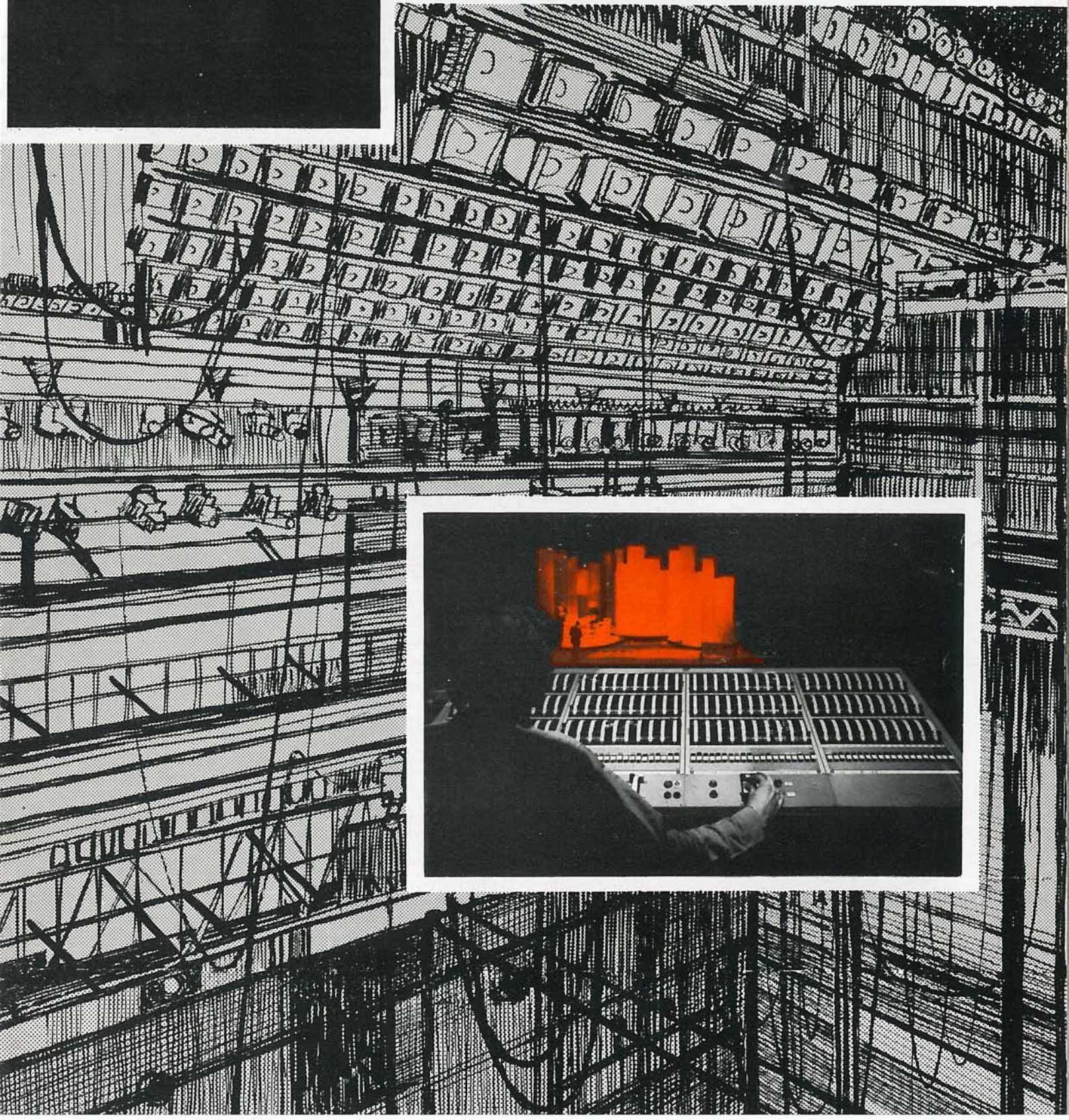




RANK STRAND ELECTRIC

STAGE LIGHTING 71



Rank Strand Stage Lighting

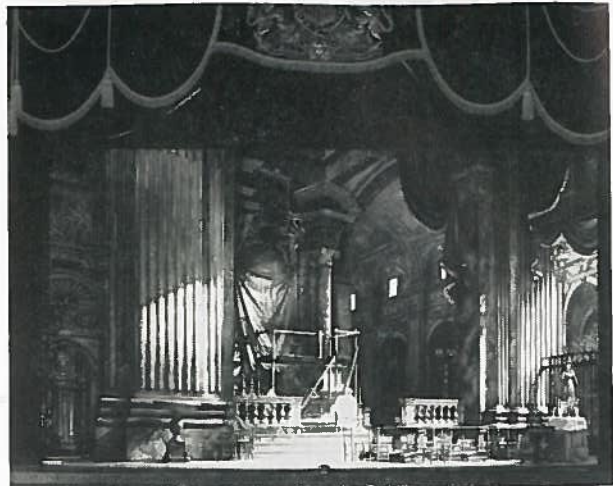
Strand Electric, now part of The Rank Organisation, have been manufacturing stage lighting equipment for over 55 years and have always made virtually everything for this purpose. Full use is made of modern precision tooling, die-castings, pressings and injection mouldings to ensure well-styled, consistent, better-quality products at competitive prices.

Stage lighting units mainly hang overhead, both over the auditorium and the acting area, and take three main forms: (a) **Floodlights**; (b) **Soft-edge Fresnel Spots**; (c) **Hard-edge Profile Spots**. **Floodlights**, which give a fixed, wide-angle beam, are today used mainly for lighting a cyclorama back-ground, or backcloths. On small stages individual floodlights, grouped several to a circuit, are often used over the acting area to consolidate the beams from the relatively few spotlights. Sometimes for close-range backcloth or cyclorama flooding and where general flooding is required from overhead on the larger stages, compartment batten, which is in effect a number of small floods joined together, is used. This is wired to alternate in 2, 3 or 4 circuits. Similar compartment equipment is used as ground-row at the bottom of a cyclorama or as footlight at the front edge of the stage when some correction to overhead lighting is necessary.

The most important lighting on the stage requires to be localised to emphasise certain areas, avoid spill on cyclorama or backings and provide dominant (motivating) lighting as sunlight, moonlight, etc.

The **Fresnel Spot** is the best general purpose unit, since it gives a wide adjustable beam ranging from 15° to 55°. These hang on bars behind the proscenium and elsewhere. They are also used vertically on 'boomerangs' or hang as 'ladders' in the wings to provide highlighting from the side.

The beam is soft-edged and indefinite; where the scatter of light is objectionable, as for example when the spotlight is close to a night sky cyclorama, then a barn-door shutter may be fitted to intercept the



Entire electrical and lighting installation at the Royal Opera House Covent Garden.

stray light. There are four independent doors and the whole barn-door unit is made to rotate. Some beam shaping can be carried out in this way, but a better unit for the purpose is the Profile Spot.

The **Profile Spot** incorporates a gate aperture which is focused by a lens. A large solid angle of light is collected by a reflector and this is passed through the adjustable gate with four separate shutters to vary the shape which is then projected by the lens. Rank Strand Profile Spots can be supplied with lenses of differing focal lengths to ensure that as far as possible a lantern operates with its gate at a wide aperture. This provision ensures that as little light as possible is wasted by being obstructed at the gate.

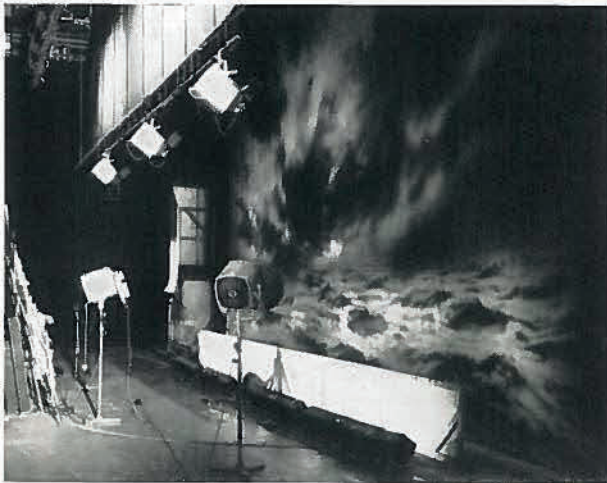
The gate of a Profile Spot can carry an iris or a gobo slide of any shape, but for most stage purposes the four built-in independently adjustable shutters will be found most convenient. These are particularly suitable for front-of-house work because straight-sided shutters allow the light to be cut off accurately at the proscenium, or where there is not one, then at the boundary between stage and audience. For picking out an artist a **Follow Spot** with an iris giving a circular beam has become traditional. For this purpose the narrow angle lens systems give the best results. Special lamps may also be used.

Concert and Stage lighting. Royal Festival Hall.



