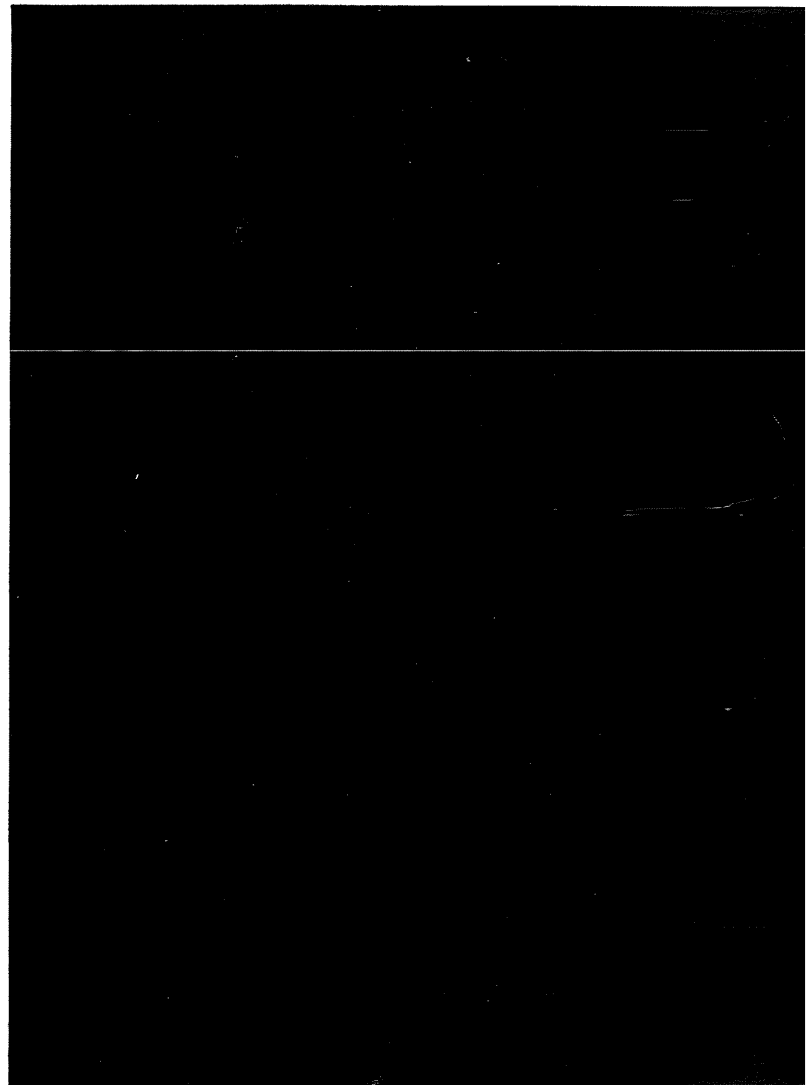
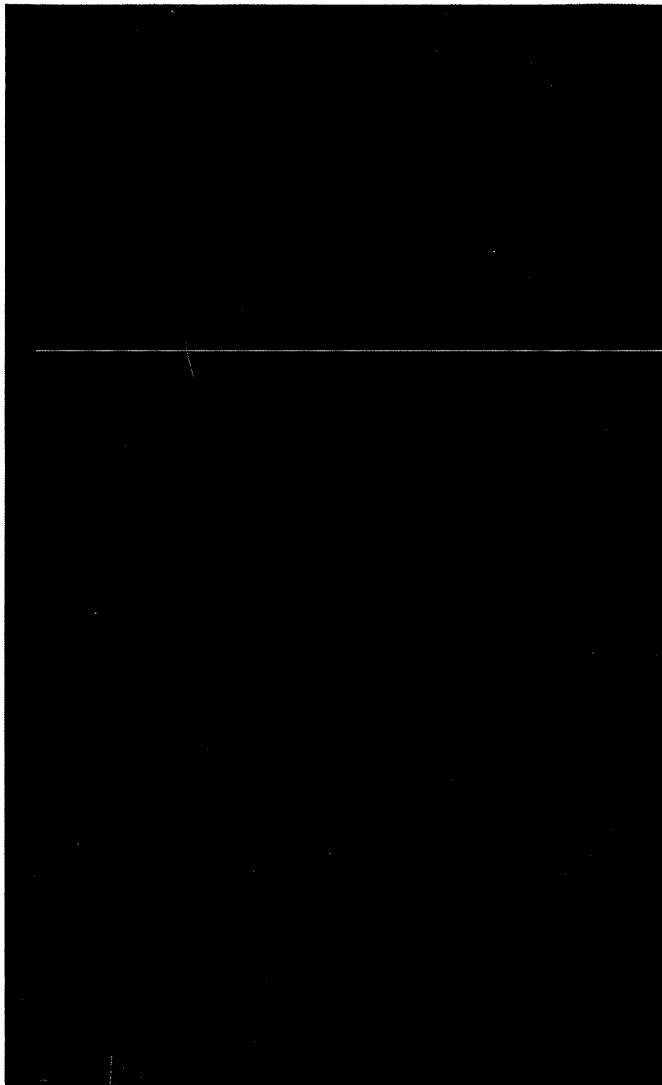


