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Dept 43-1

Spare Parts Catalogue

GAUMONT-KALEE

20-WATT AMPLIFIER EQUIPMENT

Technical Data

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Page 1

GAUMONT-KALEE 20 WATT EQUIPMENT

The amplifier channel comprises a small preamplifier and a cabinet mounted power amplifier and exciter lamp supply unit. All valves used are of the internationally accepted and available octal base type.

The preamplifier, type 384, measures only 12 inches wide, by 12 inches high, by 7 inches deep, (30 cm. x 30 cm. x 18cm.), and is mounted on the front wall of the operating enclosure in a position between the two projectors. The coaxial cables from the two soundheads are connected to terminals provided on the preamplifier, and the signal output for connection to the power amplifier is a 500 ohm line. The preamplifier houses the main volume control and the FILM-DISC-MICROPHONE switch.

Two 6SL7GT (or Mullard ECC35) double triodes are employed. These are of the type in which each triode section has its own cathode, permitting different values of cathode bias resistance to be used on the two triode sections contained within the one envelope. The circuit utilises the four sections as four separate triode stages, each stage correctly biassed for the function it discharges.

With the selector switch in the "FILM" position, all four stages are in use. The frequency response of the first stage, which is only used on "FILM" input, is designed to correct the loss introduced at high frequencies by the cell leads. The second stage, to which disc and microphone inputs are connected when the selector switch is in the appropriate position, is a plain gain stage, as is the third stage.

A 21-position, click action, main volume control follows the third stage, and is in turn followed by the fourth stage, which gives no amplification but is a cathode follower bringing the output impedance down to 500 ohms.

The complete preamplifier is assembled on a chassis which is hinged along its bottom line to the case which encloses it. In the normal closed operating position only the two controls, FILM-DISC-MICROPHONE switch, and Volume Control are visible. By withdrawing one knurled headed screw the front cover can be removed, giving access to the two valves. By withdrawing two screwdriver slotted screws the whole chassis can be tipped forward, through 180 degrees, providing access to the wiring and components. The amplifier will continue to function in this upside down position, permitting of inspection under working conditions with inputs and outputs connected.

A remote volume control, for mounting in a position on the front wall adjacent to the right hand machine, is provided. The linkage with the main volume control is by sheathed, flexible cable.

H.T. and heater supplies to the preamplifier are obtained from the power amplifier.

The power amplifier and exciter lamp supply unit are contained in a solidly constructed sheet steel cabinet 34 inches high by 18 inches wide by 10 inches deep (86 cm. x 45 cm. x 25 cm.). If the layout of the operating enclosure makes it desirable, this cabinet can be mounted immediately below the preamplifier, between the two machines, making sensibly one unit of the complete amplifier channel. Alternatively, the cabinet can be mounted

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in any other position in the operating enclosure. In extreme cases it would be quite practicable to mount the cabinet outside the operating enclosure altogether.

The power amplifier employs two 6SL7GT double triodes, three 6L6G or KT66 beam tetrodes (or three EL37 pentodes), and a 5U4G (or U52) full wave rectifier.

The first double triode is used as two separately biassed triode stages of amplification. The second double triode has plates, grids and cathodes strapped, and is used as a single triode phase inverter to feed the power output stage, which comprises two 6L6G's in push pull. The third 6L6G is a separate output stage for the monitor speaker. The power output to the stage speakers is 18 watts with total harmonic distortion not exceeding 1½%. The correct output load is 10 ohms. A switch, which substitutes a dummy load for the speaker load, permits the stage speakers to be cut off without interfering with the monitor speaker. The output to the monitor, which has an independent volume control, is 2½ watts.

Control of frequency response is by an adjustable network between the anode circuit of the first triode stage and the grid of the second triode stage. Bass and treble responses are independently variable.

The complete power amplifier and power supply unit are on one vertically mounted chassis which occupies the upper two thirds of the cabinet. All the valves, transformers, smoothing condensers and controls are on the front of this chassis. The terminals of all these front mounted components project through to the back of the chassis where all the wiring is disposed in one plane. The chassis is hinged at the bottom, and without detaching any wiring, it can be dropped forward until it rests in a horizontal position, where it is securely held. The wiring and the minor components at the back of the chassis are then conveniently displayed for inspection, or attention with a soldering iron. The performance of the amplifier is not interrupted when in this horizontal position, and an elusive intermittent fault can be quickly traced.

Either one of two types of mains transformers is supplied. One has a primary winding tapped for any voltage between 95 and 130 volts, 40 to 100 cycles, the other has a primary for voltages between 190 and 260 volts, 40 to 100 cycles; otherwise they are identical. The secondaries in either case are a 480-0-480 high tension winding, two 6.3 volt windings, one for the preamplifier valves and one for the power amplifier valves, a 5 volt winding for the rectifier filament, and a 20 volt winding for the dry metal rectifier in the exciter lamp unit. The power amplifier with 95-130 volt mains transformer is known as type 415, and with 190-260 volt transformer as type 369.

The smoothing circuit following the full wave 5U4G high tension rectifier is of the choke input type, thereby eliminating the undesirable stress across the first condenser inseparable from a condenser input filter. The smoothing condensers are of the dry electrolytic type, but due precautions have been taken to protect the rest of the circuit against possible condenser failure. In series with each condenser is a fuse, shunted by a resistance. When the equipment is first installed, which may be six months or more after the final factory test, the condenser fuses are withdrawn before the equipment is switched on. The surge current which would flow, with possible damage to the rectifier valve or mains transformer, due to the condensers requiring to be "reformed," is restricted by the series resistances to a safe value. After allowing ten minutes for the condensers to re-form, the current is switched off, the fuses replaced, and the equipment is ready for normal operation. If, after long service, the condenser fails by developing a high value of leakage current, the fuse will blow and safeguard other components.

The exciter lamp supply unit, type 416, has a smooth D.C. output of 8 volts 4 amperes, obtained from a tropically rated Westinghouse selenium

Page 3

rectifier. The smoothing circuit uses two chokes and two 1000 mfd dry electrolytic condensers. The same fuse and resistance protection in series with these condensers is afforded as is used with the high tension smoothing condensers, and on first installation the exciter supply unit should be run for ten minutes with the condenser fuses drawn.

The components of the exciter supply unit are assembled on a shallow vertically mounted tray which occupies the lower third of the cabinet. By undoing one knurled headed screw the front cover can be removed, giving access to the pre-set resistor which is used to adjust lamp voltage. By taking out two screwdriver slotted screws the complete tray can be withdrawn for examination or repair.

Sound changeover is effected by switching the exciter lamps, two switches being provided for mounting in positions convenient to the two operating positions. The switch circuit is such that when one lamp is lighted by smoothed D.C., the other lamp is preheated by approximately 2 amperes A.C. obtained via a series resistance from the 6.3 volt heater winding for the power amplifier valves. In the event of failure of the D.C. supply, the series resistance in the 6.3 volt A.C. supply can be strapped out and the performance continued, without any modification of the switching or wiring, with the exciter lamps fed with A.C. In this emergency condition a little A.C. hum will be audible from the speakers. The reduced voltage as compared with D.C. will necessitate running some three steps higher on the fader.

If, during programme hours, to permit of some adjustment being made, it is necessary to light the exciter lamp in the soundhead not actually in use, this can be done by strapping out the series pre-heating resistance and shielding the photo cell from the modulated light.

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VOLTAGE AMPLIFIERS

The type 384 Voltage Amplifier has been superseded by a new pre-amplifier, type 563. The new type is housed in a case identical with that used for the older pattern, and the two amplifier chassis, part number 384004 for the old, and part number 563001 for the new, are of the same physical dimensions and are interchangeable with each other.