Stage lighting and electrical installation. Thorndike Theatre, Leatherhead.





Rear projection at the London Coliseum for *The Flying Dutchman* using Optical Effects projectors.



School Theatre lighting. Tupton Hall Comprehensive School.

The **Bifocal Spot** is a unique Rank Strand instrument similar in principle to a standard profile spot, except that the gate is fitted with two complete sets of four shutters. One set with black operating knobs gives the usual hard profile framing, the other with red knobs is situated out-of-focus and has vignetted edges in order to give soft framing. The beam can be shaped with either set or a mixture of both. For example, hard along the front of the stage and edge of the proscenium, and soft upstage and onstage.

Optical Effects Projectors are similar to the Profile spots, although a condenser lens system is used in preference to a reflector as the principal collector of the light. A condenser lens system gives the more accurate field required for slide and optical effects projection.

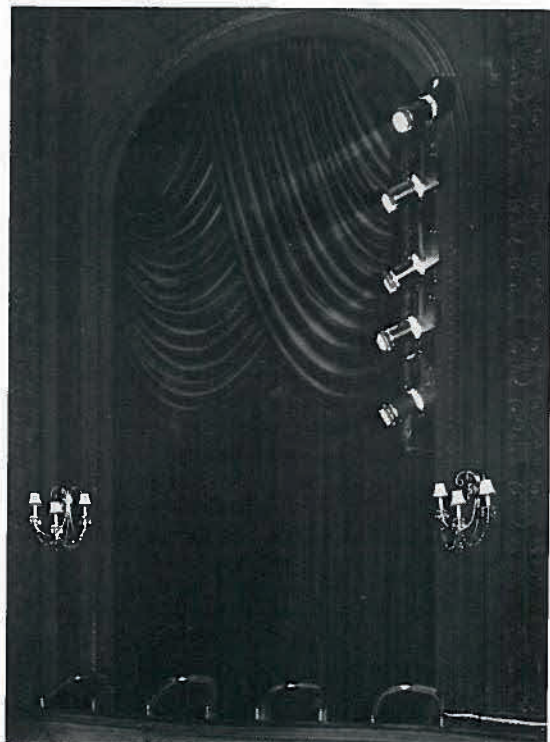
Rank Strand manufacture two principal optical projectors—the 2000-watt size used mainly for moving effects such as clouds and flames, and the 4000-watt 110-volt high-intensity projectors which, when used with high definition Dallmeyer lenses, are used as scene or background projectors. There is a full range of moving effect devices for the 2000-watt and 4000-watt units which use photographic reproduction on toughened glass giving a very high standard of picture. In addition there are a number of psychedelic effects each capable of considerable variation of the image.

Lamp Developments have recently provided increased efficiency and/or longer life. The Tungsten Halogen, sometimes referred to as Q.I. (Quartz Iodine), lamp now becoming available in certain wattages is a filament lamp whose principal characteristic is longer life and maintenance of light output without yellowing throughout that life. Some forms are interchangeable with existing lamps while others require special lampholders and particular Rank Strand lanterns may be for the new tungsten halogen only. This also applies to the extremely efficient Compact Source Mercury Halide (C.S.H.) lamps. Increases of light source output of over three times can be obtained for the same wattage. The light is of great intensity and of a quality which makes it particularly suitable for high intensity follow spots or for effects projection. Dimming by

the common method of dropping the line volts is not, however, possible.

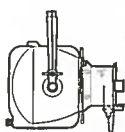
With the exception only of effects projectors all the lighting units described and illustrated are supplied with a frame for a colour filter. The Rank Strand 'Cinemoid' range of over 60 different colour filters is renowned throughout the world and has replaced the old gelatine and fragile coloured glass. 'Cinemoid' is exceptionally durable, impervious to moisture, and self-extinguishing even when deliberately set alight by prolonged contact with a naked flame.

A particular feature of stage and television lighting is the need to bring all circuits to a centralised control board and the remarkable range of Rank Strand **Lighting Controls** using Thyristor dimmers is described on pages 10 and 11.



Bifocal spots, front of house, Piccadilly Theatre, London.

Rank Strand Profile Spots



Max. Width 10½ in.
(265 mm)
Weight 7 lb. (3.2 kg)
Scale 1 : 20

Patt. 23, 23F, 23W

500W

Pressure die-cast body with top-hinged rear access to P28s holder for 500W Class T/1 lamp, 7-in. (180-mm) dia. faceted ellipsoidal rear, and annular front, reflectors. Four beam-shaping shutters and gate runners. Sliding lens tube with double runners and a 4-in. (100-mm) square colour frame. Lens variations:

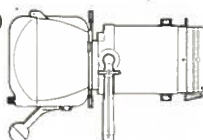
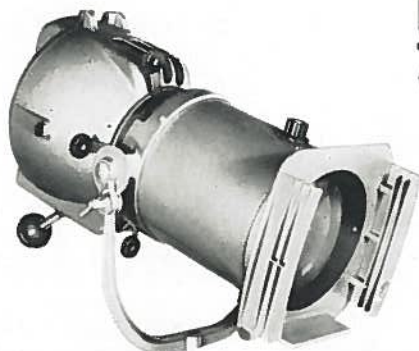
Patt. 23—3½×5-in. (90×125-mm) p.c. 20° max.

Patt. 23F—3½×4-in. (90×100-mm) Fresnel, 30° max.

Patt. 23W—two 3½×5-in. (90×125-mm) p.c. 36° max.

Iris diaphragm, ref. 363; set of four masks, ref. 362.

Max. Width 11½ in.
(285 mm)
Weight 12¼ lb. (5.6 kg)
Scale 1 : 20

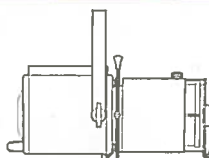


Patt. 23N

500W

Pressure die-cast body, rear handle fitted, with top-hinged rear access to P28s holder for 500W Class T/1 lamp, 7-in. (180-mm) dia. faceted ellipsoidal rear, and annular front, reflectors. Four beam-shaping shutters and gate runners with removable iris diaphragm. Sliding lens tube with 6×9-in. (150×230-mm) p.c. lens providing 11° max. spread. Die-cast lens front with double runners and a 6½-in. (165-mm) square colour frame.

Spigot adaptor for telescopic stand, ref. 484.



Max. Width 12 in.
(305 mm)
Weight 14½ lb. (6.6 kg)
Scale 1 : 20

Patt. 763, 763F, 763W Tungsten Halogen 1000W
Patt. 263, 263W 1000W

Pressed steel body with bottom-hinged front access. 6½-in. (160-mm) dia. faceted ellipsoidal reflector. Four beam-shaping shutters and gate runners. Sliding lens tube with 6-in. (150-mm) diameter lens. Die-cast front.

Patt. 763 (illustrated) with GX9.5 holder for 1000W Class T/9 tungsten halogen lamp (400 hour obj. life). Twin p.c. lens providing 20° max. beam spread.

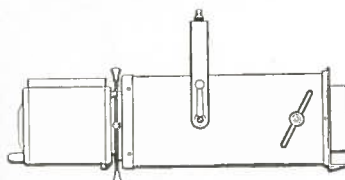
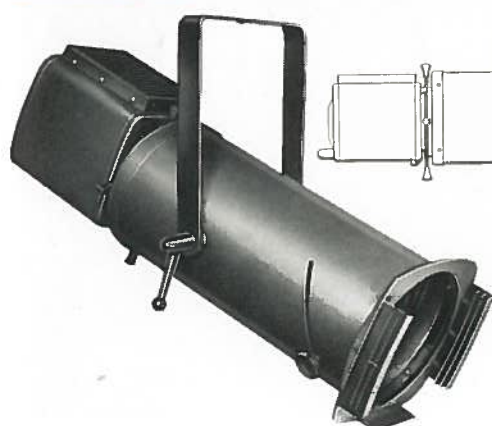
Patt. 763F—as above but Fresnel lens, 24° max.

Patt. 763W—as 763, but wide 30° max. beam spread.

Patt. 263—with pre-tilted P28s holder for 1000W Class T/4 lamp (200 hour obj. life), Fresnel lens, 20° max.

Patt. 263W—as above, but p.c. lens. 26° max. spread.

Iris diaphragm, ref. 625.



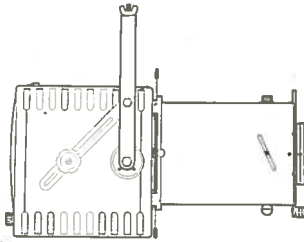
Max. Width 12 in.
(305 mm)
Weight 31 lb. (14 kg)
Scale 1 : 20

Patt. 773 Tungsten Halogen 1000W
Long Range Profile Spot

Pressed steel body with bottom-hinged lamphouse. GX9.5 holder for Class T/9 1000W tungsten halogen lamp (400 hour obj. life). 6½-in. (160-mm) diameter faceted ellipsoidal reflector. Four beam-shaping shutters and gate runners. Helically sliding internal lens tube with twin 8-in. (200 mm) diameter long focus p.c. lenses providing narrow 10.5° max. beam spread. Die-cast front with double runners and a 8½-in. (215-mm) square colour frame.

