

DENON

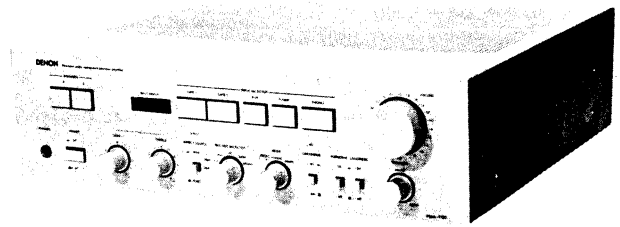
Hi-Fi Pre-Main Amplifier

SERVICE MANUAL MODEL PMA-770/750

SOLID STATE
PRE MAIN AMPLIFIER



PMA-770



PMA-750

CONTENTS

SPECIFICATIONS	1~2
BLOCK DIAGRAM	3
METHOD OF ADJUSTMENTS	4
EXPLODED VIEW OF CABINET & CHASSIS	5
EXPLODED VIEW OF PARTS LIST	6~8
PRINTED CIRCUIT BOARD PATTERNS AND PARTS LIST	
TONE EQ. UNIT ETC-453, 453J	9~12
REC & LCD UNIT ETC-454B, 454K	13~14
INPUT & EQ. UNIT ETC-452B, 452K	15~18
WIRING DIAGRAM	20, 21
CONNECTION DIAGRAM	19, 21

NIPPON COLUMBIA CO., LTD.

SPECIFICATIONS

● PMA-770

POWER AMPLIFIER SECTION

Circuit Type:	All stage direct DC servo circuit
Rated Output Power:	Both channel drive 20 Hz to 20 kHz (8 ohm Load) 100 W + 100 W (DIN, U.K., EUROPE, U.S.A.) 1 kHz (4 ohm Load) 150 W + 150 W (DIN, U.K., U.S.A.) 1 kHz (4 ohm Load) 50 W + 50 W (IEC) (Subject to change by temperature test)
Total Harmonic Distortion:	0.008% (20 Hz – 20 kHz at –3 dB rated output 8 ohm Load) 0.02% (20 Hz – 20 kHz at rated output 8 ohm Load) (U.S.A.)
Intermodulation Distortion:	Below 7 kHz / 60 Hz : 1/4 0.002% (at amplitude output equivalent to rated output)
Output Band Width:	5 Hz – 100 kHz (IHF THD 0.035%)
Transmission Characteristics:	1 Hz – 250 kHz ^{+0 dB} –3 dB (at 1 W output)
Input Sensitivity:	150 mV
Input Impedance:	47 k ohm
Output Impedance:	0.08 ohm (1 kHz)
Output Terminals:	Speaker: A and B Load 4 – 16 ohm A + B Load 8 – 16 ohm Headphone/Stereo headphone

EQUALIZER AMPLIFIER SECTION

Equalizer Amplifier Output:	Maximum Output: 10 V (at 47 k ohm Load) Rated Output: 150 mV Total harmonic wave distortion: below 0.002% (at 1 kHz, 8 V output)
Input Sensitivity/Input Impedance:	PHONO-1, 2 MM 2.5 mV 47 k ohm MC 125 μ V 100 ohm TUNER 150 mV 47 k ohm AUX, TAPE 150 mV 47 k ohm
RIAA Deviation:	PHONO-1,-2 MM within \pm 0.2 dB (20 Hz – 100 kHz) MC within \pm 0.2 dB (20 Hz – 100 kHz)

OVERALL CHARACTERISTICS

SN Ratio (IHFA Network):	PHONO-1,-2 MM 90 dB (input terminals short-circuited for 2.5 mV input) MC 73 dB (input terminals short-circuited for 250 μ V input)
Tone Control Adjustable Range:	TUNER, TAPE, AUX: 110 dB (input terminals short-circuited) BASS 100 Hz \pm 8 dB TREBLE 10 kHz \pm 8 dB
Filtering Characteristics:	SUBSONIC 18 Hz, 6 dB/oct
Loudness Characteristics:	Low frequency 100 Hz + 7 dB High frequency 10 kHz + 6 dB

AC OUTLET:

(For U.S.A. and Canada)

POWER SOURCE:

SWITCHED x 2, 100 W (Total)
UNSWITCHED x 1, 250 W
Germany and France AC 220 V, 50 Hz; U.K. AC 240 V, 50 Hz;
U.S.A. AC 120 V, 60 Hz; Hong Kong AC 200V, 50 Hz

POWER CONSUMPTION:

270 W (U.S.A.); 400 W (IEC); 290 W (Hong Kong);
800 W Maximum Output

DIMENSIONS:

434 mm (W) x 132 mm (H) x 407 mm (D)
(including rubber feet, control knobs, and terminals)

WEIGHT:

12 kg

Design and specifications are subject to change without prior notice.

NOTE: The following code correspond to the appropriate models.

E2 for Enrope EF for France, EK for U.K., E3 for U.S.A., E3 for Canada and E1 for Hong Kong, Singapore.

This Service Manual is prepared based on PMA-770 E2.

DENON

Hi-Fi Pre-Main Amplifier

SERVICE MANUAL MODEL PMA-750/770 SOLID STATE PRE MAIN AMPLIFIER

GOLD VERSION

Service Manual for this model has been already issued. The GOLD VERSION is equal to the existent SILVER VERSION except for the following items. Before use, please prepare both service manuals.

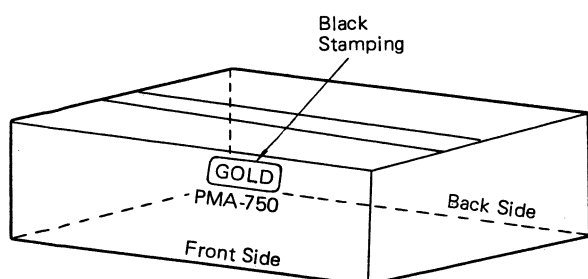
EXPLODED VIEW OF CHASSIS AND CABINET PARTS LIST

• PMA-750 Page 7

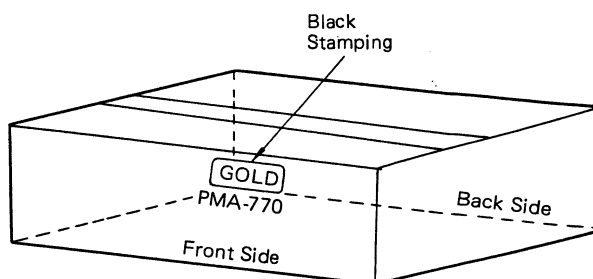
• PMA-770 Page 6

Ref. No.	Part Name & Descriptions	Part No.		Ref. No.	Part Name & Descriptions	Part No.	
		Silver Version	Gold Version			Silver Version	Gold Version
50	FRONT PANEL	1440928000	1440928013	50	FRONT PANEL	1440912003	1440912016
52	PUSH KNOB (For SP)	1130291209	1130291212	52	PUSH KNOB (For SP)	1130291209	1130291212
54	PUSH KNOB ASS'Y (For Loud.)	1130306107	1130306110	54	PUSH KNOB ASS'Y (For Loud.)	1130306107	1130306110
72	PUSH KNOB (For Input)	1130290200	1130290213	72	PUSH KNOB (For Input)	1130290200	1130290213
74	TOP COVER	1020128000	1020128013	74	TOP COVER	1020128000	1020128013
78	KNOB	1120265203	1120265229	78	KNOB	1120265203	1120265229
79	KNOB (A)	1120359106	1120359119	79	KNOB (A)	1120359106	1120359112
80	KNOB (C)	1120374000	1120374013	80	KNOB (B)	1120360001	1120360014
83	PUSH KNOB ASS'Y	1130171222	1130171235	83	PUSH KNOB ASS'Y	1130171222	1130171235

The display on the carton case is as shown below:



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NIPPON COLUMBIA CO., LTD.

JAN. 1984

SPECIFICATIONS

● PMA-750

POWER AMPLIFIER SECTION

Circuit Type:	All stage direct DC servo circuit
Rated Output Power:	Both channel drive 20 Hz to 20 kHz (8 ohm Load) 80 W + 80 W (DIN, U.K., EUROPE, U.S.A.) 1 kHz (4 ohm Load) 100 W + 100 W (DIN, U.K., U.S.A.) 1 kHz (4 ohm Load) 50 W + 50 W (IEC) (Subject to change by temperature test)
Total Harmonic Distortion:	0.008% (20 Hz – 20 kHz at –3 dB rated output 8 ohm Load) 0.02% (20 Hz – 20 kHz at rated output 8 ohm Load) (U.S.A.)
Intermodulation Distortion:	Below 7 kHz / 60 Hz : 1/4 0.002% (at amplitude output equivalent to rated output)
Output Band Width:	5 Hz – 100 kHz (IHF THD 0.035%)
Transmission Characteristics:	1 Hz – 250 kHz $\begin{matrix} +0 \text{ dB} \\ -3 \text{ dB} \end{matrix}$ (at 1 W output)
Input Sensitivity:	150 mV
Input Impedance:	47 k ohm
Output Impedance:	0.08 ohm (1 kHz)
Output Terminals:	Speaker: A and B Load 4 – 16 ohm A + B Load 8 – 16 ohm Headphone/Stereo headphone

EQUALIZER AMPLIFIER SECTION

Equalizer Amplifier Output:	Maximum Output: 10 V (at 47 k ohm Load) Rated Output: 150 mV Total harmonic wave distortion: below 0.002% (at 1 kHz, 8 V output)
Input Sensitivity/Input Impedance:	PHONO MM 2.5 mV 47 k ohm MC 125 μ V 100 ohm TUNER 150 mV 47 k ohm AUX, TAPE 150 mV 47 k ohm
RIAA Deviation:	PHONO MM within ± 0.2 dB (20 Hz – 100 kHz) MC within ± 0.2 dB (20 Hz – 100 kHz)

OVERALL CHARACTERISTICS

SN Ratio (IHFA Network):	PHONO MM 88 dB (input terminals short-circuited for 2.5 mV input) MC 72 dB (input terminals short-circuited for 250 μ V input)
	TUNER, TAPE, AUX: 110 dB (input terminals short-circuited)
Tone Control Adjustable Range:	BASS 100 Hz ± 8 dB TREBLE 10 kHz ± 8 dB
Filtering Characteristics:	SUBSONIC 18 Hz, 6 dB/oct
Loudness Characteristics:	Low frequency 100 Hz + 7 dB High frequency 10 kHz + 6 dB

AC OUTLET:

(For U.S.A. and Canada)

POWER SOURCE:

POWER CONSUMPTION:

DIMENSIONS:

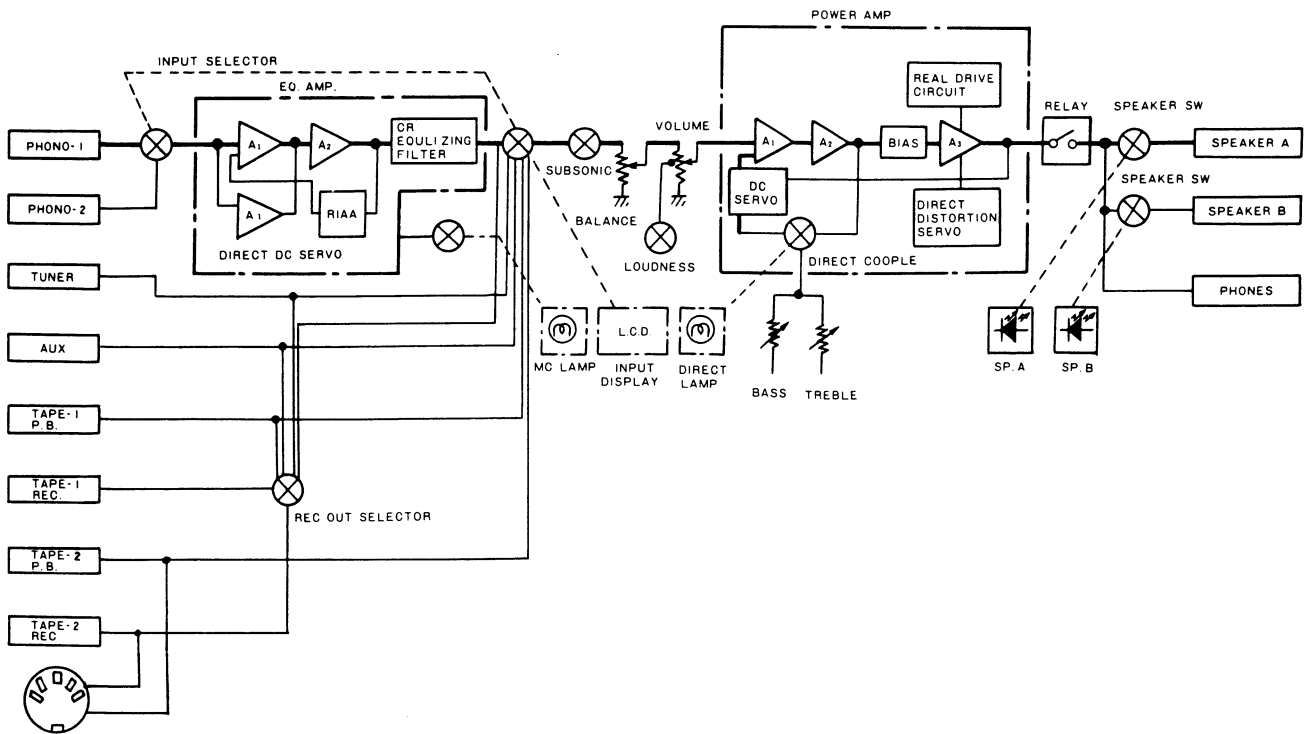
WEIGHT:

SWITCHED x 2, 100 W (Total)
UNSWITCHED x 1, 250 W
Germany and France AC 220 V, 50 Hz; U.K. AC 240 V, 50 Hz; U.S.A. AC 120 V, 60 Hz; Hong Kong AC 200V, 50 Hz
230 W (U.S.A.); 400 W (IEC); 200 W (Hong Kong); 680 W Maximum Output
434 mm (W) x 132 mm (H) x 407 mm (D) (including rubber feet, control knobs, and terminals)
12 kg

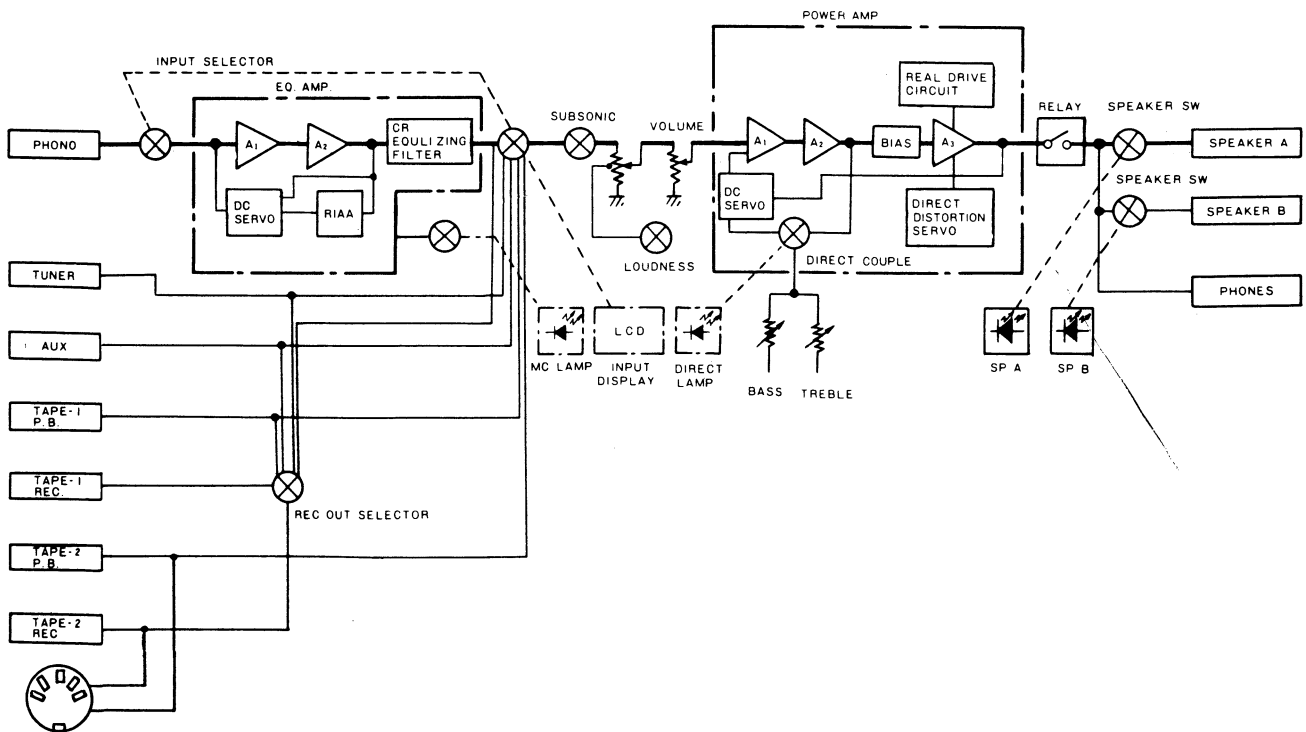
Design and specifications are subject to change without prior notice.

BLOCK DIAGRAM

• PMA-770

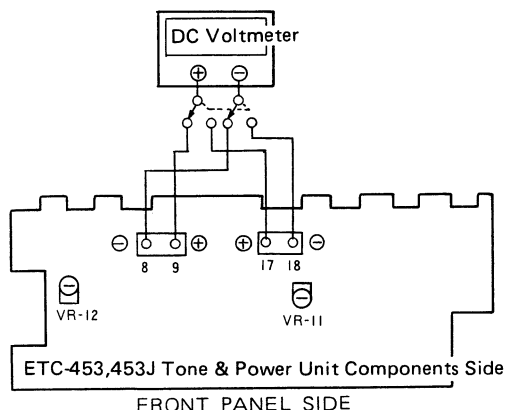


• PMA-750



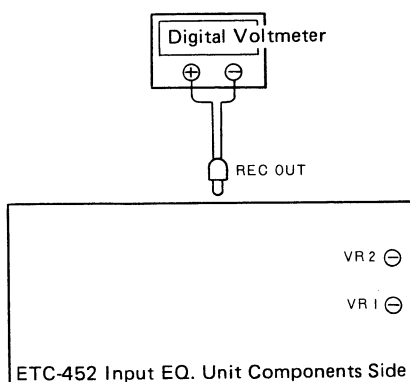
METHOD OF ADJUSTMENT

Schematic View of Tone Power for ETC-453 (PMA-770), ETC-453J (PMA-750)

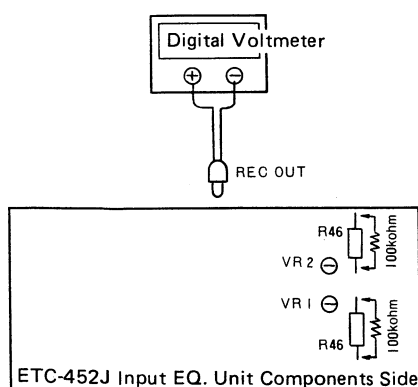


Schematic View for Input and Equalizer for ETC-452 (PMA-770), ETC-452J (PMA-750)

PMA-770



PMA-750



Adjustment of Idling Current (ETC-453, ETC-453J)

Preparation

1. Keep the unit away from direct wind blown by an air-conditioner and an electric fan. Keep the unit under normal conditions. Adjust the range of ambient temperature to 15 - 30°C.
2. Set the following switches as follows;
 - POWER (power switch) to off
 - VOLUME (volume control) to $-\infty$ (min.)
 - DIRECT COUPLE (direct switch) to DIRECT
 - SPEAKER (speaker terminal) to no load (a speaker and a dummy resistor are not connected)

Adjustment

1. Remove the top cover and turn the variable resistors VR11 and VR12 of ETC-453 and ETC-453J (tone and power unit) in the clockwise direction until they stop. Connect a DC voltmeter between the negative terminal 9 and the positive terminal 8, and between the positive terminal 17 and the negative terminal 18.
2. Connect the power source cord to an AC outlet. Turn on the power switch. Turn the variable resistors UR11 and UR12 in the counterclockwise direction within one minute. Preset adjust the voltages at the respective test points as follows:
 - PMA-770 15 ± 2 mV
 - PMA-750 11 ± 2 mV
3. Set the variable resistors VR11 and VR12 2 to 3 minutes after the presetting as follows:
 - PMA-770 19 ± 1 mV
 - PMA-750 13 ± 1 mV

Adjustment of ETC-452 and ETC-452J


Preparation

1. Insert the short pin into the "phono" input terminal.
2. Connect a digital voltmeter between the "REC" output terminals (LCH and RCH). the output voltage at the digital voltmeter must be 0.01 - 1 mV (DC).
3. Connect a resistor of 100 k ohms (1/4 W) between the resistors R45 and R46 of 10 M ohms of the unit in order to make measurement easy (only for PMA-750).
4. Set the RECOUT SELECTOR to the "phono" position and set the volume control to $-\infty$ (min.).