58

Service Manual u
Integrated Stereo Amplifier e

448 / 438A

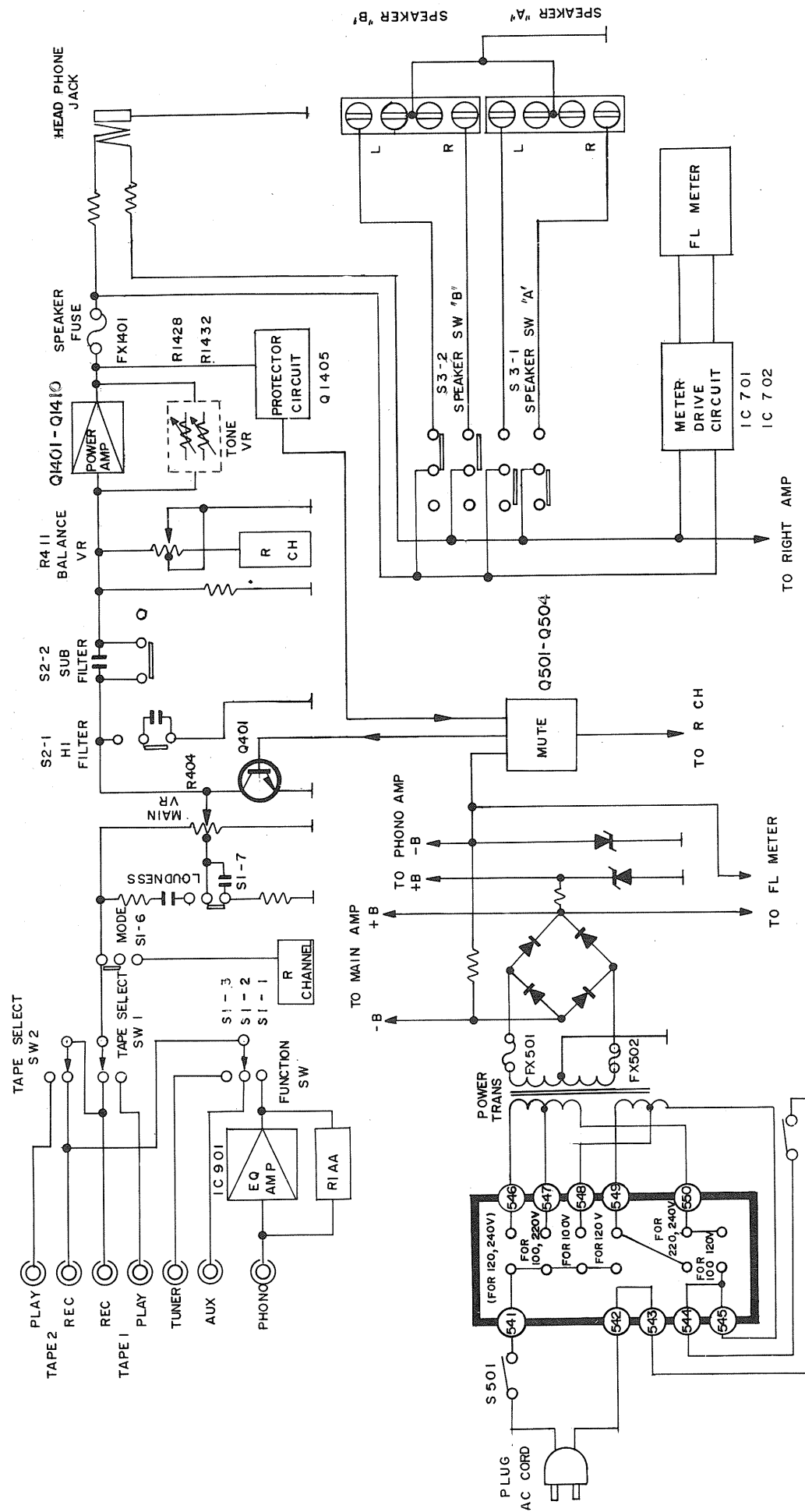


 **SCOTT®**
The Name to listen to.

SPECIFICATIONS

Integrated stereo amplifier	448A	438A
Minimum Continuous RMS Output power per channel both channels driven into 8 ohms from 20 Hz to 20 kHz With no more than rated T.H.D.	48 W	45 W
Total Harmonic Distortion at rated output	0.04%	0.04%
Total Harmonic Distortion at 10 Watt from 20 Hz to 20 kHz	0.04%	0.04%
Intermodulation at rated at rated output power; 60;7000 Hz;4:1	0.04%	0.04%
Signal to Noise Ratio, shorted input, IHF-A network: Phono (10mV, RIAA 1 kHz): Others	80 dB 95 dB	80 dB 95 dB
Input Sensitivity Phono MM Others	2.5 mV 150 mV	2.5 mV 150 mV
Phono Overload	180 mV	180 mV
Damping Factor, 1 kHz, 8 Ohm more than	60	60
Channel separation at 1 kHz PHONO at 1 kHz OTHERS	55 dB 60 dB	55 dB 60 dB
Frequency Response at 1 Watt output Phono RIAA 20 Hz – 20 kHz: Other 20 Hz – 20 kHz:	± 0.5 dB ± 0.5 dB	± 0.5 dB ± 0.5 dB
Filters subsonic 6 dB/octave, -3 dB Hi Filter 6 dB/octave, -3 dB	18 Hz 7 kHz	18 Hz 7 kHz
Tone Control Range Bass at 100 Hz Treble at 10 kHz	± 10 dB ± 10 dB	± 10 dB ± 10 dB
Loudness Contour Volume control set to - 30 dB at 10 kHz at 100 Hz	+ 3.5 dB + 7 dB	+ 3.5 dB + 7 dB
GENERAL Power requirement: (Refer to rear panel for specified voltage and frequency before making any connections.)	100V/60Hz 120V/60Hz 220V/50Hz 240V/50Hz	100V/60Hz 120V/60Hz 220V/50Hz 240V/50Hz
Power Consumption	270 W	230 W
Dimensions (W/H/D)	430 x 88 x 202	430 x 88 x 202
Net Weight	6.25 Kg	6.2 Kg

BLOCK DIAGRAM



CIRCUIT DESCRIPTION *

— Design Philosophy

As shown in the block diagram, the control of gain and frequency response is built around a one stage amplifier section which is a wide band, high open-loop gain amplifier implemented by discrete components.

— Main Amplifier

High open loop gain is provided by the dual differential amplifiers and bootstrapping. The complementary output drivers and final transistors, provide a symmetrical output drive.

With reference to the schematic diagram of 448A the first differential amplifier Q1401 and Q1402 provides excellent common mode rejection and low DC offset. Q1404 acts as voltage amplifier.

Current gain is provided by the fully complementary Darlington pairs Q1407 and Q1409 for positive swing and Q1408 and Q1410 for negative swing. The output stage bias is set by the triple diode CR1404 and RV1409.

The amplifier is controlled by multiple feedback networks. The DC feedback, assured by R1412, R1413, C1409, provides unity DC gain.

The AC gain, when no controls are activated, is determined by the relations:

$$A_v = 1 + \frac{R_{1424}}{R_{1425}} * \frac{R_{1431}}{R_{1433}}$$

— Protection Circuit

The driver and output stages are protected from short circuit and overload conditions by transistor Q1405 which short the driving signal. When current through the output transistor reaches an excessive level, saturation of Q1405 has as result a voltage drop on the base of Q503, thus driving Q503 to conduct. As consequence, Q504 shorts C510 to ground cutting the supply of the dual differential amplifiers.

— Tone Control

The tone control is a negative feedback type which uses the power amplifier stage as the active element, that is, the gain of the power amplifier stage is controlled by the tone controls circuitry. At 1 kHz, the position of the tone controls has a minor effect on the gain since at

this frequency the impedance of C1416 is high effectively removing R1428 from the circuit, and the impedance of C1419 and C1420 is low which effectively short circuits R1432.

— Bass Control

As the frequency decreases below 1 kHz, the impedance of C1419 and C1420 increases proportionately. Thus at very low frequencies, the gain is mainly determined by the position of the bass control, R1432. Rotating R1432 toward C1419 will boost the low frequencies, while turning it towards C1420 will cut the bass.

— Treble Control

At high frequencies, as at 1 kHz, R1432 is effectively short circuited. At these frequencies, however, C1416 and C1417 impedance decreases, so that R1428 becomes the main control of the amplifier gain. Rotating R1428 towards C1416 cuts the treble response.

