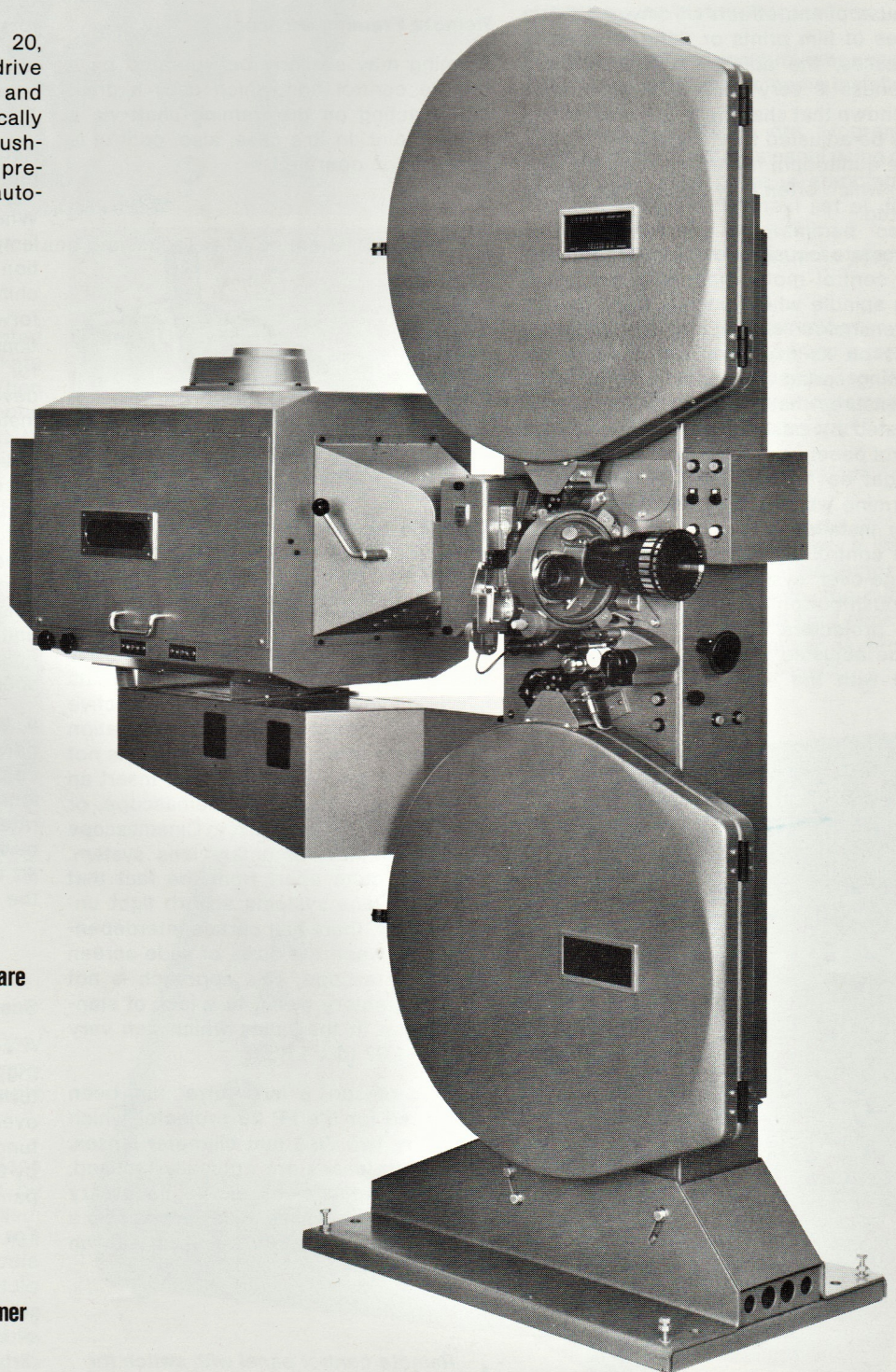




FP 20 – Remote Control and Automation

The publication describing the FP 20, 35 mm Projector points out that the drive motor, the picture change-over device and the film rupture device can be electrically operated by means of a relay with push-button control. This is an essential prerequisite for remote control and automation of the projector.



