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ELECTRONICS SERVICE MANUAL

P-10

POWER AMPLIFIER



**TELEDYNE
ACOUSTIC RESEARCH**

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Mass. 02021, USA.**

SPECIFICATION

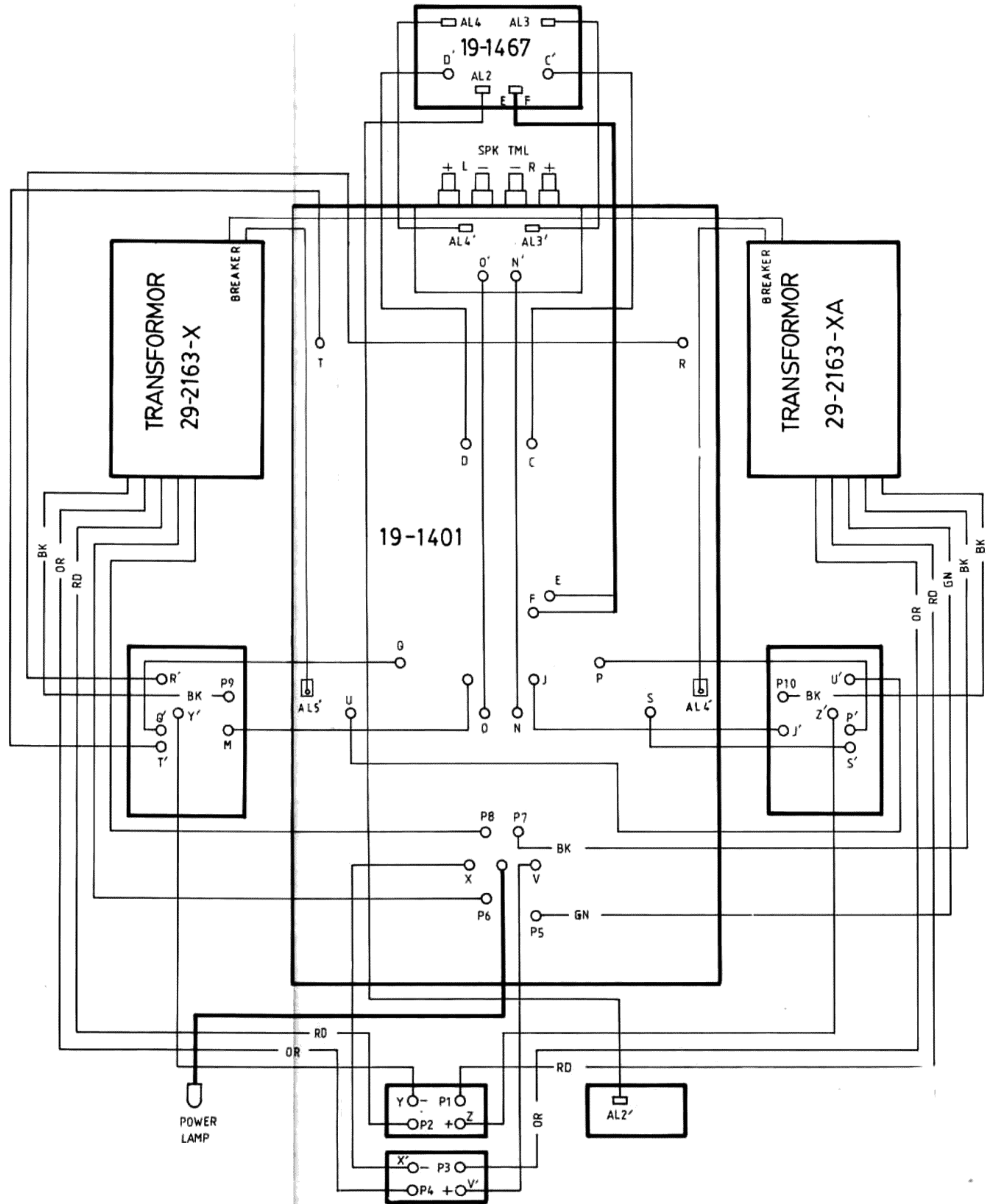
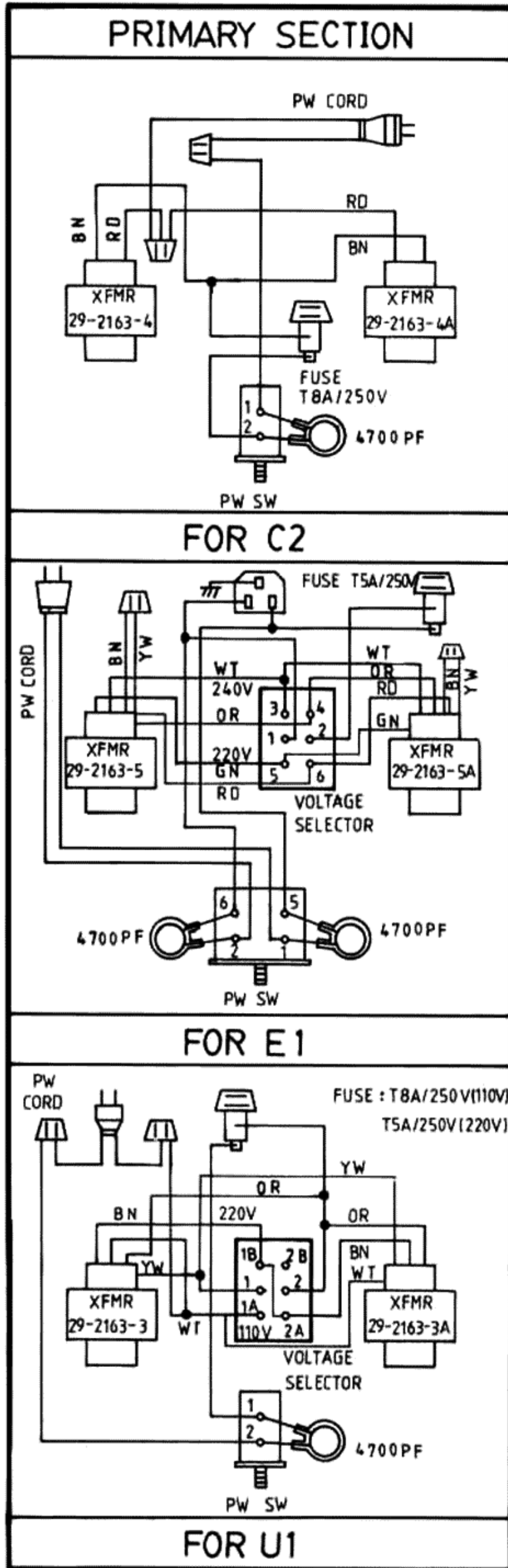
Rated power output (20Hz-20KHz 8 OHM):	120W per channel
Dynamic power at 8 OHM/4 OHM/2 OHM: (I.H.F. Standard 20ms Duration)	400W/800W/1200W
Clipping power at 8 OHM/4 OHM/2 OHM:	125W/175W/220W
Dynamic Headroom at 8 OHM/4 OHM/2 OHM:	6 dB
T.H.D. at Rated power:	0.02%
I.M.D. at Rated power:	0.02%
Damping Factor:	>100
Frequency Response 20-20KHz:	±0.2 dB
POWER Band width at T.H.D. 0.1%:	10-40 KHz
Input Resistance/Capactance:	40K OHM/120pF
Input Sensitivity:	1V
Channel Crosstalk (1 KHz):	85 dB
S/N Ratio (A-weighted):	120 dB
Dimensions W × H × D (inch):	16.9" × 4.3" × 14.3"
(cm):	43 × 11 × 36.5
Net weight:	15 Kg
POWER supply	
U.S. and Canadian Models:	120V/60 Hz
European model:	220V, 240V/50 Hz
Other Area Model:	110V, 220V/50 Hz, 60 Hz

