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SOLID-STATE TURN INDICATORS FOR MOPEDS

Inexpensive electronic add-on
increases driving safety factor

MOTORIZED bikes—mopeds—are becoming increasingly popular as laws prohibiting them are lifted. However, their low speed and, generally, young drivers, combine with the absence of lighted turn signal to cause safety problems.

Adding the turn-signal system described here will likely reduce accidents. It features a solid-state circuit, low-power lamps, can be used with a moped's 6-V negative-ground electrical system, and can be built for less than \$10. It can also be modified for use with a bicycle if a 6-V battery is added.

Circuit Operation. As shown in the diagram, a 555 timer (IC1) is used to



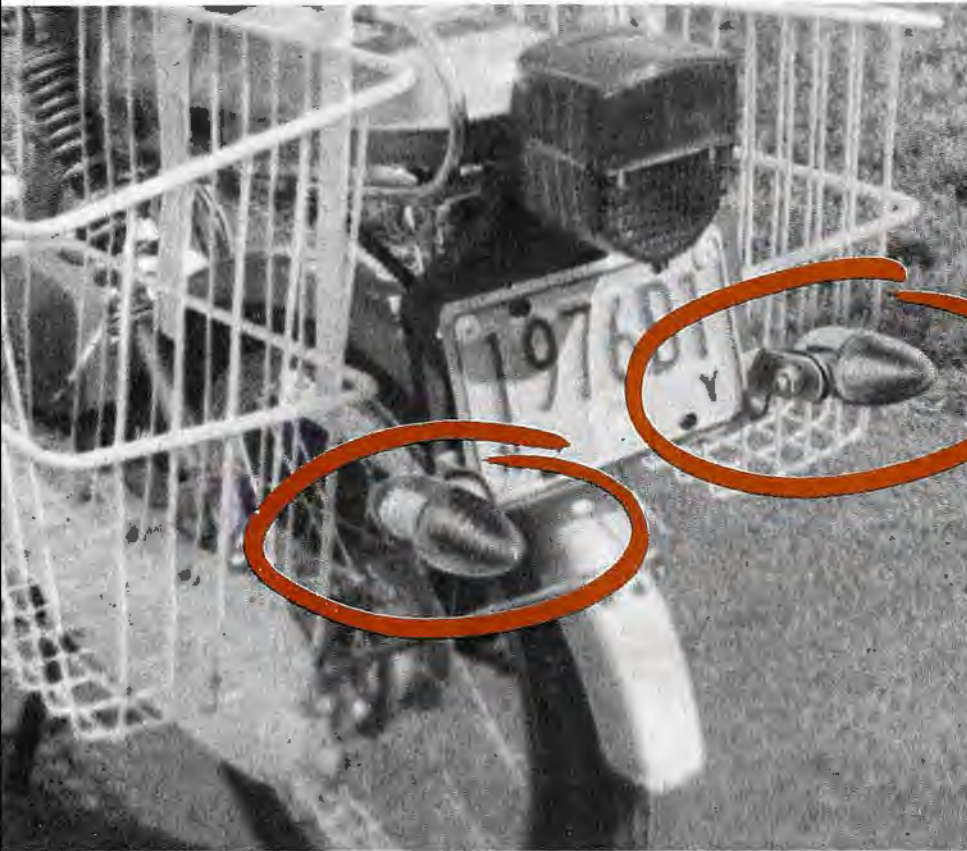


Photo shows how rear indicator lamps are insulated from moped frame by mounting them on the plastic license-plate holder. Connections to other parts of system must be through insulated flexible wire.

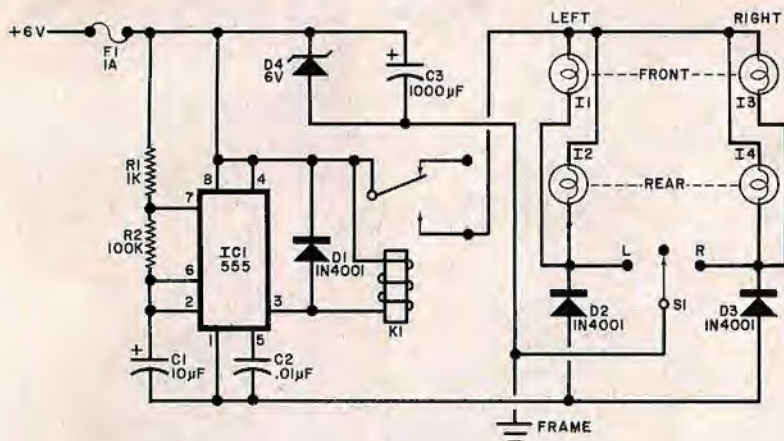


Fig. 1. When pin 1 of IC1 is connected to ground through S1, the 555 timer generates 1-Hz pulses to open and close relay K1.

PARTS LIST

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| C1—10- μ F, 15-volt electrolytic | IC1—555 timer |
| C2—0.01- μ F, 15-volt disc | K1—6-volt relay |
| C3—1000- μ F, 15-volt electrolytic | S1—3-position large bat handle switch (center off) |
| D1, D2, D3—1N4001 or similar diode | Misc.—Plastic enclosure, perforated board, wiring, plastic tubing, mounting hardware, #27 1 amps. |
| D4—6-vol t, 1-watt zener diode | |
| F1—1-ampere in-line fuse | |
| I1-14—see text | |

generate 1-Hz pulses. Note that this circuit will not operate until its pin 1 is connected to ground. When turn-select switch S1 is placed in either its L (left) or R (right) position, this ground connection is made through either D2 or D3, depending on the switch position selected. When one of these states occurs, IC1 cycles at its 1-Hz rate, opening and closing relay K1. Relay contacts direct power to the selected lamps (I1 and I2 for left front and rear, I3 and I4 for right front and rear).

Ground for selected lamps is made through the switching member of S1. Thus, as long as S1 is at one of its turn positions, the selected lamps will glow in 1-Hz cycles. When S1 is placed in its center (off) position, the circuit is isolated and stops working.

Zener diode D4 and capacitor C3 maintain a smooth 6-V dc if the output of the motor-powered generator varies.

Construction. The circuit can be assembled on a small piece of perforated board, or a small printed circuit board can be designed.

The circuit can be mounted in a small plastic box that can be secured to the moped frame. The circuit ground should be made to a good metal connection on the moped frame, while the 6 volts is taken from a source that is live when the ignition key is turned on.

The rear turn-signal lamps are inexpensive "bullet-lamp" assemblies that use two GE #81 single-contact bayonet lamps, while the front turn-signal lamps are made from an AMF "rear directional light." Both of these are obtainable from most bicycle or discount shops. The AMF unit comes with turn-switch, lamps, case and battery holder. Lamps are replaced with GE #27 lamps. The battery holder is not used, and the wiring between the holder and lamps is removed.

The rear lamps must be insulated from the frame. The easiest way to do this is to mount them on the plastic rear license-plate holder. If you mount them to the metal frame, use some form of insulation between the lamp bracket and the metal surface.

Turn switch S1 can be any large bat-handle switch having good detents and a center-off position. It can be mounted as desired on the handlebar.

Interconnections between the switch, power, lamps and the electronic circuit should be made with well-insulated flexible wire passed through a length of plastic tubing taped to the frame. \diamond