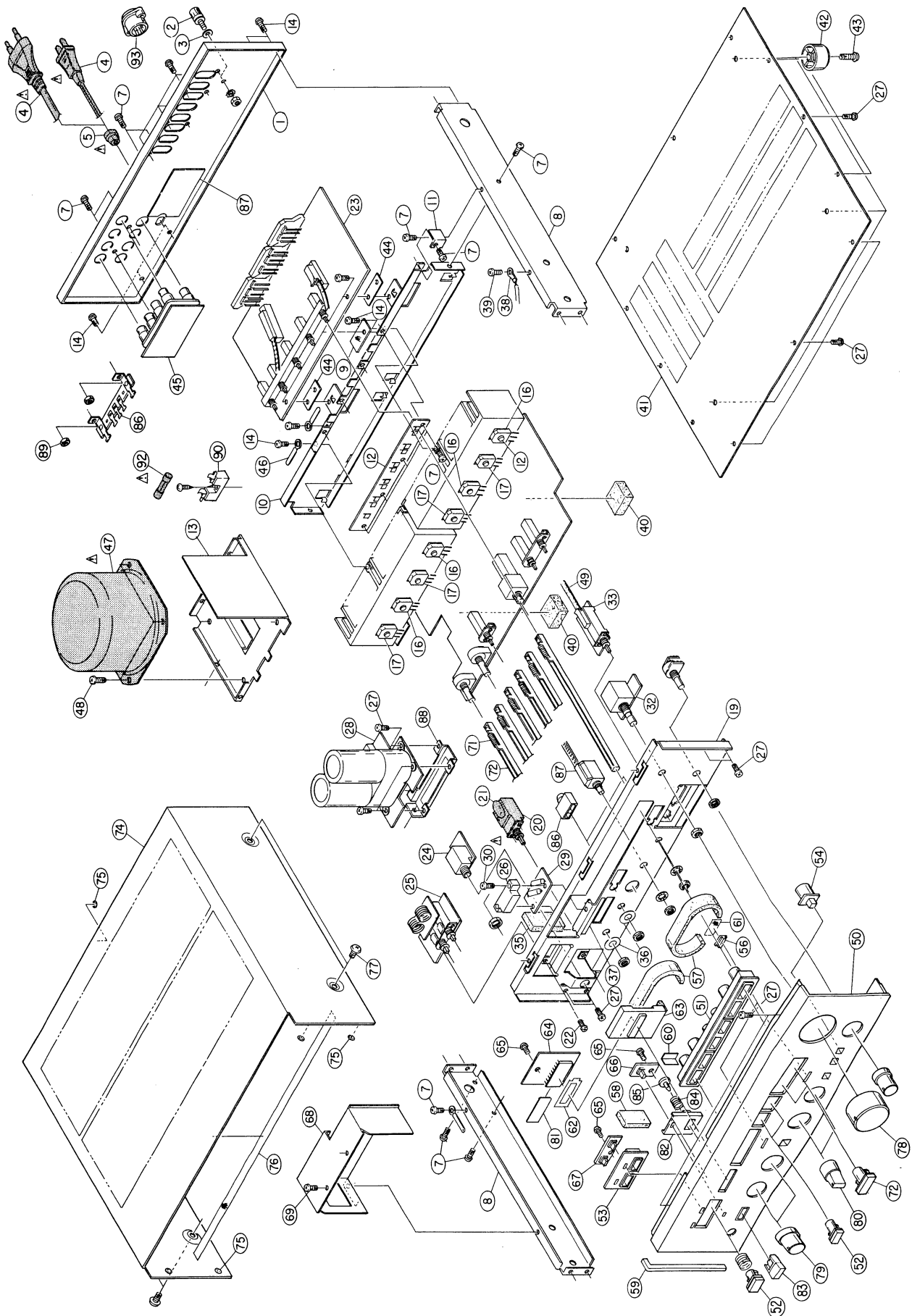
Adjustment

1. Turn on the power switch. After two minutes, perform the following procedures.
PMA-770, PMA-750
 - Adjust the variable resistor 1 (semi-fixed resistor of 100 k ohms) so that the output for LCH at the digital voltmeter reads less than 0.5 V (DC).
 - Adjust the variable resistor 2 (semi-fixed resistor of 100 k ohms) so that the output for RCH at the digital voltmeter reads less than 0.5 V (DC).

EXPLODED VIEW OF CHASSIS AND CABINET

▲  Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.

This EXPLODED VIEW is prepared based on PMA-770E2.



EXPLODED VIEW OF PARTS LIST

● (PMA-770)

- Note: 1. See addendum list below for the parts with asterisk (*) on the Ref. No. and the other parts not included in this list.
 2. The list is prepared based on E2.
 3. ● Mark same as PMA-750E2.

Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions
* 1	1050460000	BACK PANEL	52 ●	1130291102	PUSH KNOB (SP)
2 ●	2050071016	TERMINAL ASS'Y	53 ●	1460432107	PANEL BUSH (SP)
3 ●	4770018001	WASHER	54 ●	1130306000	PUSH KNOB (LOUDNESS) ASS'Y
* Δ 4	2062002031	AC CORD	55	—	—
* Δ 5	4450020005	CORD BUSH	56	1430224002	LENS
* Δ 6	—	—	57 ●	4610155011	BLIND
7 ●	4730354035	TAPPING SCREW (2)3x8 MFN1B	58 ●	4610155024	BLIND
8 ●	4120733224	SIDE CHASSIS	59 ●	4610155040	BLIND
9 ●	4410355008	HOLD PLATE	60	1250015006	BLIND SHEET (B)
10 ●	4110320113	MAIN CHASSIS	61	1430240002	FILTER
11 ●	4120965018	SUPPORT BRACKET	62 ●	1430230009	WINDOW PLATE
12 ●	4410353000	SHEET	63 ●	1430228008	WINDOW
13 ●	4110333003	TRANS CHASSIS ASS'Y	64	ETC-0454B3	LCD UNIT
14 ●	4770064107	FIXING SCREW	65 ●	4770096007	PUSH RIVET
15 ●	4170153100	POWER RADIATOR	66	ETC-0454B5	POWER LED UNIT
16	2710150028	TRANSISTOR 2SA1146(R)/(O)	67	ETC-0454B4	SPEAKER LED UNIT
17	2730298023	TRANSISTOR 2SC2706(R)/(O)	68	4120988008	LAMP COVER
18 ●	4700012022	CROSS PAN SCREW WITH W.S.W 3x12	69	4470052009	FIX. SCREW
19 ●	4110321206	FRONT CHASSIS	70 ●	4120962008	CONNECTING BRACKET
* Δ 20 ●	2124263022	PUSH SWITCH	71 ●	4630274066	SPRING
* Δ 21 ●	2538003014	CERAMIC CAP 0.0047μF 450 V	72 ●	1130290103	PUSH KNOB (INPUT)
22 ●	4700009006	CROSS PAN SCREW WITH S. WASHER 3x6	73 ●	1130291102	PUSH KNOB (SP)
*23	ETC-0452B1	INPUT & EQ. UNIT	74 ●	1020128000	TOP COVER
*24	ETC-0452B2	HEADPHONE JACK UNIT	75 ●	1040034006	STOPPER
*25	ETC-0452B3	SPEAKER SWITCH UNIT	76 ●	1220069008	SPACER
26	1430229007	L.C.D. LENS	77 ●	4734801005	TAPPING SCREW (TRUS) 4x8
27 ●	4730354019	TAPPING SCREW (2)3x8	78 ●	1120265203	KNOB
28	ETC-0454B1	RECT & LCD UNIT	79 ●	1120359106	KNOB (A)
29	ETC-0454B2	LAMP UNIT	80	1120360001	KNOB (B)
30 ●	4730358015	TAPPING SCREW (2)3x14	81 ●	1430354019	COLOR PLATE
31	ETC-04531	TONE & POWER UNIT	82 ●	1460430109	PANEL BUSH (POWER)
32	ETC-04532	VOLUME UNIT	83 ●	1130171222	PUSH KNOB ASS'Y
33	ETC-04533	CARTRIDGE SW UNIT	84 ●	4630220007	SPRING
34 ●	2120197008	ROTARY REMOTE	85 ●	1190041002	STOPPER
35	4610155037	BLIND	86 ●	2050089008	7P W TERMINAL
36 ●	1250014007	BLIND SHEET (A)	87 ●	4150088004	INSULATING SHEET
37 ●	4150208004	INSULATING SHEET	88 ●	4700042005	CROSS PAN SCREW WITH S. WASHER 3x8 (BLACK)
38 ●	2030176106	WIRE ASS'Y	89 ●	4756008008	NUT φ3
39 ●	4700044005	TAPPING SCREW WITH W. 3x8	90 ●	2020013004	FUSE HOLDER
40 ●	4610157080	CUSHION	91 ●	5130159185	FUSE LABEL
41 ●	1050450007	BOTTOM COVER	92 ●	2061015087	FUSE (4A)
42 ●	1048001002	FOOT	93 ●	2038084009	5P CONNECTOR (DIN)
43 ●	4730355018	TAPPING SCREW (2)3x10	94 ●	2412156003	CARBON FILM RESISTOR 470 k ohm
44 ●	4150197005	INSULATING SHEET	95 ●	4630274024	SPRING
*45	ETC-0452B4	SPEAKER TERMINAL UNIT	PACKING & ACCESSORIES (not included EXPLODED VIEW)		
46 ●	EP-6214	CORD HOLDER	a ●	5040064001	CABINET SHEET
* Δ 47	2335241202	POWER TRANS.	b ●	5030301101	CUSHION
48	4730454032	TAPPING SCREW (2)4x8 (BLACK)	*c	5010755049	CARTON CASE
49 ●	4350052018	FLEXIBLE SLIDER	d	5110994001	INST. MANUAL
50	1440912003	FRONT PANEL			
51	1460433106	PANEL BUSH (INPUT)			

ADDENDUM LIST

Ref. No.	Part Name & Descriptions	Part No.		
		E1 for Hong Kong	EK for U.K.	E3 for U.S.A.
1	BACK PANEL	1050462008		
Δ 4	AC CORD	2006031026		
Δ 5	CORD BUSH	MD-3802		
Δ 6	AC OUTLETS	2033909008		
Δ 20	PUSH SWITCH	2124263022		
Δ 21	CAPACITOR	2538003014		
23	INPUT & EQ-UNIT	ETC-0452D1		
24	HEADPHONE JACK UNIT	ETC-0452D2		
25	SPEAKER SWITCH UNIT	ETC-0452D3		
45	SPEAKER TERMINAL UNIT	ETC-0452D4		
Δ 47	POWER TRANS.	2335304107		
Δ 96	VOLTAGE SEL. SWITCH	2120186006		
97	CROSS PAN SCREW 3x6 (BLACK)	4711303034		
PACKING & ACCESSORIES (not included EXPLODED VIEW)				
c	CARTON CASE	5010755049		

EXPLODED VIEW OF PARTS LIST

● (PMA-750)

- Note: 1. See addendum list below for the parts with asterisk (*) on the Ref. No. and the other parts not included in this list.
 2. The list is prepared based on E2.
 3. ● Mark same as PMA-770E2.

Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions
* 1	1050459008	BACK PANEL	52 ●	1130291102	PUSH KNOB (SP)
2 ●	2050071016	TERMINAL ASS'Y	53 ●	1460432107	PANEL BUSH (SP)
3 ●	4770018001	WASHER	54 ●	1130306000	PUSH KNOB (LOUDNESS) ASS'Y
* Δ 4	2062002031	AC CORD	55	—	—
* Δ 5	4450020005	CORD BUSH	56	—	—
* Δ 6	—	—	57 ●	4610155011	BLIND
7 ●	4730354035	TAPPING SCREW (2)3x8 MFN1B	58 ●	4610155024	BLIND
8 ●	4120733208	SIDE CHASSIS	59 ●	4610155040	BLIND
9 ●	4410355008	HOLD PLATE	60	—	—
10 ●	4110320100	MAIN CHASSIS	61	—	—
11 ●	4120965005	SUPPORT BRACKET	62 ●	1430230009	WINDOW PLATE
12 ●	4410353000	SHEET	63 ●	1430228008	WINDOW
13 ●	4110334002	TRANS CHASSIS ASS'Y	*64	ETC-0454K3	LCD UNIT
14 ●	4770064107	FIXING SCREW	65 ●	4770096007	PUSH RIVET
15 ●	4170156000	POWER RADIATOR	*66	ETC-0454K5	POWER LED UNIT
16	2710143022	TRANSISTOR 2SA1187(O)/(Y)	*67	ETC-0454K4	SPEAKER LED UNIT
17	2730243025	TRANSISTOR 2SC2838(O)/(Y)	*68	ETC-0454K6	LED UNIT
18 ●	4700012022	CROSS PAN SCREW WITH W.S.W. 3x12	*69	ETC-0454K7	LED UNIT
19 ●	4110321206	FRONT CHASSIS	70 ●	4120962008	CONNECTING BRACKET
* Δ 20 ●	2124263022	PUSH SWITCH	71 ●	4630274066	SPRING
* Δ 21 ●	2538003014	CERAMIC CAP. 0.0047μF 450 W	72 ●	1130290103	PUSH KNOB (INPUT)
22 ●	4700009006	CROSS PAN SCREW WITH S. WASHER 3x6	73 ●	1130291102	PUSH KNOB (SP)
*23	ETC-0452K1	INPUT & EQ. UNIT	74 ●	1020128000	TOP COVER
*24	ETC-0452K2	HEADPHONE JACK UNIT	75 ●	1040034006	STOPPER
*25	ETC-0452K3	SPEAKER SWITCH UNIT	76 ●	1220069008	SPACER
26	1430229010	L.C.D. LENS	77 ●	4734801005	TAPPING SCREW (TRUS) 4x8
27 ●	4730354019	TAPPING SCREW (2)3x8	78 ●	1120265203	KNOB
*28	ETC-0454K1	RECT & LCD UNIT	79 ●	1120359106	KNOB (A)
*29	ETC-0454K2	LAMP UNIT	80	1120374000	KNOB (C)
30 ●	4730358015	TAPPING SCREW (2)3x14	81 ●	1430354019	COLOR PLATE
31	ETC-0453J1	tone & POWER UNIT	82 ●	1460430109	PANEL BUSH (POWER)
32	ETC-0453J2	VOLUME UNIT	83 ●	1130171222	PUSH KNOB ASS'Y
33	ETC-0453J3	CARTRIDGE SW UNIT	84 ●	4630220007	SPRING
34 ●	2120197008	ROTARY REMOTE	85 ●	1190014002	STOPPER
35	—	—	86 ●	2050089008	7P W TERMINAL
36 ●	1250014007	BLIND SHEET (A)	87 ●	4150088004	INSULATING SHEET
37 ●	4150208004	INSULATING SHEET	88 ●	4700042005	CROSS PAN SCREW WITH S. WAHSER 3x8 (BLACK)
38 ●	2030176106	WIRE ASS'Y	89 ●	4756008008	NUT φ3
39 ●	4700044005	TAPPING SCREW WITH W 3x8	90 ●	2020013004	FUSE HOLDER
40 ●	4610157080	CUSHION	91 ●	5130159185	FUSE LABEL
41 ●	1050450007	BOTTOM COVER	92 ●	2061015087	FUSE (4A)
42 ●	1048001002	FOOT	93 ●	2038084009	5P CONNECTOR (DIN)
43 ●	4730355018	TAPPING SCREW (2)3x10	94 ●	2412156003	CARBON FILM RESISTOR 470 k ohm
44 ●	4150197005	INSULATING SHEET	95 ●	4630274024	SPRING
*45	ETC-0452K4	SPEAKER TERMINAL UNIT	PACKING ACCESSORIES		
46 ●	EP-6214	CORD HOLDER	a ●	5040064001	CABINET SHEET
* Δ 47	2335344002	POWER TRANS	b ●	5030301101	CUSHION
*48	4730454032	TAPPING SCREW (2)4x18 (BLACK)	*c	5010755036	CARTON CASE
49 ●	4350052018	FLEXIBLE SLIDER	d	5110994001	INST. MANUAL
50	1440928000	FRONT PANEL			
51	1460455003	PANEL BUSH (INPUT)			

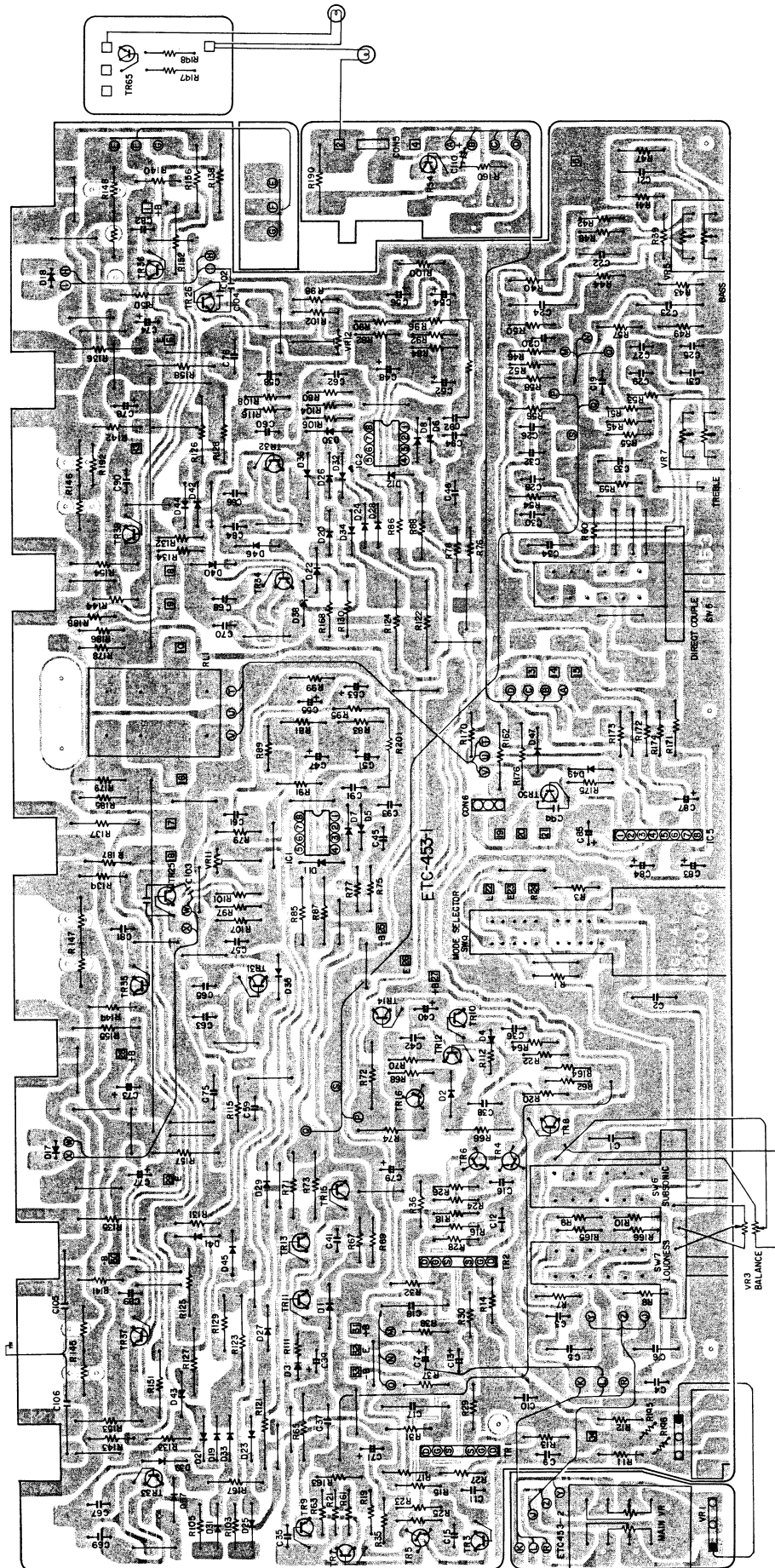
ADDENDUM LIST

Ref. No.	Part Name & Descriptions	Part No.		
		E1 for Hong Kong	EK for U.K.	E3 for U.S.A.
1	BACK PANEL	1050459008	1050461009	
△ 4	AC CORD	2062020000	2006031026	
△ 5	CORD BUSH	MD-2982H	MD-3802	
△ 6	AC OUTLET	—	2033909008	
△ 20	PUSH SWITCH	2124263022	2124263022	
△ 21	CAPACITOR	2538003014	2538003014	
23	INPUT & EQ. UNIT	ETC-0452K1	ETC-0452M1	
24	HEADPHONE JACK UNIT	ETC-0452K2	ETC-0452M2	
25	SPEAKER SWITCH UNIT	ETC-0452K3	ETC-0452M3	
28	RECT & LCD UNIT	ETC-0454K1	ETC-0454M1	
29	LAMP UNIT	ETC-0454K2	ETC-0454M2	
45	SPEAKER TERMINAL UNIT	ETC-0452K4	ETC-0452M4	
△ 47	POWER TRANS	2335345001	2335343003	
48	TAPPING SCREW	4700031016	4730454032	
64	LCD UNIT	ETC-0454K3	ETC-0454M3	
66	POWER LED UNIT	ETC-0454K5	ETC-0454M5	
67	SPEAKER LED UNIT	ETC-0454K4	ETC-0454M4	
68	LED UNIT	ETC-0454K6	ETC-0454M6	
69	LED UNIT	ETC-0454K7	ETC-0454M7	
△ 96	VOLTAGE SEL. SWITCH	—	2120186006	
97	CROSS PAN SCREW 3x6 (BLACK)	—	4711303034	
98	WATTAGE LABEL	5130683004	—	
99	VOLTAGE LABEL	5130362008	—	
100	BLIND SHEET	5130348006	—	
101	WIRE ASS'Y	2030176151	—	
102	EARTH LABEL	5130140000	—	
103	TOOTH WASHER φ3	4753001051	—	
104	CAUTION CARD	5130364006	—	
105	TOOTH WASHER φ4	4753100004	—	
PACKING & ACCESSORIES (not included EXPLODED VIEW)				
c	CARTON CASE	5010755036	5010755036	
e	IMPORTANT LABEL	5130372001	—	
f	GUARANTEE CARD	5150230000	—	

