

SERVICE MANUAL

1154

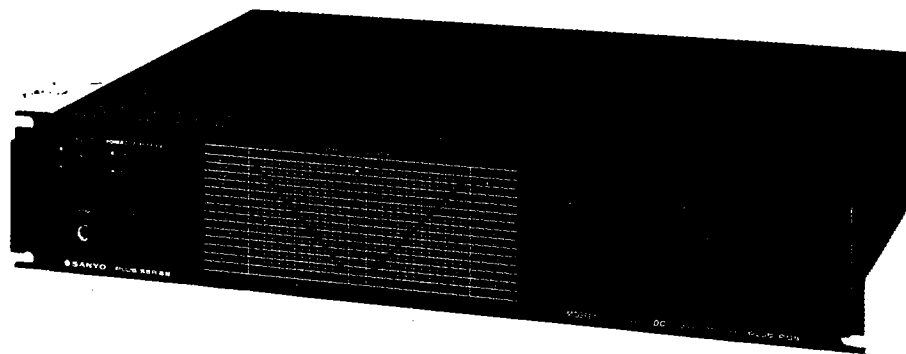
FET STEREO POWER AMPLIFIER



SANYO

PLUS P55

(U.S.A.)



SPECIFICATIONS

Continuous minimum sine wave RMS power output per channel at 8 ohms from 20Hz to 20kHz with no more than 0.009%(NORMAL) 0.03%(STRAPPED MONO) harmonic distortion.
(NORMAL) 100 watts
(STRAPPED MONO) 200 watts

Damping factor

NORMAL	60 (at 1kHz 8 ohms)
STRAPPED MONO	40 (at 1kHz 8 ohms)

Input sensitivity and impedance

NORMAL	1V/47 kohms
STRAPPED MONO	0.7V/47k ohms

Intermodulation distortion

(60Hz:7kHz - 4:1)

NORMAL	0.009%(100W output, 8 ohms)
STRAPPED MONO	0.03%(200W output, 8 ohms)

Transient response: Slew rate

NORMAL	150V/ μ sec
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Frequency response

(1W output, 8 ohms)

NORMAL	DC - 100kHz (+0/-1dB)
STRAPPED MONO	DC - 100kHz (+0/-2dB)

Signal to noise ratio

NORMAL (IHF-A curve)	110dB
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Power requirements

AC 120V, 60Hz

Power consumption

400W

Dimensions (Approx.)

440(W) x 320(D) x 88(H)mm
(17-3/8" x 12-9/16" x 3-1/2")

Weight (Approx.)

12 kg

* Specifications are subject to change without notice.

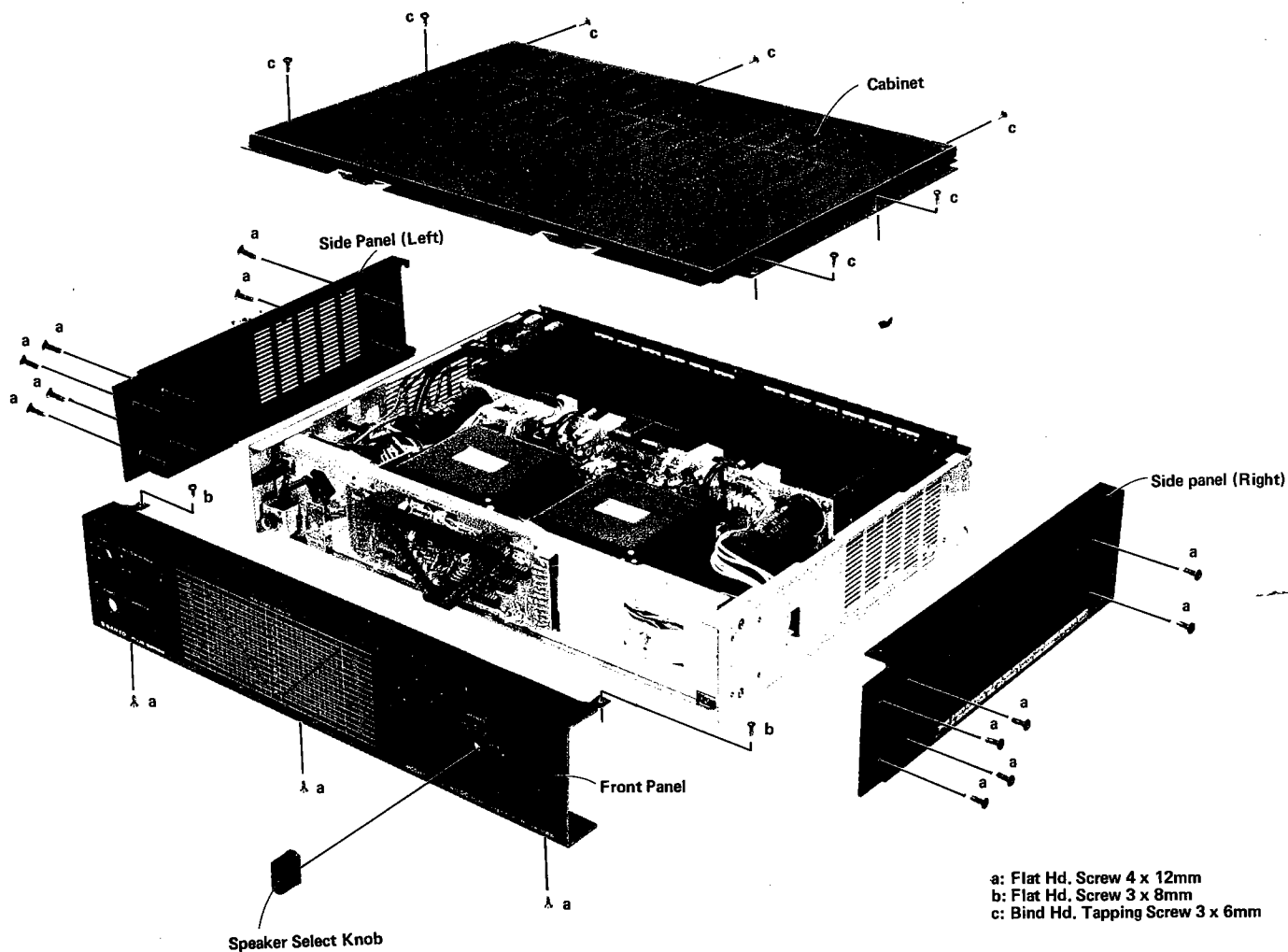
HOW TO REMOVE THE CABINET AND PANELS

Be sure to have the power cord pulled out from the consent.

