

PHILIPS



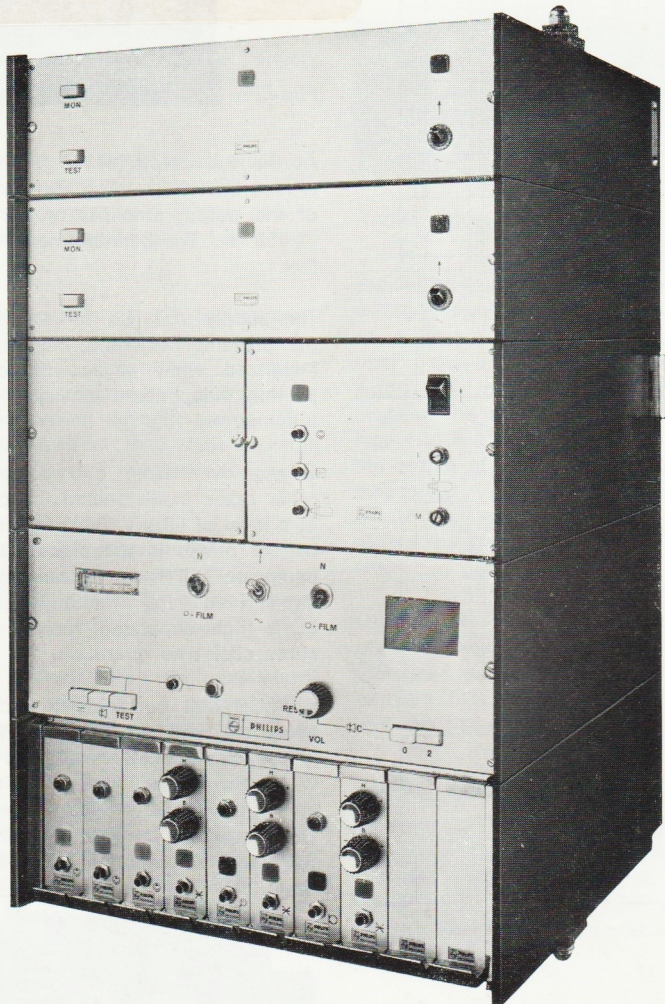
FILM PROJECTION EQUIPMENT



**EMI Sound & Vision
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EMI Pathe Division

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Fully transistorised cinema amplifier equipment, type "O₂"



Superb sound reproduction
Utterly reliable
Compact
Operational simplicity
Built-in test facilities
Extremely flexible

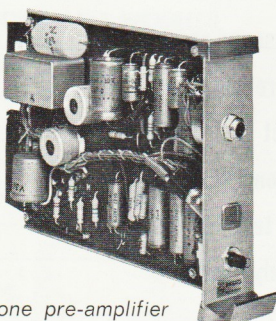
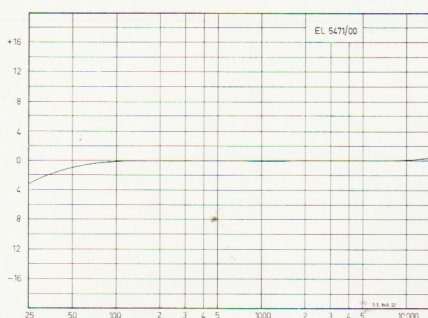
This fully transistorized cinema amplifier equipment satisfies the most stringent demands of cinema sound track reproduction. It is suitable for the reproduction of the optical sound track of 35 mm films. In addition up to three non-sync sound sources can be handled, such as microphones, gramophones or tape-recorders.

All conventional mains voltages and frequencies can be used to power the equipment. Remote and automatic control facilities are available. The equipment is suit-

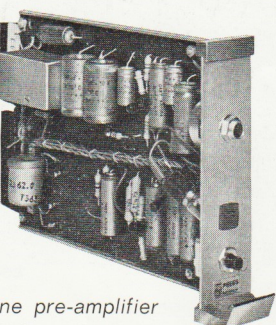
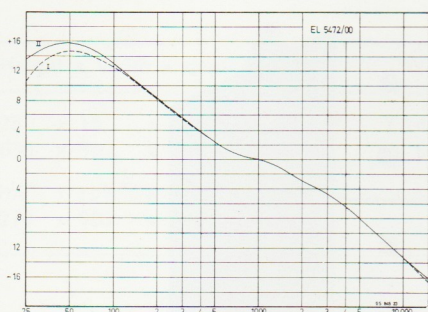
able for use under tropical conditions and is easily adapted to projectors and loud-speakers of various manufacture.