PRINTED WIRING BOARD PATTERNS AND PARTS LIST

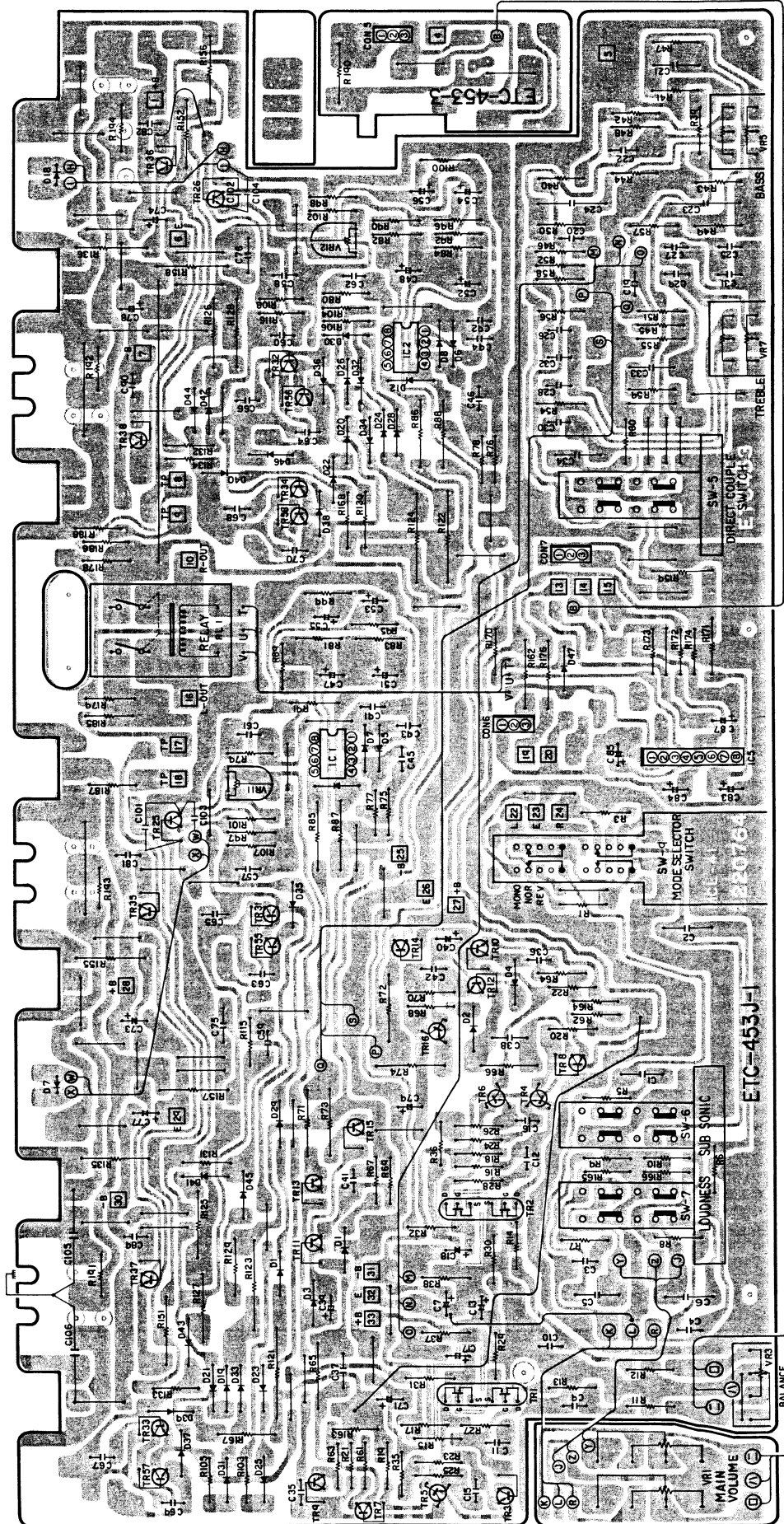
• For PMA-770

ETC-453 TONE & EQ. UNIT



• For PMA-750

ETC-453J TONE & EQ. UNIT



ETC-453 & ETC-453J TONE & EQ. UNIT PARTS LIST

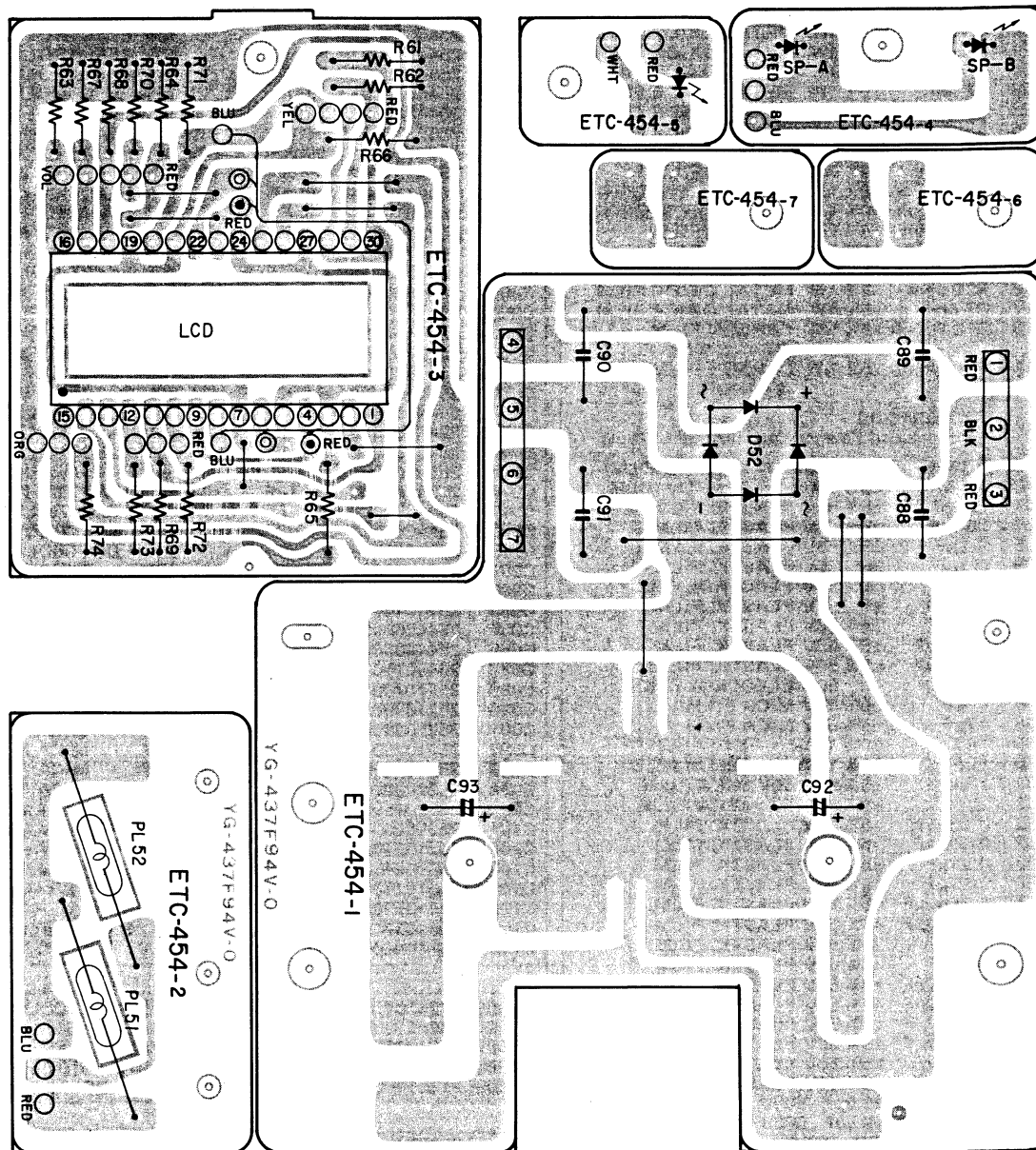
Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions
SEMICONDUCTORS			RESISTORS (not included Carbon Film $\pm 5\%$, $\frac{1}{4}W$ Type)		
IC001	2630118001	NJM4560D	VR001	2110257000	VARIABLE RESISTOR 55 k ohm MAIN
IC002	2630118001	NJM4560D	VR003	2110311001	VARIABLE RESISTOR 100 k ohm BALANCE
IC005	2630102004	HA12002	VR005	2110246011	VARIABLE RESISTOR 100 k ohm BASS
TR001	2750024033	μ PA68H(L)/(H)	VR007	2110253004	VARIABLE RESISTOR 50 k ohm TREBLE
TR002	2750024033	μ PA68H(L)/(H)	VR011	2116025058	SEMI FIXED RESISTOR 10 k ohm
TR003	2730235020	2SC1841(F)/(E)	VR012	2116025058	SEMI FIXED RESISTOR 10 k ohm
TR004	2730235020	2SC1841(F)/(E)	R013	2412314007	100 ohm $\pm 5\%$ $\frac{1}{4}W$ CARBON FILM
TR005	2730235020	2SC1841(F)/(E)	R014	2412314007	100 ohm $\pm 5\%$ $\frac{1}{4}W$ CARBON FILM
TR006	2730235020	2SC1841(F)/(E)	R015	2412320017	8.2 k ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
TR007	2710110000	2SA916(L)	R016	2412320017	8.2 k ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
TR008	2710110000	2SA916(L)	R017	2412320017	8.2 k ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
TR009	2710110000	2SA916(L)	R018	2412320017	8.2 k ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
TR010	2710110000	2SA916(L)	R019	2412314010	390 ohm $\pm 5\%$ $\frac{1}{4}W$ CARBON FILM
TR011	2730205005	2SC1815(L)	R020	2412314010	390 ohm $\pm 5\%$ $\frac{1}{4}W$ CARBON FILM
TR012	2730205005	2SC1815(L)	R021	2412314010	390 ohm $\pm 5\%$ $\frac{1}{4}W$ CARBON FILM
TR013	2740060007	2SD667A(C)	R022	2412314010	390 ohm $\pm 5\%$ $\frac{1}{4}W$ CARBON FILM
TR014	2740060007	2SD667A(C)	R031	2422007003	20 M ohm $\pm 10\%$ $\frac{1}{4}W$ CARBON COMPOSIT
TR015	2720053005	2SB647A(C)	R032	2422007003	20 M ohm $\pm 10\%$ $\frac{1}{4}W$ CARBON COMPOSIT
TR016	2720053005	2SB647A(C)	R035	2412314036	750 ohm $\pm 5\%$ $\frac{1}{4}W$ CARBON COMPOSIT
TR025	2730193015	2SC1815(BL)	R036	2412314036	750 ohm $\pm 5\%$ $\frac{1}{4}W$ CARBON COMPOSIT
TR026	2730193015	2SC1815(BL)	R065	2440051028	6.8 k ohm $\pm 5\%$ 1W METAL OXIDE FILM
TR031	2730111063	2SC1213(D)/(C)	R066	2440051028	6.8 k ohm $\pm 5\%$ 1W METAL OXIDE FILM
TR032	2730111063	2SC1213(D)/(C)	R067	2412313008	100 ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
TR033	2710040073	2SA673A(D)/(C)	R068	2412313008	100 ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
TR034	2710040073	2SA673A(D)/(C)	R069	2412313008	100 ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
TR035	2730199027	2SC2238(Y)/(O)	R070	2412313008	100 ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
TR036	2730199027	2SC2238(Y)/(O)	R071	2440025025	47 ohm $\pm 5\%$ 1W METAL OXIDE FILM
TR037	2710104029	2SA968(Y)/(O)	R072	2440025025	47 ohm $\pm 5\%$ 1W METAL OXIDE FILM
TR038	2710104029	2SA968(Y)/(O)	R073	2440025025	47 ohm $\pm 5\%$ 1W METAL OXIDE FILM
TR050	2730198044	2SC1815(Y)/(GR)	R074	2440025025	47 ohm $\pm 5\%$ 1W METAL OXIDE FILM
TR054	2710102005	2SA1015(Y)	R077	2412314023	470 ohm $\pm 5\%$ $\frac{1}{4}W$ CARBON FILM
TR065	2730177007	2SC1626(Y)	R078	2412314023	470 ohm $\pm 5\%$ $\frac{1}{4}W$ CARBON FILM
D001	2760171028	HV-23G(YW)	R079	2412312003	1 k ohm $\pm 5\%$ $\frac{1}{4}W$ CARBON FILM
D002	2760171028	HV-23G(YW)	R080	2412312003	1 k ohm $\pm 5\%$ $\frac{1}{4}W$ CARBON FILM