- 1) Unscrew 12 (flat head 4 x 12 mm) screws fastening both side panels.
- 2) Remove five (two flat head 4 x 12 mm and three flat head tapping 3 x 8 mm) screws fastening the front panel.

- 3) As the head less w/Hex hole 3 x 4 mm screw fastening the speaker change-over switch is unscrewed, the front panel can then be removed.

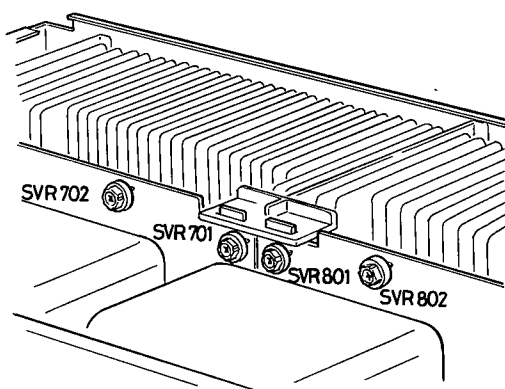
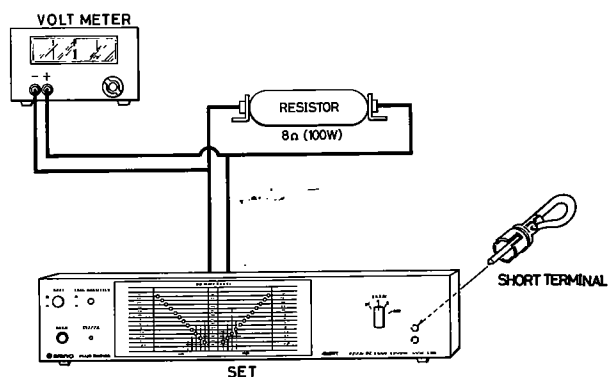
- 4) As seven (baird head tapping 3 x 6 mm) screws fastening the cabinet are unscrewed, the surroundings of the set amounts to being removed.



ADJUSTMENT

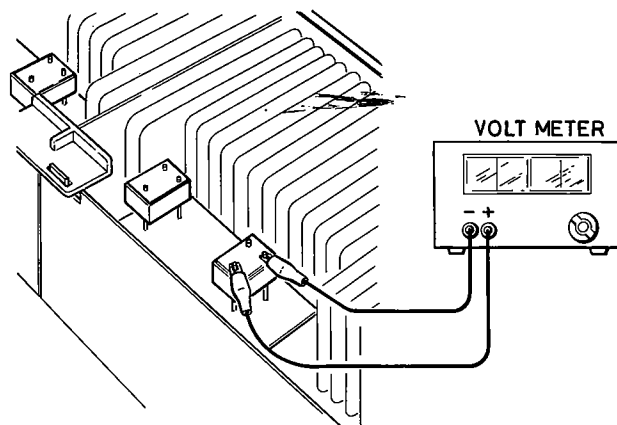
Middle Point Potential Adjustment

- 1) Set the output display change-over switch in the "x1" position; the mode switch, the "STEREO" position; and the speaker switch, the "A" position, respectively.
- 2) Short circuit the main amp. input terminals (MAIN IN) as shown in the figure to achieve the state of short of the input.
- 3) Connect a 8-ohm (100 W) resistor and digital voltmeter to the speaker output terminals (SPEAKERS) "A".
- 4) Turn on the power switch, and adjust semifixed resistor SVR701 (SVR801) so that the indicated value of the digital voltmeter becomes within 10 mV.



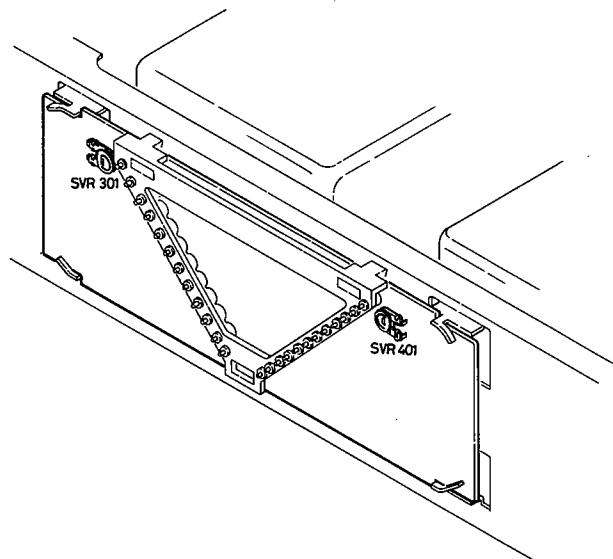
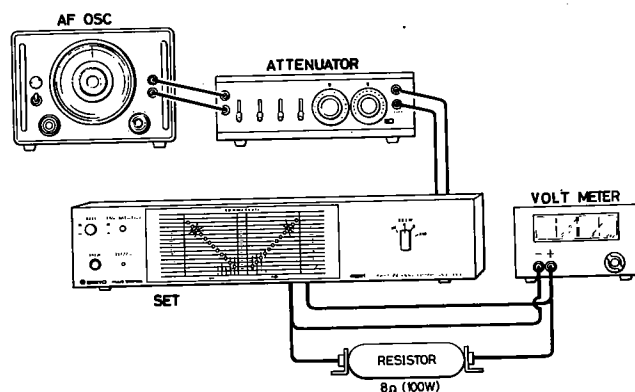
Power Stage Current Adjustment

- 1) Achieve the state of short of the input.
- 2) Adjust resistor SVR702 so that the sum of voltages of R735 both ends and R734 both ends of the cemented resistor becomes 50 mV. (Keeping either of the two — R735 and R736 — fixed, adjust so that the sum total of values appeared becomes 50 mV.)
- 3) Confirm that the sum of voltages of R737 both ends and R738 both ends of the cemented resistor has become 50 mV.
- 4) Next, adjust resistor SVR802 so that the sum of voltages of both ends of R835 and R836 becomes 50 mV.
- 5) Similar to Step 3, confirm that the sum of voltages of R837 and R838 has become 50 mV.