ALIGNMENT

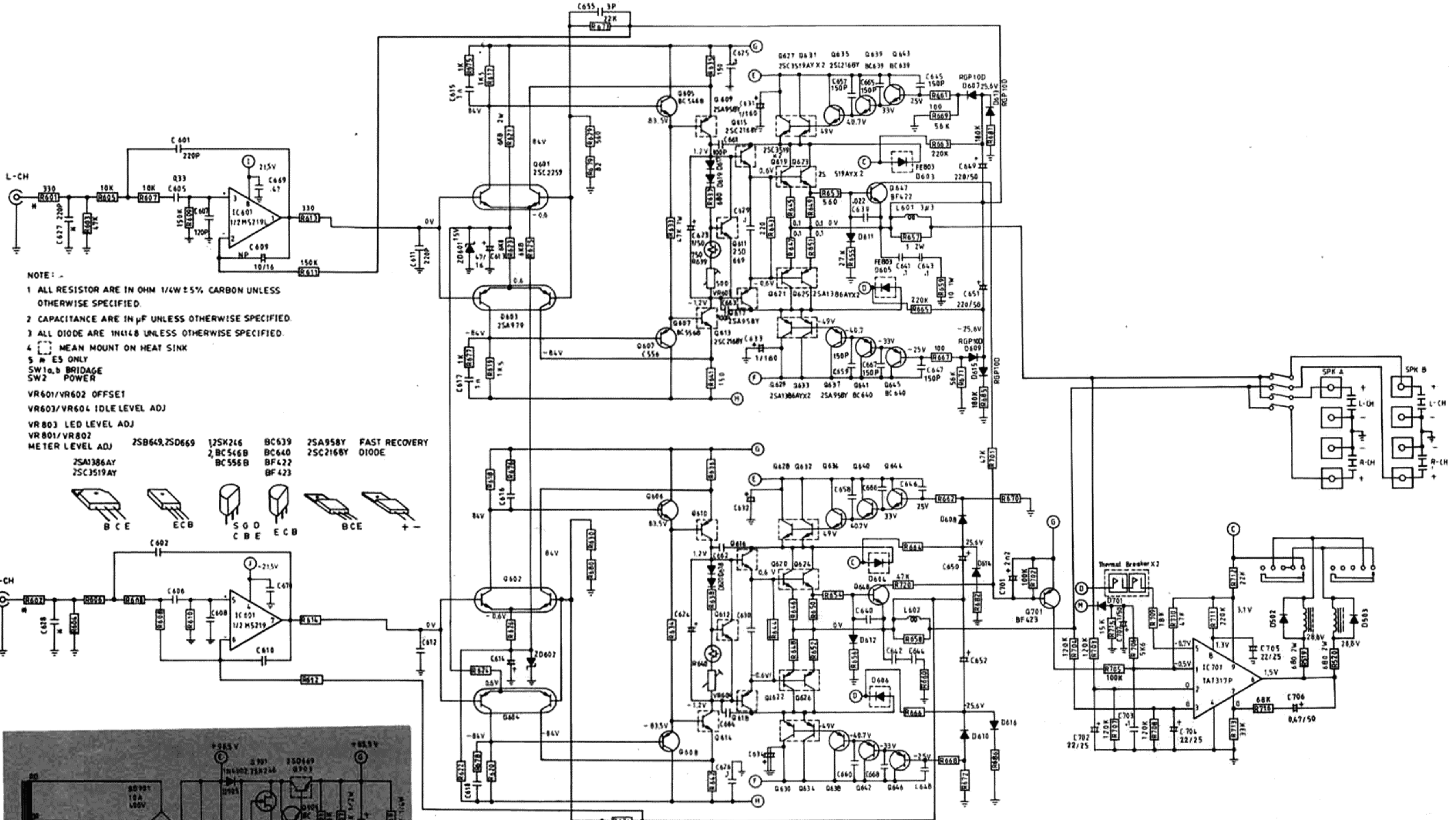
IDLE CURRENT ALIGNMENT

1. Turn VR603, VR604 to fully counter clockwise position.
2. Remove the load from speaker terminals.
3. Push on power for 5 minutes pre-heating.
4. Connect DC millivolt-meter across R651 for left channel R652 for Right channel. The meter sensitivity should be set at 100mV full scale deflection.
5. Adjust VR603 (Left channel) and VR604 (Right channel) till the reading from meter is between 2.5mV and 5mV the alignment is completed.