In the earlier amplifier the first two stages of amplification were carried out by the two halves of a double triode. In the new amplifier the place of the double triode is taken by a single pentode, EF37A. (Note that the large physical size of the 6J7G makes this tube unsuitable, as it interferes with hinging the chassis forward out of the case.) The revision of the input stage results in the ability of the G.K. 20 channel to reject outside interference to the same extent as that of the G.K. 21.

The new preamplifier has slightly less sensitivity on the film input than its predecessor, the difference is approximately 3 db. If necessary this can be regained easily by a slight increase in cell potential. All inputs, FILM DISC and MICROPHONE, are taken to the grid of the pentode, but the disc and microphone inputs are attenuated 6 db so that approximately the same setting of the volume control will be employed irrespective of what is connected to the input terminals.

The FILM-DISC-MICROPHONE switch is arranged so that whichever of the three inputs is selected, the other two are grounded. With the switch on FILM, no signal from the pick-up will be received at the grid even though the non-synchronous attachment be running, with a needle in the groove of the record.

With the switch in the FILM position the amplifier's response compensates for the loss at high frequencies due to the self capacity of the cell cables. With the switch in either of the other positions this compensation is cut out.

There has been no alteration of any moment in the last two stages of the amplifier. The revisions affect only the input end of the amplifier, the rest can be accepted for practical purposes as identical with the earlier equipment.

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The control unit type 478, which is most conveniently fixed on the wall immediately above the 'A' amplifier cabinet, incorporates two on-off switches controlling A.C. supply to the 'A' and 'B' power amplifiers, and a rotary switch for selection of the 'A' and 'B' channels. The rotary switch is a heavy duty, enclosed, four section type, and operation of the switch simultaneously transfers stage speakers, monitor speaker, and exciter lamps to either the 'A' or 'B' channel. The four sections handle respectively stage speakers, monitor speaker, D.C. to exciter lamps, and A.C. (preheating) current to exciter lamps.

There is no switching of signal circuits between preamplifiers and power amplifiers, and no switching of high tension and heater supplies between pre- and power amplifiers. The signal output of preamplifier 'A,' the upper of the two in the dual preamplifier, is permanently connected to power amplifier 'A,' and high tension and heater supply circuits for preamplifier 'A' are permanently connected to power amplifier 'A.' Similarly, preamplifier 'B,' in respect of signal, high tension, and heater circuits, is permanently connected to power amplifier 'B.'

In operation if any fault develops in the channel in use, whether in the main volume control, the FILM-DISC-MICROPHONE switch, any part of the amplifier chain, or the exciter lamp supply unit, it is only necessary to throw over the two rotary switches, one on the panel which divides the two preamplifiers and the other in the 478 control box, and a complete new channel is brought into use.

It is recommended that the practice be adopted of employing the alternative channels on alternate weeks. This will ensure a constant check on the performance of the two channels and prevent the possibility of electrolytic condensers lying unused for long periods.

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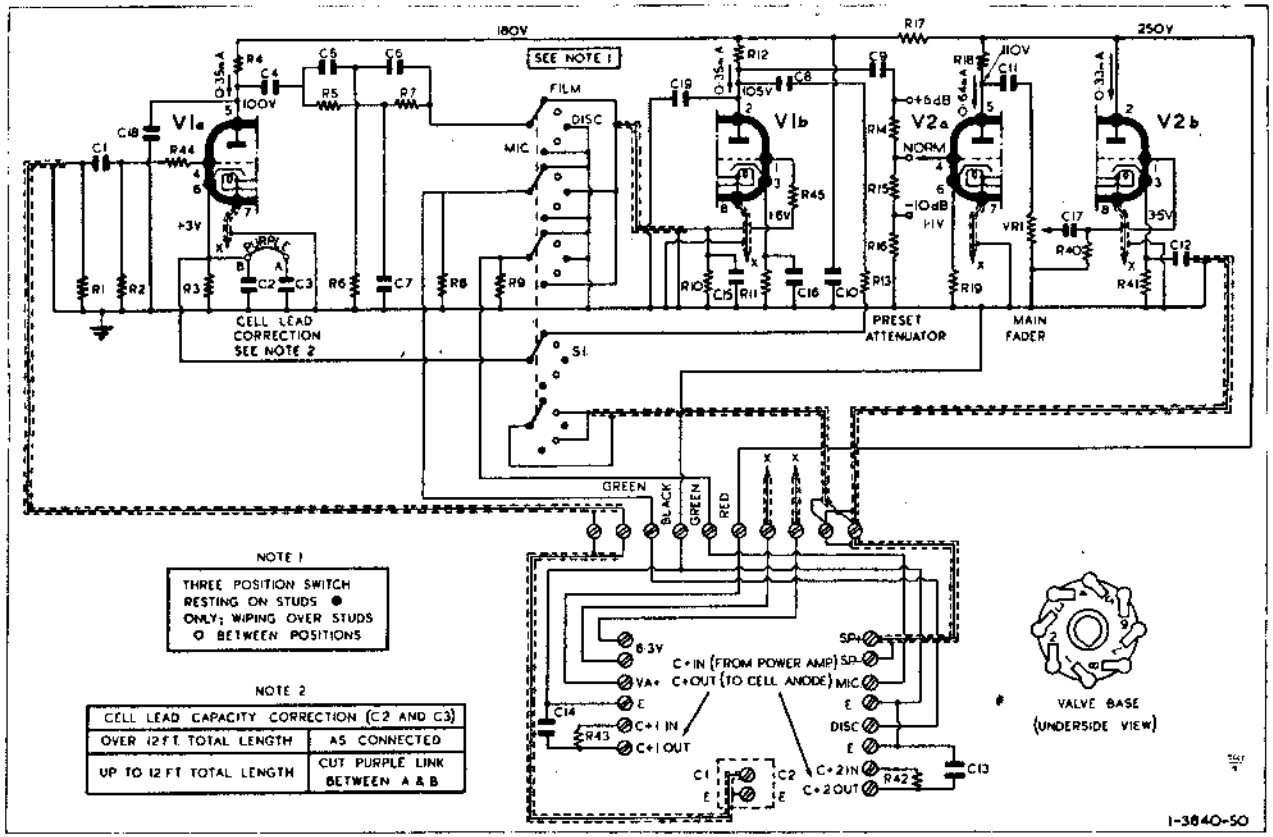
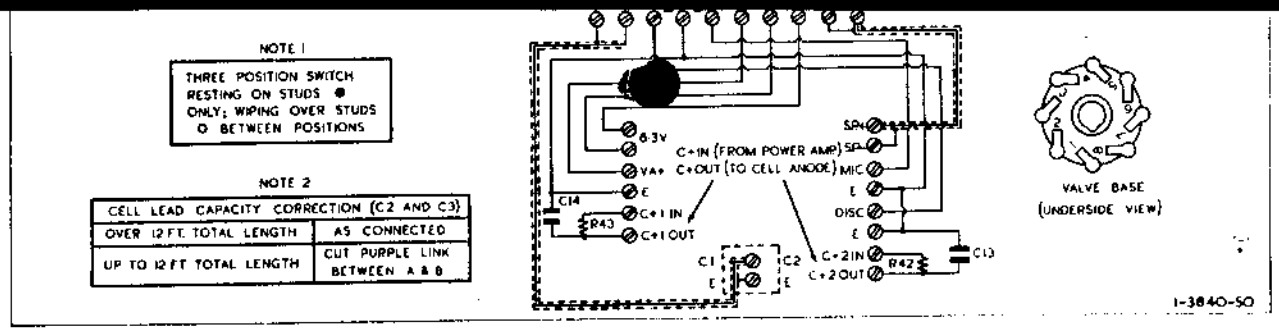
VOLTAGE AMPLIFIER TYPE 384