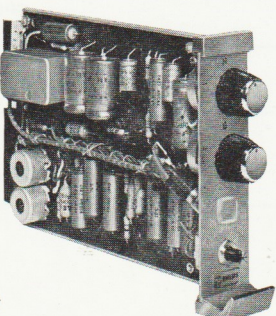
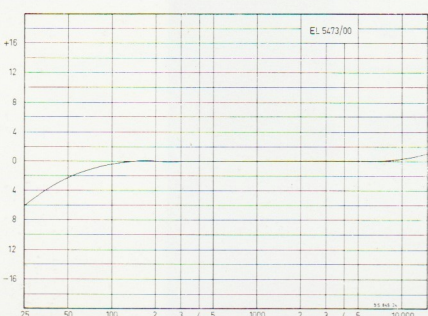
Optical pre-amplifier



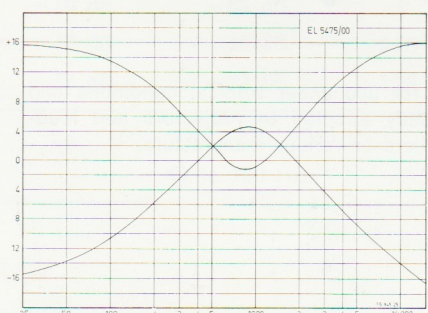
Gramophone pre-amplifier



Microphone pre-amplifier

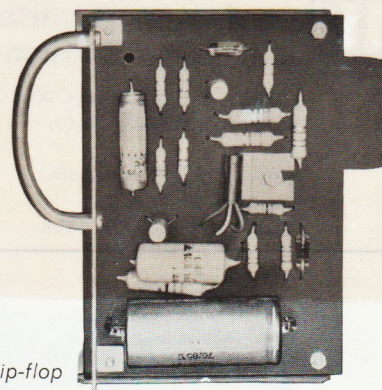


Filter unit



PERFECT SOUND REPRODUCTION

In this equipment each soundhead and each non-sync. sound source has its own pre-amplifier with adjustable gain. The sound volume of all the signals can therefore be set accurately to the same level. Moreover, each channel has its own filter unit. Consequently, the frequency responses of all the channels can be adjusted independently of each other so as to provide the best possible adaptation to the prevailing acoustics of the auditorium.



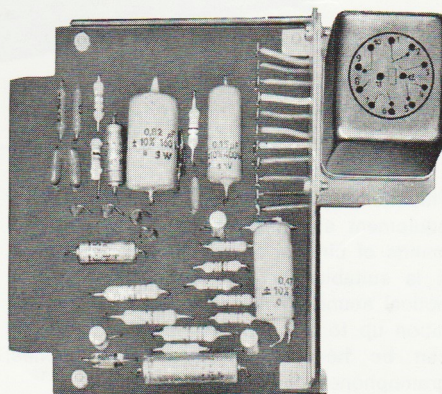
Flip-flop

At the full output of 40 W the distortion is less than 1.5 %. The frequency response of the output amplifier is flat from 40 to 12 000 Hz. The hum-and-noise level is very low.

The supply voltages for the exciter lamp, the pre-amplifiers and the filter units are stabilised, which makes the sound reproduction independent of mains-voltage fluctuations.

Change-over from one projector to the other takes place behind the pre-amplifiers at a level of 80 mV, 5000 Ω and without the use of relays in the signal leads. In this equipment all the switching operations in signal leads are effected with the aid of LDRs (light-dependent resistors), which assures click-free operation.