Iris diaphragm, ref. 625.

Rank Strand Profile Spots



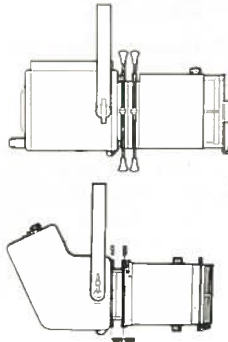
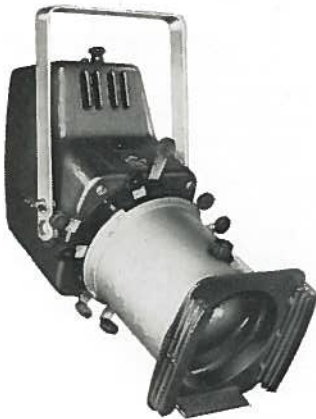
Max. Width 17 in. (430 mm)
Weight 54 lb. (24.5 kg)
Scale 1 : 20

Patt. 253

2000W

Pressed steel body with top access to 15° pre-tilted P40s holder for 2000W Class A1/218 or CP/28 tungsten halogen (hard glass) tubular lamp. 9-in. (230-mm) dia. faceted ellipsoidal reflector. Four beam-shaping shutters, built-in iris diaphragm and gate runners. Helically sliding internal lens tube with 8×13-in. (200×330-mm) p.c. lens providing wide 24° max. spread. Die-cast front with double runners and a 11½-in. (300 mm) square colour frame.

Hand-operated magazine for four colours, ref. 636.



Max. Width 12 in.
(305 mm)
Weight 16½ lb. (7.5 kg)
Scale 1 : 20

Patt. 764, 764W Tungsten Halogen 1000W Patt. 264, 264W Bifocal Spot 1000W

Pressed steel body with bottom-hinged front access. 6½-in. (160-mm) dia. faceted ellipsoidal reflector. Four hard-edge and four soft-edge beam-shaping shutters and gate runners. Sliding lens tube with 6-in. (150-mm) diameter p.c. lens. Die-cast front and runners.

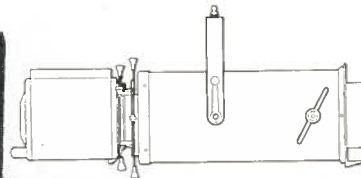
Patt. 764—with GX9.5 holder for 1000W Class T/9 tungsten halogen lamp (400 hour obj. life), 20° max. beam spread. 7½-in. (190-mm) square colour frame.

Patt. 764W—as above, but wide 30° max. beam spread.

Patt. 264—with pre-tilted P28s holder, as illustrated, for 1000W Class T/4 lamp (200 hour obj. life), 17° max. beam spread. 6½-in. (165-mm) square colour frame.

Patt. 264W—as above, but 26° max. beam spread.

Iris diaphragm, ref. 625.

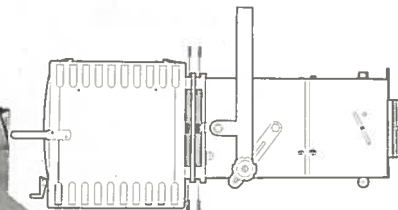
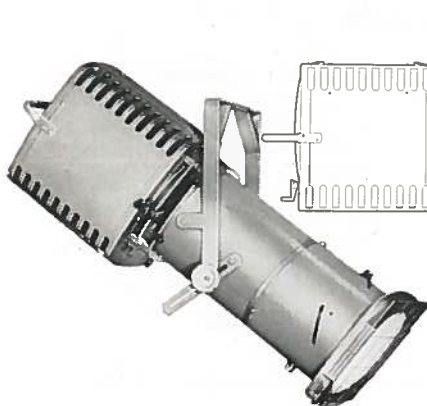


Max. Width 12 in.
(305 mm)
Weight 31 lb.
(14 kg)
Scale 1 : 20

Patt. 774 Tungsten Halogen 1000W Long Range Bifocal Spot

Pressed steel body with bottom-hinged lamphouse. GX9.5 holder for Class T/9 1000W tungsten halogen lamp (400 hour obj. life). 6½-in. (160-mm) diameter faceted ellipsoidal reflector. Four hard-edge and four soft-edge beam-shaping shutters and gate runners. Helically sliding internal lens tube with twin 8-in. (200-mm) diameter long focus p.c. lenses providing narrow 10.5° max. beam spread. Die-cast front with double runners and a 8½-in. (215-mm) square colour frame.

Iris diaphragm, ref. 625.

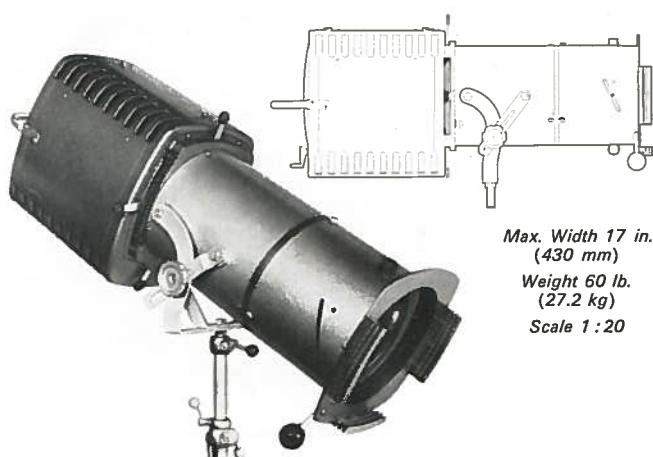


Max. Width 17 in.
(430 mm)
Weight 60 lb.
(27.2 kg)
Scale 1 : 20

Patt. 294 Bifocal Spot 2000W

Pressed steel body with rear handle. Top access to 15° pre-tilted P40s holder for 2000W Class A1/218 or CP/28 tungsten halogen (hard glass) tubular lamp. 9-in. (230-mm) dia. faceted ellipsoidal reflector. Four hard-edge and four soft-edge beam-shaping shutters, built-in iris diaphragm and gate runners. Helically sliding internal lens tube with 10×20-in. (250×510-mm) p.c. lens providing 15° max. spread. Die-cast front with double runners and a 11½-in. (300-mm) square colour frame.

Rank Strand Follow Spots



Patt. 293

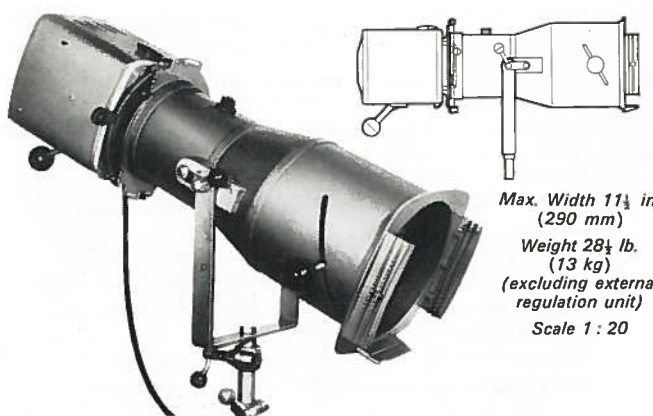
2000W

Pressed steel body with rear handle. Top access to 15° pre-tilted P40s holder for 2000W Class A1/218 or CP/28 tungsten halogen (hard glass) tubular lamp. 9-in. (230-mm) dia. faceted ellipsoidal reflector. Built-in iris diaphragm with blackout disc, four beam-shaping shutters and gate runners. Helically sliding internal lens tube with 10×20-in. (250×510-mm) p.c. lens providing 15° max. spread. Die-cast front with handle, double runners and a 11 $\frac{3}{4}$ -in. (300-mm) square colour frame.

Max. Width 17 in.
(430 mm)
Weight 60 lb.
(27.2 kg)
Scale 1 : 20

Hand-operated magazine for four colours, ref. 636.

Braced telescopic stand, ref. 628.