COMPONENTS SUPPLIED AS SPARE PARTS

Part No.	Description	Drawing Ref.	Part No.	Description	Drawing Ref.
384057	100,000 Ohms Fader	VR.1	384058	FILM-DISC-MICROPHONE Switch	S1
	1·4 Megohms plus/minus 20%	R.40			
	0·01 Microfarad plus/minus 10%	C.17			



COMPONENTS SUPPLIED AS SPARE PARTS

Part No.	Description	Drawing Ref.	Part No.	Description	Drawing Ref
384057	100,000 Ohms Fader	VR.1	384058	FILM-DISC-MICROPHONE Switch	S1
	1·4 Megohms plus/minus 20%	R.40			
	0·01 Microfarad plus/minus 10%	C.17			

RESISTANCE AND CONDENSER VALUES

Drawing Ref.	Value	Drawing Ref.	Value	Drawing Ref.	Value
R1	220,000 Ohms plus/minus 5%	R16	22,000 Ohms plus/minus 5%	C10	2 Microfarad plus/minus 15%
R2	220,000 Ohms plus/minus 5%	R17	100,000 Ohms plus/minus 10%	C11	0·25 Microfarad plus/minus 20%
R3	3,900 Ohms plus/minus 5%	R18	220,000 Ohms plus/minus 20%	C12	2 Microfarad plus/minus 25%
R4	220,000 Ohms plus/minus 20%	R19	2,200 Ohms plus/minus 10%	C13	0·01 Microfarad plus/minus 15%
R5	180,000 Ohms plus/minus 10%	R41	10,000 Ohms plus/minus 10%	C14	0·01 Microfarad plus/minus 15%
R6	180,000 Ohms plus/minus 10%	R42	1 Megohm plus/minus 20%	C15	40 Picafarad plus/minus 20%
R7	1·8 Megohm plus/minus 10%	R43	1 Megohm plus/minus 20%	C16	40 Picafarad plus/minus 20%
R8	1 Megohm plus/minus 20%	C1	0·05 Microfarad plus/minus 20%	V1a, V1b	ECC 35
R9	1 Megohm plus/minus 20%	C2	0·01 Microfarad plus/minus 15%		
R10	1 Megohm plus/minus 20%	C3	0·005 Microfarad plus/minus 15%	V2a, V2b	ECC 35, 6SL7GT
R11	4,700 Ohms plus/minus 10%	C4	0·02 Microfarad plus/minus 20%		
R12	220,000 Ohms plus/minus 20%	C5	0·1 Microfarad plus/minus 20%	R44	10,000 Ohms plus/minus 20%
R13	100,000 Ohms plus/minus 5%	C6	0·01 Microfarad plus/minus 25%	R45	10,000 Ohms plus/minus 20%
R14	68,000 Ohms plus/minus 5%	C7	0·1 Microfarad plus/minus 20%	C18	40 Picafarad plus/minus 20%
R15	47,000 Ohms plus/minus 5%	C8	0·25 Microfarad plus/minus 20%	C19	40 Picafarad plus/minus 20%
		C9	0·1 Microfarad plus/minus 20%		

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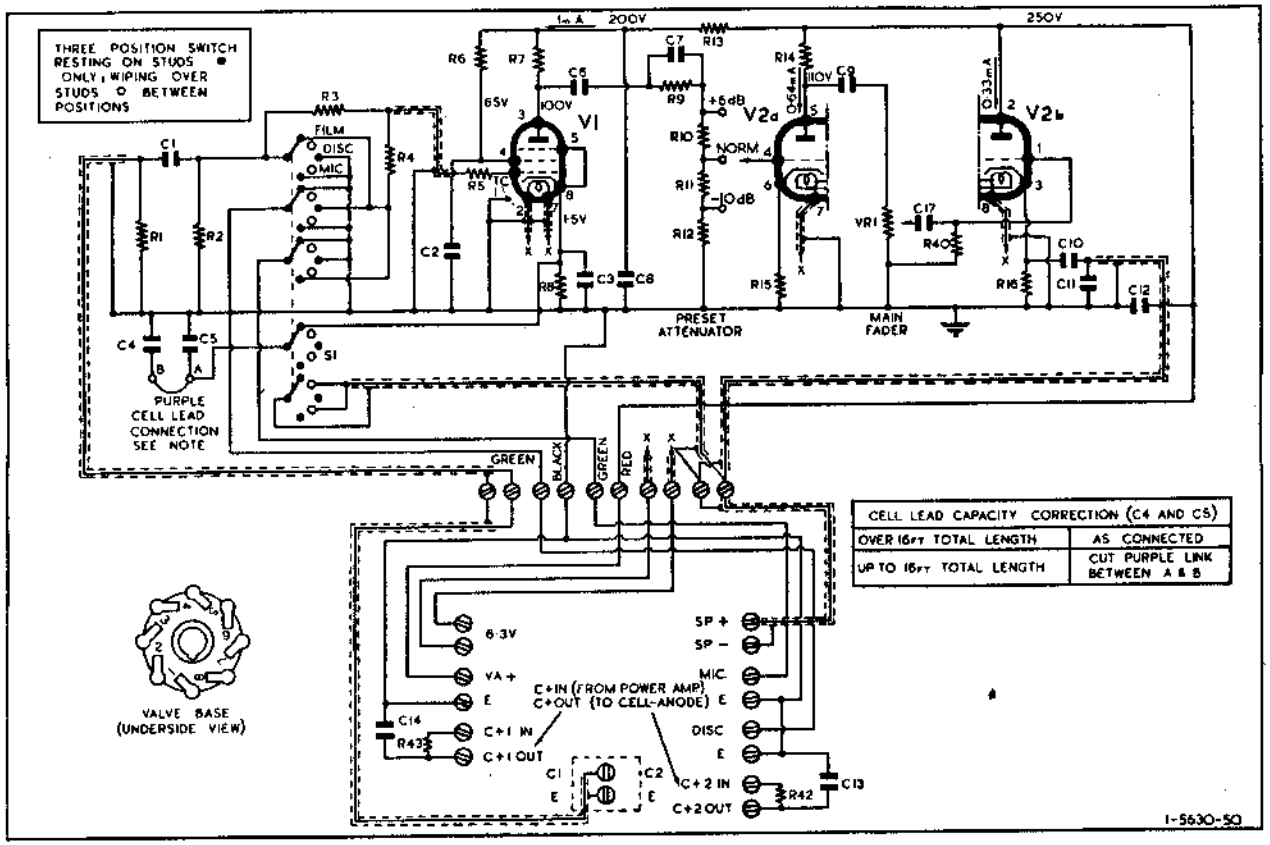
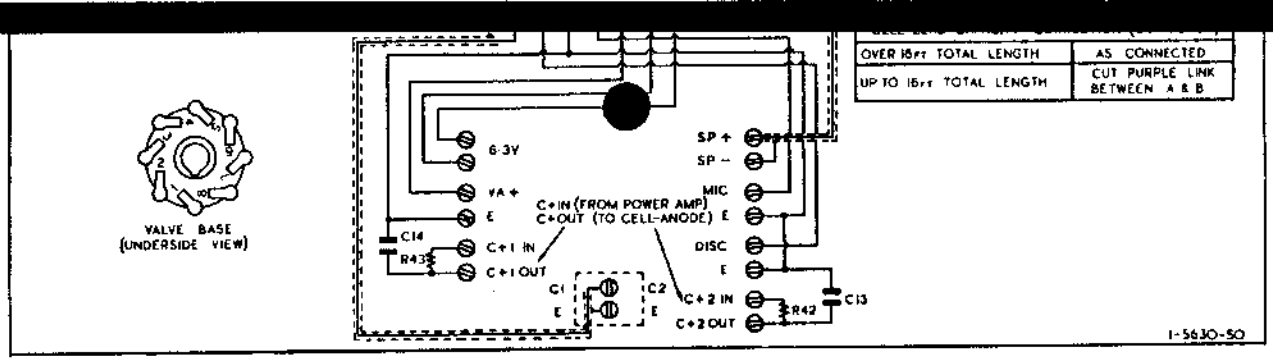
VOLTAGE AMPLIFIER TYPE 563