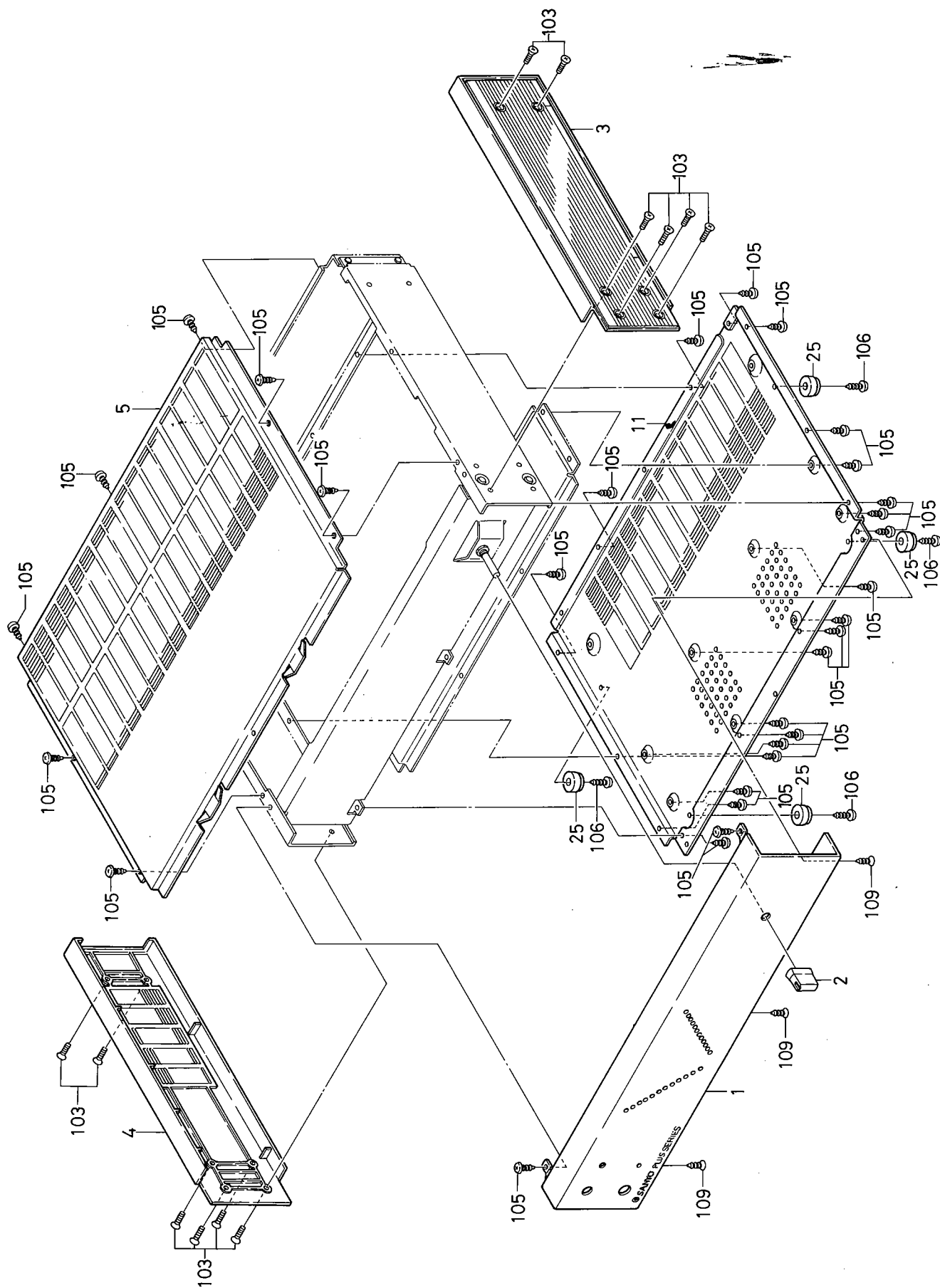


Adjustment of Level Meter

- 1) Introduce 1 kHz input to the set, and adjust so that its output becomes 100 W. (If voltage of a 8-ohm resistor is 28.3 V, this is also acceptable.)
- 2) Adjust resistors SVR301 and SVR401 so that a red LED, third from the top, of the LED level meter lights up.



