

Radio-Electronics

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75c ■ SEPT. 1975

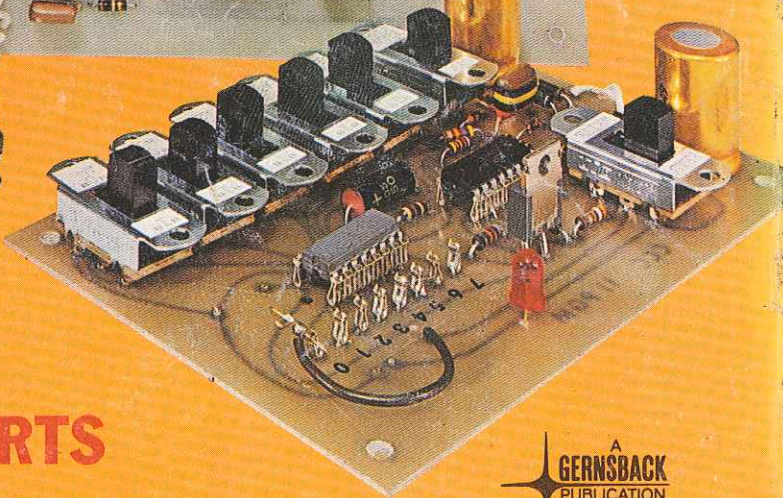
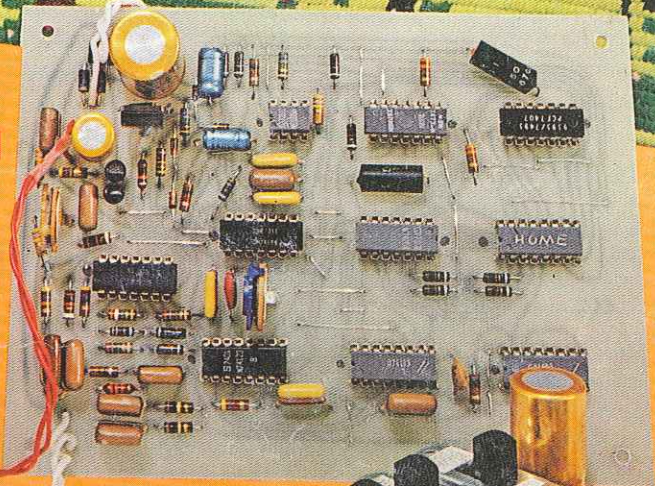
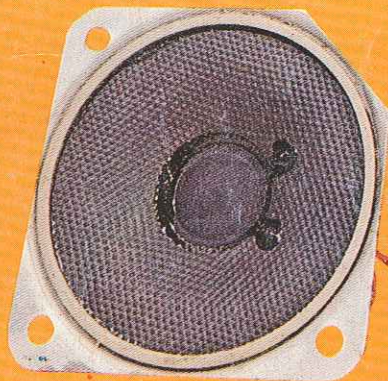
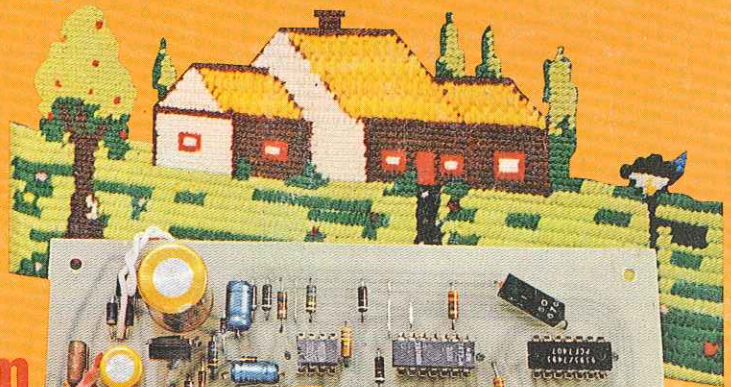
Radio-Electronics