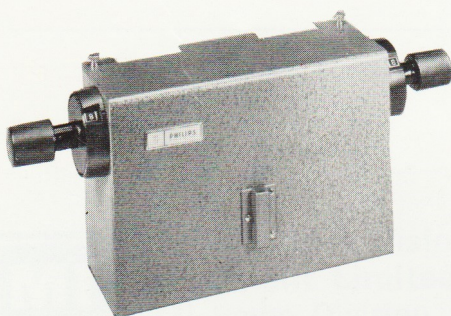
An LDR unit consists of a cadmium sulphide cell and a 6-V lamp. When the cell is not illuminated, its resistance is very high; when the cell is illuminated, it drops to a low value. Cells of this kind are inserted in series with the outputs of all the pre-amplifier and filter units. A signal is allowed to



Relay unit

pass by the switching on of the LDR lamps of all the units in its path, which is effected

by means of flip-flops. These are transistorised switching elements without moving parts.



Main volume control

MAXIMUM RELIABILITY

With this equipment utmost reliability—so important for cinemas—is achieved by means of:

- LDRs instead of relays,
- transistors instead of valves,
- printed circuits instead of the conventional wiring,
- plug-in units

The LDRs, unlike relays, contain no moving components nor soiling contacts. The 6-V LDR lamp operates at a voltage of 5 V; because of this undervoltage it has a very long life.

Only for change-over of the exciter lamp and for the dowser supply is one relay per projector used. A complete equipment therefore contains two relays at the most. These are housed in air-tight boxes; after a life test, during which they were operated 250 000 times, they did not show any measurable wear.

Transistors contain no components subject to deterioration, such as the filament of a valve, and hence their life is many times longer.

The use of printed wiring excludes short-circuits, such as may occur in normal wiring because of a worn insulation. Moreover the soldering spots are much more reliable.

Each equipment comprises a spare plug-in unit for the output-amplifier. Spare plug-in units can also be supplied for the filter, the supply, the relay and the flip-flop units.

SMALL DIMENSIONS

Because of the use of transistors and of printed wiring, this equipment is much smaller than its predecessors. Consequently it fits easily even into rather small projection booths. The dimensions are indicated on the back page.

VERY EASY OPERATION

Near each sound source there is a push-button. Simply pressing it will open the path for the relevant sound signal and simultaneously block the paths of the other signals. The push-buttons near the projectors serve at the same time for opening the relevant dowser so that picture and sound are changed over simultaneously

from one projector to the other.

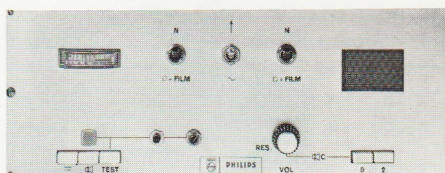
The equipment is switched on by means of the master mains switch and the volume is adjusted with the aid of the main volume control.

MINIMUM MAINTENANCE

As this equipment contains only two relays and no valves, maintenance involves nothing more than keeping it dust-free.

BUILT-IN CHECKING DEVICES

Normally the spare output amplifier is used as a monitor amplifier to which the loudspeakers near each projector (two or three) are connected. The sound volume of the monitor speakers depends on the position of the main volume control but can in addition be adjusted to the desired level by a separate control on the control panel.



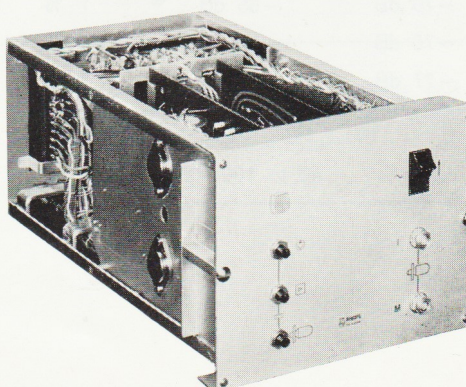
Control panel

Behind the control panel there is an oscillator/measuring amplifier, also constructed as a plug-in unit. All the pre-amplifiers, filter units and output amplifiers are provided with a test button. When that is pressed the oscillator supplies a 1000 Hz signal to the input of the relevant unit and the output of the latter is connected to the measuring instrument via the measuring amplifier. The reading on the meter must always be $0 \text{ dB} \pm 1 \text{ dB}$, so that no mistakes are possible.

On the measuring instrument can also be read the exciter-lamp current and the supply voltages for the pre-amplifiers after the relevant test button on the power-supply unit has been pressed.

GREAT VERSATILITY

The pre-amplifier rack contains space, sockets and wiring for a third optical pre-amplifier and a third relay unit so that an additional 35 mm projector for optical sound can be connected after adding these plug-in units.