D03	2760216019	KB-265	R085	2440046020	2.7 k ohm $\pm 5\%$ 1W METAL OXIDE FILM
D04	2760216019	KB-265	R086	2440046020	2.7 k ohm $\pm 5\%$ 1W METAL OXIDE FILM
D05	2760049008	1S2076	R087	2440046020	2.7 k ohm $\pm 5\%$ 1W METAL OXIDE FILM
D06	2760049008	1S2076	R088	2440046020	2.7 k ohm $\pm 5\%$ 1W METAL OXIDE FILM
D007	2760049008	1S2076	R107	2412313053	1 k ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
D008	2760049008	1S2076	R108	2412313053	1 k ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
D011	2760224001	HZ-30	R111	2412322015	82 ohm $\pm 5\%$ $\frac{1}{4}W$ CARBON FILM
D012	2760224001	HZ-30	R112	2412322015	82 ohm $\pm 5\%$ $\frac{1}{4}W$ CARBON FILM
D017	2760049008	1S2076	R115	2412313053	1 k ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
D018	2760049008	1S2076	R116	2412313053	1 k ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
D019	2760049008	1S2076	R121	2440107024	5.6 k ohm $\pm 5\%$ 2W METAL OXIDE FILM
D020	2760049008	1S2076	R122	2440107024	5.6 k ohm $\pm 5\%$ 2W METAL OXIDE FILM
D021	2760049008	1S2076	R123	2440107024	5.6 k ohm $\pm 5\%$ 2W METAL OXIDE FILM
D022	2760049008	1S2076	R124	2440107024	5.6 k ohm $\pm 5\%$ 2W METAL OXIDE FILM
D023	2760049008	1S2076	R125	2440041025	1 k ohm $\pm 5\%$ 1W METAL OXIDE FILM
D024	2760049008	1S2076	R126	2440041025	1 k ohm $\pm 5\%$ 1W METAL OXIDE FILM
D025	2760049008	1S2076	R127	2440041025	1 k ohm $\pm 5\%$ 1W METAL OXIDE FILM
D026	2760049008	1S2076	R128	2440041025	1 k ohm $\pm 5\%$ 1W METAL OXIDE FILM
D027	2760049008	1S2076	R129	2410219007	27 k ohm $\pm 5\%$ $\frac{1}{4}W$ CARBON FILM
D028	2760049008	1S2076	R130	2410219007	27 k ohm $\pm 5\%$ $\frac{1}{4}W$ CARBON FILM
D029	2760049008	1S2076	R131	2412313095	120 ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
D030	2760049008	1S2076	R132	2412313095	120 ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
D031	2760049008	1S2076	R133	2412313095	120 ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
D032	2760049008	1S2076	R134	2412313095	120 ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
D033	2760049008	1S2076	R135	2440013024	4.7 ohm $\pm 5\%$ 1W METAL OXIDE FILM
D034	2760049008	1S2076	R136	2440013024	4.7 ohm $\pm 5\%$ 1W METAL OXIDE FILM
D035	2760049008	1S2076	R137	2440013024	4.7 ohm $\pm 5\%$ 1W METAL OXIDE FILM
D036	2760049008	1S2076	R138	2440013024	4.7 ohm $\pm 5\%$ 1W METAL OXIDE FILM
D037	2760049008	1S2076	R139	2412315035	33 ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
D038	2760049008	1S2076	R140	2412315035	33 ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
D039	2760221004	HZ-36	R141	2412315035	33 ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
D040	2760221004	HZ-36	R142	2412315035	33 ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
D041	2760049008	1S2076	R143	2412315035	33 ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
D042	2760049008	1S2076	R144	2412315035	33 ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
D043	2760049008	1S2076	R145	2432026003	0.47/0.47 ohm $\pm 10\%$ 3.15W WIRE WOUND
D044	2760049008	1S2076	R146	2432026003	0.47/0.47 ohm $\pm 10\%$ 3.15W WIRE WOUND
D045	2760221004	HZ-36	R147	2432026003	0.47/0.47 ohm $\pm 10\%$ 3.15W WIRE WOUND
D046	2760221004	HZ-36	R148	2432026003	0.47/0.47 ohm $\pm 10\%$ 3.15W WIRE WOUND
D047	2760049008	1S2076	R149	2412315035	33 ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
D049	2760221004	HZ-36	R150	2412315035	33 ohm $\pm 2\%$ $\frac{1}{4}W$ CARBON FILM
			R151	2440037026	470 ohm $\pm 5\%$ 1W METAL OXIDE FILM

(Con.)