WIRING DIAGRAM

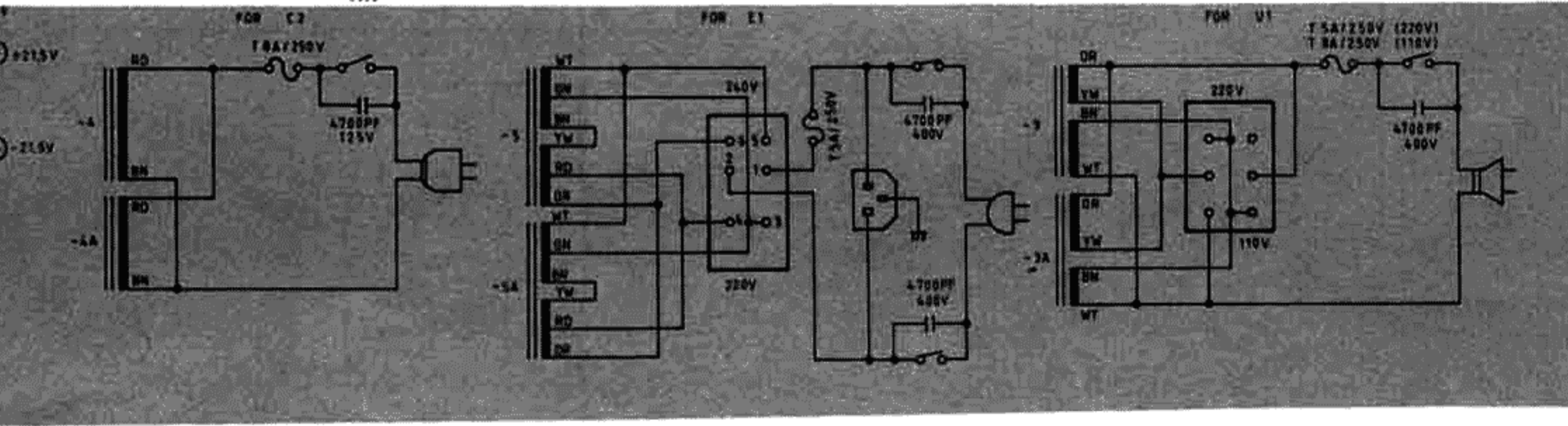
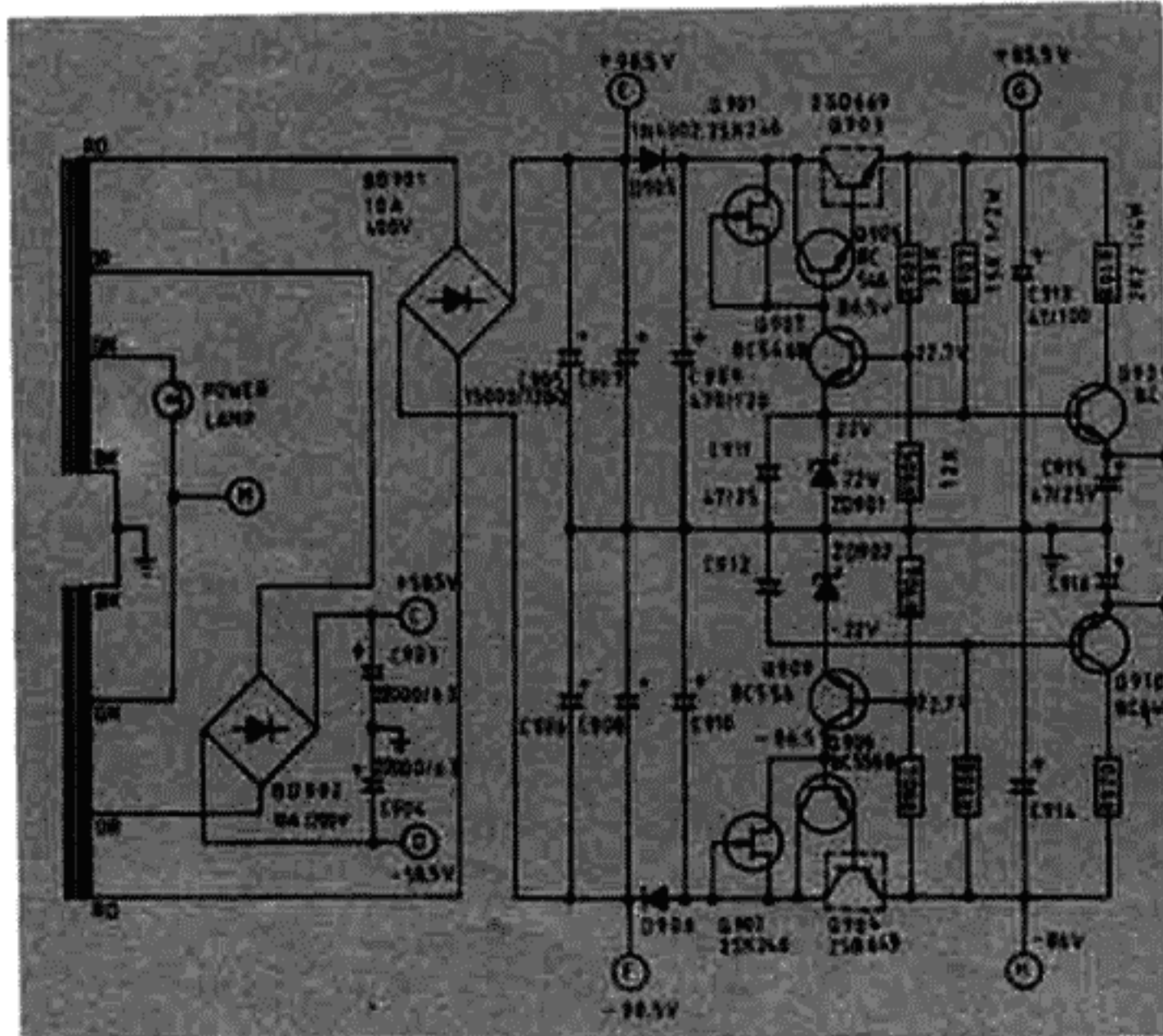