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TV Typewriter II screen-read board

Add this optional plug-in board to the TV Typewriter II and you can automatically access information that has been typed onto the TV screen.

by ED COLLE

IF YOU EVER NEED TO USE YOUR TV Typewriter II (see **Radio-Electronics**, Feb. 1975 issue) in a situation where you want to acquire information that has been typed onto the TV screen and into another parallel input device, you will probably want to use the screen read board. The TV Typewriter II's memory is constantly addressed and read out to generate the video data used by the television display. So the idea is to capture and hold the data in a particular location in memory and tell the parallel input device thru a "data ready" line that the data is ready to be used. When the parallel input device accepts the data, it in turn tells the screen read board thru the "data accepted" line to seek and provide data

in the next character location. The screen read board retrieves information in the screen cursor location and continues until a manual switch stop command is given or if desired, until an exclamation point is encountered.

Since the cursor is automatically advanced by the screen read board, it is seldom seen at fast read rates that may be as high as the memory read speed or 16.6 ms. This speed can only be achieved if the parallel input device connected to the screen read board can accept the data at a one character-per-microsecond or faster rate. This speed is very useful when performing memory search routines where you are looking for a specific character or symbol somewhere in memory. If the device

connected to the screen read board is not capable of handling a 1-ms acquisition time, but is capable of a 63-ms rate, the entire screen can be read in about 500 milliseconds. In both situations, however, up to 16.6 milliseconds of delay may be encountered between the time the read command is given and the time the screen read board actually begins accessing data. This allows the memory address counters to cycle to the current cursor location.

The entire circuit is built on a 3-1/16 in. x 4-1/2 in. fiber glass circuit board which is plugged onto connector strips J5 and J6 on the main board of the TV Typewriter II next to the cursor board.

(continued on page 76)

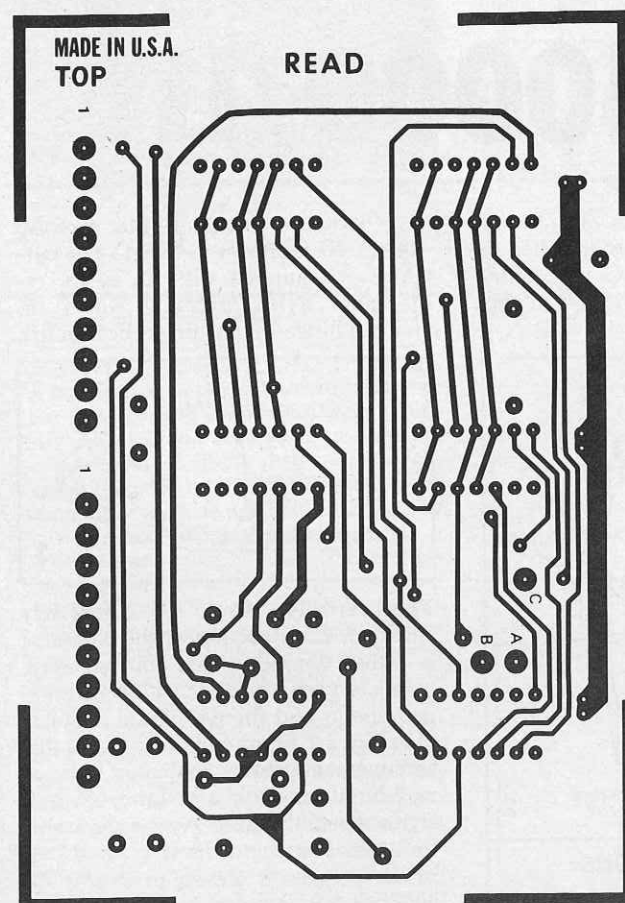


FIG. 2—FOIL PATTERN for component side of double-sided board shown full size.

