A PULSER CIRCUIT FOR RELAY PROGRAMMING

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The circuit described here is a simple but versatile pulser for programming with relay equipment. A relay is designed to operate from the charge and/or discharge current of an electrolytic capacitor. Since these two currents flow in opposite directions, a diode may be connected across the relay coil to by-pass one or the other of these currents so they will not operate the relay. Figure 1 shows the pulser designed to operate only from the discharge current of the capacitor and produce an end-pulse when operated. Reversing the diode would cause the relay to operate only from the charge current and would produce a start pulse. Removing the diode and $10\ \Omega$ resistor allows the relay to operate on both the charge and discharge currents and would produce both a start and an end-pulse when operated. These three modes of operation may be obtained from a single unit by using a DPDT center-off toggle switch to reverse or remove the diode from the circuit. The duration of the output pulse is approximately 50 ms using a 25 mfd capacitor and may be lengthened by increasing the size of this capacitor. This circuit resets very rapidly but

because it cannot stretch pulses it will not perform satisfactorily as a keyer.

Fig. 1. Schematic diagram of the pulser in the end-pulse configuration. Reversing the direction of the diode makes a start-pulse circuit. Removing the diode and $10\ \Omega$ resistor results in both a start and an end-pulse when operated. The size of the electrolytic capacitor may be increased to lengthen the duration of the output pulse.

An end-pulse is most useful for setting up conditions or for advancing to the next step in a program. A desirable feature of using an end-pulse is that it allows switching to be accomplished immediately after the cessation of an input pulse, but never during the pulse itself. This avoids the common pitfall of pulse-splitting that can be appeased but never completely cured by a careful selection of RC time constants across relays. Also, it allows a convenient means of introducing a small delay between successive operations in a program.

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