COMPONENTS SUPPLIED AS SPARE PARTS

Part No.	Description	Drawing Ref.	Part No.	Description	Drawing Ref.
384057	100,000 Ohms Fader	VR.1	384058	FILM-DISC-MICROPHONE Switch	S.1
	1·5 Megohms plus/minus 20%	R.40			
	0·01 Microfarad plus/minus 10%	C.17			



COMPONENTS SUPPLIED AS SPARE PARTS

Part No.	Description	Drawing Ref.	Part No.	Description	Drawing Ref.
384057	100,000 Ohms Fader	VR.1	384068	FILM-DISC-MICROPHONE Switch	S.1
	1·5 Megohms plus/minus 20%	R.40			
	0·01 Microfarad plus/minus 10%	C.17			

RESISTANCE AND CONDENSER VALUES

Drawing Ref.	Value	Drawing Ref.	Value	Drawing Ref.	Value
R1	100,000 Ohms plus/minus 10%	R13	47,000 Ohms plus/minus 5%	C6	0·05 Microfarad plus/minus 20%
R2	2·2 Megohms plus/minus 20%	R14	220,000 Ohms plus/minus 20%	C7	180 Picafarad plus/minus 5%
R3	330,000 Ohms plus/minus 5%	R15	2,200 Ohms plus/minus 10%	C8	2 Microfarad plus/minus 15%
R4	330,000 Ohms plus/minus 5%	R16	10,000 Ohms plus/minus 10%	C9	0·1 Microfarad plus/minus 20%
R5	47,000 Ohms plus/minus 20%	R42	1 Megohm plus/minus 20%	C10	2 Microfarad plus/minus 25%
R6	470,000 Ohms plus/minus 10%	R43	1 Megohm plus/minus 20%	C11	100 Picafarad plus/minus 20%
R7	100,000 Ohms plus/minus 10%	C1	0·01 Microfarad plus/minus 15%	C12	0·05 Microfarad plus/minus 20%
R8	1,500 Ohms plus/minus 5%	C2	0·25 Microfarad plus/minus 20%	C13	0·01 Microfarad plus/minus 15%
R9	150,000 Ohms plus/minus 5%	C3	40 Picafarad plus/minus 20%	C14	0·01 Microfarad plus/minus 15%
R10	68,000 Ohms plus/minus 5%	C4	0·01 Microfarad plus/minus 15%	V1	EF37, 6J7GT, 6J7
R11	47,000 Ohms plus/minus 5%	C5	0·02 Microfarad plus/minus 20%	V2a, V2b	ECC35, 6SL7GT
R12	22,000 Ohms plus/minus 5%				

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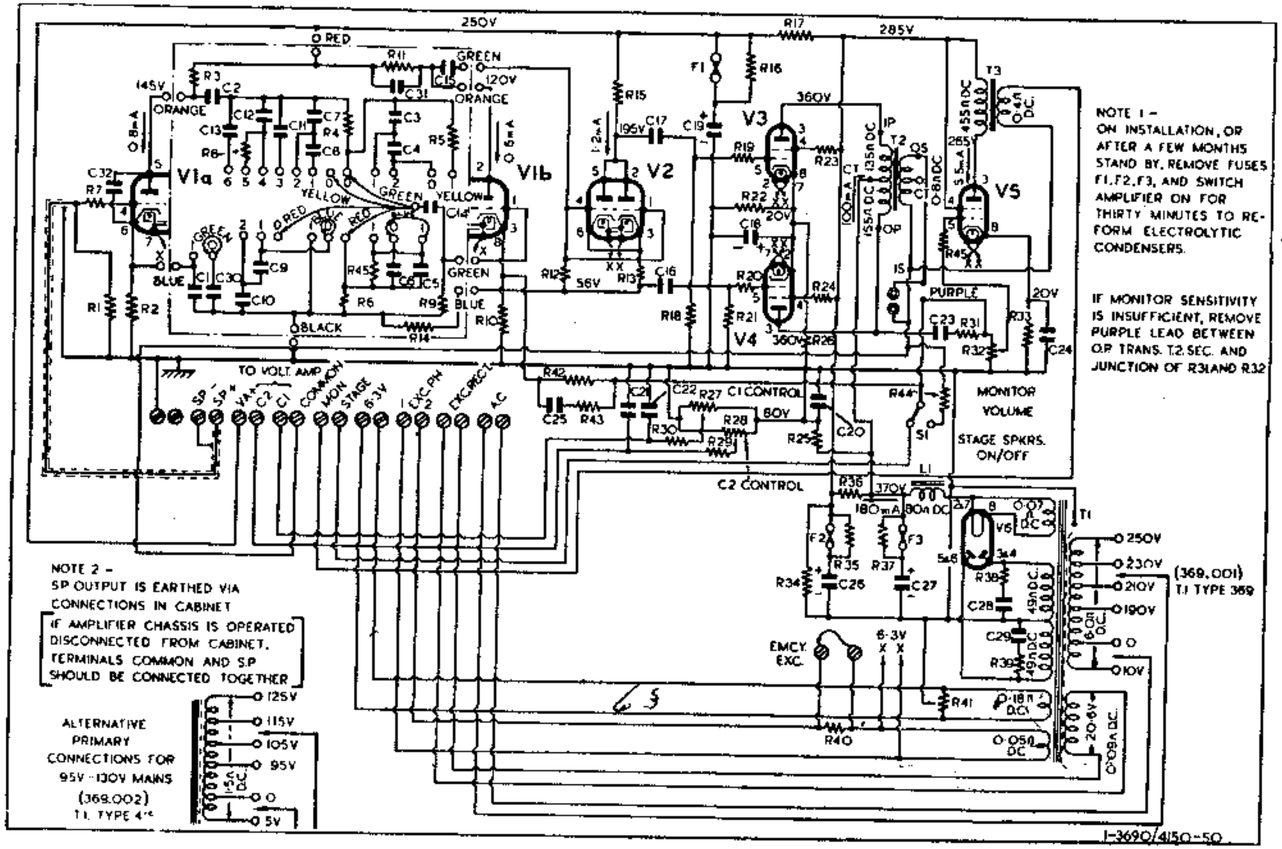
POWER AMPLIFIER 20W TYPES 369/415



COMPONENTS SUPPLIED AS SPARE PARTS

Part No.	Description	Drawing Ref.	Part No.	Description	Drawing Ref.
369,001 369,050	Mains Transformer 190/260V	T1	498,000	O.P. Transformer	T2
			369,003	Mon. O.P. Transformer	T3
369,002 415,002	Mains Transformer 95/130V	T1	68,000	Choke 7H. at 250mA	L1
			369,004	Speaker Switch	S1