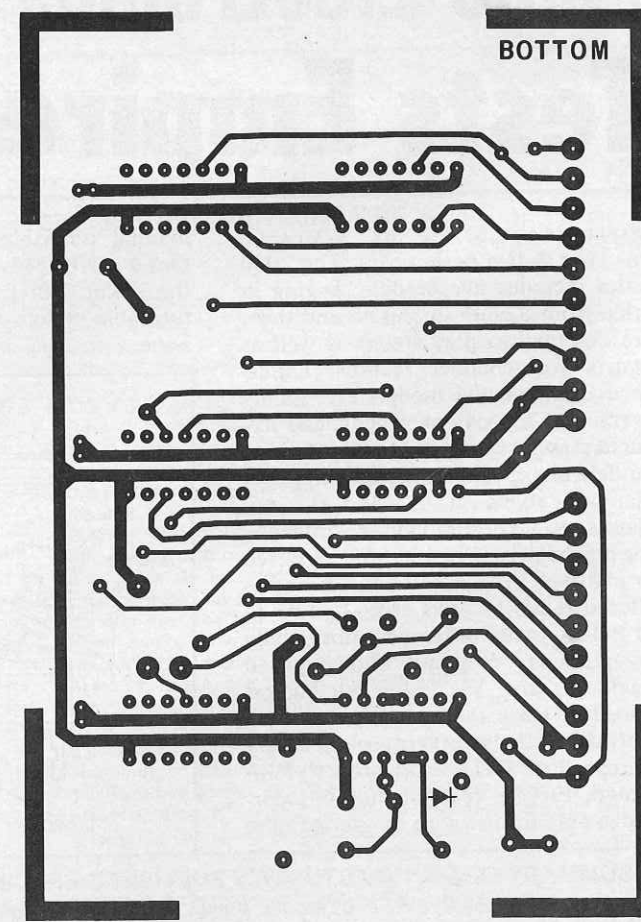


FIG. 3—FOIL PATTERN for foil side of double-sided board shown full size.