Patt. 265

Halospot

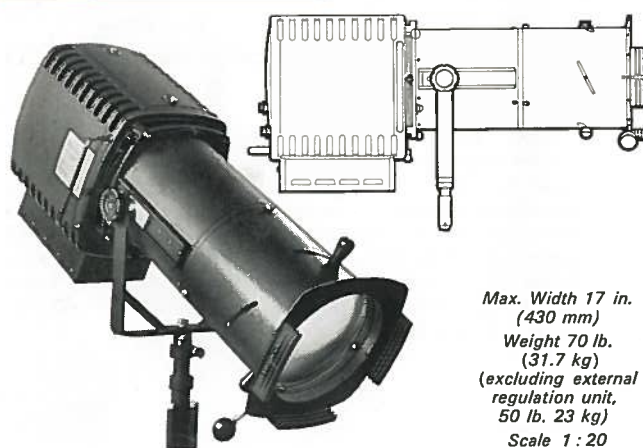
CSI 400W

Pressed steel body with rear handle and bottom-hinged lamphouse. Holder for 400W CSI Mercury Halide lamp. 6 $\frac{1}{4}$ -in. (160-mm) dia. faceted ellipsoidal reflector. Built-in iris diaphragm, pair of strip shutters rotatable 30° around axis of beam, and gate runners. Variable spread lens system with 8×16-in. (200×405-mm) p.c. front lens and 3 $\frac{1}{2}$ ×5-in. (90×125-mm) p.c. rear lens in separate, helically-sliding, internal lens tubes. 10.5°/18.5° max. beam spread. Die-cast front with double runners and a 8 $\frac{1}{2}$ -in. (215-mm) square colour frame. Separate starter unit, providing EHT starting pulse and regulation, with EHT insulated cable and connectors to mate with lamp-house.

Max. Width 11 $\frac{1}{2}$ in.
(290 mm)
Weight 28 $\frac{1}{2}$ lb.
(13 kg)
(excluding external regulation unit)
Scale 1 : 20

Braced telescopic stand, ref. 628.

Hand-operated magazine for four colours, ref. 701.



Patt. 765

Halospot

CSI 1000W

Pressed steel body with rear handle. Top access to holder for 1000W CSI Mercury Halide lamp. Built-in EHT starting circuit and hour-counter. External unit for regulation. 8 $\frac{1}{2}$ -in. (210-mm) dia. ellipsoidal type reflector. Built-in iris diaphragm and blackout disc, two pairs of strip shutters rotatable 30° around axis of beam. Helically sliding internal lens tube with two 10×40-in. (250×1015-mm) p.c. lenses providing 14° max. spread. Die-cast front with handle, double runners and 11 $\frac{3}{4}$ -in. (300-mm) square colour frame. Complete with special tripod stand.

Max. Width 17 in.
(430 mm)
Weight 70 lb.
(31.7 kg)
(excluding external regulation unit,
50 lb. 23 kg)
Scale 1 : 20

Hand-operated magazine for four colours, ref. 636.

Mechanical dimming shutter assembly, ref. 740.



COLOUR CHANGE

Hand-operated magazine for four colours.

To fit runners of Patt. 265; ref. 701.

To fit runners of Patt. 253, 293 or 765; ref. 636.

Remote Colour Change Wheels, AC motor drive.

12 $\frac{1}{2}$ -in. (320 mm) dia. for Patt. 23, 23F, 23W; ref. 382.

17 $\frac{1}{2}$ -in. (445 mm) dia. for Patt. 123; ref. 410.

17 $\frac{1}{2}$ -in. (445 mm) dia. for Patt. 23N, 263, 264; ref. 622.

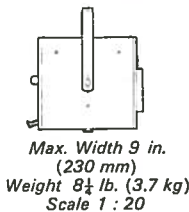
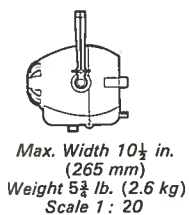
Control box for five colour select, or continuous, control of one colour change wheel.

1—unit control box; ref. 383.

2—unit control box; ref. 384.

4—unit control box, with master switch; ref. 385.

Rank Strand Fresnel Spots



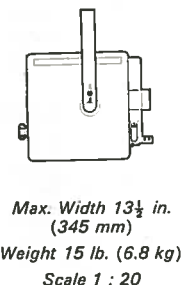
Patt. 123 500W

Pressure die-cast body with bottom-hinged lens front and lamp tray. Recessed 6-in. (150-mm) dia. short focus Fresnel lens. P28s holder for 500W Class T/1 lamp. Lamp tray, with 4½-in. (115-mm) dia. spherical reflector, has bottom slide focus. Beam spread adjustable between 26°/51°. Double runners with a 6½-in. (165-mm) square colour frame.

Coloured lens available, add suffix —/C.
Four door rotatable barndoor attachment, ref. 131.

Patt. 45 Junior Spot 500W

Pressed steel body with side-hinged rear door access. Recessed 4½-in. (115-mm) dia. short focus Fresnel lens. P28s holder for 500W Class T/1 lamp. Slide focus provides beam spread adjustable between 14°/45°. Runners with a 5¾×5¼-in. (145×135-mm) millboard colour frame.



Patt. 743 Tungsten Halogen 1000W Patt. 223 1000W

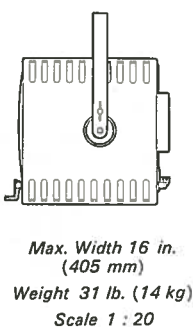
Pressed steel body with diagonally-hinged, die-cast lens front. Recessed 8-in. (200-mm) dia. short focus Fresnel lens.

Patt. 743—with GX9.5 holder for 1000W Class T/9 tungsten halogen lamp (400 hour obj. life).

Patt. 223—with P28s holder for 1000W Class T/6 lamp (200 hour obj. life).

Lamp tray, with 6-in. (150-mm) dia. spherical reflector, has lead-screw focus from front or rear. Beam spread adjustable between 15°/80°. Double runners with a 8½-in. (215-mm) square colour frame.

Coloured lens available, add suffix —/C.
Four door rotatable barndoor attachment, ref. 633.

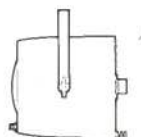


Patt. 243BP 2000W

Pressed steel body with bottom-hinged lens front. Recessed 10-in. (250-mm) dia. short focus Fresnel lens. Bi-post holder for 2000W Class CP/12 or CP/41 tungsten halogen lamp (200 hour obj. life).

Lamp tray, with 7½-in. (190-mm) dia. spherical reflector, has lead-screw focus from front or rear. Beam spread adjustable between 16°/50°. Die-cast double runners and a 11¾-in. (300-mm) square colour frame.

Coloured lens available, add suffix —/C.
Four door rotatable barndoor attachment, ref. 133.

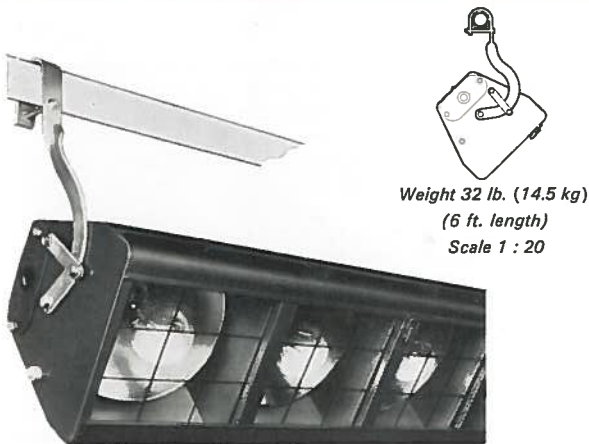


Beamlight

Patt. 750 Tungsten Halogen 1000W

Circular lamphouse with 10-in. (250-mm) diameter parabolic rear reflector and 3¼-in. (80-mm) spherical front reflector. GX9.5 holder for 1000W Class T/9 tungsten halogen lamp (400 hour obj. life). Lead-screw focus from rear. High intensity near parallel beam adjustable between 9°/18°. Die-cast runners and a 11¾-in. (300-mm) square colour frame.

Rank Strand Floodlights



Weight 32 lb. (14.5 kg)
(6 ft. length)
Scale 1 : 20

Patt. S/63 Batten

8×150W

Pressed steel channel and compartment divisions. Compartments at 9-in. (230-mm) centres each with E.27(ES) holder, for 150W GLS clear lamp, and 8½-in. (215-mm) matt reflector. Beam spread 105°. Internal runners, with top-hinged lid and toggle fastener. Set of 8×9¼-in. (210×235-mm) colour frames. Internally wired to terminal blocks each end as follows:

Patt. S/63—6-ft. (1830-mm) length, 8 compartments on 3 circuits.

Patt. S/64—as above, but on 4 circuits.

Patt. S/34—3-ft. (915-mm) length, 4 compartments on 4 circuits.

Footlight, with offset reflectors, add suffix —/F.

Pair floor brackets for adjustable tilt groundrow, ref. 620.

Cable grip for ¾-in. (20-mm) max. dia. cable ref. 519.



Max. Width 12¾ in.
(325 mm)
Weight 8 lb. (3.6 kg)
Scale 1 : 20

Patt. 137

200W

Pressed steel body with E.27 (ES) holder, for 150 or 200W GLS clear lamp, and 8½-in. (215-mm) dia. matt reflector beam spread 105°. Internal runners with sprung-closed hinged lid and one 8×9¼-in. (210×235-mm) colour frame).