Some auxiliary units for automating or remotely controlling projector functions are described below:—

- Remote Focusing Device
- Remote Framing Device
- Motor-Operated Lens Turret
- Motor-Operated Aperture Changing
- Retardation of Ignition
and Automatic Ignition Unit
- Scanning of the Film Contacts
- Automatic Change-over System
- Automation using the Matrix-Programmer

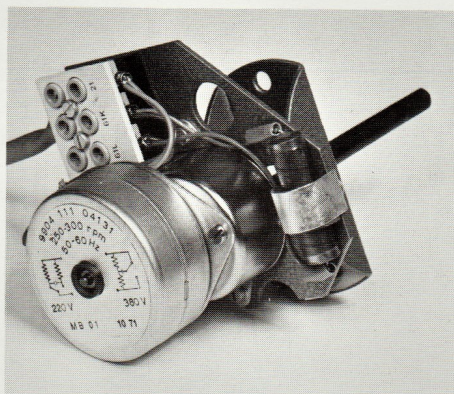
Remote Control Unit

Remote control offers marked advantages to many types of user, including private, studio and cinema operators, as it avoids the projectionist having to be continually present in the booth, by enabling him to operate the projection equipment from the auditorium or – if several cinemas are involved – from a common control desk. The use of television monitors is of particular benefit in these cases. All necessary control functions are carried out from push-button panels and any number of remote control panels can be connected in series at different locations.

Remote Focusing Device

Because of the effects of different thicknesses of film prints or different printing processes, the ability to adjust picture sharpness is very important; experience has shown that sharpness can most effectively be adjusted from a suitable location in the auditorium rather than in the booth itself, which often may be far from ideally situated.

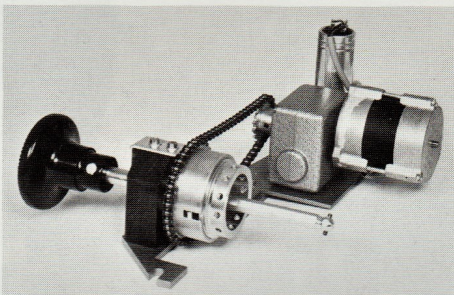
The remote focusing device consists mainly of a control motor operating a flat key via a spindle which pushes the lens and the lensholder slowly forwards or backwards on its fixed support towards the retaining spring. The construction of the key ensures that it cannot seize up. It is operated by push-buttons at the remote control panel, and since from this position it might not be immediately possible to determine which projector of a multi-projector installation is in operation, the remote control device is connected to the change-over system, consequently only one push-button assembly is required for both projectors. Picture sharpness can still be adjusted manually on a projector fitted with the remote focusing facility.



Motor-driven focusing unit

Remote Framing Device

Framing may similarly be operated by a remote control unit which uses a drive motor acting on the framing shaft via a friction joint. In this case, also, control is push-button operated.



Motor-driven framing unit

Motor-Operated Lens Turret

A supporting programme will generally consist of two different picture formats which will involve changing the objective lens. When remote control or automation devices are fitted, manual changing is not possible. A simple method is to insert an anamorphic system for Cinemascope, or to adjust from wide screen to Cinemascope by using a supplementary lens system. However, quite apart from the fact that additional lens systems absorb light unnecessarily, there is a certain interdependence between the sizes of wide screen and Cinemascope. This approach is not very satisfactory owing to a lack of standardisation in the ratios which can vary from 1:–1.37 to 1:1.85.

For this reason, a lens turret has been developed for the FP 20 projector which can carry two 70.6 mm diameter lenses. Once both lenses are optimally focused, no further adjustment will be necessary when changing lenses. Also, lenses with a 62.5 mm diameter can be used with an appropriate sleeve.

The lens turret is motor operated under push-button control. An electronic control unit provides both rapid change, and precise, positive insertion of the lens into the system. The aperture is closed during the rapid changing process, so that the audience is unaware of the change in picture size.

Motor-Operated Aperture Changing

Different picture sizes demand different aperture dimensions. For this reason, apertures are altered by vertical displacement and precisely adjusted using a small control motor, operating in parallel with the lens turret. All aperture changes, therefore, are carried out by, and in time with, the lens turret control unit.