Ref. No.	Part No.	Part Name & Descriptions	
R152	2440037026	470 ohm	±5% 1W METAL OXIDE FILM
R153	2440013024	4.7 ohm	±5% 1W METAL OXIDE FILM
R154	2440013024	4.7 ohm	±5% 1W METAL OXIDE FILM
R155	2440013024	4.7 ohm	±5% 1W METAL OXIDE FILM
R156	2440013024	4.7 ohm	±5% 1W METAL OXIDE FILM
R157	2440022028	27 ohm	±5% 1W METAL OXIDE FILM
R158	2440022028	27 ohm	±5% 1W METAL OXIDE FILM
R162	2440041025	1 k ohm	±5% 1W METAL OXIDE FILM
R163	2412315051	51 ohm	±2% ¼W CARBON FILM
R164	2412315051	51 ohm	±2% ¼W CARBON FILM
R165	2420203003	10 M ohm	±10% ¼W CARBON COMPOSIT
R166	2420203003	10 M ohm	±10% ¼W CARBON COMPOSIT
R167	2410219007	27 k ohm	±5% ¼W CARBON FILM
R168	2410219007	27 k ohm	±5% ¼W CARBON FILM
R171	2410175002	390 ohm	±5% ¼W CARBON FILM
R176	2440040026	820 ohm	±5% 1W METAL OXIDE FILM
R190	2440023027	33 ohm	±5% 1W METAL OXIDE FILM
R195	2412031018	510 k ohm	±5% ¼W CARBON FILM (STANDING)
R196	2412031018	510 k ohm	±5% ¼W CARBON FILM (STANDING)
CAPACITORS (not included Ceramic Capacitor 50 V Type)			
C001	2554082048	0.18µF	±5% 100V PLASTIC FILM
C002	2554082048	0.18µF	±5% 100V PLASTIC FILM
C003	2554142001	750pF	±5% 50V PLASTIC FILM
C004	2554142001	750pF	±5% 50V PLASTIC FILM
C005	2554193005	0.1µF	±5% 50V PLASTIC FILM
C006	2554193005	0.1µF	±5% 50V PLASTIC FILM
C007	2544044009	1µF	±5% 50V ELECTROLYTIC
C009	2554121006	100pF	±5% 50V PLASTIC FILM
C010	2554121006	100pF	±5% 50V PLASTIC FILM
C011	2554145008	0.001µF	±5% 50V PLASTIC FILM
C012	2554145008	0.001µF	±5% 50V PLASTIC FILM
C013	2544044009	1µF	50V ELECTROLYTIC
C015	2521026008	47pF	±5% 50V MICA FILM
C016	2521026008	47pF	±5% 50V MICA FILM
C017	2561008060	1µF	±10% 100V METALIZED
C018	2561008060	1µF	±10% 100V METALIZED
C019	2521010001	10pF	±0.5pF 50V MICA FILM
C020	2521010001	10pF	±0.5pF 50V MICA FILM
C021	2554183002	0.039µF	±5% 50V PLASTIC FILM
C022	2554183002	0.039µF	±5% 50V PLASTIC FILM
C023	2551122095	0.27µF	±5% 50V PLASTIC FILM
C024	2551122095	0.27µF	±5% 50V PLASTIC FILM
C025	2554161008	0.0047µF	±5% 50V PLASTIC FILM
C026	2554161008	0.0047µF	±5% 50V PLASTIC FILM
C027	2554127000	180pF	±5% 50V PLASTIC FILM
C028	2554127000	180pF	±5% 50V PLASTIC FILM
C029	2554147006	0.0012µF	±5% 50V PLASTIC FILM
C030	2554147006	0.0012µF	±5% 50V PLASTIC FILM
C031	2554155001	0.0027µF	±5% 50V PLASTIC FILM
C032	2554155001	0.0027µF	±5% 50V PLASTIC FILM
C033	2554187008	0.056µF	±5% 50V PLASTIC FILM
C034	2554187008	0.056µF	±5% 50V PLASTIC FILM
C035	2521081043	10pF	±0.5pF 500V MICA FILM
C036	2521081043	10pF	±0.5pF 500V MICA FILM
C037	2554079048	0.01µF	±10% 100V PLASTIC FILM
C038	2554079048	0.01µF	±10% 100V PLASTIC FILM
C039	2544060025	1µF	100V ELECTROLYTIC
C040	2544060025	1µF	100V ELECTROLYTIC
C041	2554121006	100pF	±5% 50V PLASTIC FILM
C042	2554121006	100pF	±5% 50V PLASTIC FILM
C045	2554121006	100pF	±5% 50V PLASTIC FILM
C046	2554121006	100pF	±5% 50V PLASTIC FILM
C047	2544019005	220µF	16V ELECTROLYTIC
C048	2544019005	220µF	16V ELECTROLYTIC
C051	2544019005	220µF	16V ELECTROLYTIC
C052	2544019005	220µF	16V ELECTROLYTIC
C053	2544016008	33µF	16V ELECTROLYTIC
C054	2544016008	33µF	16V ELECTROLYTIC
C055	2544016008	33µF	16V ELECTROLYTIC
C056	2544016008	33µF	16V ELECTROLYTIC
C057	2554139001	560pF	±5% 50V PLASTIC FILM
C058	2554139001	560pF	±5% 50V PLASTIC FILM
C059	2554139001	560pF	±5% 50V PLASTIC FILM
C060	2554139001	560pF	±5% 50V PLASTIC FILM
C061	2521010001	10pF	±0.5pF 50V MICA FILM
C062	2521010001	10pF	±0.5pF 50V MICA FILM
C063	2554165004	0.0068µF	±5% 50V PLASTIC FILM
C064	2554165004	0.0068µF	±5% 50V PLASTIC FILM
C065	2554161008	0.0047µF	±5% 50V PLASTIC FILM
C066	2554161008	0.0047µF	±5% 50V PLASTIC FILM
C067	2554161008	0.0047µF	±5% 50V PLASTIC FILM
C068	2554161008	0.0047µF	±5% 50V PLASTIC FILM
C069	2554165004	0.0068µF	±5% 50V PLASTIC FILM
C070	2554165004	0.0068µF	±5% 50V PLASTIC FILM
C071	2544059078	2.2µF	63V ELECTROLYTIC
C073	2544059036	4.7µF	63V ELECTROLYTIC
C074	2544059036	4.7µF	63V ELECTROLYTIC
C075	2554169000	0.01µF	±5% 50V PLASTIC FILM
C076	2554169000	0.01µF	±5% 50V PLASTIC FILM
C077	2544059036	4.7µF	63V ELECTROLYTIC
C078	2544059036	4.7µF	63V ELECTROLYTIC
C079	2544059078	2.2µF	63V ELECTROLYTIC
C081	2521079039	47pF	±10% 500V MICA FILM
C082	2521079039	47pF	±10% 500V MICA FILM
C083	2544044009	1µF	500V ELECTROLYTIC
C084	2544066003	2.2µF	500V ELECTROLYTIC
C085	2544005006	330µF	6.3V ELECTROLYTIC
C087	2549015004	22µF	±10% 10V ELECTROLYTIC
C089	2521079039	47pF	±10% 500V MICA FILM
C090	2521079039	47pF	±10% 500V MICA FILM
C091	2521026008	47pF	±5% 50V MICA FILM
C092	2521026008	47pF	±5% 50V MICA FILM
C093	2521030007	68pF	±5% 50V MICA FILM
C094	2521030007	68pF	±5% 50V MICA FILM
C099	2539015001	0.1µF	±20% 25V CERAMIC
C101	2531024003	0.01µF	+80,-20% 50V CERAMIC
C102	2531024003	0.01µF	+80,-20% 50V CERAMIC
C103	2531024003	0.01µF	+80,-20% 50V CERAMIC
C104	2531024003	0.01µF	+80,-20% 50V CERAMIC
C105	2531052004	4700pF	+100,-0% 500V CERAMIC
C106	2531052004	4700pF	+100,-0% 500V CERAMIC
C110	2544006005	470µF	6.3V ELECTROLYTIC
SWITCHES			
SW005	2124264005	1P PUSH SWITCH DIRECT COUPLE	
SW006	2124328006	2P PUSH SWITCH LOUDNESS	
SW007	2124328006	2P PUSH SWITCH SUBSONIC	
SW008	2124329005	1P PUSH SWITCH CARTRIDGE	
SW009	2120196009	ROTARY SWITCH MODE	
OTHER PARTS			
RL001	2220796008	P.W. BOARD	
	2140037009	RELAY	
	EP-5667H1	TERMINAL USED 4	
	2035622008	3P CONNECTOR BASE POWER LED	
	2050003000	3T LUG	
PL002	3930068009	PILOT LAMP 0.08A ASS'Y	
PL003	3930068009	PILOT LAMP 0.08A ASS'Y	

• For PMA-770

ETC-454B RECT & LCD UNIT

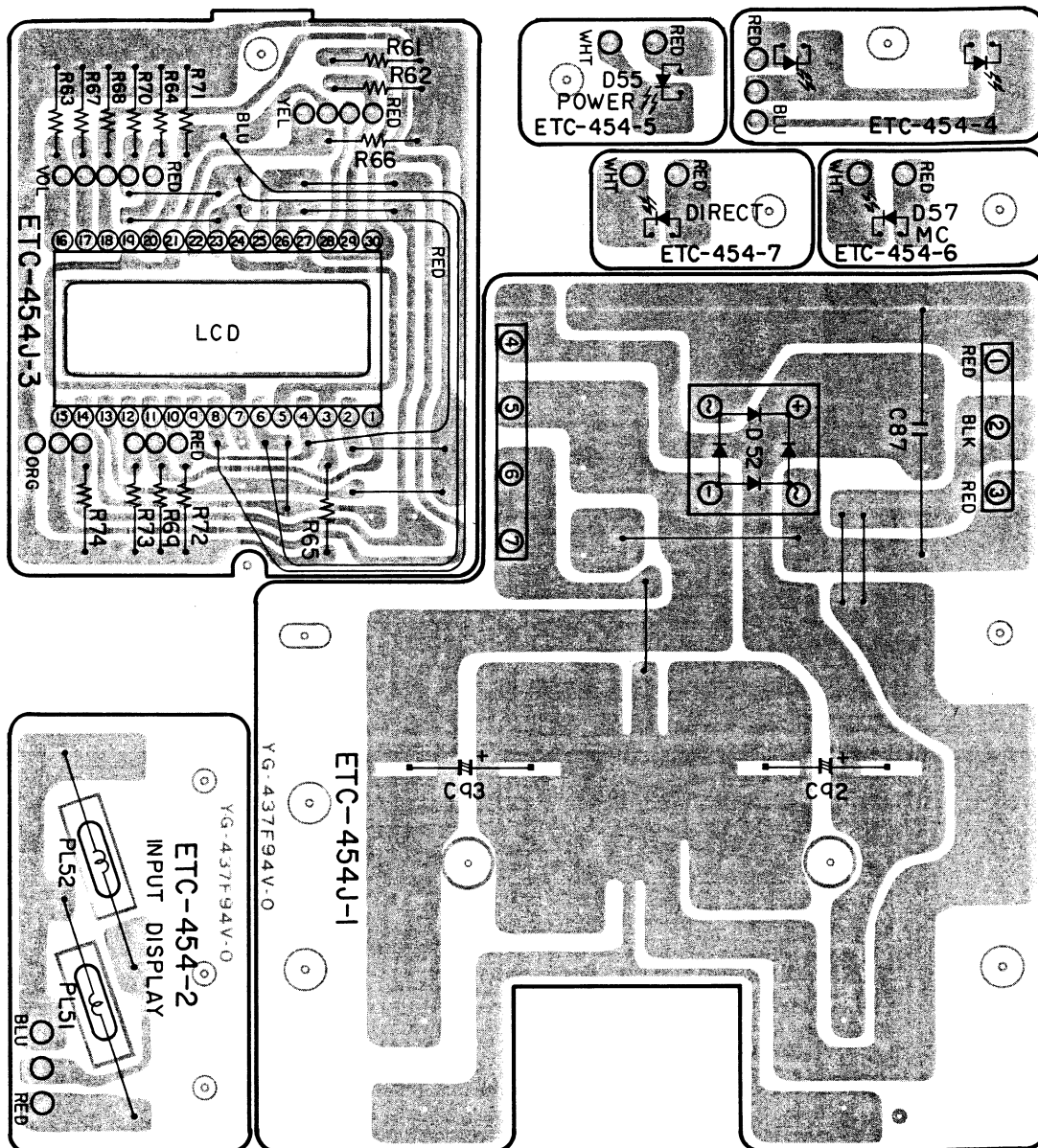


ETC-454B RECT & LCD UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions	
SEMICONDUCTORS			
D052	2760233005	M4C-51	DIODE
D053	3939149000	BG5531K GREEN	LIGHT EMITTING DIODE
D054	3939149000	BF5531K GREEN	LIGHT EMITTING DIODE
	3939149013	PR5531K RED	LIGHT EMITTING DIODE
	3939130006	LCD DISPLAY	
RESISTORS (not included Carbon Film ±5%, ¼W Type)			
CAPACITORS (not included Ceramic 50V Type)			
C088	2561017019	0.01µF ±10% 630V	METALLIZED
C089	2561017019	0.01µF ±10% 630V	METALLIZED
C090	2561017019	0.01µF ±10% 630V	METALLIZED
C091	2561017019	0.01µF ±10% 630V	METALLIZED
C092	2546058006	22000µF/22000µF	63V ELECTROLYTIC
C093	2546058006	22000µF/22000µF	63V ELECTROLYTIC
OTHER PARTS			
PL051 PL052	2220765000	P.W. BOARD	
	2050087039	3P TERMINAL	
	2050087042	4P TERMINAL	
	2090008162	JUMPER P=20mm USED 1	
	2090008120	JUMPER P=10mm USED 8	
	2090008146	JUMPER P=5mm USED 2	
	3930060010	PILOT LAMP (14V, 200 mA)	
	3930060010	PILOT LAMP (14V, 200 mA)	
	2034146035	3P CONNECTOR CORD FOR POWER	
	2034147034	3P CONNECTOR CORD FOR SP	
	2036082045	4P CONNECTOR CORD FOR LCD	
	2038091047	5P CONNECTOR CORD FOR LCD	
	2040075051	6P CONNECTOR CORD FOR LCD	
	4120952102	CONDENSER BRACKET	
4730354019	TAPPING SCREW (2) 3x8		
1430231008	COLOR PLATE		