Masking Hood, ref. 245

Max. Width 14½ in.
(370 mm)
Weight 12 lb. (5.4 kg)
Scale 1 : 20

Patt. 60

500W

Pressed steel body with E.40 (GES) holder, for 300 or 500W GLS clear lamp, and 10½-in. (265-mm) dia. matt reflector. Beam spread 90°. Internal runners with sprung-closed hinged lid and one 11¾-in. (300-mm) square colour frame.



Max. Width 19 in. (485 mm)
Weight 20 lb. (20 kg)
Scale 1 : 20

Patt. 49

1000W

Shallow steel body with E.40 (GES) holder, for 1000W GLS clear lamp, and 15¼-in. (385-mm) dia. matt reflector. Beam spread 120°. Internal runners with sprung-closed hinged lid and one 16¼-in. (410-mm) square colour frame.



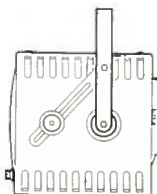
Max. Width 20 in. (510 mm)
Weight 25½ lb. (11.5 kg)
Scale 1 : 20

Patt. 249

Tungsten Halogen 2×1000W

Pressed steel body with top-hinged front access to R7S holders for two Class K/4 1000W double-ended tungsten halogen lamps. Special reflector system provides large area source and excludes all direct light from line filaments. Beam spread 90°×135°. Runners and one 17¾×12½-in. (450×320-mm) colour frame.

Rank Strand Effects Projectors



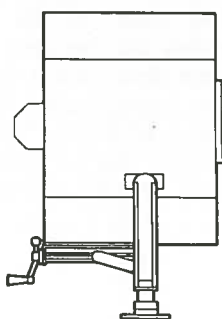
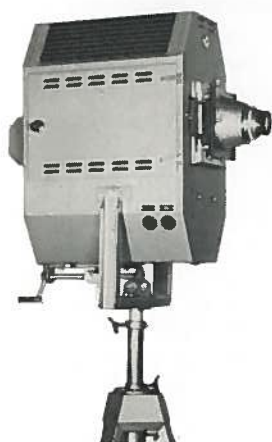
Max. Width 16½-in. (420 mm)
excluding attachments
Weight 36 lb. (16.5 kg)
Scale 1 : 20

Patt. 252

2000W

Pressed steel body with top access. P40s holder for 2000W Class A1/218 tubular lamp. Die-cast lens front and separate mounts for 6-in. (150-mm) dia. 3-element condenser lens system including heat filter. Runners only with clamping discs, for standard 8-in. (203-mm) backplate optical effects attachments or 3¼×4-in. slide carrier. Lamp tray, with 7½-in. dia. spherical reflector, adjustable from rear by lead-screw drive.

Moving Effects Attachments AC motor-driven disc type
Thunder Clouds; ref. 653 Smoke; ref. 140
Fleecy Clouds; ref. 134 Flames; ref. 141
Storm Clouds; ref. 135 Chromosphere; ref. 667
Rain; ref. 136 Dissolving Colours; ref. 147
Snow; ref. 137 Psychedelic Mk II; ref. 723
Running Water; ref. 138 Kaleidosphere; ref. 724
2½-in. focus objective lens, slide focusing; ref. 151
3-in. focus objective lens, slide focusing; ref. 152
4-in. focus objective lens, slide focusing; ref. 153



Weight, with stand 128 lb. (58 kg)
with hanging bracket 105 lb. (47.6 kg)
Scale 1 : 20

Patt. 152

4000W 110V

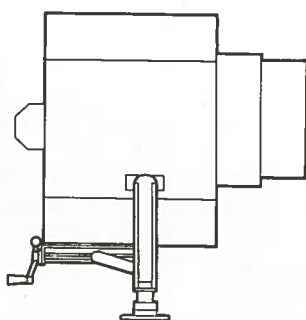
Aluminium body with silent internal fan and ducting to cool lamp and condenser system. Access by hinged door each side. Bipost holder for 4000W 110V 4M/T32 tubular lamp. Separate mounts for 6-in. (150-mm) dia. 4-element condenser lens system including two heat-absorbing glasses. Adjustable lamp tray with 7-in. (175-mm) spherical glass reflector. Runners (only) for standard 8-in. (203-mm) backplate optical effects attachment or 3¼×4-in. slide carrier. Tilt adjustment by fine pitch lead-screw. Inclusive of special tripod stand, or (add suffix —/H) hanging bracket.

Super-silent auto-transformer, 220/250V AC input, 4kva at 110V output to socket with mating plugtop; ref. 522.

Turntable front, ref. 154. Slide carrier for two 3¼×4-in. slides; ref. 156.

High Definition Objective Lenses

4-in. focus f1.9 Dallmeyer, micrometer focusing; ref. 391
6-in. focus f1.9 Dallmeyer, micrometer focusing; ref. 393
Backplate for 4-in. lens; ref. 392. Backplate for 6-in. lens; ref. 394



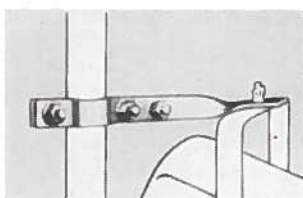
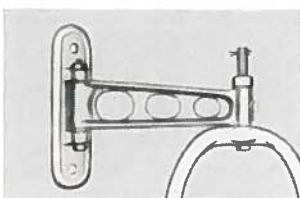
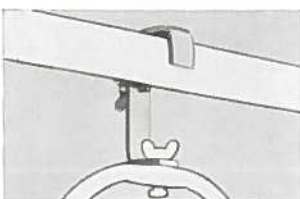
Weight, with stand 148 lb. (67 kg)
with hanging bracket 125 lb. (56.5 kg)
Scale 1 : 20

Patt. 752

4000W 110V

As Patt. 152 but with 10-in. (225-mm) dia. 4-element condenser lens system. Complete with carrier for two 7-in. (180-mm) square slides, adaptors for 5-in. (130-mm) square slides, two serrated shutter combs and mount (only) for ref. 393 6-in. (150-mm) focus high definition objective lens. Alternative casting included with runners for standard 8-in. (203-mm) backplate effects attachments

Transformer, as for Patt. 152; ref. 522.



CLAMPS, BRACKETS & STANDS

Hook clamp for horizontal 1⅞-in. (50-mm) ext. dia. pipe; ref. 483.

Safety chain, 22-in. (560-mm) long, with clip; ref. 64.
Ceiling or base plate, 6-in. (150-mm) dia.; ref. 367.

Swivel arm wall bracket, 9-in. (230-mm) reach; ref. 247

Fixed wall bracket, 8-in. (200-mm) reach; ref. 238.

Boom bracket for vertical 1⅞-in. (50-mm) ext. dia. pipe; ref. 255.

Spigot adaptor for 200/500W Floods, 500/1000W Spots; ref. 484.

Spigot adaptor for 1000/2000W Floods, 2000W Spots; ref. 487.

Braced stand, 34 to 49 in. (865 to 1250-mm); ref. 628.

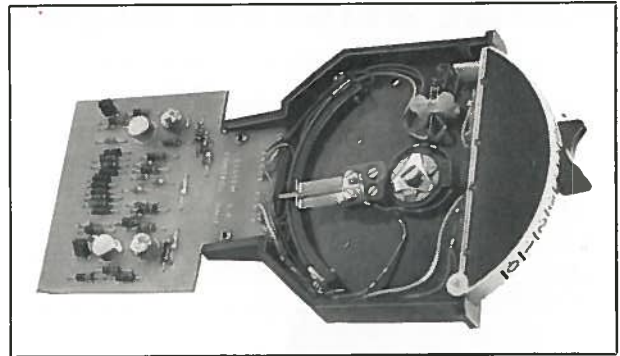
Telescopic stand, 52 to 92 in. (1330 to 2260-mm); ref. 626.

Rank Strand Control

Nowhere does Rank Strand Electric's long experience, allied to the latest technical development, show to better advantage than in modern lighting control. In the following 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. Although custom built or special control systems can be supplied they are largely rendered unnecessary. Standard control systems mean keen price and delivery.

This entire range uses the latest form of dimmer—the Thyristor dimmer—which is backed by Strand's practical experience in the field since the first pilot installations in 1964. Today the same Rank Strand Thyristor dimmers are common to the large Opera House and the school stage. The London Coliseum, home of the Sadlers' Wells Opera Company, has 240 type JTM dimmers in twelve racks whereas Craigmount School, Edinburgh, has just one rack with 20 of exactly the same dimmers. The difference between these two lighting controls lies in the facilities provided by the control desk. In a Rank 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. They are easy to learn and no nerve racking nightmares follow in which the operator wonders if all is set properly for the new cue. He, or she, can concentrate on the subtleties of lighting, instead of the mechanics of operating a switchboard.