CABINET EXPLODED VIEW



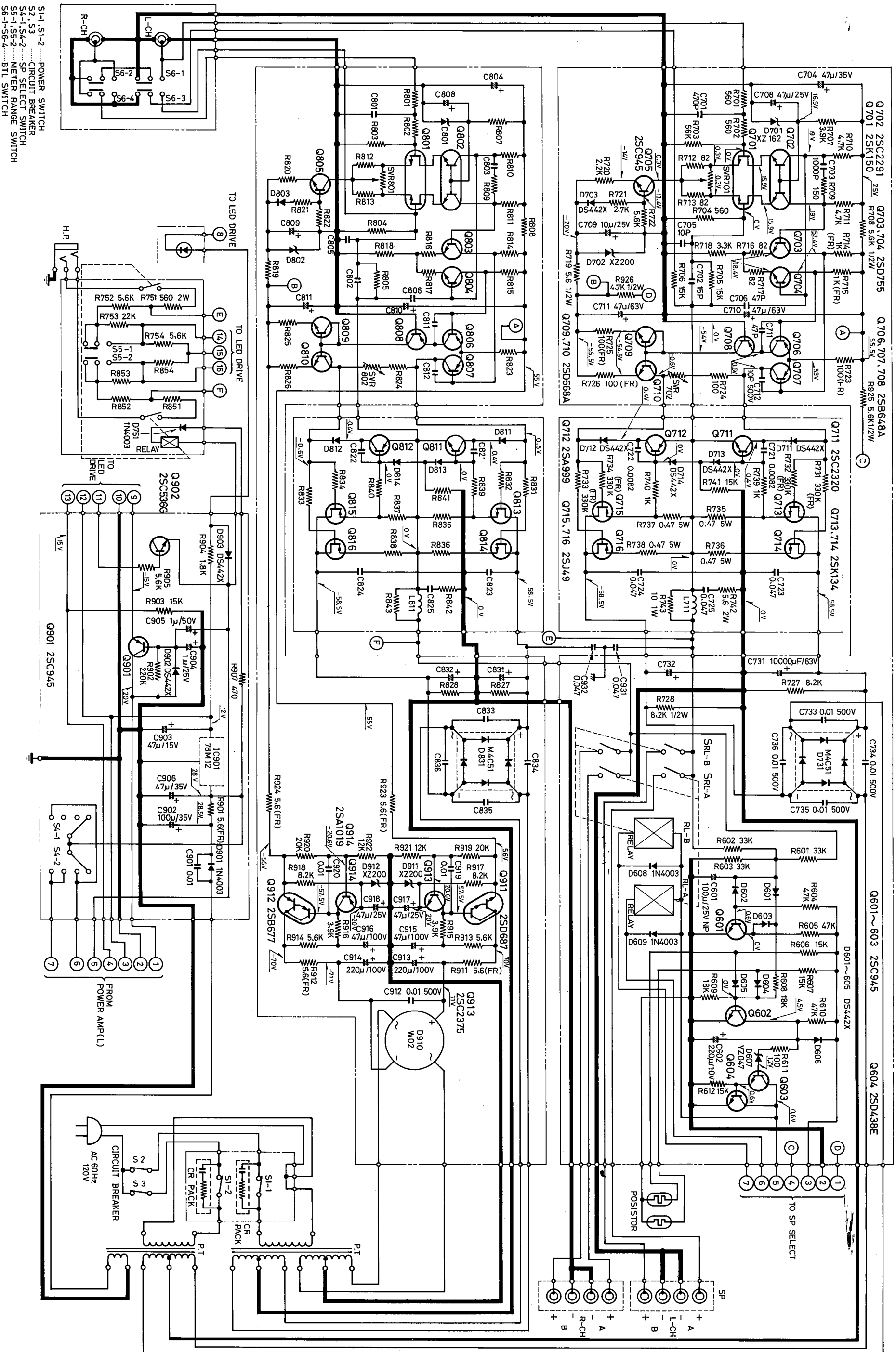
PARTS LIST

Key No.	Part No.	Description	Q'ty	Key No.	Part No.	Description	Q'ty
PACKING				ELECTRICAL PARTS			
	141-6-133T-10300	Individual Carton	1	51	4-300T-08500	Power Trans, L Channel	1
	141-6-144T-61000	Form Plastic Case, Left	1	52	4-300T-08600	Power Trans, R Channel	1
	141-6-144T-61100	Form Plastic Case, Right	1	53	4-243T-81271	Power Cord	1
	141-6-231T-45602	Inner Poly Cover, Set	1	54	4-237T-07000	Terminal Board, Speaker	1
	141-6-231T-25350	Inner Poly Cover, Inst. M	1	55	141-2-382T-07000	Terminal, Ground	2
	141-6-231T-15200	Inner Poly Cover, Handle	1	56	4-238T-12373	Special Switch	2
	141-2-246T-16800	Sheet, Handle	1	57	4-209T-01172	Posistor	2
	141-6-317T-19500	Pad, Handle	1	58		Transistor FET 23K134	4
ACCESSORY				59		Transistor FET 2SJ49	4
	141-6-410T-39000	Instruction Manual	1	60	4-235T-44871	Socket, Headphon W/Nut	1
	141-0-271T-16400	Bracket Ass'y, Handle	2	61	123-2-472R-00401	Lug, C931, 932	4
	141-2-171T-16500	Handle	2	62		Ceramic Cap. 0.047 μ F 50V +80-20%	2
	4-243T-13375	Flat Hd. Screw 3x14 Lead Cord, RCA - RCA	4 1	63	141-4-464T-20600	Fixer	5
CABINET				64	141-4-464T-20672	Fixer	1
1	141-0-122T-32900	Front Panel Ass'y	1	POWER AMP (L) PCB ASS'Y			
2	141-0-163T-63630	Rotary Knob Ass'y, Function	1	81	141-4-233T-30700	P.C Board Ass'y, Power Amp L	1
3	141-0-123T-05500	Side Panel Ass'y	1		4-235T-80200	Socket 4P	1
4	141-0-123T-05600	Side Panel Ass'y	1		4-235T-79900	Socket 3P	1
5	141-2-111T-42900	Cabinet	1		4-236T-10274	Plug 3P-25P	1
CHASSIS					4-236T-13472	Pulg 3P	1
11	141-2-125T-19400	Bottom Lid	1	SVR701	4-222T-62071	Semifixed Variable Resistor 100 ohm	1
12	141-2-214T-04800	Bracket, Frame	1	SVR702	4-222T-62073	Semifixed Variable Resistor 220 ohm	1
13	141-2-315T-21200	Reinforcement, Right	1		4-232T-05200	Relay, 24V	2
14	141-2-315T-21300	Reinforcement, Left	1	Q701		Transistor FET 2SK150	1
15	141-2-315T-21400	Reinforcement, Power Trans	1	Q702		Transistor 2SC2291	1
16	141-2-119T-00300	Back Panel	1	Q703,704		Transistor 2SD755	2
17	141-2-368T-19000	Heat Sink	1	Q706,707, 708		Transistor 2SB648A	3
18	141-2-210T-19900	Bracket, Amp Center	1	Q709,710		Transistor 2SD668A	2
19	141-2-210T-20000	Bracket, Amp Side	2	Q705,601, 602,603		Transistor 2SC945	4
20	141-2-210T-20200	Bracket, Capacitor	2	Q604		Transistor 2SD438	1
21	141-2-210T-19800	Bracket, LED	1	D731		Diode M4C51	1
22	141-2-310T-35600	Bracket, Headphone	1	D608,609		Diode 1N4003	2
23	141-2-310T-35700	Bracket, Range Switch	1	D701		Zener Diode XZ162	1
24	141-2-310T-35800	Bracket, Power Switch	1	D702		Zener Diode XZ200	1
25	141-0-174T-05101	Stand Ass'y	4	D607		Diode YZ047	1
26	141-0-161T-74100	Push Button Ass'y, Range Switch	1	D703,601, 602,603, 604,605, 606		Diode DS442 X	7
27	141-0-156T-21730	Knob Ass'y Power Switch	1	CAPACITORS			
28	141-2-464T-11800	Fixer, AC Cord	1	C601		Electrolytic 100 μ F 25V Nonpolar	1
29	141-2-135T-66800	Cover	1	C602		Electrolytic 220 μ F 10V	1
HARDWARE				C704		Electrolytic 47 μ F 35V	1
101		Screw Pan Hd. 2.6x4mm	2	C708		Electrolytic 47 μ F 25V	1
102		Screw Pan Hd. 3x18mm	16	C702		Ceramic 15pF 500V $\pm 10\%$	1
103		Flat Hd. 4x12mm	12	C712		Ceramic 10pF 500V $\pm 10\%$	1
104		Bind Hd. 3x6mm	12	C733,734, 735,736		Ceramic 0.01 μ F 500V +100-0%	4
105		Bind Hd. Tapping 3x6mm	39	C711,706		Ceramic 47pF 50V $\pm 10\%$	2
106		Bind Hd. Tapping 3x8mm	27	C705		Ceramic 15pF 50V $\pm 10\%$	1
107		Bind Hd. Tapping 3x12mm	2	C701		Mylar 470pF 50V $\pm 10\%$	1
108		Bind Hd. Tapping 4x10mm	8	C703		Mylar 0.001 μ F 50V $\pm 10\%$	1
109		Flat Hd. 3x8mm	3	C731,732		Electrolytic 10000 μ F 63V	2
110		Washer 3mm	1	C710,711		Electrolytic 47 μ F 63V	2
111		Washer 4x8x0.8mm	8	C709		Electrolytic 10 μ F 25V	1
112		Washer 3mm	16	RESISTORS			
113		Ext. Tooth Lock Washer 2.6mm	3	R708,719		Solid 5.6K ohm $\pm 10\%$ 1/2W	2
114		Ext. Tooth Lock Washer 3mm	2	R925,926		Solid 4.7K ohm $\pm 10\%$ 1/2W	2
115		Pan Hd. Tapping Screw W/Washer 3x8mm	4	R727,728		Solid 8.2K ohm $\pm 10\%$ 1/2W	2
				R703		Carbon 56K ohm $\pm 5\%$ 1/4W	1
				R604,605, 620		Carbon 47K ohm $\pm 5\%$ 1/4W	3
				R601,602, 603		Carbon 33K ohm $\pm 5\%$ 1/4W	3
				R608,609		Carbon 18K ohm $\pm 5\%$ 1/4W	2