RESISTANCE AND CONDENSER VALUES

Drawing Ref.	Value	Drawing Ref.	Value	Drawing Ref.	Value

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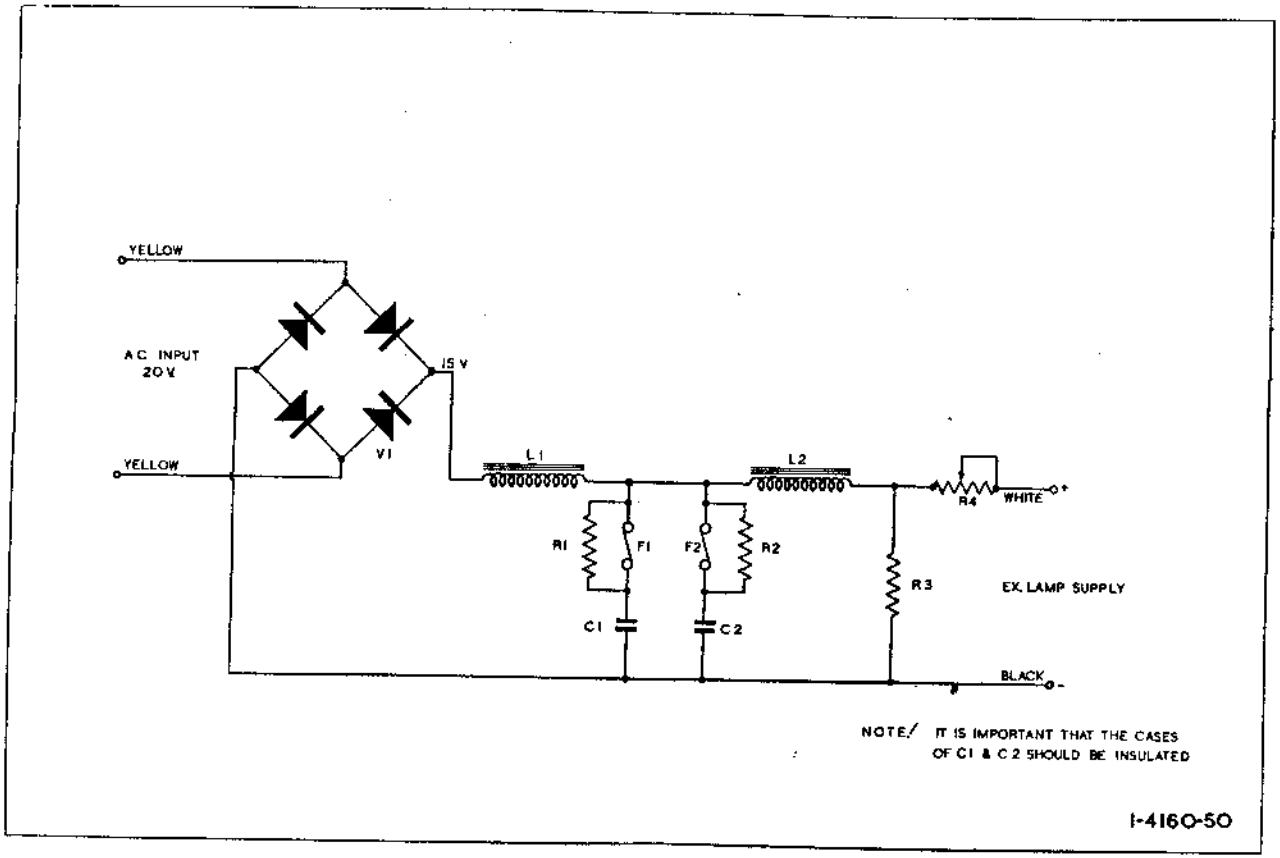
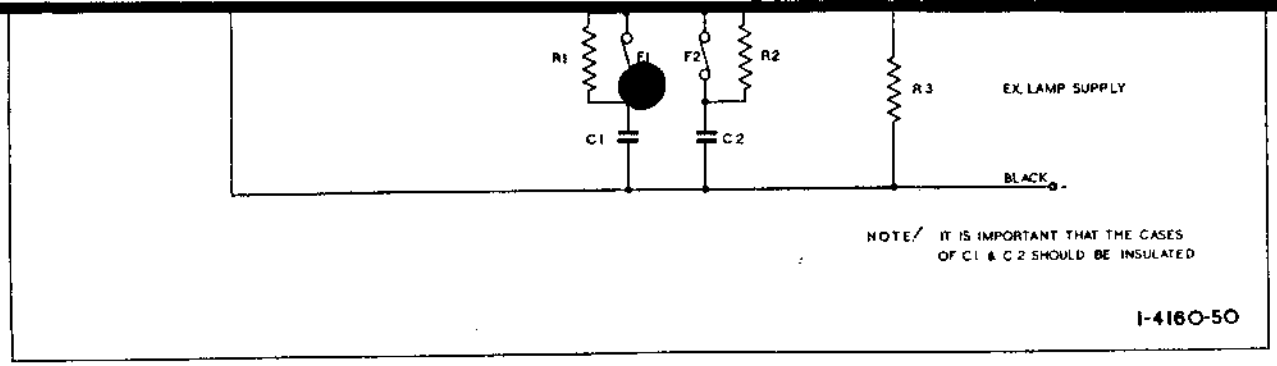
EXCITER LAMP SUPPLY PANEL TYPE 416



COMPONENTS SUPPLIED AS SPARE PARTS

Part No. 395,000

- Choke L1 30 mH 0.4 ohms D.C.
- Choke L2 30 mH 0.4 ohms D.C.



COMPONENTS SUPPLIED AS SPARE PARTS

Part No. 395,000 — Choke L1 30 mH 0.4 ohms D.C.
Choke L2 30 mH 0.4 ohms D.C.

RESISTANCE AND CONDENSER VALUES

Drawing Ref.	Value	Drawing Ref.	Value	Drawing Ref.	Value
R1	1·5K Ohms plus/minus 20% No. 8	C1	1000 Ohms F.25V. CE23C	F1	1 Amp
R2	1·5K Ohms plus/minus 20% No. 8	C2	1000 Ohms F.25V. CE23C	F2	1 Amp
R3	37,000 Ohms plus/minus 5% LW6			V1	Rectifier 12A20
R4	1·3 Ohms plus 10 20% K2/RAYS				

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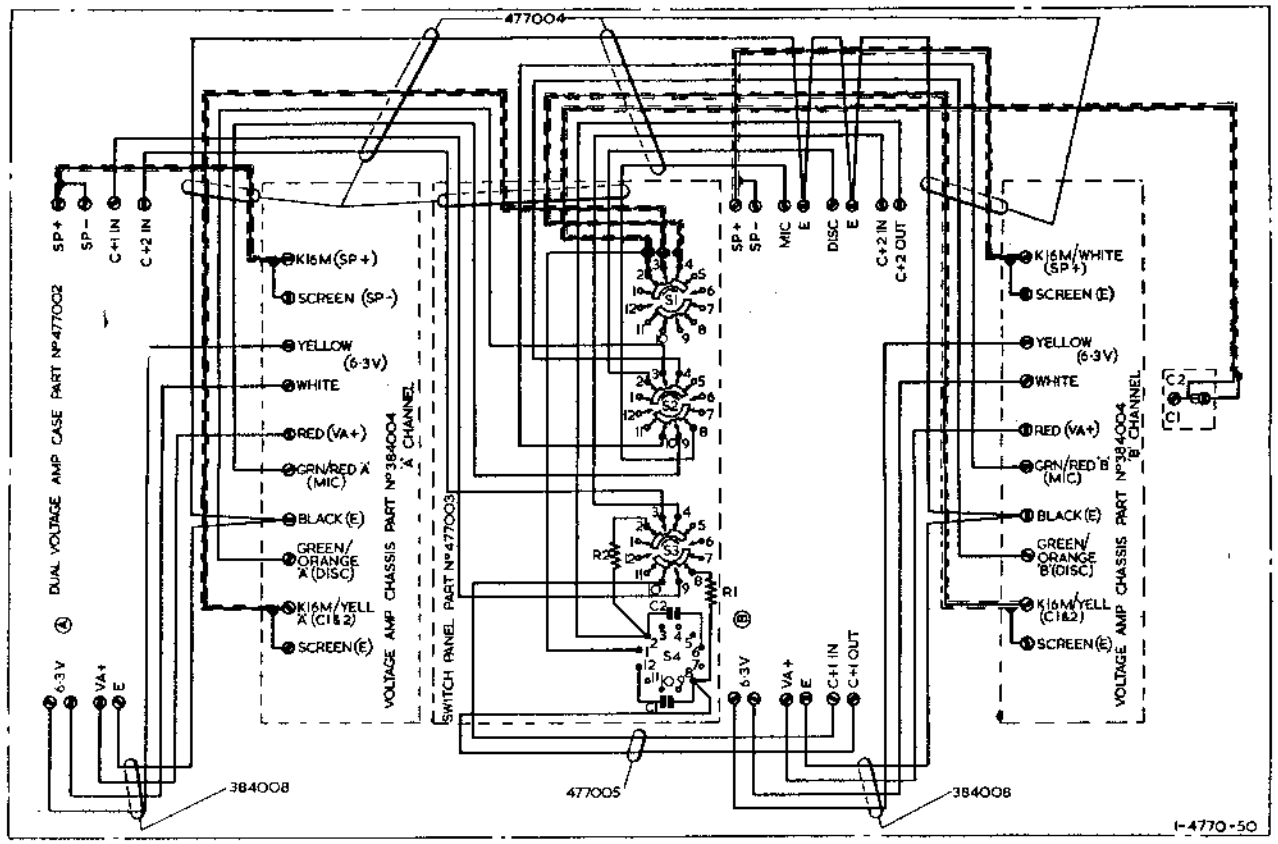
DUAL CHANNEL 20W VOLTAGE AMPLIFIER