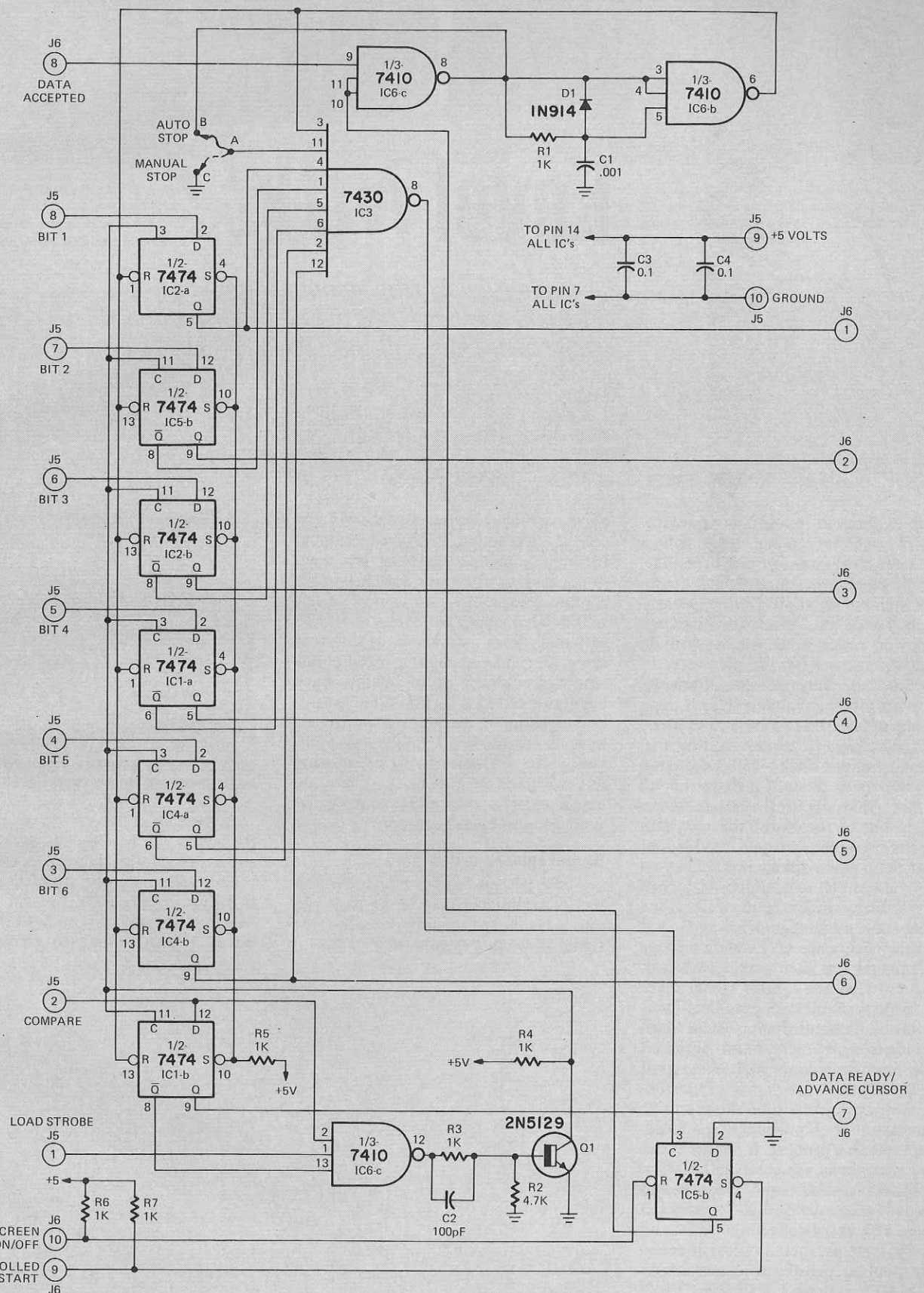


FIG. 1—SCREEN READ BOARD schematic diagram.

PARTS LIST

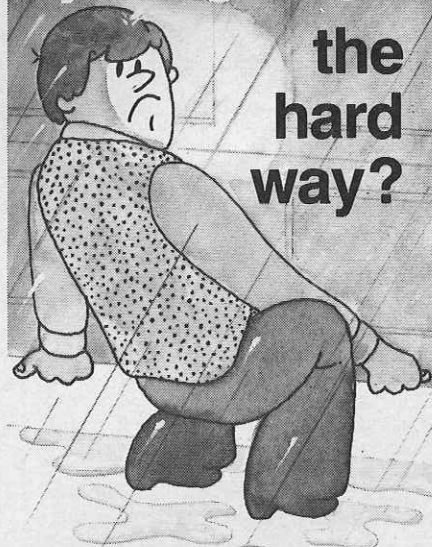
R1, R3-R7—1000 ohms, 1/4-watt, 10%
R2—4700 ohms, 1/4-watt, 10%
C1—1000 pF polystyrene

C2—100 pF polystyrene
C3, C4—0.1 μF, 12V
D1—1N914 silicon diode
Q1—2N5129 transistor

IC1, IC2, IC4, IC5—7474 dual type D flip-flop
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SCREEN-READ BOARD

(continued from page 36)

How it works

Figure 1 shows the schematic diagram. The "compare" and "load strobe" signals from the main board tell the screen read board when the memory has been indexed to the current cursor location and when the data is actually ready for reading. These signals are gated with the "ready to load" signal from IC1 pin 8 forcing IC6-c pin 12 low and transistor Q1's collector high. This loads each of the holding registers, IC1-a, IC2, IC4 and IC5-b, with the memory data located in the cursor position. The "data ready" line goes high and the "ready to load" line, IC1 pin 8, goes low signaling that valid data is contained in the holding registers and inhibiting IC6-c from clocking in new data. The cursor is also advanced one forward position or carriage return/line feed if in column 32, since the "data ready" line drives a transistor on the cursor board which is wire OR'ed to the cursor counter "forward" input on the

main board. It is for this reason that the screen read board must always be used in conjunction with a cursor control board.

