A relatively inexpensive eight-channel tape reader¹

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The stepping tape reader is a flexible device for electromechanical and solid-state instrumentation. A standard eight-channel tape reader by itself can be used to sequence nine distinct events. Combinations of relays or AND-gates in the circuit permit the additional use of any pattern of two or more channels. Thus, a single reader often eliminates the need for expensive timers, stepping relays, and other components normally used in complex programs, enhancing circuit reliability and reducing equipment costs.

The factory-assembled tape reader module is a costly piece of equipment, typically priced in excess of \$1,000. But relatively inexpensive readers are available which, with additional circuitry, will duplicate essential functions of factory-assembled modules. One such reader is Mohawk Data Sciences' Model 2166 (formerly Ohrtronic Model 166), priced at approximately \$200, a number of which have given extremely reliable service in our laboratory for several years. Other models with additional features, such as backward stepping, are available at somewhat higher cost.

Figure 1 shows a 24-V dc reader circuit likely to be generally useful. The portion enclosed in dashed lines is the reader, which is factory-wired, basically as shown. The remaining circuitry must be added to complete the module. The reader steps with momentary dc current applied to the electromagnet; 24-, 48-, and 90-V dc capacities are available. The reader will step at rates of up to 35-40 steps/second, depending upon the nature of the program and input. A SPST pushbutton switch may be added to step the reader manually at the module. With each step, eight arms with sensors detect holes punched in paper computer tape. When a hole is sensed, current is transferred by a reader contact

Fig. 1. Schematic representation of the tape reader and related circuitry.

to the corresponding output jack and signal lamp (Sylvania, Type 30150-0) for that channel.

The diagram also shows a current interrupt circuit, which is an added convenience. In the interrupt state, attained by activating the relay (Allied Control, Type TF 154) in the interrupt circuit, current from all of the channels is interrupted with each step by a switch in the reader unit. By means of a direct connection, interrupted current from any one of the channels directly to the stepping magnet will effect an automatic 35- to 40-step/second tape advance. Switching the current through a second contact on the interrupt relay would make the necessary connection automatically as well as isolate this function from other uses of the particular channel. Although this would restrict the use of the interrupt circuit to rapid advancement of the tape, this would not be a disadvantage in most laboratory applications of the module. In the

noninterrupt state (interrupt relay inactive), the current flow from each channel is continuous when a succession of holes is detected.

Automated methods of eight-channel tape punching are strongly recommended over manual methods. Some alternatives for tape-punching equipment are described briefly by D'Amato (1965).

REFERENCE

D'AMATO, M. R. Direct programming of multiple stimuli—the tape block reader. *Journal of the Experimental Analysis of Behavior*, 1965, 8, 230.

NOTE

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