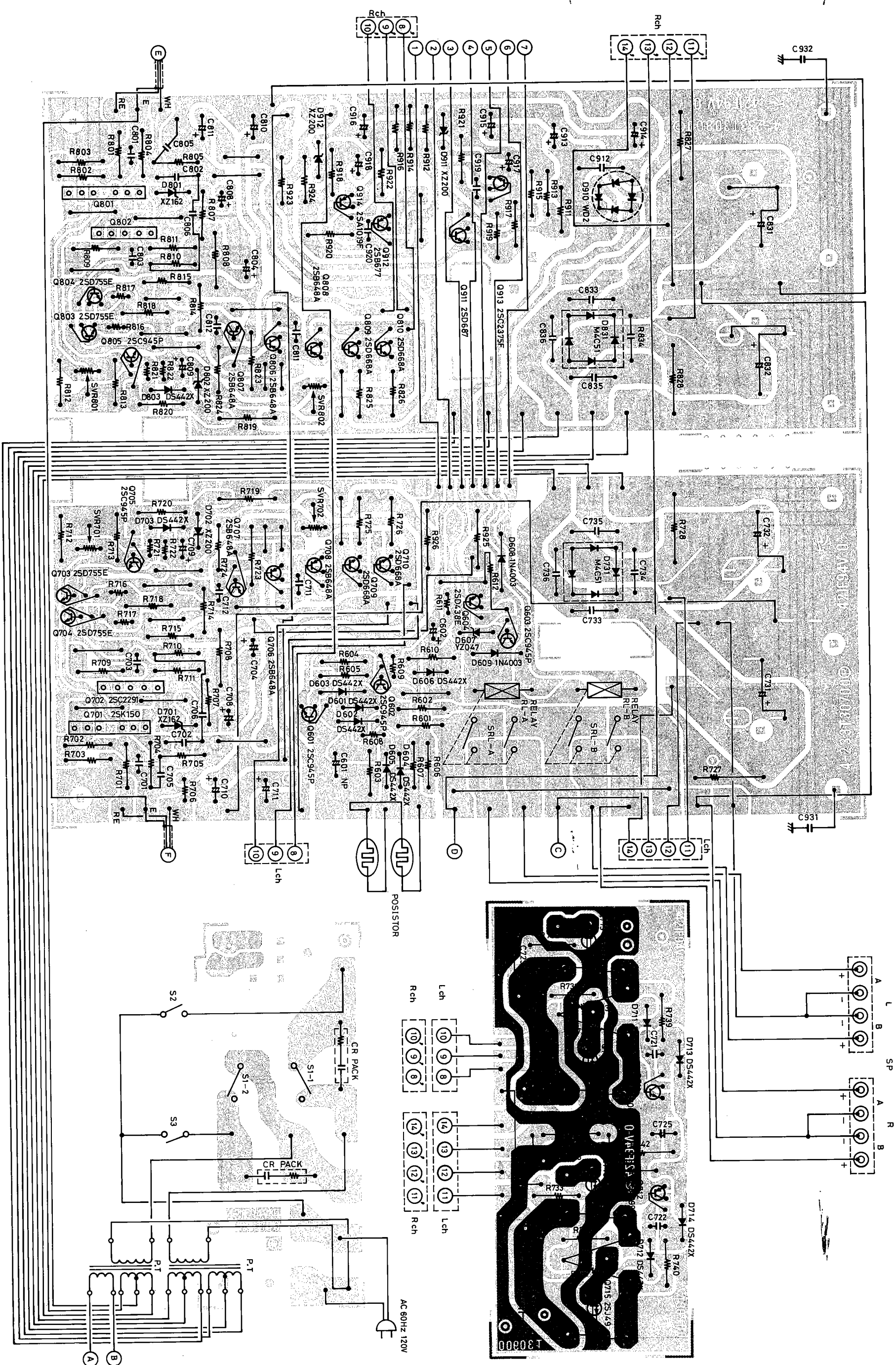
PARTS RIST

Key No.	Part No.	Description	Q'ty	Key No.	Part No.	Description	Q'ty
POWER AMP (L) PCB ASS'Y				POWER AMP (R) PCB ASS'Y			
R705,706		Carbon 15K ohm $\pm 5\%$ 1/4W	2	RESISTORS			
R606,607		Carbon 56K ohm $\pm 5\%$ 1/4W	2	R808,819		Solid 5.6K ohm $\pm 10\%$ 1/2W	2
R722		Carbon 5.6K ohm $\pm 5\%$ 1/4W	1	R827,828		Solid 8.2K ohm $\pm 10\%$ 1/2W	2
R710,711		Carbon 4.7K ohm $\pm 5\%$ 1/4W	2	R803		Carbon 56K ohm $\pm 5\%$ 1/4W	1
R707		Carbon 3.9K ohm $\pm 5\%$ 1/4W	1	R805		Carbon 15K ohm $\pm 5\%$ 1/4W	1
R718		Carbon 3.3K ohm $\pm 5\%$ 1/4W	1	R921,922		Carbon 12K ohm $\pm 5\%$ 1/4W	2
R721		Carbon 2.7K ohm $\pm 5\%$ 1/4W	1	R913,914		Carbon 10K ohm $\pm 5\%$ 1/4W	2
R720		Carbon 2.2K ohm $\pm 5\%$ 1/4W	1	R917,918		Carbon 8.2K ohm $\pm 5\%$ 1/4W	2
R701,702,704		Carbon 560 ohm $\pm 5\%$ 1/4W	3	R822		Carbon 5.6K ohm $\pm 5\%$ 1/4W	1
R709		Carbon 150 ohm $\pm 5\%$ 1/4W	1	R810,811		Carbon 4.7K ohm $\pm 5\%$ 1/4W	2
R724		Carbon 56 ohm $\pm 5\%$ 1/4W	1	R807,915,916		Carbon 3.9K ohm $\pm 5\%$ 1/4W	3
R611		Carbon 100 ohm $\pm 5\%$ 1/4W	1	R818		Carbon 3.3K ohm $\pm 5\%$ 1/4W	1
R712,713		Carbon 82 ohm $\pm 5\%$ 1/4W	2	R821		Carbon 2.7K ohm $\pm 5\%$ 1/4W	1
R716,717		Carbon 82 ohm $\pm 5\%$ 1/4W	2	R820		Carbon 2.2K ohm $\pm 5\%$ 1/4W	1
R612		Carbon 15K ohm $\pm 5\%$ 1/4W	1	R801,802,804		Carbon 560 ohm $\pm 5\%$ 1/4W	3
R714,715		Carbon 1K ohm $\pm 5\%$ 1/4W	2	R809		Carbon 150 ohm $\pm 5\%$ 1/4W	1
R725,726,723		Carbon 100 ohm $\pm 5\%$ 1/4W	3	R824		Carbon 100 ohm $\pm 5\%$ 1/4W	1
POWER AMP (R) PCB ASS'Y				R812,813		Carbon 82 ohm $\pm 5\%$ 1/4W	2
82	141-4-233T-30800	P.C. Board Ass'y, Power Amp. R	1	R816,817		Carbon 82 ohm $\pm 5\%$ 1/4W	2
	4-235T-80271	Socket 4P	1	R814,815		Carbon 1K ohm $\pm 5\%$ 1/4W	2
	4-235T-79900	Socket 3P	1	R825,826,823		Carbon 100 ohm $\pm 5\%$ 1/4W	3
	4-236T-13475	Plug 6P	1	R911,912,923,924		Carbon 5.6 ohm $\pm 5\%$ 1/4W	4
SVR801	4-222T-62071	Semifixed Variable Resistor 100 ohm	1	R919,920		Metal 20K ohm $\pm 1\%$ 1/4W	2
SVR802	4-222T-62073	Semifixed Variable Resistor 220 ohm	1	POWER FET PCB ASS'Y			