CIRCUIT DIAGRAM

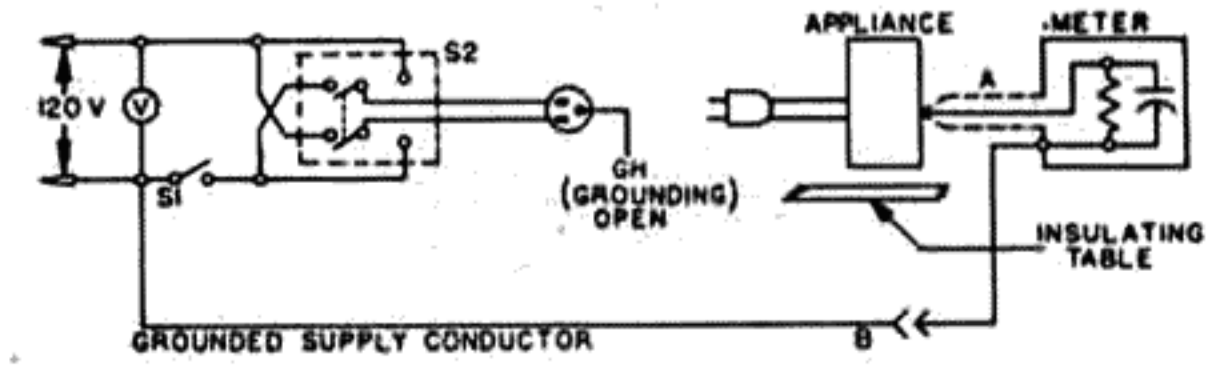


NOTE:

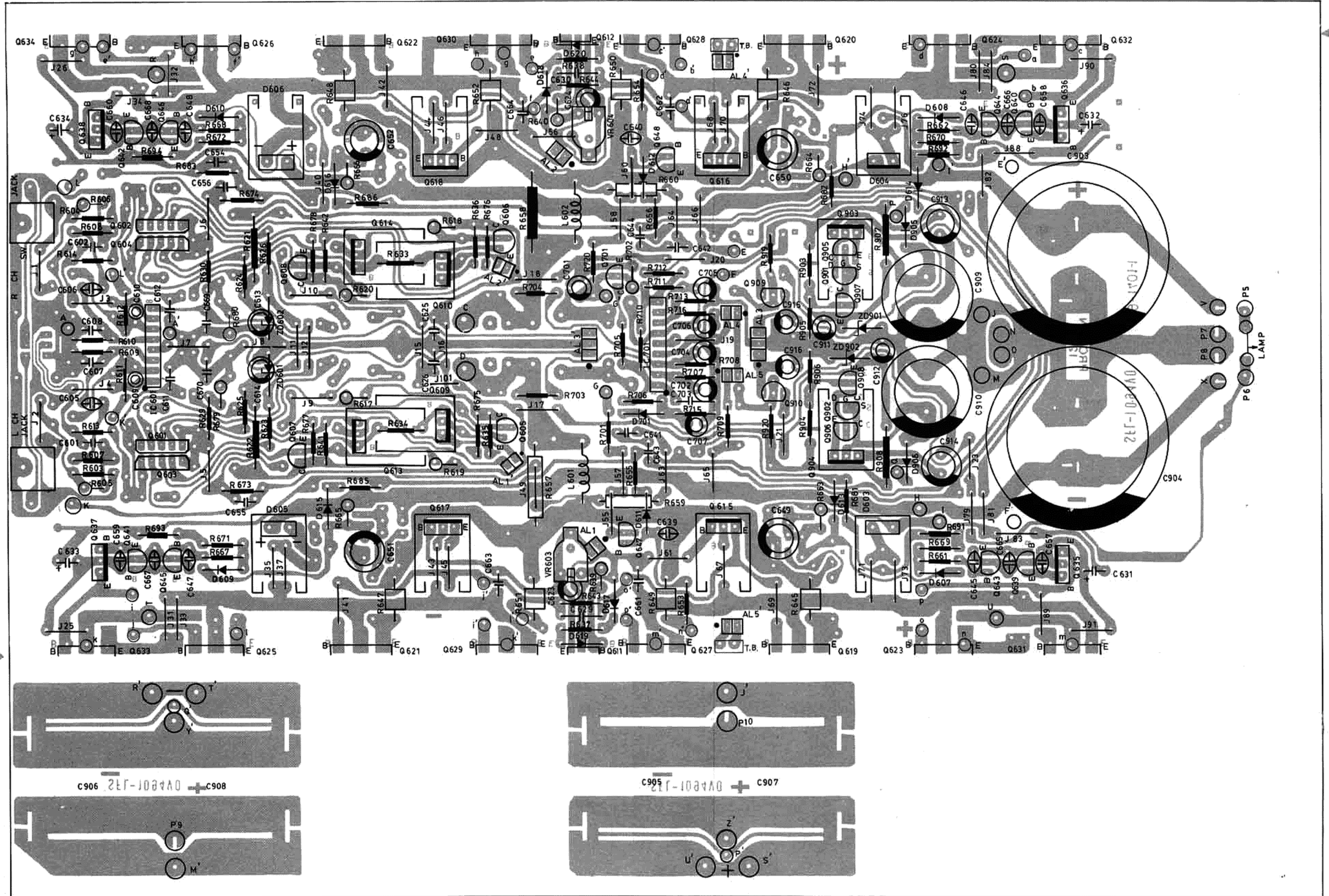
- 1 ALL RESISTOR ARE IN OHM 1/4W ±5% CARBON UNLESS OTHERWISE SPECIFIED.
 - 2 CAPACITANCE ARE IN µF UNLESS OTHERWISE SPECIFIED.
 - 3 ALL DIODE ARE 1N4148 UNLESS OTHERWISE SPECIFIED.
 - 4 □ MEAN MOUNT ON HEAT SINK
 - 5 * ES ONLY
 - SW1, a, b BRIDGE
 - SW2 POWER
- VR601/VR602 OFFSET
 VR603/VR604 IDLE LEVEL ADJ
 VR803 LED LEVEL ADJ
 VR801/VR802 METER LEVEL ADJ
- | | | | | |
|----------------|----------|-------|----------|---------------|
| 2SB649, 2SD669 | 12SK246 | BC639 | 2SA958Y | FAST RECOVERY |
| 2SA1386AY | 2 BC546B | BC640 | 2SC2168Y | DIODE |
| 2SC3519AY | BC556B | BF422 | BF423 | |