— Filters

● Subsonic Filter

The subsonic filter consists of a passive network C404, R508. It provides a-3 dB attenuation at 18 Hz.

● Hi Filter

The Hi filter consists of a passive network C403, R407. It provides a-3 dB attenuation at 7 kHz.

— Phono Preamplifier

The phono equalizer consists of an Op. Amp. IC901 with a feedback network to fulfill the RIAA equalizing requirements.

— Muting Circuit

In this model, Q401 and Q451 are used to mute audio output until supply voltages have stabilized thus reducing any potential "thump" in the loudspeakers or headphones.

When first switched on, Q502 will conduct placing a positive voltage on the the base of each muting transistor, which short the driving signal.

C510 is being charged positively through R508 thus causing Q501 to conduct and supply current for the differential amplifier circuits and also to apply a positive voltage on the base of Q502 thus cutting this device off and further allowing the base of each muting transistor to go fully negative. When these voltages have stabilized, the unit will be operative.

*All Descriptions refer to left channel only. However they can be applied in same way to right channel too.

Meter Circuit

The FL tube is driven by a MOS LSI (IC702) which performs the analogue to digital conversion and the peak holding for both channels. Since the input response of this IC is linear, a LOG signal conversion is required.

The AC to DC conversion and LOG compression is performed by IC701.

Since this IC is a current activated device, its input voltage sensitivity, is determined by a series resistor to its input.

The auto-ranging circuit changes the sensitivity of the circuit by turning ON or OFF transistors Q-701 and Q-702.

The FLIP-FLOP (Q-704, Q-703) drives the input attenuator transistors and lights the corresponding decimal points on the display.

Need for change over, from lower to high range is detected by diodes CR-711 and CR-710 which are connected to the last segments (most significant) of both channels display.

These diodes switch the FLIP-FLOP to the high range.

As long as the 2 least significant segments are lit, the range will remain in the high one.

If these segments turn off (underrange condition) for more than 3 seconds (determined by R-717 and C-709) the FLIP-FLOP will switch to the low range by Q-705 triggering the transition.

These segments are monitored by diodes (CR-709 and C-708) which keep Q-705 in CUT OFF if these segments are lit.

Transistor Q-706 serves as system voltage regulator, utilising the 8.2V internal reference of the LOG converter (IC701)

ADJUSTMENT

Equipment Required

Audio signal generator

Dc voltmeter

Speaker load resistors, 8 Ohms, 100W

Digital voltmeter

The following adjustments are the same for both left and right channels.

Bias Adjustment

- 1) Connect 8 Ohm resistors to the speaker "A" terminals, and set the Speaker Mode switch to "A" position.
- 2) Turn the Volume control fully counter-clockwise.
- 3) Turn R1409 fully counter-clockwise.
- 4) Set digital voltmeter to most sensitive voltage range. Connect probes across TP1 and TP2 (Voltmeter bias test point, L channel). — See diagram
Turn unit on. Let it idle for 1 minute
Adjust R1409 for 30mV across the resistors.

- 5) Perform the same procedure for the right channel, except measure voltage across TP 3 and TP4 (Voltmeter bias test point, R channel).

Adjustment is made with R1459.

- 6) Leave the amplifier on for about 30 minutes, then recheck measurement. A tolerance of $\pm 25\%$ is acceptable. Readjust if necessary.

Meter Adjustment

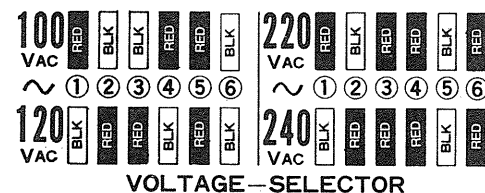
1. Turn R705 Fully counter-clock wise.
2. With all controls flat and volume maximum adjust input level to get an output of 40W (no load) at 1kHz
3. Turn R705 until the segment corresponding to 40W on the fluorescent display turns on.
4. Proceed as above for right channel (Adjust with R755).

LINE VOLTAGE SETTING

(4 Voltage Version Only)

To change line voltage, proceed as below note that "BLACK" jumpers are active connectors and the "RED" ones dummies.

A label to demonstrate voltage selecting procedure is attached inside each unit.

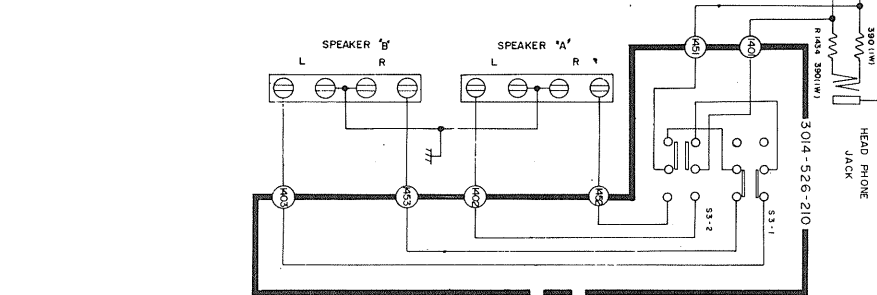
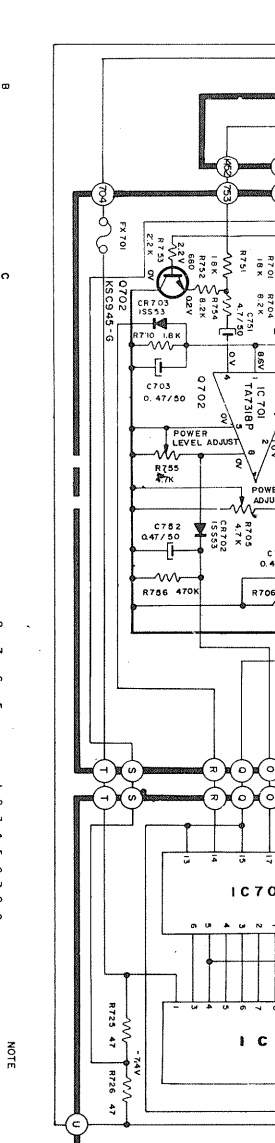
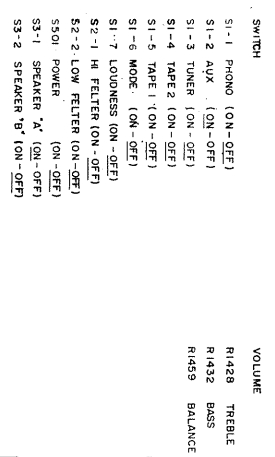


NOTICE:

Units built for sale in USA and CANADA are wired for 120V/60Hz. Units with voltage change selector are available only on special order.