Retardation of Ignition and Automatic Ignition Unit

When incandescent lamps or halogen lamps are used, as well as manual operation at the lamphouse, 'on' and 'off' switching may be carried out by a straightforward automatic procedure using additional contacts of the motor relay. However, for Xenon operation, certain additional devices are required. These may be easily installed in the projector assembly.

Reliable ignition of the Xenon lamp is an essential prerequisite for remote control and automation. Should the Xenon lamp not ignite at the first pulse, the ignition process has to be repeated automatically using short pulses until ignition occurs. This is achieved by the automatic ignition unit which is designed to prevent ignition noises being transmitted to the loudspeaker.

If the rectifier is being switched on in parallel using a motor relay via the mains contactor, the Xenon lamp cannot be ignited immediately. This is because the rated voltage of the rectifier must first be built up. In this case, the ignition is retarded, so that the first pulse occurs only when the rectifier has achieved its full voltage.

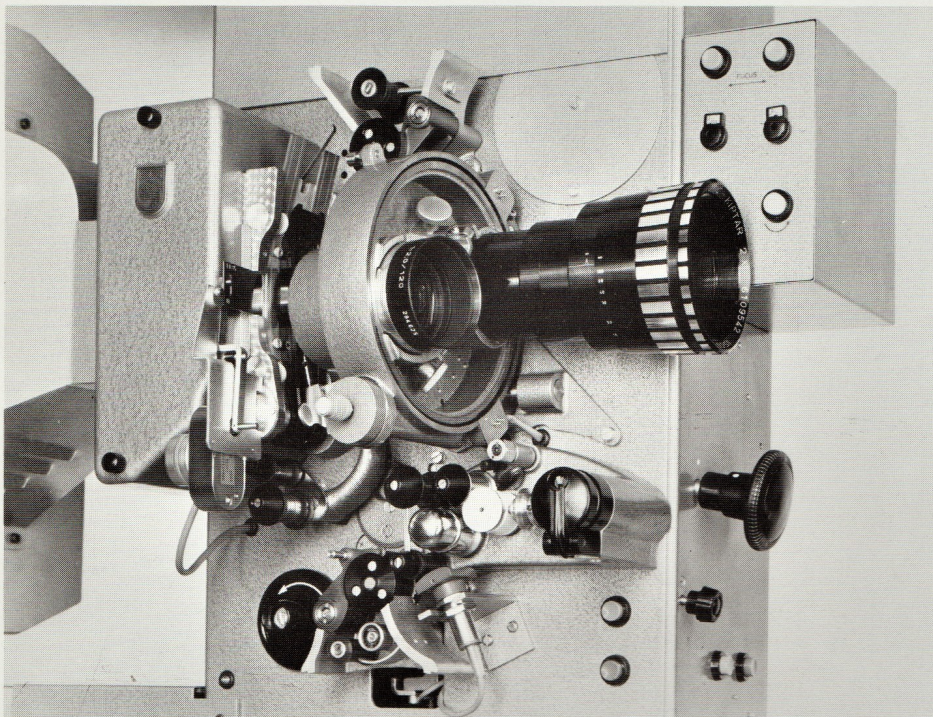
Scanning the Film Contacts

A control pulse is necessary in order to trigger automatic operation of the lens turret, to operate automatic lens change-over, and to allow control of the other functions. This pulse can be generated by the push-buttons on the remote control panel, or by the running film itself.

For operation by the film, a metal foil is stuck on the frame line between two pictures. From this position, it can be removed more readily than from the edge of the film or the perforation, and avoids dirtying the sprockets or other parts of the film guide system.

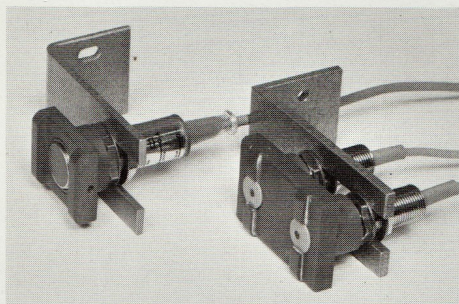


Remote control panel with switch for motor-driven volume control



Lens turret and aperture changing device and proximity switch on the FP 20 projector

A proximity switch or sensor is mounted on a support with a short slide skate not directly in contact with the film. When the metal foil passes, an electromagnetic pulse is generated. This is sufficient to operate a control relay with one or more functions.