It is Rank Strand Electric's world-market which allows tooling up for precision moulding of purpose-made items such as dimmer levers. These are all small in size, but always large enough for finger-operation. To ensure close centres, and to pattern the layout, conventional dimmer levers are arranged



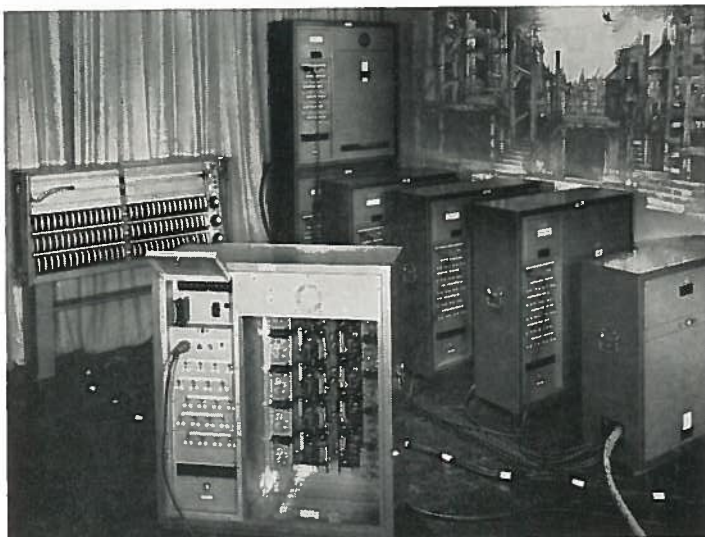
Luminous dimmer lever showing printed circuit board with solid state switching and routing elements.

one either side of a common scale.

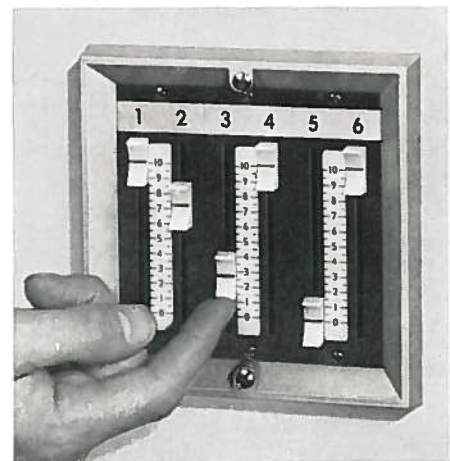
Rank Strand controls begin with a simple set of finger tip levers in a compact wall-mounting box as shown below. The dimmers for these will be remote thus keeping load carrying equipment and wiring clear of the control point. The dimmer modules can be unit type in separate boxes used decentralised about the building—only the dimmer levers being common, or they can be mounted together in a rack. Where appropriate, push button operation can be substituted to initiate automatic motion. These automatics are described on page 16.

For stage lighting the minimum requirement is two sets of dimmer levers for the one set of dimmers. Each set will have a master fader so that while the existing lighting effect is held the next one can be *preset*. Stage lighting effects tend to be complex; firstly because dimmers are used to balance the lighting—to paint a number of stage pictures in light. Secondly, because dimmers are used to change the light from one picture to another, sometimes imperceptibly as in a dawn or sunset or suddenly as when a character switches on or off a supposed source of illumination.

The minimum type of control to give facilities adequate for today's standards of lighting is the Mini-2 (page 12). Both the dimmer packs and the control units are made portable which not only helps the setting up of temporary installations for occasional performances but enables a minimum



A Rank Strand JP preset system for the touring company.



Simple control for six unit Thyristor dimmers.



The luminous dimmer lever exclusive to Rank Strand control systems.



The illuminated rocker dimmer switches designed for Rank Strand memory controls.

installation of six channels to be built up progressively to twelve and then eighteen as funds permit. Other portable dimmer equipments on a more substantial scale can be supplied, one being shown on the opposite page.

The JP (Junior Preset) series provides, in conjunction with standard JTM racks of 10 or 20 channels, two preset desk or wall-mounting controls and three preset floor-mounting units which can be used standing or seated (page 12).

For over 40 channels the System SP (Standard Preset) is commonly used. Two forms are made, one shallow for wall or existing desk top, the other as a floor-standing console. A row of three position switches along the top allows grouping to an A master or a B master so there are two master faders per preset and the need to preset a complete row of levers to affect the lighting of only part of the stage is avoided.

For 80 or 100 channels a new model known as the Threeset has been introduced in which a separate set of three position group switches is provided to each preset in conjunction with three master faders, making nine in all.

In these ways more and more dimmer channels are brought under effective control of the operator. As the number of channels increases it is convenient to integrate both grouping and intensity regulating functions in one unit. For this purpose the unique Rank Strand luminous dimmer unit is used. Two colour internal illumination of the dimmer scale and the micro-switch operated by it open up a host of control facilities without any need of extra space. Systems LP, Lightset and MGP all make use of this form of lever—this last in conjunction with multiple group memory.

Rank Strand instant dimmer memory in which the complete stage lighting picture is recorded for subsequent repeat is also available and in one case uses the luminous lever and in the other the rocker channel control illustrated above. A number of such Rank Strand controls are installed in various

parts of the world and provide advanced facilities impossible to summarise in a general introduction such as this. *All systems of control are the subject of data sheets and other literature which can be supplied against specific enquiries.*

THYRISTOR DIMMERS

All the lighting controls illustrated in the next four pages are used in conjunction with Rank Strand Thyristor dimmers. As is generally known the A.C. supply alternates above (positive) and below (negative) zero making a complete cycle fifty times each second. This complete cycle when averaged out gives the full supply voltage for which lamps and other electrical equipment are designed. When a pair of thyristors is inserted back to back in the circuit one of them can conduct for the positive half cycle and the other for the negative half, in which case the results add together as full supply voltage once more. However, when a control signal is applied to a third contact on each thyristor it passes less and less of its half cycle. In consequence the output voltage averages 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. The Thyristor dimmer is not load dependent like earlier dimmers. If set to pass only that part of the A.C. cycle which represents half light (80% full volts) then it will make no difference within the stated maximum capacity of the dimmer how many or how few lamps are in circuit, each will be at half light.

The effect of chopping the waveform makes for great technical efficiency and heat losses are negligible compared to older forms of dimmer but it creates a pulsing current which may radiate interference to be picked up by sound equipment and which, especially at low intensity levels, may cause actual noise at the lamp filaments. This undesirable side-effect is overcome by a substantial filter network which is an essential part of all Rank Strand Thyristor dimmers.

Rank Strand Mini-2 Portable

The Mini-2 range allows a complete breakaway from the primitive facilities and limited load capacity of all previous "portable" switchboards. The heart of the Mini-2 range is a new, lightweight pack of six variable-load dimmers, each dimmer controlling up to 2000 watt through twin socket outlets. The desks, with finger-tip operated dimmer levers and presetting facilities for 12 or 18 channels, simply plug in to the required number of dimmer packs, each of which requires only a 50 Hz supply. For remote operation the short control cable to each pack can be extended by a 10 or 30 metre extension cable.



Ref. 736 Mini-2 Desk, 6-channel, 6-lever, 2-m cable
7½-in. (190-mm) × 5¾-in. (145-mm) deep × 3½-in. (80-mm) high. Requires one 6-channel dimmer pack.

Ref. 737 Mini-2 Desk, 12-channel, 2-preset, 2-m cables
15-in. (380-mm) × 10¾-in. (265-mm) deep × 4¼-in. (110-mm) high. Requires two 6-channel dimmer packs.

Ref. 738 Mini-2 Desk, 18-channel, 2-preset, 2-m cables
19½-in. (495-mm) × 10¾-in. (265-mm) deep × 4¼-in. (110-mm) high. Requires three 6-channel dimmer packs.

Extension Control Cables, with mating plug and socket.

Ref. 739 10-metre (33-ft.) long, for one dimmer pack.

Ref. 753 30-metre (98-ft.) long, for one dimmer pack.

Ref. 735 Mini-2 6-Dimmer Pack, single phase.

For 220/250v 50 Hz single phase supply. Six 2000 watt maximum Thyristor dimmers each with twin 15 amp 3-pin socket outlets. Weight 43 lb (20 kg). 28½-in. (725-mm) × 6-in. (155-mm) deep × 10-in. (255-mm) high.

Ref. 745—as above but with twin 5 amp 3-pin sockets.