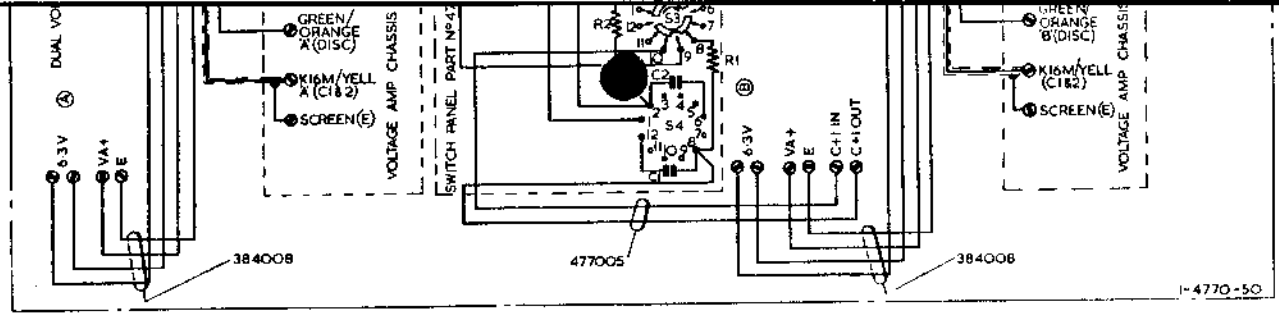
CONTROL PANEL TYPE 477



COMPONENTS SUPPLIED AS SPARE PARTS

Part No.	Description	Drawing Ref.
477015	N.S.F. Oak 'H' Switch	S1, S2, S3, S4

RESISTANCE AND CONDENSER VALUES



COMPONENTS SUPPLIED AS SPARE PARTS

Part No.	Description	Drawing Ref.
477015	N.S.F. Oak 'H' Switch	S1, S2, S3, S4

RESISTANCE AND CONDENSER VALUES

Drawing Ref.		Value
R1	1	Megohm plus/minus 20%
R2	1	Megohm plus/minus 20%

Drawing Ref.	Value
C1	0·01 Microfarad plus/minus 15%
C2	0·01 Microfarad plus/minus 15%

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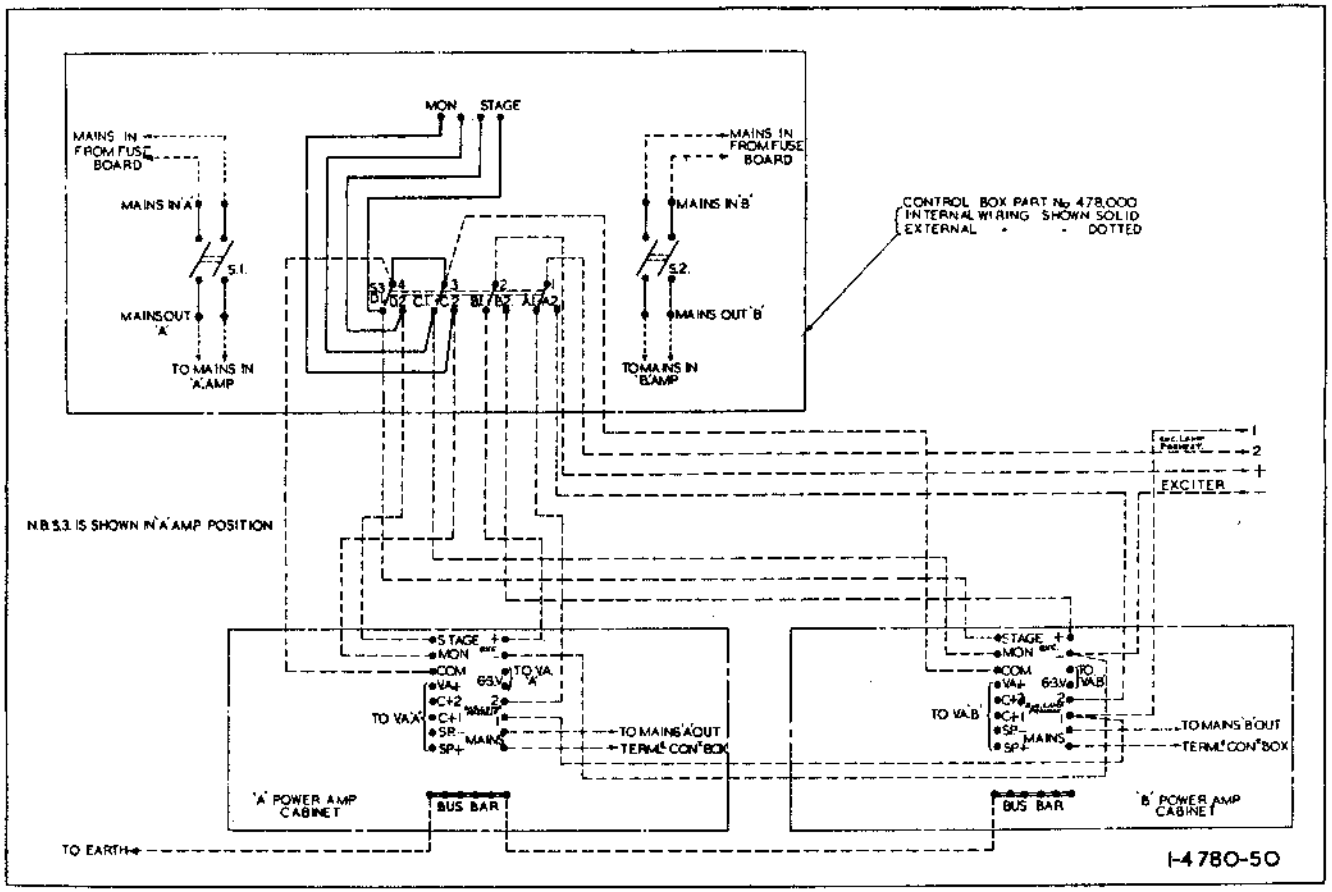
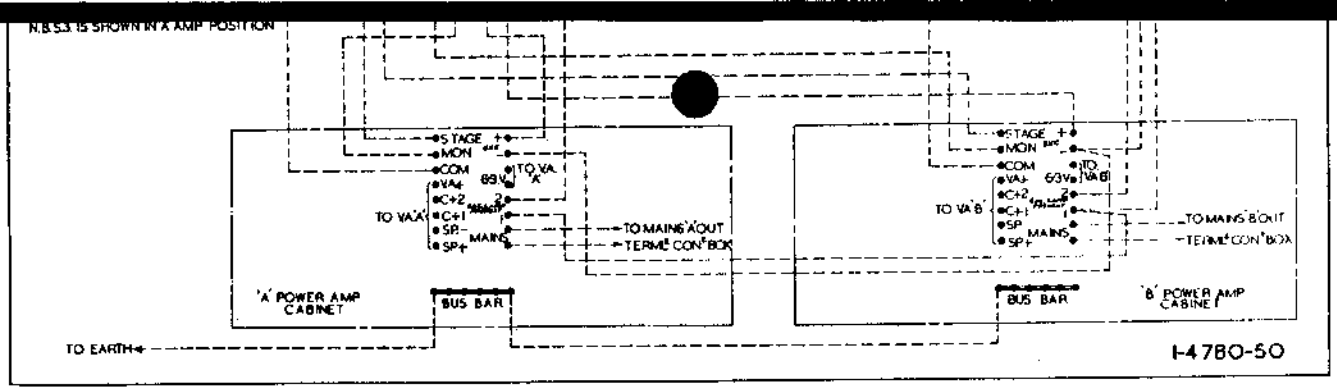
CONTROL BOX TYPE 478 FOR 20W EQUIPMENT