Proximity switch for single or double scanning

The proximity switch is supplied with 24v direct current. If this voltage is not normally available, a separate power supply unit can be provided.

If two different, independent functions have to be controlled and operated by pulses, a double sensor can be supplied. In this case, the metal foil is only half the picture height.

Experience has shown that this scanning system is preferable to any other because of its high reliability and its immunity to dust and dirt.

Change-Over System

If projector change-over is to be effected by means of a remote control pulse or by scanning of film contacts, a change-over system is built into one of the projectors.

A motor is started via a motor relay by the control pulse which operates all functions necessary for the change-over through control discs and micro switches.

When the change-over is completed, the change-over system returns to the zero

position in readiness for another change-over, when the next pulse is given.

Matrix Programmer

The capabilities of the various remote control and automation facilities already described are extremely comprehensive, and fully attuned to the demands of modern cinema technology. A further important stage is to combine the control units for operating the projector, lens turret, aperture changing, and projector change-over in one single device and, in addition, to provide control of auditorium lighting, stage-lighting, stage curtains, screen masking and intermission timing. These requirements are met simply and reliably by the Matrix Programmer.

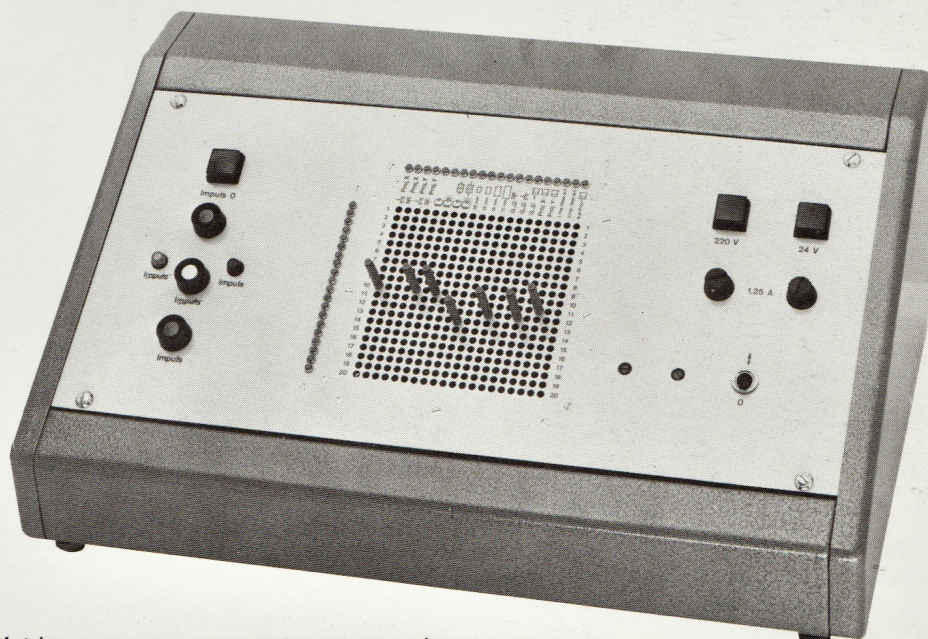
The Matrix Programmer provides universal, automatic control of a cinema installation.

The projection stages are programmed in advance on the Matrix panel using diode plugs. After each pulse, a stepping mechanism brings in the next set of diodes and executes the programmed instructions. A total of 20 programme steps are possible.

Depending on the programming, an electronic pulse unit can operate a second pulse after 5 or 10 seconds, so that a time delay can be achieved automatically for change-over or other functions.

Pulses are transmitted by relays to the controlled devices.

In the event of film rupture, a safety-device ensures that the projector and light source are shut down, the curtains are closed, the auditorium light dimmer is operated, and interval music is brought up to replace the optical sound.



Matrix-programmer – easy to survey and to operate