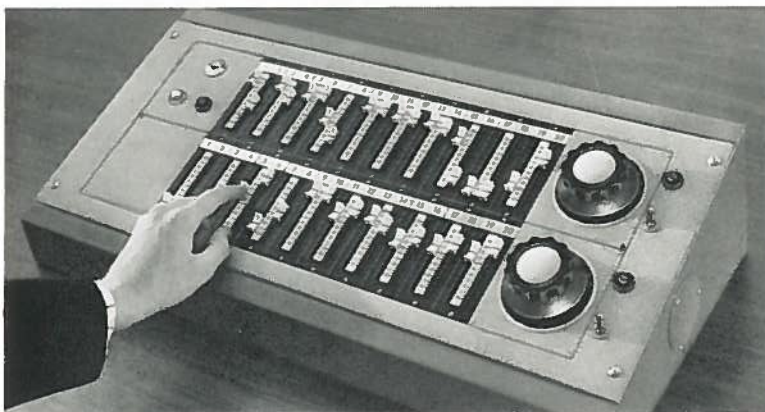
Ref. 755 Mini-2 6-Dimmer Pack, three phase*.

For 220/380v 50 Hz three phase supply. Six 2000 watt maximum Thyristor dimmers each with twin continental socket outlets. Weight 45 lb (21 kg). 32½-in. (830-mm) × 6-in. (155-mm) deep × 10-in. (255-mm) high.

*Not available in UK where 2-m phase separation required.

Rank Strand JP Series

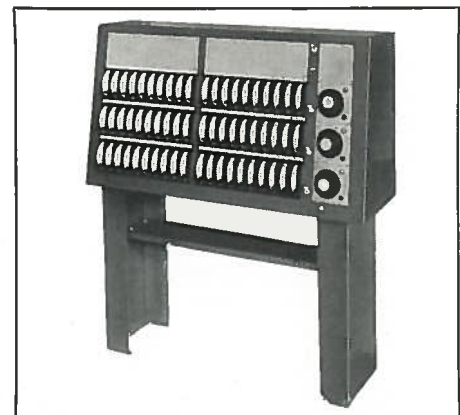
Low-cost desks, for use with type JTM Thyristor dimmers, providing the essential facilities for presetting intensity levels in advance of the lighting in use and master dimmers to fade from one effect to the next. They have the great merit of being so easy to comprehend that no particular know-how is required for either plotting or operation, an important factor in multiple-user application. Shallow 2-preset desks have flat-scale dimmer levers; 3-preset wing panels have quadrant-scale levers.



Type JP.20/2, 20-channel, 2-preset

Shallow table-top desk, panel reversible for wall-mounting.
Size: 27 in. (685 mm) × 13 in. (330 mm) deep × 6 in. (155 mm) high.

Uses one type JTM 20-channel rack.



Type JP.40, 40-channel, 3-preset

Near vertical wing panel, floor-fixed.
Size: 40 in. (1020 mm) × 11 in. (280 mm) deep × 48 in. (1220 mm) high.

Uses two type JTM 20-channel racks.

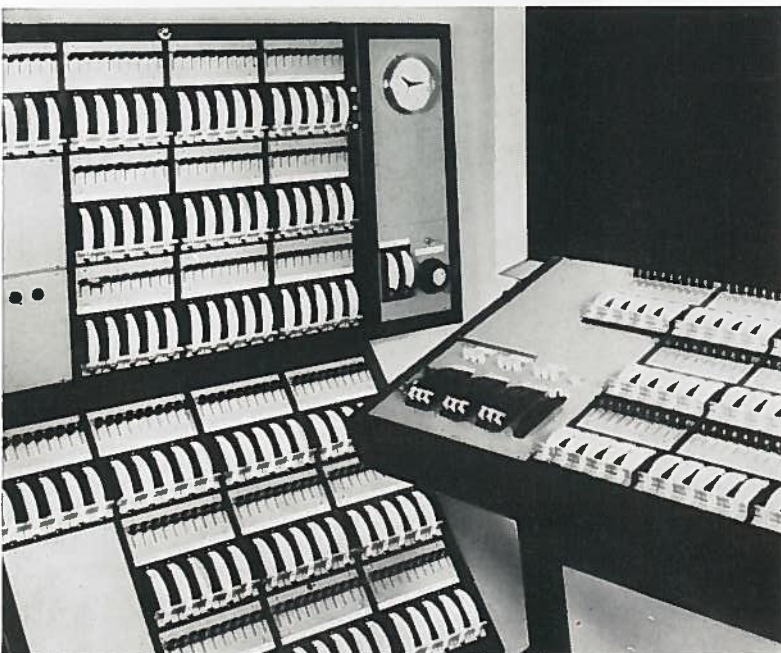
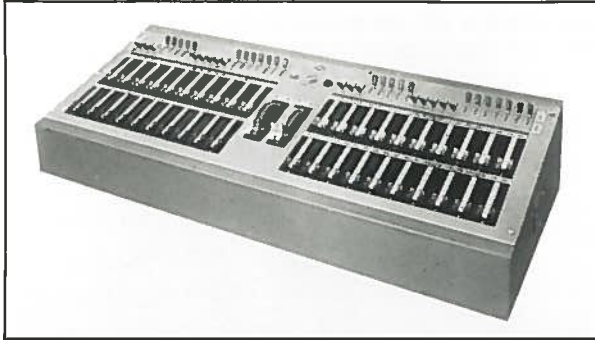
Type JP.30, 30-channel, 3-preset

Construction and dimensions as above.

Uses one 20- and one 10-channel type JTM racks.

Rank Strand SP Series & Threeset

To enable lighting changes to be limited to part of a preset grouping facility two types of switch grouping control are offered. In both cases the grouping is carried out by means of a long lever toggle switch which is easily operated and gives a clear indication. In **System SP** (Standard Preset) one set of switches provides common grouping to all presets and there are two group masters per preset. **System Threeset** is a development with extra facilities to enable the operator to control a large number of channels yet keep within a modest budget when compared with the more sophisticated and advanced systems overleaf. One preset is housed in the master desk while a wing unit houses the other two presets.



System SP

Two master faders, A and B, to each preset. Lever switch to each channel groups all presets to either the A master faders, or to the B master faders, or when central, to both the A and B masters simultaneously thus allowing channels common to both groups to be kept steady when cross-fading between groups within a preset. Master dimmers are now electronic type operated by quadrant-scale faders with fingertip motion. Shallow 2-preset desks have flat-scale dimmer levers; 3-preset free-standing desks have quadrant-scale levers. Inhibitor master fader for permanent group fitted to 3-preset desks.

Type SP.40/2, 40-channel, 2-preset, 2-group

Shallow table-top desk, reversible for wall-mounting
Size: 38 in. (975 mm) × 15½ in. (390 mm) deep × 7¼ in. (185 mm) high. Uses two type JTM 20-channel racks.

Type SP.30/2, 30-channel, 2-preset, 2-group

Sizes as above, uses one 20- and one 10-channel JTM rack.

Type SP.20/2, 20-channel, 2-preset, 2-group

As above, but 22½ in. (575 mm) wide.
Uses one type JTM 20-channel rack.

Type SP.80/3, 80-channel, 3-preset, 2-group

Free-standing desk, top internal access.
Size: 66¾ in. (1695 mm) × 25½ in. (640 mm) deep × 36 in. (915 mm) high. Uses four JTM or PTM 20-channel racks.

Type SP.60/3, 60-channel, 3-preset, 2-group

As above, but 50¾ in. (1290 mm) wide.
Uses three type JTM or PTM 20-channel racks.

Type SP.40/3, 40-channel, 3-preset, 2-group

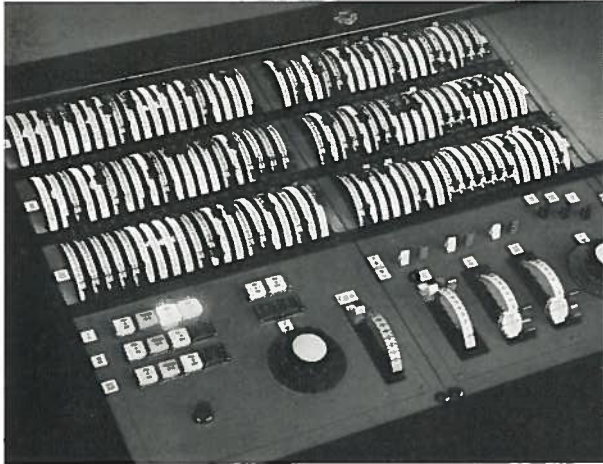
As above, but 50½ in. (1290 mm) wide.
Uses two type JTM or PTM 20-channel racks.

Threeset

Each of the three presets has its own set of 3-position switches, one per channel, enabling dimmer controls to be grouped independently in each preset to A, B and C group faders. The master desk houses the nine group faders together with their associated blackout switches and also provides ample plot space and an overall inhibitor for spot circuits out front. Available for 60, 80, 100 or 120 channels.