	141-2-368T-13801	Heat Sink	1	83	141-4-233T-30900	P.C. Board Ass'y, Power FET	1
	141-2-243T-09800	Base	2		4-235T-80300	Socket	4
	141-2-327T-18200	Insulator	2		4-236T-12971	Plug 4P	1
Q801		Transistor FET 2SK150	1		4-236T-10200	Plug	1
Q802		Transistor 2SC2291	1	L701	4-265T-05800	VHF Coil	1
Q803,804		Transistor 2SD755	2	Q711		Transistor 2SC2320	1
Q806,807,808		Transistor 2SB648A	3	Q712		Transistor 2SA999	1
Q809,810		Transistor 2SD668A	2	D711,712,713,714		Diode DS442 X	4
Q914		Transistor 2SA1019	1	CAPACITORS			
Q913		Transistor 2SC2375	1	C721,722		Mylar 0.0082 μ F 50V $\pm 20\%$	2
Q804		Transistor 2SC945	1	C725		Mylar 0.047 μ F 50V $\pm 20\%$	1
Q912		Transistor 2SB677	1	C723,724		Electrolytic 0.047 μ F 150V	2
Q911		Transistor 2SD687	1	RESISTORS			
D831		Diode M4C51	1	R743		Metal 10 ohm $\pm 5\%$ 1W	1
D910		Diode W02	1	R742		Metal 5.6 ohm $\pm 5\%$ 2W	1
D801		Zener Diode XZ162	1	R739,740		Carbon 1K ohm $\pm 5\%$ 1/4W	2
D802,911,912		Zener Diode XZ200	3	R731,732,733,734		Carbon 330 ohm $\pm 5\%$ 1/4W	4
D803		Diode DS442 X	1	R735,736,737,738	4-221T-03600	Resistor 0.47 ohm 5W x 2	2
CAPACITORS				POWER SWITCH PCB ASS'Y			
C804		Electrolytic 47 μ F 35V	1	84	141-4-233T-31000	P.C. Board Ass'y, Power Switch	1
C808,917,918		Electrolytic 47 μ F 25V	3		4-238T-07971	Push Switch	1
C809		Electrolytic 10 μ F 25V	1		4-227T-01000	CR Pack	2
C802		Ceramic 15pF 500V $\pm 10\%$	1	LED/DRIVE PCB ASS'Y			
C812		Ceramic 10pF 500V $\pm 10\%$	1	85	141-4-233T-31200	P.C. Board Ass'y, LED/Drive	1
C833,834,835,836,912		Ceramic 0.01 μ F 500V $\pm 100-0\%$	5		141-2-210T-19800	Bracket	1
C811,706		Ceramic 47pF 50V $\pm 10\%$	2		4-235T-80000	Socket 6P	1
C919,920		Ceramic 0.01 μ F 50V $\pm 80-20\%$	2	SVR301,401	4-222T-39575	Semifixed Variable Resistor	2
C802		Ceramic 15pF 50V $\pm 10\%$	1	IC301,401		IC NJM 4558D } or IC RC4558P	2
C801		Mylar 470pF 50V $\pm 10\%$	2				
C803		Mylar 0.001 μ F 50V $\pm 10\%$	1				
C831,832		Electrolytic 10000 μ F 63V	2				
C913,914		Electrolytic 220 μ F 100V	2				
C810,811		Electrolytic 47 μ F 63V	2				
C915,916		Electrolytic 47 μ F 100V	2				