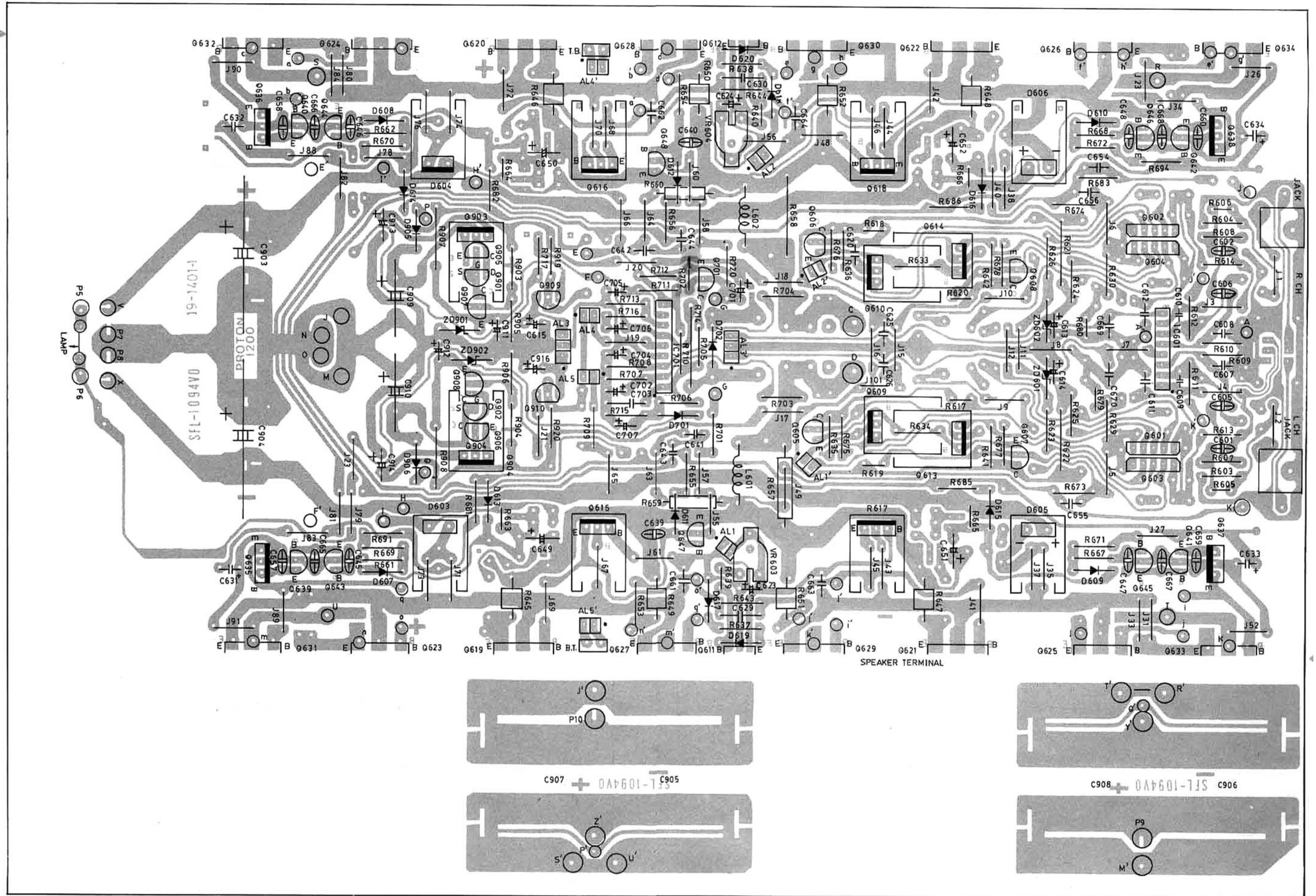
SERVICE INFORMATION
CAUTION: Each precaution to be followed during servicing.
CRITICAL COMPONENT WARNING: These CRITICAL COMPONENTS that are shaded of the schematic diagram are used to prevent electric shock and fire hazards. All these special components must be replaced only with the same type identical to these in the schematic diagram.
CAUTION: Make leakage current measurement before returning the appliance to the customer. See measurement circuit as shown below.