Rank Strand LP Series & Lightset

Rank Strand make a series of controls using internally illuminated levers. These provide separate grouping facilities to each of the three presets. This grouping is carried out, and also displayed, within the dimmer lever without the need for any auxiliary switches. This makes for great compactness. Selection to the White or Red master faders, or to both of them simultaneously, or off, is by pressing the appropriate master push together with the quadrant scale moulding of the dimmer lever; the scale is then internally illuminated white or red or red and white. Special Auto matching facilities are provided as two variants: system LP and system Lightset. **System LP** allows the grouping of any preset to be instantly copied on to any other preset. **System Lightset** on the other hand transfers the grouping from the white to the red master fader within each preset. In both variants the six master faders can be grouped in turn to either of two grand master faders, or independent of them. Inhibitor master fader for a permanent group, such as Front of House circuits, is provided.

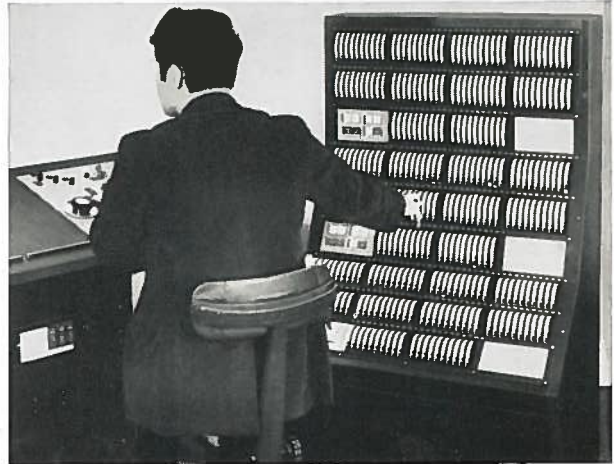


Type LP 40 or Lightset 40, 40-channel, 3-preset each 2-group

Size: $43\frac{1}{2}$ in. (1105 mm) \times $26\frac{1}{4}$ in. (670 mm) deep \times $36\frac{1}{4}$ in. (920 mm) high. Uses three type JTM or PTM 20-channel racks.

Type LP 60 or Lightset 60, 60-channel, 3-preset each 2-group

Size as above, uses two type JTM or PTM 20-channel racks.



Type LP 80 or Lightset 80, 80-channel, 3-preset each 2-group

Size: 57 in. (1450 mm) \times $26\frac{1}{4}$ in. (670 mm) deep \times $36\frac{1}{4}$ in. (920 mm) high. Uses four type JTM or PTM 20-channel racks.

Type LP 100 or 120 and Lightset 100 and 120

Consist of a master desk and an ergonomically shaped wing which houses the luminous dimmer levers for the three presets.

Rank Strand Memory Control Systems

Rank Strand Electric were the first to use automatic memory equipment to help one man to control a large lighting installation. In 1940 and in 1949 console controls were based on such devices which became standard for all Strand Electric large installations. From 1956 some three hundred theatres and television studios were equipped with systems C and CD as they were called. The earlier installations were of servo-operated electro-mechanical dimmer banks with resistance and transformer dimmers. The memory action was by crossbar relay specially developed for this purpose. When the all-electric solid state Thyristor dimmers replaced servo dimmers the memory system was adapted as system C/AE for, among several others, the 240-channel Thyristor installations at the Royal Opera House Covent Garden in 1964 and the London Palladium (above)



in 1966. An advanced development—system MGP—is still available for use where appropriate.

These systems are now known as Group Memory to differentiate them from Dimmer Memory controls in which the full positional information of all the dimmer levels that go to make up each stage lighting picture is recorded. The most obvious method of recording is that first used by Rank Strand Electric in 1959 (System KTV), namely, punched card. This in a

refined form (system Memocard) makes today a convenient, simple and effective system where cost is all-important. Automatic reproduction from cards provides accurate performance night after night of complicated lighting cues. Three card readers and individual dimmer levers per channel allow for rapid succession of cues and for modification as necessary. Recording on the cards can be manual or automatic. An advantage of these punched cards is that they can be read visually without the need to put them in the machine at all. Also they constitute both the long term and short term store, it being only necessary to go to the drawer or shelf to obtain the pack representing the particular show. An example of system Memocard is to be seen in the photograph below of the Allardyce Nicoll Studio for the drama department of Birmingham University. In addition to several overseas installations one of 150 channels is under construction for the Kings Theatre, Edinburgh.

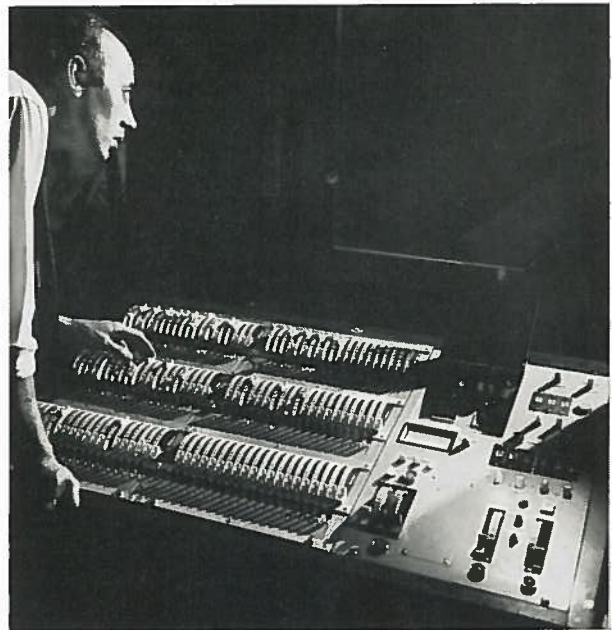
The most sophisticated form of control uses magnetic memory equipment to record both the long



Rank Strand Memocard control system for 100 channels in the Allardyce Nicoll Studio, Birmingham University. Masters are seen centre under window, channel controls on left and card readers and patching controls on right.

term and short term stores. Access is so fast as to cause imperceptible delay and in consequence the use of the term "instant" is justified. Rank Strand system IDM (Instant Dimmer Memory) in its latest form system MSR is recommended as the stage lighting control with a memory. A large number of these are installed and, for example, are to be found in the London Coliseum (home of the Sadler's Wells Opera), the Haymarket Theatre and the Globe, London. Basically IDM/DL resembles a normal control with a standard dimmer lever per channel. As each stage lighting picture is composed it can be instantly "memorised" thus cutting out all plotting delays—three hundred cues in full detail being recorded. Playback only involves calling up the cue number and operating the cross-fader. An

alternative to dimmer levers is rocker control to each channel, as used on the two very large instant memory systems in the theatres of the National Arts Centre, Ottawa. Rank Strand Electric Instant Dimmer Memory systems represent the ultimate in control for the theatre.



Rank Strand System IDM in the Globe Theatre, London. The 120 levers for the dimmer channels are on the left and the memory playback masters on the extreme right.



Rank Strand System DDM. Individual rocker tablet controls for 240 channels are on the wing. Dimmer memory controls and numerical selector to break sequence is on the left of the desk and the playback controls on the right.

Rank Strand Thyristor Dimmers

Type JTM 200/250v 50 Hz*

Compact, wall-mounting rack housing either a total of twenty or ten 2000-watt maximum or 5000-watt maximum Thyristor dimmers, each of which is a self-contained unit complete with filter.

Sizes: 20-channel, 38-in. (965-mm) wide \times 61 $\frac{3}{4}$ -in. (1570 mm) high \times 11-in. (280-mm) deep. Weight 120 lb. (55 kg.) approx.
10-channel, 26-in. (660-mm) wide otherwise as above.

*Similar equipment available for 110/120v 60Hz

Type PTM 200/250v 50 Hz*

Free-standing rack housing a total of twenty plug-in Thyristor dimmer modules, 2500-watt maximum or 5000-watt maximum. The filter network is mounted separately below the dimmer modules.

Size: 42-in. (1065-mm) wide \times 74-in. (1880-mm) high \times 21-in. (535-mm) deep. Weight 620 lb. (281 kg.) approx.

*Similar equipment available for 110/120v 60Hz, 3 or 6 kW max.



Thyristor Automatic & Unit Dimmers

Type PTU 200/250v 50 Hz

Wall-mounting dimmer with integral solid-state controller allowing Up, Down or to Preset intensity level control from any number of push-button stations connected in parallel. Available for 5000*-watt maximum or 2000-watt maximum. Up to five type TU slave units can be controlled from one type PTU.

Size: 15 $\frac{3}{4}$ -in. (400-mm) wide \times 11-in. (280-mm) high overall \times 6 $\frac{1}{2}$ -in. (165-mm) deep.

Type MTU, Type TU 200/250v 50 Hz

Where automatic control is not required and simple control from a dimmer lever is required a Type TU dimmer for a single circuit or a Type MTU and Type TU slave units, collectively or individually controlled can be used.

*Similar equipment available for 110/120v 60Hz



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