineers mount the core by cutting two holes in the printed-circuit board and bonding the core pieces together through these holes. When current flows in a printed lead passing through a core, a pulse is generated and is transmitted from the core to the buffer. In the 1067, each Ascii symbol is associated with a specific path through the cores.

"But there was still a problem," recalls David Aiken, one of the engineers who designed the keyboard. "It wasn't possible to fit in all the codes on just eight cores. There just wasn't enough room to put down the conductive paths for all the Ascii symbols." So in went four more cores.

It seems that the 1067, unlike a typewriter, has three shift levels. Some of its 63 keys produce just a lower-case symbol, others a lower and an upper, and a few handle three symbols. Aiken took advan-

tage of this. He laid out the keyboard so that regardless of how many symbols a key represents or which of the three cases the keyboard is in when the key is pressed, the first four bits associated with a given key's symbol are the same. Two or three symbols can thus share the same path through the first four cores if they share the same key. One core handles each of the first four bits and two cores split up the heavier traffic for each of the last four bits.

Optional clicks. All the 1067's circuitry is mounted on two p-c cards, one for the driver, matrix, and keys, and the other for the buffer. Each key is a Navco KRM—a reed switch and a small p-c board packed in a plastic case. Pushing the key moves a magnet that trips the reed. It's all silent, but there's an attachment available that clicks reassuringly every time a key is punched. The keys are soldered to the p-c card, and can be easily replaced; their lifetime is 100 million operations.

The driver circuit contains a comparator that senses the amount of current being drawn and locks the keyboard when the level runs too high. The more keys pressed, the higher the current. One key can be pressed when another is down, but pressing a third when two are down causes lockup.

The buffer, which is made up of transistor-transistor-logic integrated circuits, produces pulses whose amplitude can be adjusted from 2.4 to 4 volts.

To increase the 1067's flexibility, Navigation Computer offers a variety of outputs in either serial or parallel formats. In one parallel machine, a data-ready signal appears along with the data signals at the output. Other units generate two strobe pulses with adjustable widths. And one has a serial output in Teletype format.

The 1067 comes in a desk-top package or a panel, or in special packages for original-equipment manufacturers.

Navigation Computer, which until now has made only customized Ascii keyboards, has already sold some 1067's to Xerox.

Navigation Computer Corp., Valley Forge Industrial Park, Norristown, Pa. 19401 **[389]**