STAGE LIGHTING CONTROL SYSTEM

CONVENTIONAL COMPONENTS ACHIEVE PROFESSIONAL EFFECTS

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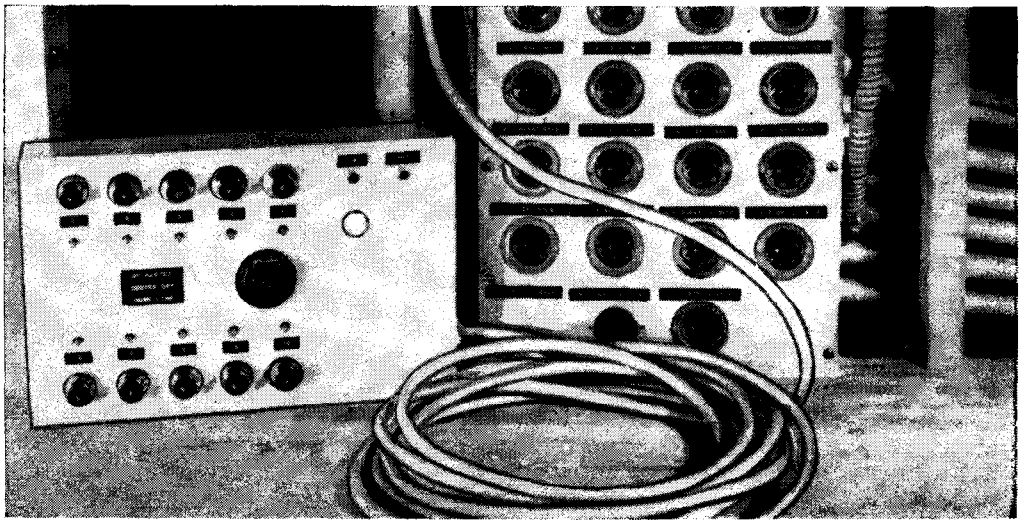
LITTLE THEATRE groups and other "amateur" production organizations are notoriously short on funds and one thing they usually need but can't afford is a good stage lighting system. If you are reasonably good at electrical construction projects, you can be a real hero coming to the rescue by building them a solid-state light control system. If you use silicon controlled rectifiers (SCR's) the job is easy and the cost is low.

The dimmer system shown in the photos in this article is built around ten General Electric Triac units. It is a 120-volt, 15,000-watt system consisting of ten individual 1500-watt units. It has a portable control console which can be used in the front of the house, while the dimmers are mounted backstage. The Triacs are pre-assembled SCR variable-voltage circuits with complete linear dimming ranges, zero *sets, RFI* suppression and isolated heat sinks.

Of course, any type of Triac or SCR dimmer, whose output is varied with a control potentiometer, may be used. Some of these dimmers may be purchased at your local hardware or electri-

Take a group of commercially available light dimmers, make only a small circuit change, package them neatly, and you have a professional looking control system that can make the lighting on any stage similar to that in big-time theatres.



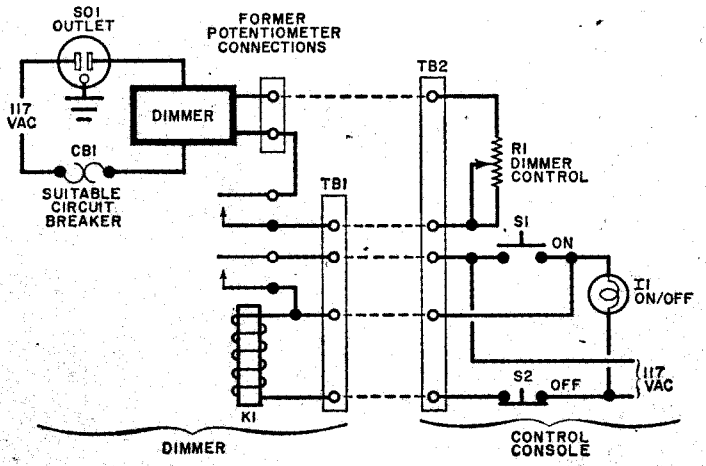
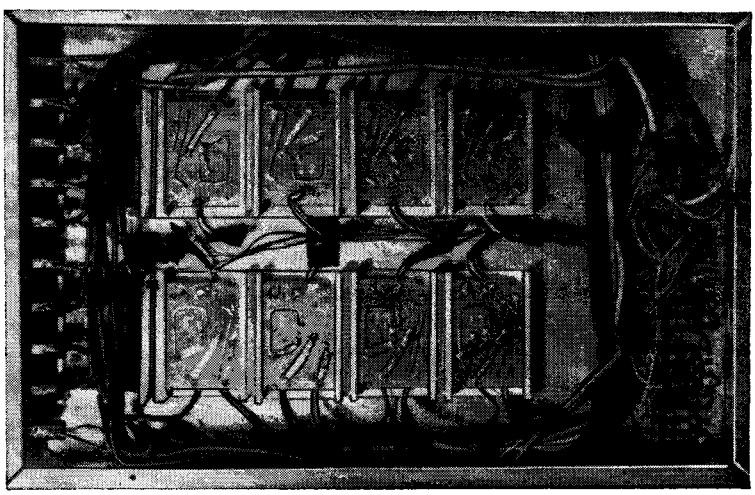