Power-supply unit

Moreover, the equipment can easily be extended later on for four- or six-channel magnetic sound reproduction. The control panel is already completely equipped for this purpose.

The microphone pre-amplifier is also suitable for the connection of a tape recorder or a gong.

The gramophone pre-amplifier can be used for both crystal and magnetodynamic pickups.

MAINS VOLTAGES AND FREQUENCIES

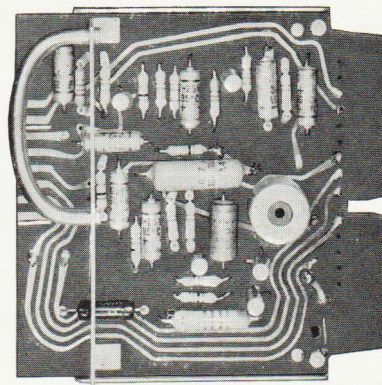
The equipment is suitable for a.c. mains with a rated voltage of 110 - 125 - 220 - 250 V and with a frequency of 40 to 100 Hz, i.e. for practically all existing mains.

SUITABLE FOR USE UNDER TROPICAL CONDITIONS

The equipment is suitable for indoor use at an ambient temperature of up to 113°F (45°C) and an air humidity of up to 100 %.

FACILITIES FOR REMOTE CONTROL AND AUTOMATION

A great advantage of the flip-flops is that any desired number of remote controls or contacts of an automatic programme selector can readily be connected to them, in parallel with the push-buttons of the relevant sound sources.



Oscillator/measuring amplifier

MATCHING TO PROJECTORS AND LOUDSPEAKERS OF OTHER MAKES

As a rule, matching is very simple since:

- the equipment is supplied with, optionally, a 5 V - 4 A or 6 V - 5 A or 9 V - 4 A exciter-lamp supply;
- the equipment can supply a dowser voltage of both 90 V d.c. and 6 V a.c.;
- the output impedance of the output amplifiers can be set as required to 250 - 125 - 62.5 - 31 - 15.5 - 2.5 Ω .

SURVEY OF THE VARIOUS VERSIONS

Type	Unit	Type LCC 0002/.			
		/20	/22	/23	/24
EL 5471/10	optical pre-amplifier	2	2	2	2
EL 5472/00	gramophone pre-amplifier	1	—	—	1
EL 5473/00	microphone pre-amplifier	1	2	3	2
EL 5475	filter unit	3	3	4	4
EL 5477	output amplifier	2	2	2	2
EL 5478	power supply unit	1	1	1	1
EL 5481	relay unit	2	2	2	2
EL 5482	N/S flip-flop	2	2	3	3

With all versions the one-channel volume control EL 5462/00 is supplied.

On request the pre-amplifier rack can be supplied with optical pre-amplifiers EL 5471/00 for photocell instead of EL 5471/10 Solar cell.

DIMENSIONS AND WEIGHTS

Component	Height x width x depth	Weight
Amplifier assembly LCC 002/.	25" x 15" x 15½"	145 lb
	630 x 380 x 395 mm	66 kg
Volume control EL 5462/00	8¼" x 15¼" x 4"	13 lb
	270 x 390 x 100 mm	6 kg

TECHNICAL DATA

	Voltage	impedance
Inputs:		
Solar cell	1 mV	500 Ω
microphone	1 mV	≥ 2100 Ω
		from 100 - 20 000 Hz
pick-up: crystal	300 mV	≥ 50 000 Ω
magneto-dynamical	30 mV	≥ 40 000 Ω
Output of the output amplifier:		
power	40 W	
voltages	100 - 70 - 50 - 35 - 25 - 10 V	
impedances	250 - 125 - 62.5 - 31 - 15.5 - 2.5 Ω	
	noise level	max. distortion
	average	max. at 1000 Hz
Pre-amplifiers:		
optical	-64 dB	-60 dB 0.1 %
microphone	-65 dB	-60 dB 1 %
gramophone	-70 dB	-65 dB 1 %
Filter units	-76 dB	-70 dB 0.25 %
Output amplifier	-77 dB	-72 dB 1.25 %
Mains voltages	100 - 125 - 220 - 250 V	
Mains frequencies	40 to 100 Hz	