When the device connected to the read board accepts data it must put a low on the "data accepted" line, J6-8. This in turn dumps the holding registers and resets the "data ready" line. A variable delay has been built into the read board which allows for a premature "data accepted" acknowledge-

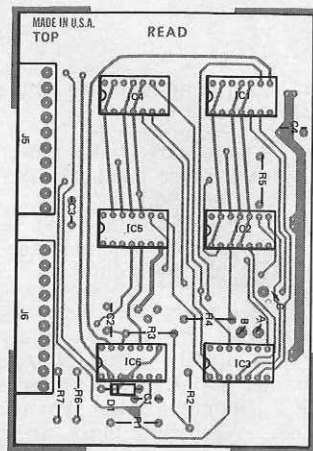


FIG. 4—COMPONENT LAYOUT.

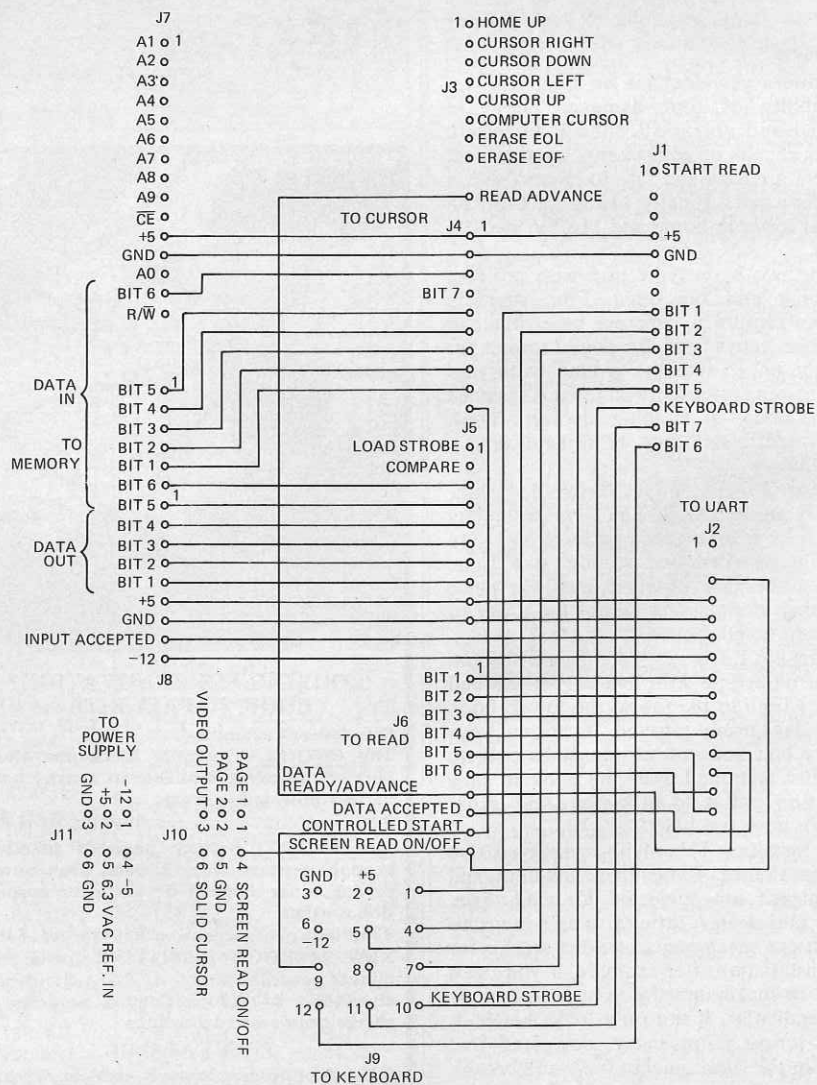


FIG. 5—JACK INTERCONNECTION diagram of TV Typewriter II.