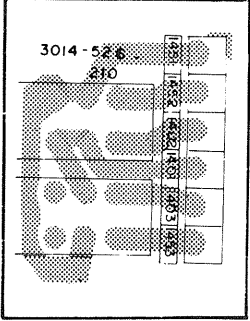
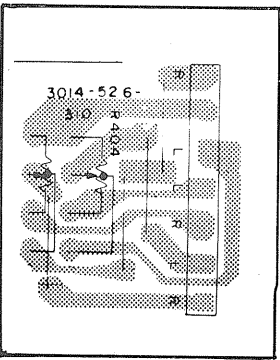
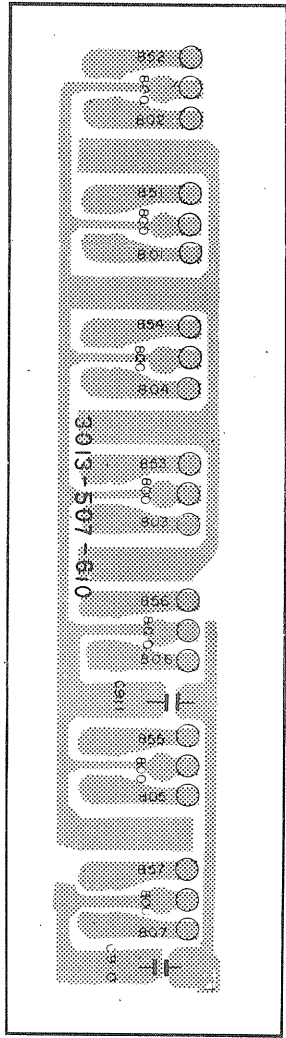
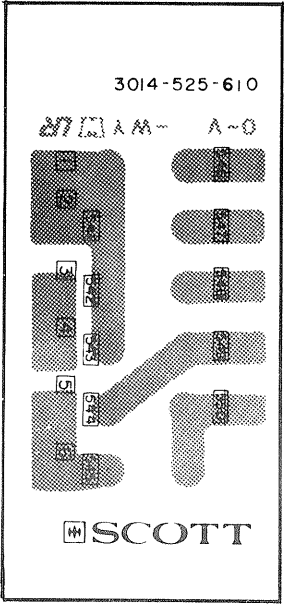
FUSE RATINGS	
LOCATION	RATING
F503	T2A
FX501	T6.3A
FX502	T6.3A
FX701	T315mA
FX1401	T6.3A
FX1451	T6.3A



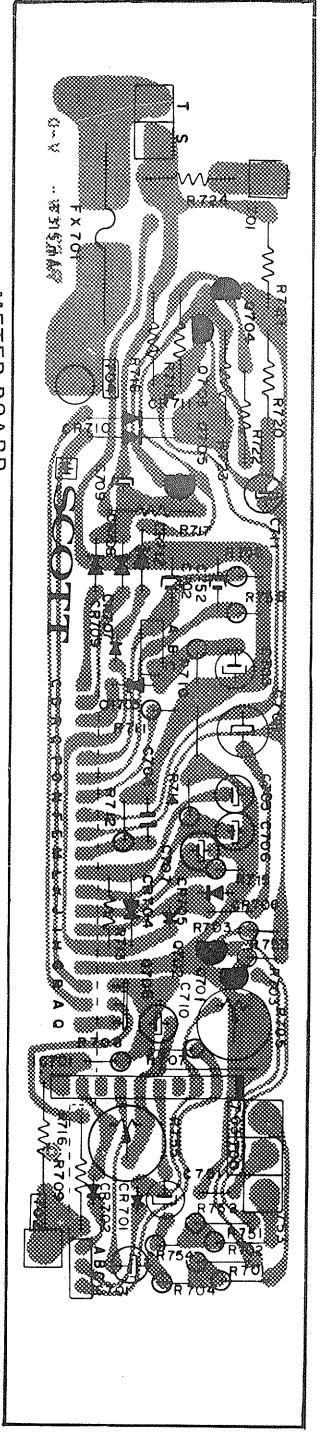
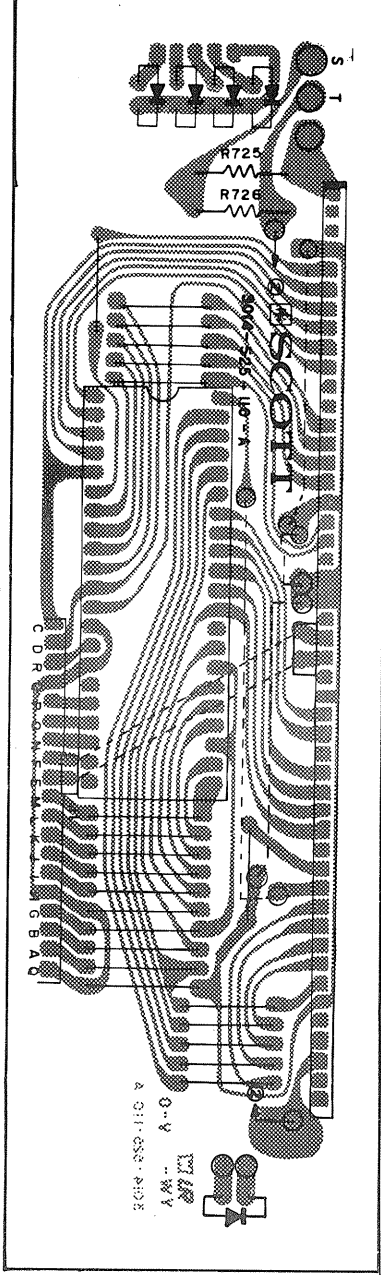
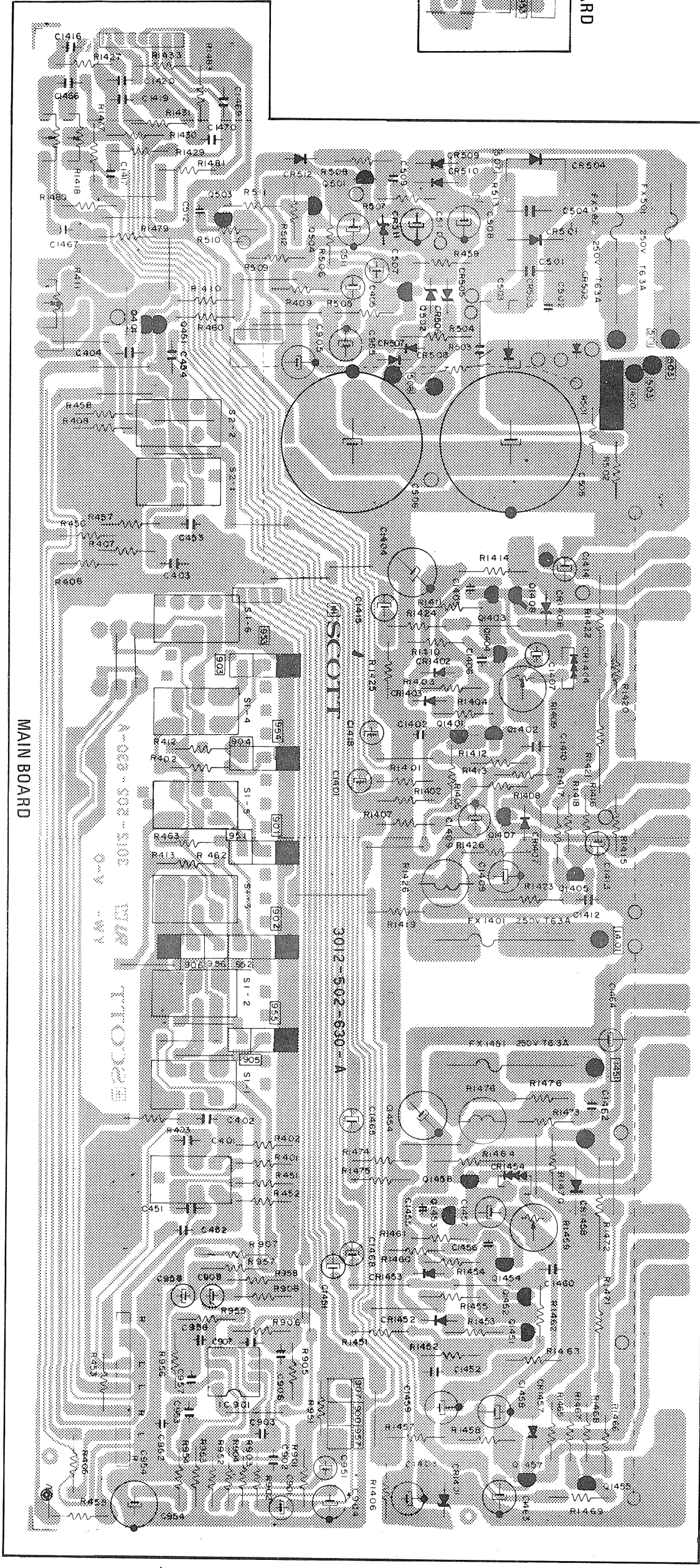
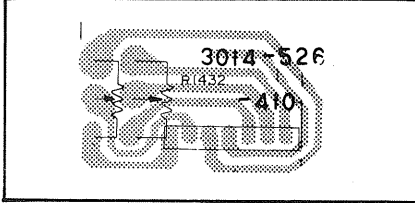
NOTE

