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Y ALLOWANCE PLAN

8085
A look at one memory IC that is among the 8085 family of devices.

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IN A PREVIOUS COLUMN (JANUARY 1979), we described the new Intel 8085 microprocessor IC. This is an upgraded type of 8080 microprocessor, since it has features that are not found on the 8080 device. One of the advantages in using the 8085 is the availability of "family" devices that can be used with little or no additional external logic. This makes the 8085 and its family ideal for small controllers, instruments and games, where ex-

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pansion and the ability to run large programs such as BASIC may not be required.

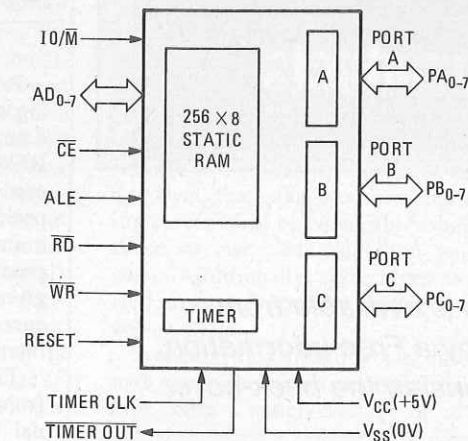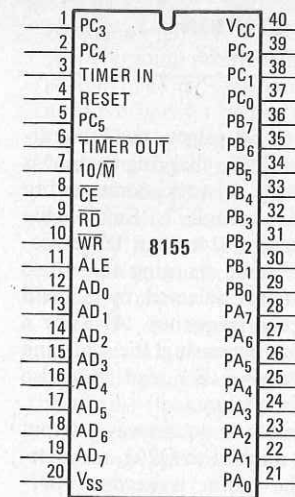This month we will describe one of the 8085-family devices, the 8155 read/write memory.

8155 RAM

The 8155 read/write memory IC contains 256 bytes of memory, which is probably more than enough for a small system. In most cases, the read/write memory will be used for temporary storage of data or results, as well as register and address information. The 8155 is also bus-compatible with the 8085 system through the use of the bidirectional address-data bus and standard control sig-

nals. In this case, only the $IO/\overline{M}$, $\overline{RD}$ and $\overline{WR}$ signals are necessary for memory control. The ALE, CLOCK and RESET signals from the 8085 are also provided for internal control of the IC.

The 8155 has some I/O lines—in fact, there are two 8-bit I/O ports and one 6-bit I/O port. The two 8-bit I/O ports can be operated in either the input or output mode; individual bits cannot be selected. These two ports are called ports A and B. The 6-bit I/O port (port C) can be operated in several ways, but these are beyond the scope of this article. Let us just say that these operations allow the I/O ports to perform in a manner similar to that provided by the mode 1 and mode 2 operation of the 8255 programmable peripheral interface.

The 8155 read/write memory also contains a 14-bit programmable counter, re-

ferred to as a timer. The timer uses either the 8085's clock output or an externally applied clock signal. The timer's output is available as a pin on the 8155 IC, and it can be used several ways, depending on your requirements. It could be connected to the Serial Input Data (SID) pin 5 to be sensed by the RIM instruction, or connected to one of the 8085's interrupt pins (RST 7.5, for example) so that the end of the timer's period could be detected via an interrupt. The timer's output is fairly flexible, being programmed to operate in one of four ways:

Control bits M2 and M1 are the most significant ones in the 16-bit value programmed into the counter. Since the counter is only 14-bits-long, the control bits are not included in the count itself, but are used by the control logic to determine the counter-output state when the count has been finally decremented to zero. Whenever a new 14-bit count value is reprogrammed into the counter, these two control bits must also be included in the new 16-bit word.

The 8155 read/write memory also has an internal control register that is loaded with an 8-bit byte that is used to determine operation of the I/O ports and the 14-bit counter.

R-E

Control Bits		
M2	M1	Mode Of Operation
0	0	Output a logic 0 during the second half of the count.
0	1	Output a squarewave, same as 00 above, but reload and restart the count at the end of each count sequence.
1	0	Output a single short pulse at the end of the count sequence.
1	1	Output a single pulse at the end of the count, but reload and restart the count at the end of each count sequence.