DETAILS

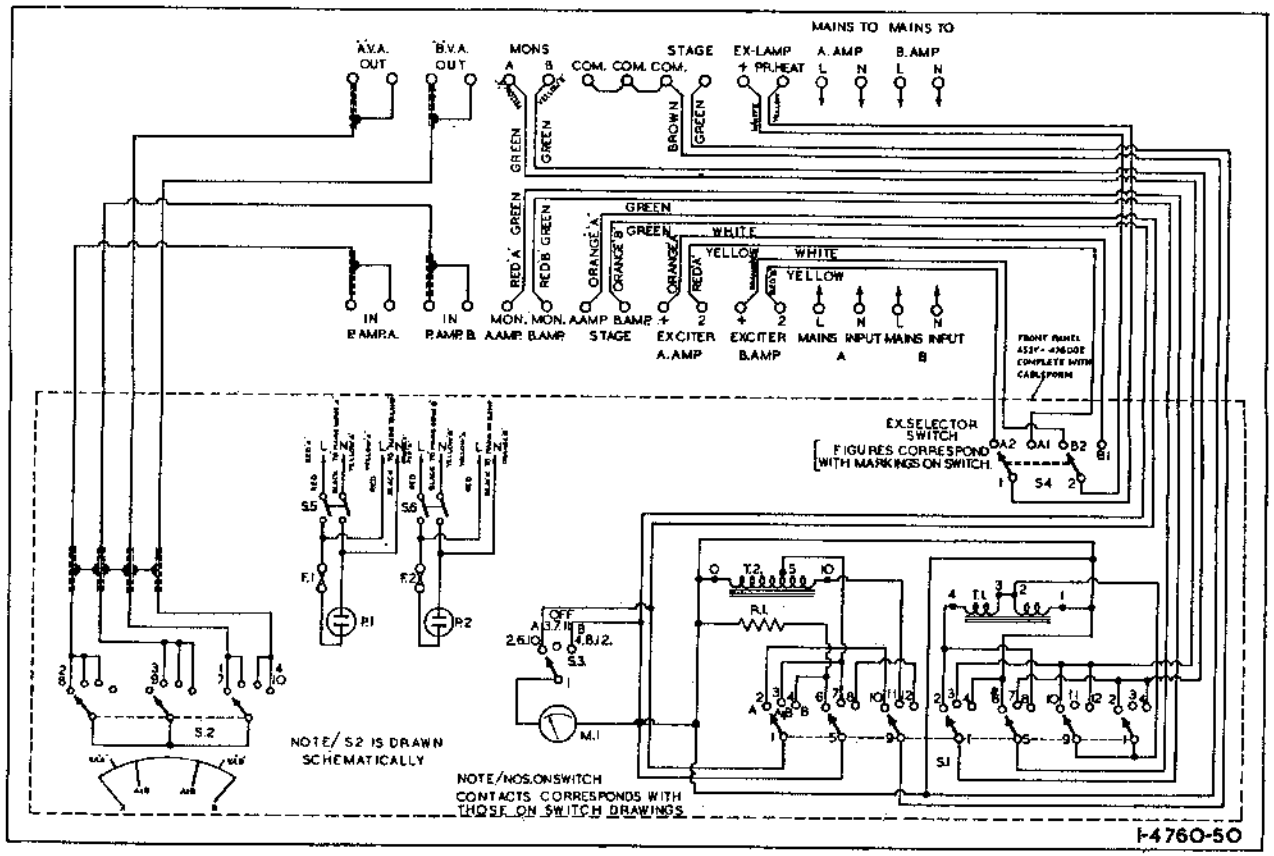
Drawing Ref.	Value
S1	Switch Diamond H Type 2T



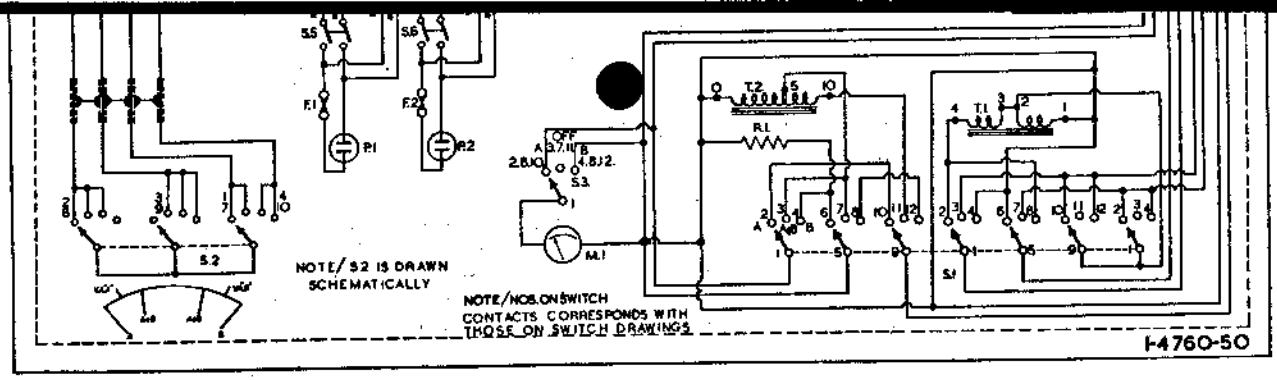
DETAILS

Drawing Ref.	Value
S1	Switch Diamond H Type 2T
S2	Switch Diamond H Type 2T
S3	Switch Santon Type SR149A

CONTROL BOX TYPE 476 FOR 40W EQUIPMENT



RESISTANCE AND CONDENSER VALUES



RESISTANCE AND CONDENSER VALUES

Drawing Ref.	Value	Drawing Ref.	Value	Drawing Ref.	Value
R1	10 Ohms K.1.V.R. 10	S5	Diamond 'H' Type 2T	P2	95-130V or 230-240V
S1	Oak 'H' Type	S6	Diamond 'H' Type 2T	F1	1055/2 Amp.
S2	Oak 'H' Type	T1	Mon. Transformer	F2	1055/2 Amp.
S4	'Santon' Type SR125A	T2	Auto Transformer	M1	Meter 15·5V. F.S.D.
		P1	Neon Indicator and Lamp		