1. ALL RESISTANCE VALUES IN OHMS, K=KILO OHM, M=MEGA OHM
2. ALL CAPACITOR VALUES IN MFD UNLESS OTHERWISE SPECIFIED
3. THERE MIGHT BE SLIGHT CHANGE IN ACTUAL SET

PARTS LOCATION DIAGRAM



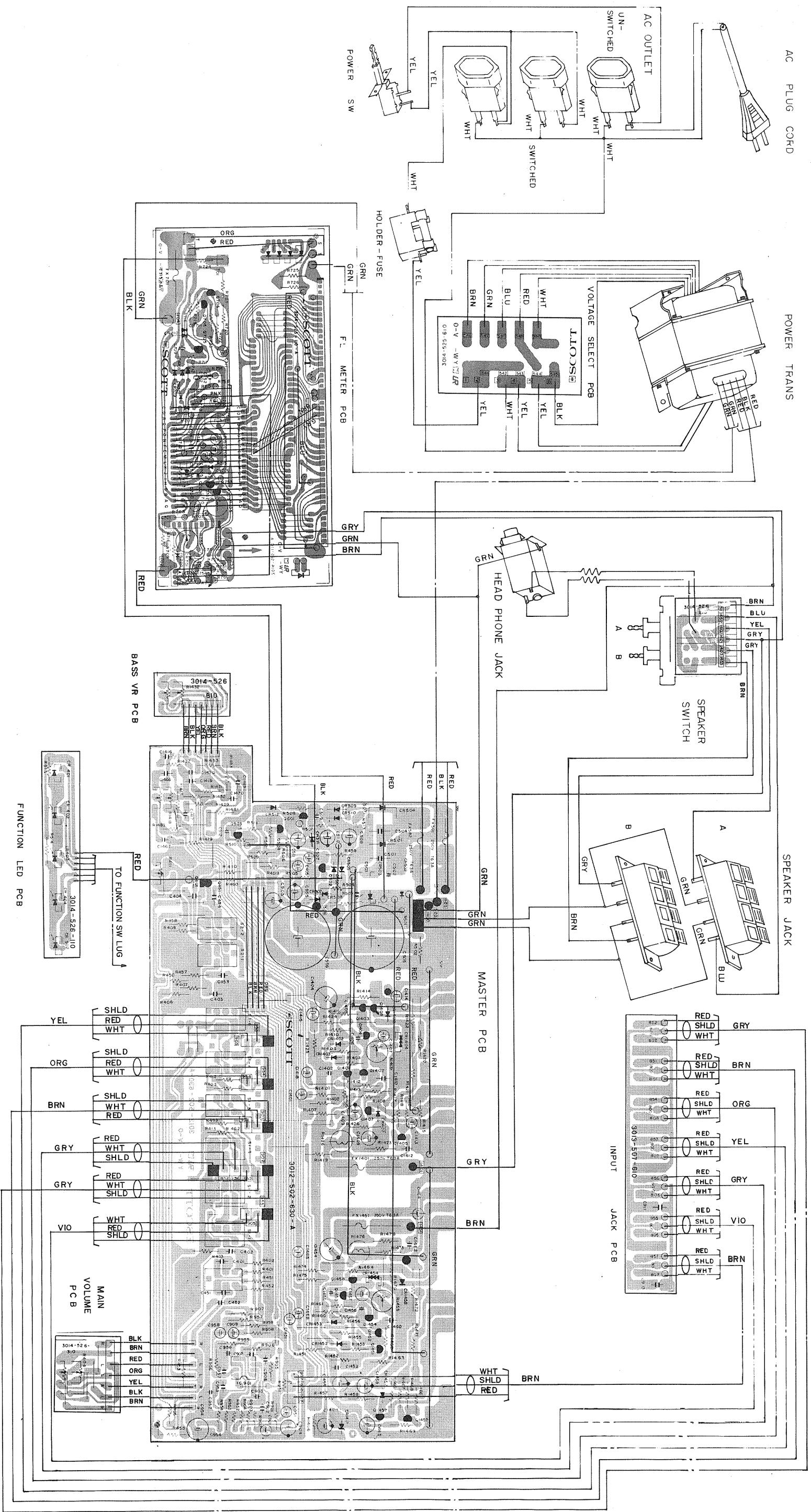
SCOTT
TONE CONTROL
BASS
BOARD



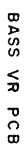
FL DRIVE BOARD

REMARK:
PARTS LOCATION IDENTICAL FOR
INTEGRATED AMPLIFIER 438A AND 448A

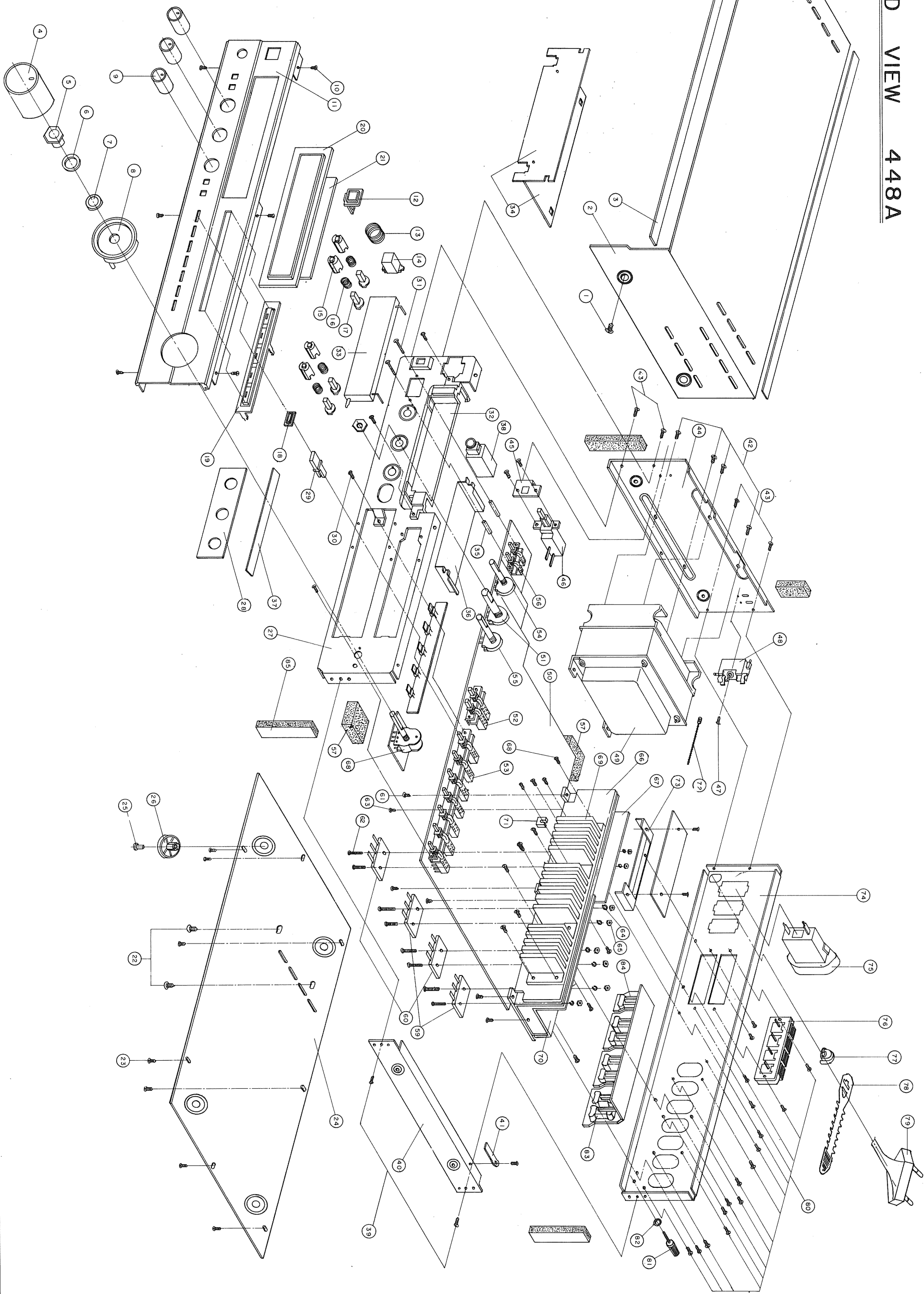
CONNECTION DIAGRAM 448A



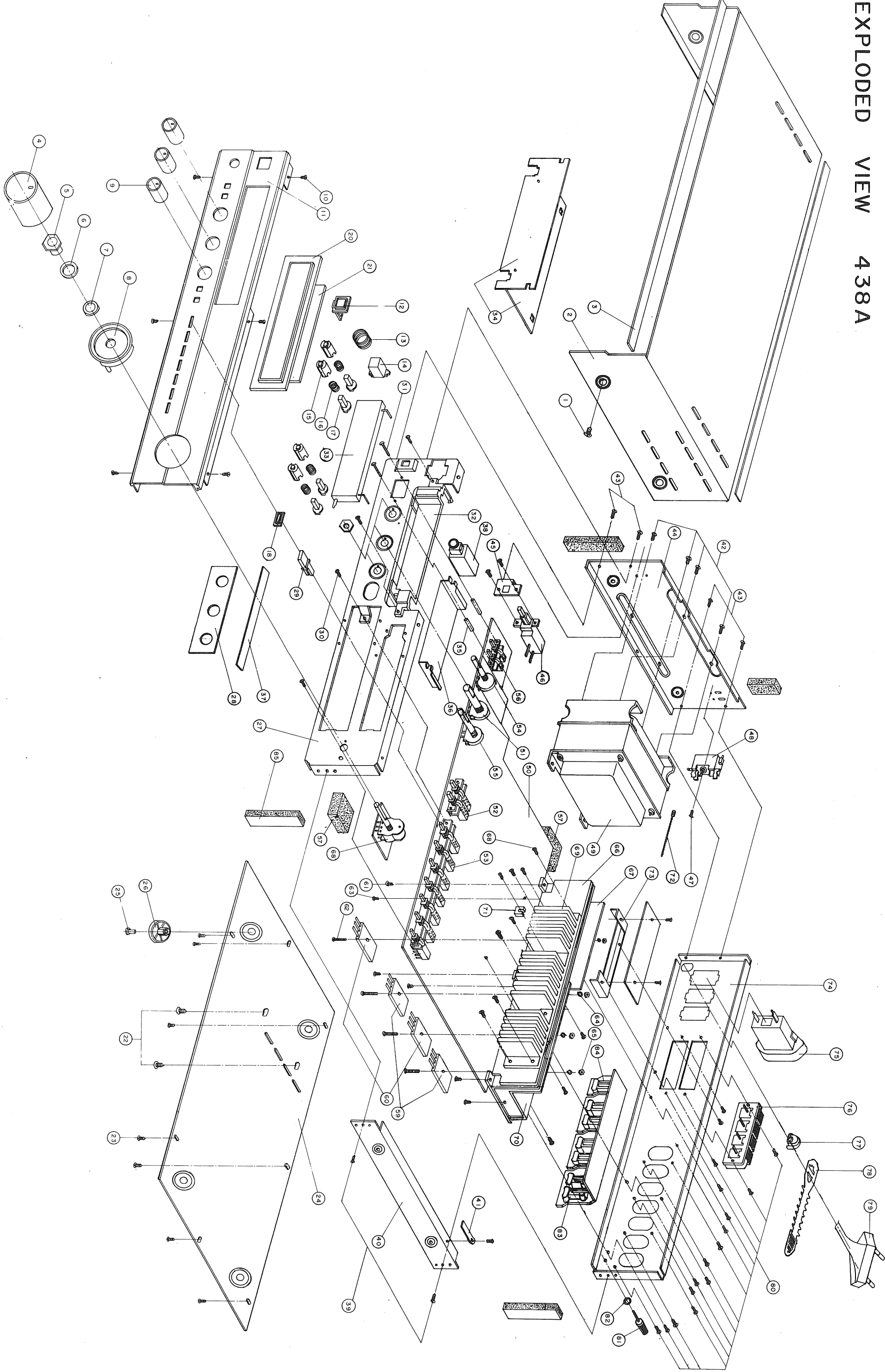
POWER TRANS



EXPLODED VIEW 448A



EXPLODED VIEW 438A



REVISIONS

	FUSE	ORIGINAL	CHANGED TO
438A UL	FX501,FX502 FX503	NOR 8A FROM 11090001 TO 11100500 NOR 4A FROM 11090001 TO 11100500	SLO 6A SLO 4A
VERSION	FX1401,1451 FX701	NOR 6A FROM 11090001 TO 11100500 SLO 0.5A FROM 11090001 TO 11100500	NOR 7A SLO 0.3A

REPLACEMENT PARTS LIST — 438A/448A

MECHANICAL PARTS

SIMBOL EXP VIEW NO	DESCRIPTION	SPECIFICATION	PART NO	USED IN
2	CABINET	0.9T PVC STEEL SILVER	6102-503-530	BOTH
3	SPACER CABINET	0.5T HIMERON SHEET	6804-502-2106	BOTH
4	KNOB-VOLUME 37	ALB C-GOLD & ABS 94HB	7724-510-710	BOTH
5	NUT-SPECIAL	MBS	7204-500-320	BOTH
6	WASHER-SPECIAL	0.5T SPCI FZY	7304-500-810	BOTH
7	SPECIAL-RUBBER	RUBBER-NOMMIGRATION	6854-502-010	BOTH
8	MASK-KNOB 37	94HB ABS SPRAY PRINT	7603-502-2104	BOTH
9	KNOB-ROTARY	ALB C-GOLD & ABS 94HB	7724-510-810	BOTH
11	PANEL-FRONT	AL EXTR HAIR-LINE	7702-510-810	438A
11	PANEL-FRONT	AL EXTR HAIR-LINE	7702-510-820	448A
