LIGHTING CONTROL BY STRAND ELECTRIC

Nowhere does Strand Electric's long experience, allied to the latest technical development, show to better advantage than in modern lighting control. In these pages will be found a range unapproached in its comprehensiveness; covering as it does, preset controls for the tightest budget on the one hand and for the largest theatre or television studio on the other.

This new range uses the latest form of dimmer – the thyristor – which is backed by Strand's practical experience in the field. To date (autumn 1968) Strand Electric has over 25,000 thyristor channels installed and working in theatres and television studios. To purchase a Strand Control is to take advantage of all this know-how of 'the new' and combine it with the knowledge and experience that comes from growing up with electric stage lighting controls from their infancy.

Strand designers have anticipated each new advance whether in technology or production which explains why Strand are *always* first. Even more important than technical development is design from the operator's point of view. It is all too easy for engineers and designers to chase each new technical device regardless of operational desirability. Strand controls are supervised through every design stage by men who are operators themselves. Men who know what it is like to work production lighting plots with anything from four to over two hundred or more dimmer channels to control.

The most obvious features of any of the standard Strand Preset Controls described herein is their clarity of layout and fine finish. Strand Controls are not just well styled and made but have an instrumental finish gracious to the touch and smooth to operate. It is Strand Electric's large world market which enables them to tool up for precision moulding of purpose-made items such as dimmer levers.

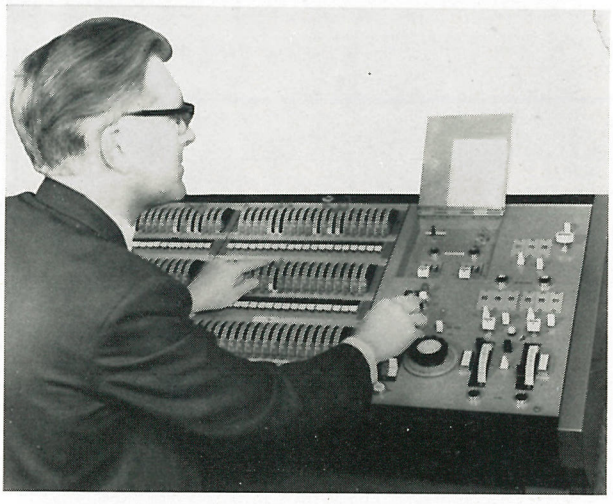
Basic simplicity in the number of controls fitted means clarity in layout which in its turn spells versatility. It is all too easy to build up a complicated panel covered with levers, switches, extra sub masters and grand masters. Such things not only take up unnecessary space but visually confuse. The operator cannot make a rapid appraisal to take in the situation at a glance. In a Strand control just those controls that are needed are supplied and care is taken to position and design them so the operator can relax and use them with confidence. Strand controls are easy to learn and no nerve racking nightmares follow in which the operator wonders if all is set properly for the next cue.

How a Thyristor Dimmer Works

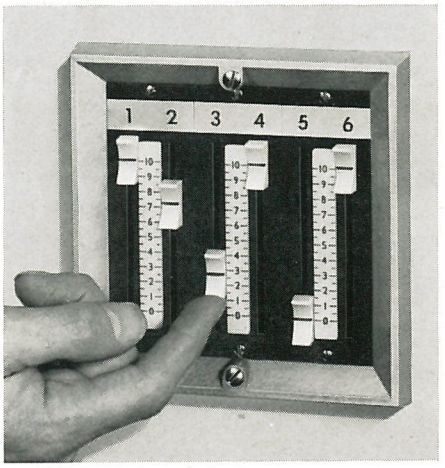
The thyristor is a solid state device known as a semiconductor or rectifier, which is a relation of the transistor but used to control heavy currents at mains voltages. Strand thyristor dimmers are available in standard modules of up to 5kW on 200/250 volt*. Each dimmer has a pair of thyristors used in the manner known to engineers as back to back. As is generally known, electric supply alternates above (positive) and below (negative) zero making a complete cycle fifty times every second. This cycle when averaged out gives the full mains voltage for which lamps and other electrical equipment are designed. When a pair of thyristors (i.e. semi-conductors) is inserted back to back in the circuit one of them conducts for the positive half cycle and the other for the negative half and the result adds together as full mains voltage once more. However the thyristor is what is known as a controlled rectifier and regulation can be applied to the pair from a small dimmer lever in such a way that each passes less and less of its half cycle. In consequence the voltage averages at less and less until stopped off completely. It follows that any lamps fed can be given their full voltage or starved of it until they are extinguished. Unlike the resistance dimmer and saturable reactor (choke) dimmers commonly used in Britain the thyristor is not load dependent. For example if set to pass only that part of the AC cycle which represents half light (80% full volts) then it will make no difference within the stated top capacity of the dimmer how many or how few lamps† are switched into the circuit, each will be at half light.

The control voltages and current at the dimmer lever are very small indeed and there are no moving parts to the thyristor dimmer itself. One precaution however must not be overlooked, though it is in the cheap domestic type of dimmer, and that is the need for what is known as 'clean up'. The effect of chopping the waveform makes for great technical efficiency and heat losses are negligible compared to other forms of dimmer but it creates a pulsing current which may radiate electrical interference to be picked up by the theatre's sound amplifiers and which, especially in the dim positions below half light, may cause actual noise at the lamp filaments. This can, however, be corrected by a small iron-cored filter in series with the load. The degree of clean-up necessary varies and all Strand thyristor control systems are designed to take this into account.

† All thyristor dimmers require to be loaded to not less than 60 watts to control properly.



Strand Instant Dimmer Memory systems with 250 presets and control for 240 dimmer channels (Below). Finger tip control for half a dozen Strand Unit Thyristor dimmers.



* A similar range but 6 kW is available for 100/120 Volts, 60 cycles.