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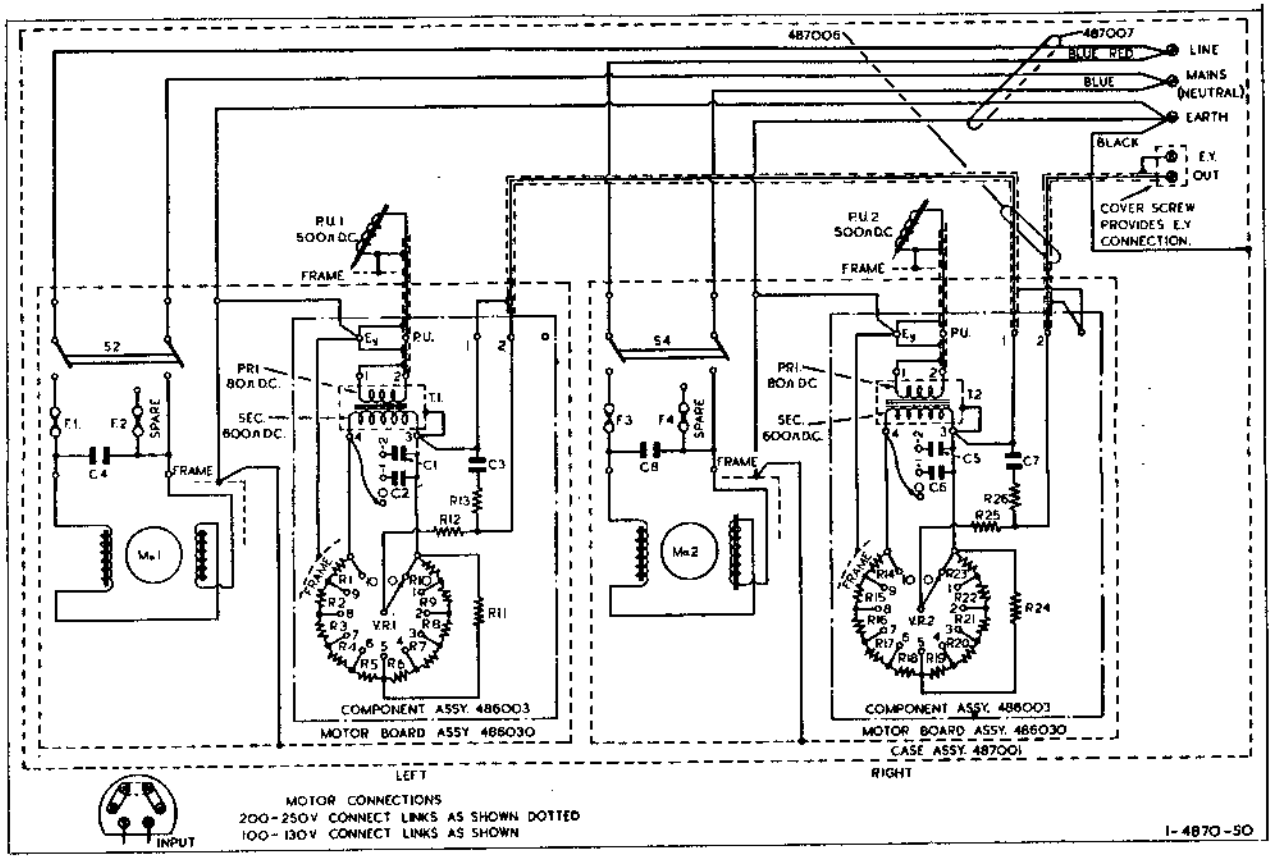
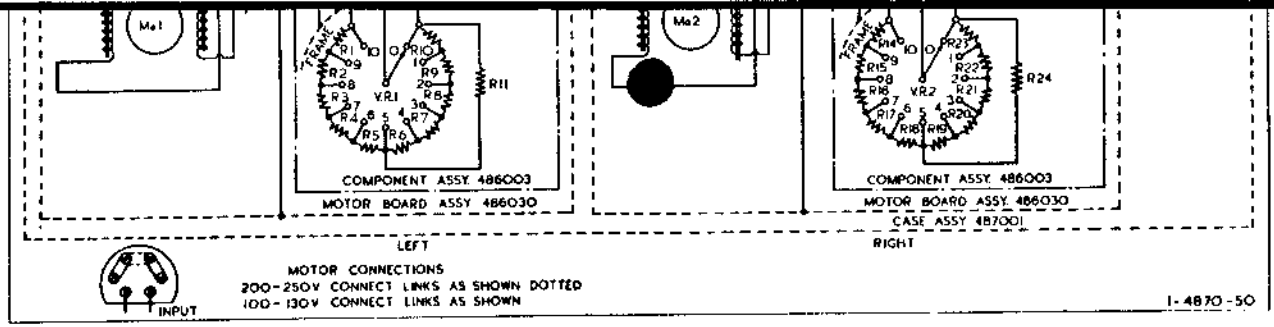
TWIN NON. SYNC ATTACHMENT TYPE 487



COMPONENTS SUPPLIED AS SPARE PARTS

Part No.	Description	Drawing Ref.	Part No.	Description	Drawing Ref.
486004	Complete Fader	VR.1	486004	Complete Fader	VR.2
486021	P.U. Transformer	T.1	486021	P.U. Transformer	T.2



COMPONENTS SUPPLIED AS SPARE PARTS

Part No.	Description	Drawing Ref.	Part No.	Description	Drawing Ref.
486004	Complete Fader	VR.1	486004	Complete Fader	VR.2
486021	P.U. Transformer	T.1	486021	P.U. Transformer	T.2
486020	Reproducer	P.U.1	486050	Reproducer	P.U.2

RESISTANCE AND CONDENSER VALUES

Drawing Ref.	Value
R1-R8	22,000 Ohms plus/minus 20%
R9	10,000 Ohms plus/minus 20%
R10	10,000 Ohms plus/minus 20%
R11	100,000 Ohms plus/minus 20%
R12	100,000 Ohms plus/minus 10%
R13	22,000 Ohms plus/minus 10%
C1	0·001 Microfarad plus/minus 10%
C2	0·0005 Microfarad plus/minus 25%
C3	0·02 Microfarad plus/minus 20%

Drawing Ref.	Value
C4	0·1 Microfarad plus/minus 20%
S2	Switch D.P.S.T.
F1 & F2	1 Amp. L1055/A
M01	A.C.7A or A.C.6c
R14-R21	22,000 Ohms plus/minus 20%
R22	10,000 Ohms plus/minus 20%
R23	10,000 Ohms plus/minus 20%
R24	100,000 Ohms plus/minus 20%

Drawing Ref.	Value
R25	100,000 Ohms plus/minus 10%
R26	220,000 Ohms plus/minus 10%
C5	0·001 Microfarad plus/minus 10%
C6	0·0005 Microfarad plus/minus 25%
C7	0·02 Microfarad plus/minus 20%
C8	0·1 Microfarad plus/minus 20%
S4	Switch D.P.S.T.
F3 & F4	1 Amp L1055/A
M02	A.C.7A or A.C.6c

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TYPE 443 DIVIDING NETWORK

COMPONENTS SUPPLIED AS SPARES

Details	Part No.
C1	10 Microfarad Type 62 IM CXI 1411
	10 Microfarad type 62 IM CXI 1411
C2	10 Microfarad type 62 IM CXI 1411
	10 Microfarad type 62 IM CXI 1411
L1	Choke 5·1 mH 79003
L2	Choke 5·1 mH 79003
S1	Switch Assembly 402009
S2	Switch Assembly 355004
R12	1·3 Ohms plus/minus 5% ASW 14V RWX 21P3

TYPE 402 DIVIDING NETWORK

COMPONENTS SUPPLIED AS SPARES

Details	Part No.
C1	10 Microfarad type 62 IM CXI 1411
C2	10 Microfarad type 62 IM CXI 1411
L1	Choke 2·5 mH 402017
L2	Choke 2·5 mH 402017
S1	Switch Assembly 402009
S2	Switch Assembly 355004
R12	1·3 Ohms ASW 14V plus/minus 5% RWX 21P3

A GAUMONT-KALEE PRODUCT

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