12	GUIDE-KNOB(P)	94HB ABS	6464-501-6101	BOTH
13	SPRING-PUSH, KNOB	STS # 27	6674-510-0100	BOTH
14	KNOB-PUSH(P)	94HB ABS CR PLATING	7724-507-8109	BOTH
15	GUIDE-KNOB S	94HB ABS DARK GRAY	6464-500-530	BOTH
16	SPRING-PUSH KNOB S	STS # 27 PI 0.35	6674-504-7106	BOTH
17	KNOB-PUSH (S)	94HB ABS 5 x 5	7724-508-7107	BOTH
18	GUID-KNOB L	94HB ABS GRAY	6463-500-8101	BOTH
19	HOLDER-LED L	94HB ABS C-GOLD	6603-500-9102	448A
20	WINDOW-FL	94HB ACRYL 5.0T CLR	7653-503-610	BOTH
21	FILTER-FL	SMOKE-ACRYL 1.0T PINK	7654-504-610	BOTH
24	FOOT-STOPPER	94HB ABS BLK	6074-500-9106	BOTH
25	FOOT	94HB PVC SOFT BLK	6074-500-8101	BOTH
26	CHASSIS-BOTTOM	0.8T SPCI FZY	6022-507-1108	BOTH
27	CHASSIS-FRONT	0.8T SPCI FZY	6022-506-7105	BOTH
28	MASK-KNOB 16	0.5T HIMERON SHEET BLK	7604-503-810	BOTH
29	KNOB-PUSH L	94HB ABS 3 x 12.5 PLATING	7723-500-8101	BOTH
32	SUPPORTER-(FL)	94HB ABS BLK	6602-500-110	BOTH
33	FL	FIP 12YS 12AW	2319-101-0506	BOTH
34	PWB-FL	69 x 163 x 1.6T 94VO	3014-525-1100	BOTH
35	SPACER-PUSH S/W	SPCI 0.8T FZY	6864-500-830	BOTH
36	SHIELD-PLATE	0.3T TE-SBC	4544-503-410	BOTH
37	MASK-FL	1.0T HIMERON BLK	7604-503-910	BOTH
38	JACK-EARPHONE	HLJ 0279-01-070	3339-521-0505	BOTH
40	FRAME-R	0.8T SPCI FZY	6023-502-2105	BOTH

SIMBOL/ EXP VIEW NO	DESCRIPTION	SPECIFICATION	PART NO	USED IN
41	LUG	0.3T TE-SPCI	3114-102-4208	BOTH
44	FRAME-L	1.0T SPCI FZY	6023-501-8102	BOTH
45	BRACKET-POWER S/W	0.8T SPCI FZY	6614-591-5106	BOTH
46	SWITCH-POWER	SDL 1P	3529-501-4300	BOTH