Fig. 1. Each dimmer stage is coupled to the remote control console via a multi-lead cable—preferably shielded to reduce electrical noise. Almost any number of dimmers may be used, all to one console.

PARTS LIST

CB1—Suitable circuit breaker
Dimmer—Wattage as required, modified per text
I1—Indicator lamp with holder
K1—Relay to suit power source
R1—Potentiometer removed from dimmer
S1—Normally open s.p.s.t. pushbutton switch
S2—Normally closed s.p.s.t. pushbutton switch
SO1—Three-pin electrical outlet
TB1, TB2—Multiterminal barrier strip (or similar)
Misc.—Interconnecting power cable, shielded pair cable, chassis for dimmer and relay, chassis for control console, knobs, press-type lettering, etc.



When mounting a number of dimmers in one chassis, make sure that sufficient heat sink area is provided to enable each to operate at a safe temperature.

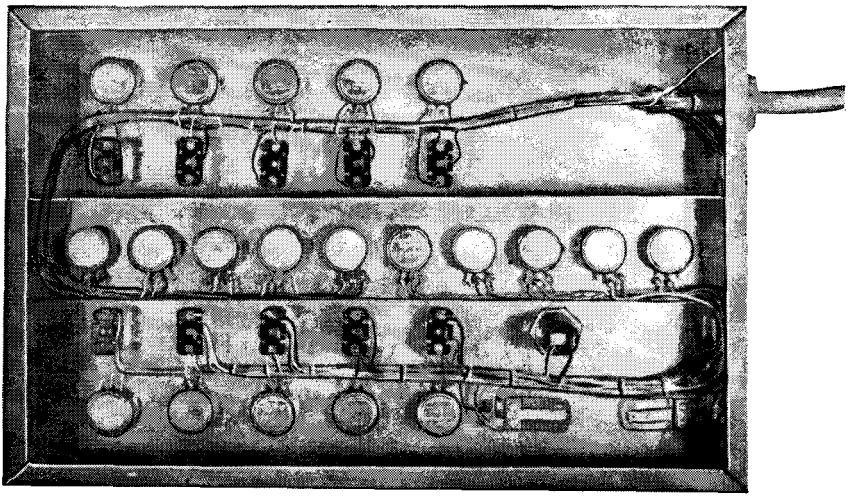


Fig. 2. Example of a typical control console showing dimmer potentiometers and on-off switches. Each control covers different lighting function.

cal store. Others are available through catalogs. Select the dimmers that will handle the contemplated load. The total cost of the system will depend on the type and number of dimmer units you have to buy. The 15,000-watt system shown here is about $200.

Typical Circuit. Since the variations and complexity of the systems that can be built are practically endless, we will describe in detail only the basic one-dimmer, one-control circuit. The first step in constructing such a system is to locate the dimming control potentiometer on the unit you are using. Remove the potentiometer from the circuit and wire the two leads that formerly went to the potentiometer to two terminals of a barrier (or similar) strip. If you want remote turn-on/turn-off control, obtain a 117-volt d.p.s.t. a.c. relay to be mounted in the cabinet backstage with the dimmer. Wire the system as shown in Fig. 1. External connections to the relay are made to other terminals on the barrier strip.

The dimmer control and on-off controls (with a pilot light indicator) are mounted in the control console as shown *in* Fig. 2. The control potentiometer is connected to the remote dimmer through a shielded pair, while the other wiring can be made with conventional multilead power cable. Just make sure that the wire is large enough to handle the relay coil current. Of course, if you have some low-voltage d.c. relays and a suitable power supply, these can be used instead of the 117-volt a.c. relay.

Obviously tandem potentiometers can be used to control two or more dimmers simultaneously or individually and more relay contacts can be used to switch more than one dimmer.

Connections between the control console and the dimmer must follow local electrical codes for safety. Mark the outlet of each dimmer with the maximum load it can tolerate. This will prevent damage through accidental overload.