PCB PARTS LIST LOCATION (TOP VIEW)



PCB PARTS LIST LOCATION (BOTTOM VIEW)



ELECTRICAL PARTS LIST

REF NO.	AR PARTS NO.	DESCRIPTION	MER'S PARTS NO.
RESISTORS (All are carbon film 1/4W +-5% unless noted otherwise)			
R603-R604		47K OHM	16-1/4CA473J
R605-R606		10K OHM	16-1/4CR103J
R607-R608		10K OHM	16-1/4CA103J
R609-R610		150K OHM	16-1/4CA154J
R611-R612		150K OHM	16-1/4CA154J
R613-R614		330 OHM	16-1/4CA331J
R617-R618		1K5 OHM	16-1/4CR152J
R619-R620		1K5 OHM	16-1/4CR152J
△ R621-R622		2W NO 6K8 OHM	16-2AN682J
R623-R624		6K8 OHM	16-1/4CA682J
R625-R626		6K8 OHM	16-1/4CA682J
R629-R630		560 OHM	16-1/4CA561J
△ R633-R634		1W NO 47K OHM	16-1AN473J
△ R635-R636		1/4W NO 150 OHM	16-1/4AS151J
R637-R638		680 OHM	16-1/4CA681J
△ R639-R640		NO 750 OHM +-10%	16-1045
△ R641-R642		1/4W NO 150 OHM	16-1/4AS151J
△ R643-R644		1/4W NO 220 OHM	16-1/4AN221J
R645-R646		7W CM 0.1 OHM +-10%	16-1044
R647-R648		7W CM 0.1 OHM +-10%	16-1044
R649-R650		7W CM 0.1 OHM +-10%	16-1044
R651-R652		7W CM 0.1 OHM +-10%	16-1044
R653-R654		560 OHM	16-1/4CA561J
R655-R656		27K OHM	16-1/4CA273J
△ R657-R658		2W NO 1 OHM	16-2AN100J
△ R659-R660		1W NO 10 OHM	16-1AN100J
△ R661-R662		1/4W NO 100 OHM	16-1/4AS101J
R663-R664		220K OHM	16-1/4CR224J
R665-R666		220K OHM	16-1/4CR224J
△ R667-R668		1/4W NO 100 OHM	16-1/4AS101J
R669-R670		56K OHM	16-1/4CA563J
R671-R672		56K OHM	16-1/4CA563J
R673-R674		22K OHM	16-1/4CA223J
R675-R676		1K OHM	16-1/4CA102J
R677-R678		1K OHM	16-1/4CA102J
R679-R680		82 OHM	16-1/4CR820J
R681-R682		120K OHM	16-1/4CA124J
R685-R686		120K OHM	16-1/4CA124J
R701		47K OHM	16-1/4CA473J
R702		100K OHM	16-1/4CR104J
R703-R704		120K OHM	16-1/4CA124J
R705		100K OHM	16-1/4CA104J
R706		56K OHM	16-1/4CA563J
R707-R708		120K OHM	16-1/4CA124J
R709		18K OHM	16-1/4CA183J
R710		47K OHM	16-1/4CA473J
R711		220K OHM	16-1/4CA224J
R712		22K OHM	16-1/4CA223J
R713		33K OHM	16-1/4CA333J
R715		15K OHM	16-1/4CA153J
R716		68K OHM	16-1/4CA683J
R720		47K OHM	16-1/4CA473J
△ R519-R520		2W NO 680 OHM	16-2AN681J
R903-R904		33K OHM	16-1/4CA333J
R905-R906		12K OHM	16-1/4CA123J
R907-R908		1/2W 15K OHM	16-1/2CN153J
R919-R920		2K2 OHM	16-1/4CA222J
CAPACITORS			
C601-C602		CERAMIC 220pF 50V +-5% SL	17-5DR221JSL
C605-C606		METALIZED 0.33uF 50V +-5%	17-5HR334J
C607-C608		CERAMIC 120pF 50V +-5% SL	17-5DR121JSL

Note: The components identified by shading and mark △ are critical for safety. Replace only with part number specified.