48	HOLDER-FUSE	XN-1153	3364-502-0108	BOTH
49	TRANS-POWER	EI 85.8MM AC MULTI 50HZ	2869-197-8008	438A
49	TRANS-POWER	EI 85.8MM AC MULTI 50HZ	2869-197-8804	448A
50	PWB-MAIN	330 x 139 x 1.6T 94VO	3012-502-630	BOTH
51	VR-DOUBLE	GM 70E 20F M7 C100K	1219-108-0105	BOTH
52	SWITCH-PUSH	SUF 21	3529-203-2901	BOTH
53	SWITCH-PUSH	SUF 74 2C 2P	3529-203-3100	BOTH
54	VR-DOUBLE	GM 70E 20F M7 C100K	1219-108-0105	BOTH
55	VR-SIG DETENT	VM 10E 20F M7 W250K 50%	1269-101-0507	BOTH
56	SWITCH PUSH	SUF 21 (M-CURRENT)	3529-203-3003	BOTH
57	SPACER	1.0Tx30x25 RUBBER SPONGE	6834-502-0101	BOTH
58	VR-DOUBLE	GM 80B 25F M7 B 250K 50%	1219-802-0100	BOTH
66	HEAT-SINK	3.0T ALS BLK COATING	5682-501-430	BOTH
67	HEAT-SINK,SUB/B	2.0T ALS BLK COATING	5683-501-830	BOTH
68	HEAT-SINK,SUB/C	2.0T ALS BLK COATING	5683-501-930	BOTH
70	HEAT-SINK,SUB/D	2.0T ALS BLK COATING	5684-504-230	BOTH
73	BRACKET-4V	1.0T SPCI FZY	6614-593-010	BOTH
74	CHASSIS-REAR	0.8T SPCI FZY BLK COATING	6022-508-2106	438A
74	CHASSIS-REAR	0.8T SPCI FZY BLK COATING	6022-508-220	448A
75	AC-OUTLET	S-1 6495 # 01	3339-594-0103	BOTH
76	TERMINAL-BOARD PUSH	DRP 003 4P	3304-501-6105	BOTH
77	CLAMPER CORD	HEYCO SP-4N-4 BLK	6634-100-8103	BOTH
78	BAND-CORD WIRE	P.P BLACK	6634-101-8106	BOTH
79	POWER-CORD AC	KP-419C LTVD-2F BLK VDE	3053-501-6109	BOTH
81	TERMINAL-SCREW	ABS BLACK 94HB	3104-501-6109	BOTH
83	JACK-AUX	94HB ABS & 4P BLACK	3339-543-0105	BOTH
84	JACK-AUX	94HB ABS & 2P BLACK	3339-543-0202	BOTH