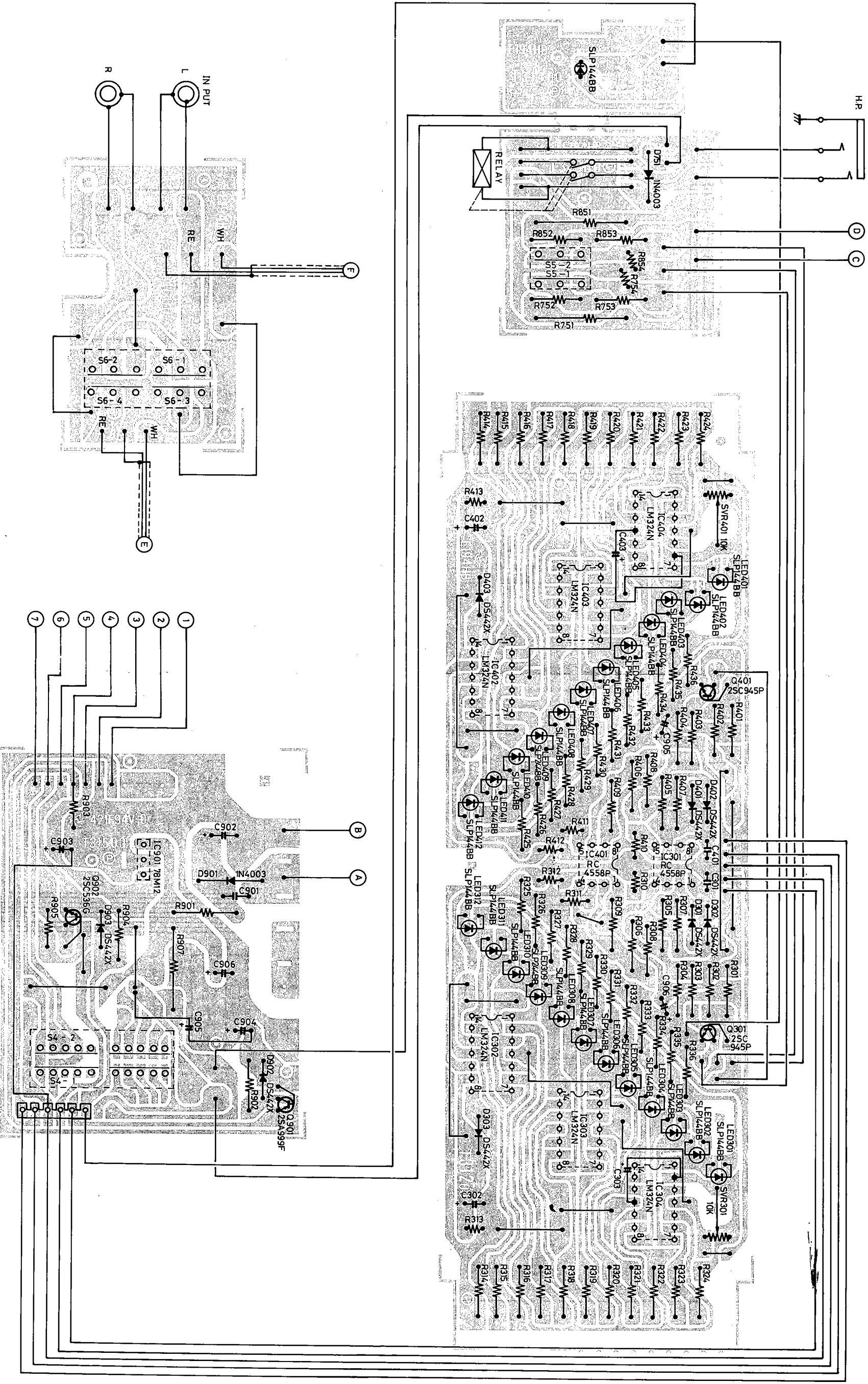
SCHEMATIC DIAGRAM

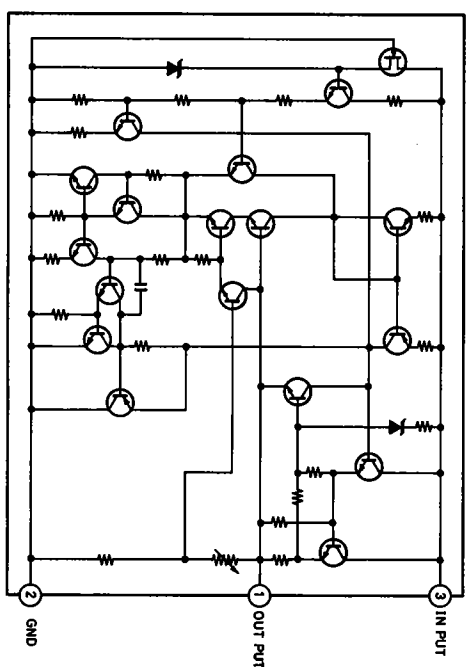
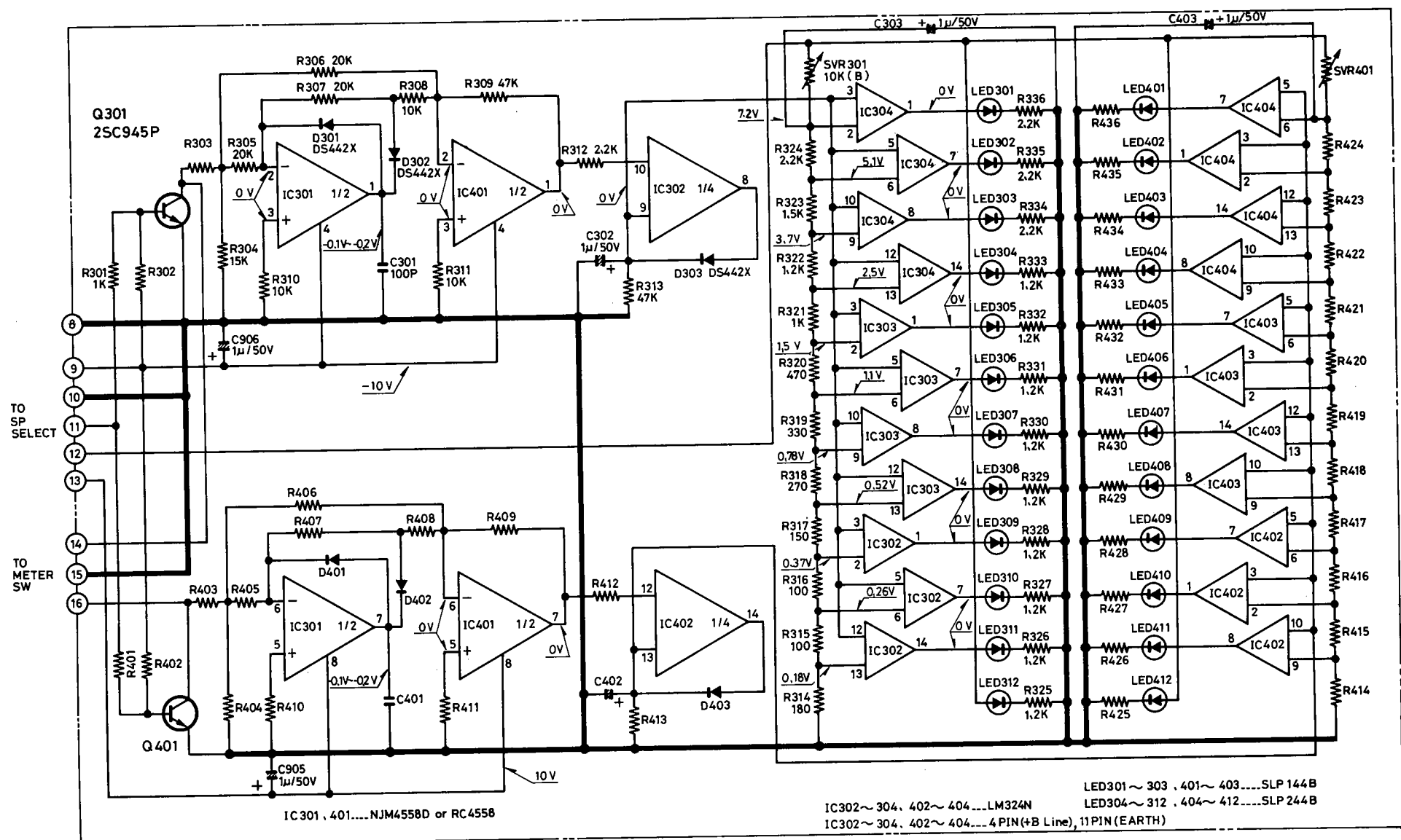