REF NO.	AR PARTS NO.	DESCRIPTION	MER'S PARTS NO.
CAPACITORS			
C609-C610		ELECTROLYTIC BP 10uF 16V +-20%	17-1.6SF106M
C611-C612		CERAMIC 220pF 50V +-5% SL	17-5DR221JSL
C613-C614		ELECTROLYTIC 47uF 16V +-20%	17-1.6ER476M
C615-C616		MYLAR 0.001uF 50V +-5%	17-5FP102J
C617-C618		MYLAR 0.001uF 50V +-5%	17-5FP102J
C623-C624		ELECTROLYTIC 1uF 50V +-20%	17-5ER105M
C625-C626		CERAMIC 0.1uF 100V +-20%	17-10DF104M
C629-C630		CERAMIC 0.1uF 50V +-80-20%	17-5DH104Z
C631-C632		ELECTROLYTIC 1uF 160V +-20%	17-16EF105M
C633-C634		ELECTROLYTIC 1uF 160V +-20%	17-16EF105M
C639-C640		MYLAR 0.022uF 50V +-5%	17-5FR223J
C641-C642		CERAMIC 0.1uF 100V +-20%	17-10DF104M
C643-C644		CERAMIC 0.1uF 100V +-20%	17-10DF104M
C645-C646		CERAMIC 150pF 50V +-5%	17-5DR151J
C647-C648		CERAMIC 150pF 50V +-5%	17-5DR151J
C649-C650		ELECTROLYTIC 220uF 50V +-20%	17-5EF227M
C651-C652		ELECTROLYTIC 220uF 50V +-20%	17-5EF227M
C655-C656		CERAMIC 3pF 50V +-0.25pF	17-5DR222J
C657-C658		CERAMIC 150pF 50V +-5%	17-5DR151J
C659-C660		CERAMIC 150pF 50V +-5%	17-5DR151J
C665-C666		CERAMIC 150pF 50V +-5%	17-5DR151J
C667-C668		CERAMIC 150pF 50V +-5%	17-5DR151J
C669-C670		CERAMIC 0.047uF 50V +-80-20%	17-5DR473Z
C701		MYLAR 0.0022uF 50V +-5%	17-5PR222J
C702-C704		ELECTROLYTIC 22uF 25V +-20%	17-2.5ER226M
C705		ELECTROLYTIC 22uF 25V +-20%	17-2.5ER226M
C706		ELECTROLYTIC 0.47uF 50V +-20%	17-5ER474M
C707		ELECTROLYTIC 1uF 50V +-20%	17-5ER105M
C903-C904		ELECTROLYTIC 22000uF 63V +-50-10%	17-6.3P229Y
C905-C906		ELECTROLYTIC 15000uF 120V +-50-10%	17-12P159Y
C907-C908		ELECTROLYTIC 15000uF 120V +-50-10%	17-12P159Y
C909-C910		ELECTROLYTIC 470uF 120V +-50-10%	17-12EG477Y
C911-C912		ELECTROLYTIC 47uF 25V +-20%	17-2.5ER476M
C913-C914		ELECTROLYTIC 47uF 100V +-50-10%	17-10EF476Y
C915-C916		ELECTROLYTIC 47uF 25V +-20%	17-2.5ER476M
DIODE			
D617-D618		1N4148	30-1152TA
D619-D620		1N4148	30-1152TA
D611-D612		1N4148	30-1152TA
△ D603-D604		1N4148	30-1152TA
△ D605-D606		1N4148	30-1152TA
△ D607-D608		1N4148	30-1152TA
△ D609-D610		1N4148	30-1152TA
△ D613-D614		1N4148	30-1152TA
△ D625-D616		1N4148	30-1152TA
D701		1N4148	30-1152TA
△ D501-D503		1N4002	30-1002
△ D905-D906		1N4002	30-1002
ZD601-ZD602		ZENER 15V HZ15-2	30-1044-1
ZD901-ZD902		ZENER 22V RD22EB3	30-1041
BD901		BRIDGE KBPC10-04	30-1317
BD902		BRIDGE KBPC10-02	30-1318
TRANSISTOR			
Q601-Q602		2SC2259	30-2404
Q603-Q604		2SA979	30-2405
Q605-Q606		BC546B	30-2090-2
Q607-Q608		BC556B	30-2096
Q609-Q610		2SA958	30-2390
Q611-Q612		2SD669	30-2260
Q613-Q614		2SC2168	30-2391

Note: The components identified by shading and mark △ are critical for safety. Replace only with part number specified.

ASSEMBLY DIAGRAM