INTEGRATED CIRCUITS

SIMBOL/ EXP VIEW NO	DESCRIPTION	SPECIFICATION	PART NO	USED IN
IC 901	IC	NJM 4558DD	2119-401-0303	BOTH

TRANSISTORS

SIMBOL/ EXP VIEW NO	DESCRIPTION	SPECIFICATION	PART NO	USED IN
Q401,Q451	TRANSISTOR	KSC1222-L	2139-301-2809	BOTH
Q501	TRANSISTOR	KSC1008-Y	2149-301-4309	BOTH
Q504,Q1405 Q1455	TRANSISTOR	KSC945-Y	2139-302-7409	BOTH
Q701,Q702	TRANSISTOR	KSC945-G	2139-302-6501	BOTH
Q703,Q704 Q705,Q502 Q503	TRANSISTOR	KSA733-Y	2139-103-3802	BOTH
Q706	TRANSISTOR	KSC1096-Y	2149-403-1406	BOTH
Q1401,Q1402 Q1451,Q1452	TRANSISTOR	KSA970-BL	2139-103-8603	BOTH
Q1403,Q1404 Q1453,Q1454	TRANSISTOR	KTC2240-BL	2139-305-6704	BOTH
Q1407,Q1457	TRANSISTOR, DRIVER	KTC2235-Y	2139-304-6505	BOTH
Q1408,Q1458	TRANSISTOR, DRIVER	KTA965-Y	2149-102-6304	BOTH
Q1409,Q1459	TRANSISTOR, POWER	KSC2580-Y	2149-301-3304	438A
Q1410,Q1460	TRANSISTOR, POWER	KSA1105-Y	2149-101-3306	438A
Q1409,Q1459	TRANSISTOR, POWER	KSC2838-Y	2149-301-2503	448A
Q1410,Q1460	TRANSISTOR, POWER	KSA1187-Y	2149-101-6107	448A

DIODES

CR501,CR502 CR503,CR504	DIODE-RECT IN4142	3A 400V	2169-201-1509	BOTH
CR505	DIODE-ZENER,WZ150	500MW 14.4-15.6V	2169-404-2307	BOTH
CR506	DIODE-ZENER,BZ150	1W 13.8-15.6V	2169-403-9202	BOTH
CR509,CR510	DIODE-RECT,IN4001	1.0A 50V	2169-201-0504	BOTH
CR507,CR508 CR512,CR1402	DIODE-SW,1SS53	CT:6PF	2169-301-2901	BOTH
CR1452,CR1403 CR1453,CR701				
CR702,CR703 CR704,CR705				
CR706,CR707 CR708,CR709				
CR710,CR711				
CR511	DIODE-ZN, W2220	500MW 20.8-23.3V	2169-404-2200	BOTH
CR1401	DIODE-ZN, WZ120	500MW 11.4-12.6V	2169-404-6103	BOTH
CR1404,CR1454	VARISTER-STV3H	7MA 1.6-1.8V	2189-105-1007	BOTH
CR1407,CR1457 CR1408,CR1458	DIODE-RECT, IN4002	1.0A 100V	2169-201-0601	BOTH

COILS

SYMBOL/EXP VIEW NO	DESCRIPTION	SPECIFICATION	PART NO	USED IN
L1401,1451	COIL-CHOKE,SPEAKER	2.5uH	2429-005-0303	BOTH

FUSES (EUROPE VERSION)

FX501,502	FUSE	T6.3A	4709-241-3202	BOTH
FX1401,1451				
FX503	FUSE	T2A	4709-241-2508	BOTH
FX701	FUSE	T315mA	4709-241-1105	BOTH

FUSES (UL VERSION FOR 438A)

FX501,502	FUSE	NOR 8A	4709-131-3309	
FX503	FUSE	NOR 4A	4709-131-3008	
FX1401,1451	FUSE	NOR 6A	4709-131-4003	
FX701	FUSE	SLO 0.5A	4709-133-1402	

RESISTORS

R503	R-METAL OXIDE	RS 1P 1K-K	1049-301-250	BOTH
R504	R-METAL OXIDE	RS 3P 390-K	1049-301-2008	BOTH
R507	R-METAL OXIDE	RS 1P 150-K	1049-301-1504	BOTH
R1423,1473	R-METAL OXIDE	RS 1P 10-K	1049-301-0101	BOTH
R1414,1464	R-METAL OXIDE	RS 1P 68-K	1049-301-1106	BOTH
R1421,1471	R-CEMENT,WIRE	RW 5P 0.47-K	1039-905-0908	BOTH
R1422,1472				
R1420,1470	R-CARBON	RD 1/2P 220-J	1018-327-2215	BOTH
R1409,1459	VR-SEMI	SR 19R B470	1249-102-0102	BOTH

CAPACITORS

C501,502	C-CERAMIC	CK 45D 500V 0.01M-M	1419-206-4308	BOTH
C503,504				
C505,506	C-ELECTROLYTIC	50V 8200M PCB TYPE	1619-018-2701	BOTH
C508	C-ELECTROLYTIC	CE04W 50V 47M	1609-402-2800	BOTH
C510	C-ELECTROLYTIC	CE04W 35V 100M	1609-402-1009	BOTH
C1404,1454	C-ELECTROLYTIC	CE04W 50V 100M	1609-402-2907	BOTH