WIRING DIAGRAM

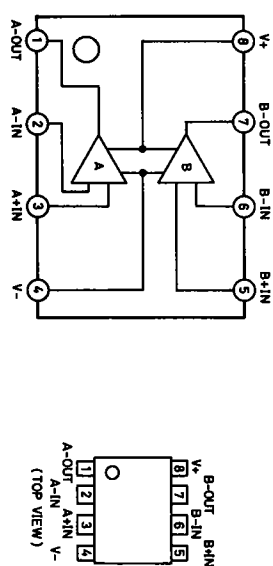


WIRING DIAGRAM

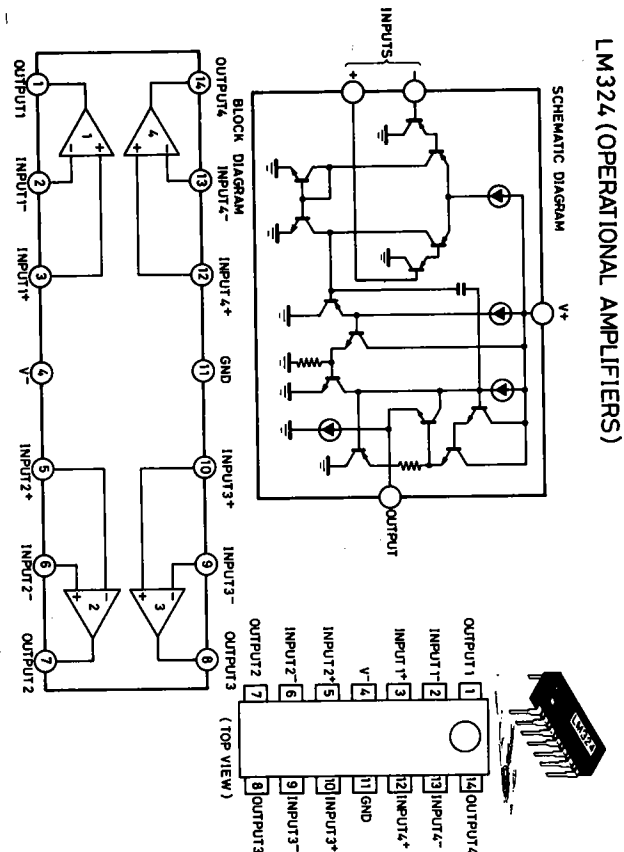




NJM78M12 (VOLTAGE REGULATOR)



NJM4558, RC4558
(DUAL HIGH-PERFORMANCE OPERATIONAL AMPLIFIERS)



LM324 (OPERATIONAL AMPLIFIERS)

HOW TO REMOVE THE FLUID CONVECTION RADIATOR (EXCHANGER).

Warning: Freon gas under pressure, do not apply heat or flame to exchanger. Do not puncture tubing.

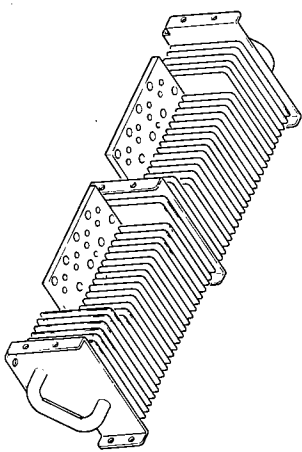
- 1) Loosen three screws (106) found between the exchanger (17) and the back panel, and remove these screws together with three plain washers (114).
- 2) Unscrew two screws (106) found between the exchanger (17) and the bottom lid.
- 3) By removing screws of Steps 2 and 3, the exchanger (17), PCB's (81 & 82), etc. can be lifted up as a block.
- 4) Unscrew one screw (106) found between the cover (29) and the bracket. Consequently, the cover (29) comes off.
- 5) Loosen four screws (115) two screws (106) found between the PCB's (81 & 82) and the bracket (18 & 19), and remove these screws together with two washers (110). Consequently, PCB's (81 & 82) come off.
- 6) Unscrew six screws (106) found between the brackets (18 & 19) and the exchanger (17). Consequently, the brackets (18 & 19) come off.
- 7) Loosen 16 screws (102) found between the FET's (58 & 59) and the PCB (83), and remove these screws together with 16 spring washers (112). Consequently, eight pieces off FET's (58 & 59) and two sheets of PCB (83) come off.
- 8) Unscrew two screws (105) found between the posistor (57) and the exchanger (17). Consequently, two pieces of posistor (57) come off.
- 9) The exchanger (17) can be removed by carrying out Steps 1 and 8.

NOTES: ● When refitting, do not forget two ceramic

- condensers (52) and mica sheets of FET's.
- When exchanging do not after the exchanger is cooled down by turning off the power switch (or pulling the AC cord out of the consent).

CAUTIONS ON HANDLING OF THE HEAT LOOP TYPE THERMAL RADIATOR

- 1) When touching the heat pipe during reassembly or repairing of the set, pay attention not to rupture the pipe, etc.
- 2) Refrain from storage where exposed to the weather and the direct rays of the sun or where temperature exceeds 60°C.
- 3) In the case of discarding the set as it no longer becomes usable on account of defective thermal radiator, do not discard the set as it is. First either cut or drill the pipe portion of the thermal radiator with metal saw or drill, for instance, at a well ventilated place to let freon gas and freon liquid out of the pipe, and only then discard the disused set.



BTL (Balanced Transformerless)

BTL refers to a power amplifier circuit to operate speakers connected to the output interval of two sets of SEPP (Single Ended Push-Pull) circuits driven with antiphase.