ment since some devices connected to the read board generate the acknowledge signal and yet require that the holding registers not be dumped immediately. The delay time can be increased by making capacitor C1 larger, however, for maximum output speed the capacitor should be made as small as possible with a minimum capacitance of 100 pF. New data is then loaded into the holding registers and the "data ready" line goes high, completing one cycle of the operation which continues until a stop command is received from the screen read ON/OFF switch, or if the auto stop jumper is installed, a /. This clocks the Q output of IC5-a low and stops the screen read function. The controlled start input, J6-9, must be pulsed low either with a manually operated switch, computer controlled cursor or a combination since the input may be wire OR'ed to initially start the read sequence or restart it after a stop. Note however that the screen read ON/OFF switch must be in the ON position.

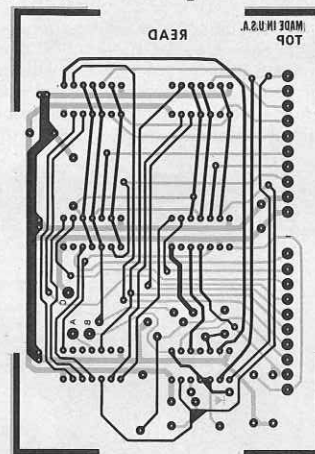


DIAGRAM SHOWS how both foil patterns overlap to form a double-sided board.

Assembly

The board assembly is easy since there aren't many parts, but be sure to orient the transistor, diode and integrated circuits correctly. The foil pattern for both sides of the double-sided board is shown in Figs. 2 & 3. Figure 4 shows the component layout. When plugging the assembled screen read board onto the main board, be sure not to plug in the board backwards. Since all of the pins were used there was not room for an indexing key, so be sure to orient the board the same as the memory and cursor boards. Also be sure that the main board of the terminal is working properly before plugging in the screen read board onto it. The jack interconnection diagram of the TV Typewriter II is shown in Fig. 5.

You can use the jack interconnection diagram of the TV Typewriter II to determine how the screen-read board connects to the rest of the circuitry. R-E

Great leap ahead for pay TV due with satellite programming

More than 800,000 persons will be served with Home Box Office pay cable television programs by one company alone this Fall. Teleprompter, largest cable TV operator in the country, plans to build 24 earth stations across the country to receive programs via satellite and retransmit them to its subscribers. The new service will be available to 82 of Teleprompter's 140 cable systems by the end of 1976.

Home Box Office has contracted with RCA Global Service for satellite facilities and will begin distributing programs by satellite late this year. At present, it

provides about 70 hours of programming a week over cable and microwave nets.

Manhattan Cable Television, which has a franchise for the lower half of Manhattan, NY, now offers Home Box Office programs to more than 17,000 subscribers. They pay \$9 per month for the special paid program service in addition to \$9 per month for the regular cable hookup. Teleprompter, covering the upper half of Manhattan, is offering Home Box Office programs to its 55,000 subscribers, beginning late summer or early Fall. It also expects to be able to offer the pay programs by microwave transmission to seven other Teleprompter cable systems in New Jersey, New York and Connecticut.

What does it take to build the world's smallest scientific calculator?

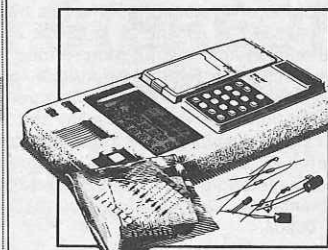
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Specifications

- Functions:** 4 arithmetic, 2 logarithmic, 6 trigonometric
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- Exponent:** 200-decade range, from 10^{-99} to 10^{+99}
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