• For PMA-750

ETC-454K (For E2), 454K (For EK), 454M (For E1) RECT & LCD UNIT

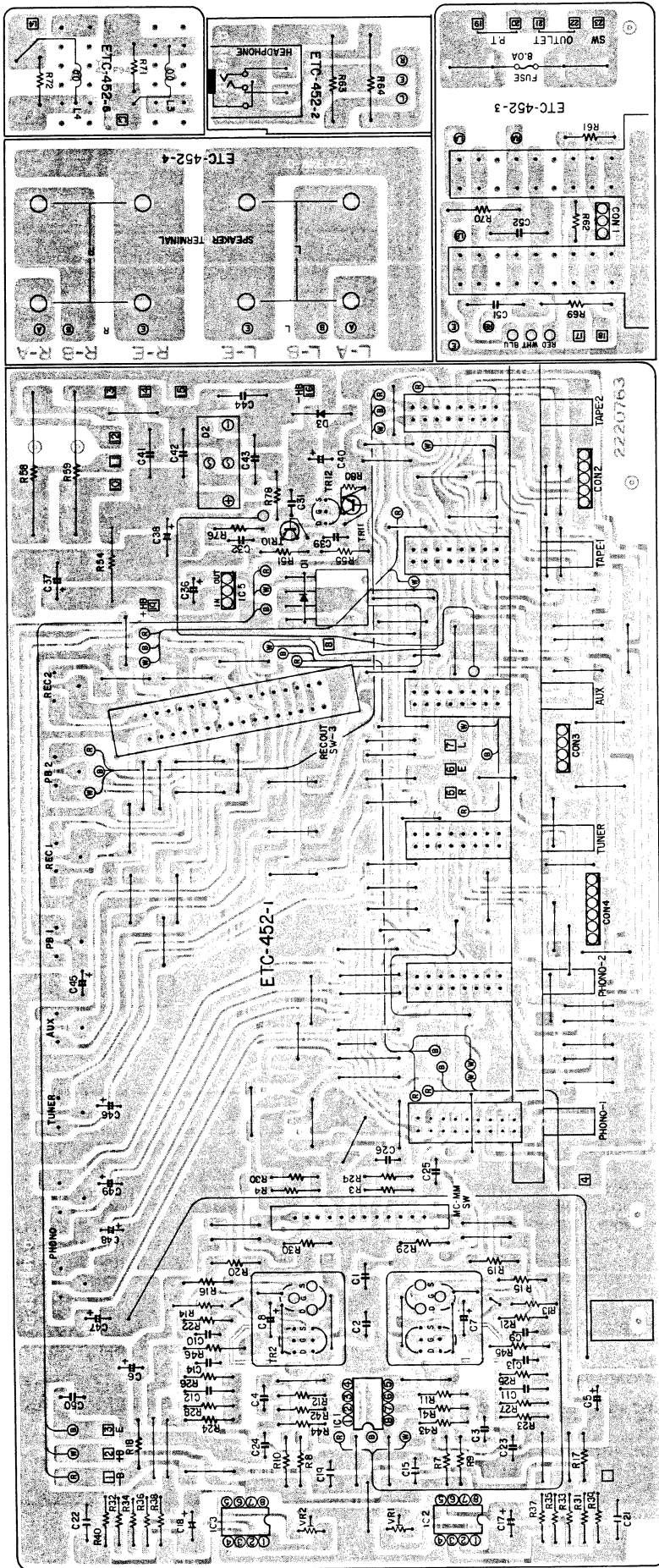


ETC-454K RECT & LCD UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions		Ref. No.	Part No.	Part Name & Descriptions		
SEMICONDUCTORS				OTHER PARTS				
D052	2760233005	M4C-51	DIODE	PL051 PL052	2220765000	P.W. BOARD		
D053	3939149000	BG5531K GREEN	LIGHT EMITTING DIODE		2050087039	3P TERMINAL		
D054	3939149000	BG5531K GREEN	LIGHT EMITTING DIODE		2050087042	4P TERMINAL		
D055	3939149013	PR5531K RED	LIGHT EMITTING DIODE		2090008133	JUMPER P=7.5mm USED 1		
D056	3939149000	BG5531K GREEN	LIGHT EMITTING DIODE		2090008120	JUMPER P=10mm USED 9		
D057	3939149000	BG5531K GREEN	LIGHT EMITTING DIODE		2090008162	JUMPER P=20mm USED 1		
	3939130006	LCD DISPLAY			3930060010	PILOT LAMP (14 V, 200 mA)		
RESISTORS (not included Carbon Film ±5% ¼W Type)						3930060010	PILOT LAMP (14 V, 200 mA)	
CAPACITORS						2034146035	3P CONNECTOR CORD FOR POWER	
C087	2561017019	0.01µF ±10% 630V	METALLIZED ELECTROLYTIC			2034147034	3P CONNECTOR CORD FOR SP	
C092	2546063004	15000/15000µF 63V	ELECTROLYTIC			2034146006	3P CONNECTOR CORD (USED 2)	
C093	2546063004	15000/15000µF 63V	ELECTROLYTIC			4120952102	FOR TONE MC	
						4730354019	CONDENSER BRACKET	
					1430231008	TAPPING SCREW (2)3x8		
						COLOR PLATE		

• For PMA-770

ETC-452B (For E2), 452D (For E1) INPUT & EQ. UNIT

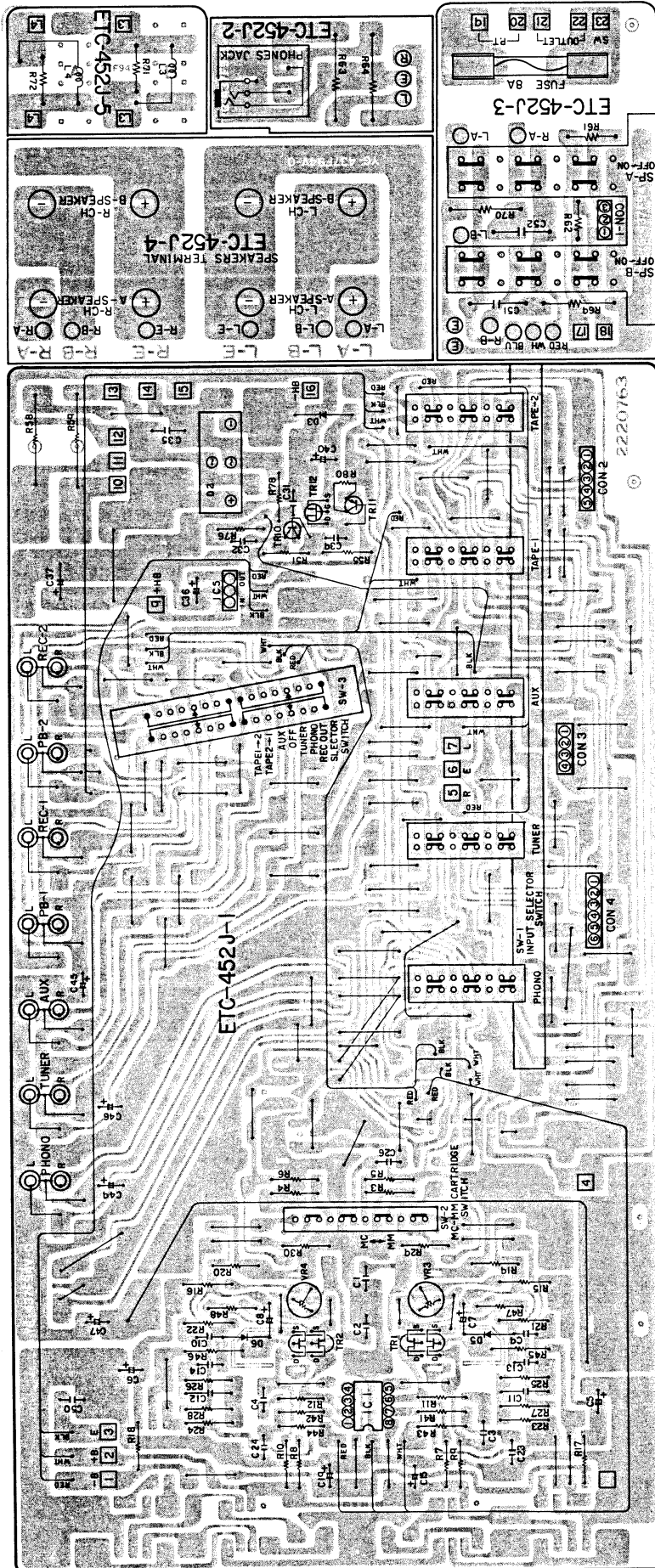


ETC-452B INPUT & EQ. UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions		Ref. No.	Part No.	Part Name & Descriptions	
SEMICONDUCTORS							
IC001	2650034013	NJM4559D	INTEGRATED CIRCUIT	C021	2554169000	0.01 μ F	\pm 5% 50V PLASTIC FILM
IC002	2630133002	MPC741C	INTEGRATED CIRCUIT	C022	2554169000	0.01 μ F	\pm 5% 50V PLASTIC FILM
IC003	2630133002	MPC741C	INTEGRATED CIRCUIT	C023	2554161008	0.0047 μ F	\pm 5% 50V PLASTIC FILM
IC005	2630155006	μ PC78M15	INTEGRATED CIRCUIT	C024	2554161008	0.0047 μ F	\pm 5% 50V PLASTIC FILM
TR001	2750029025	2SK240(BL)/(V)	FIELD EFFECT TRANSISTOR	C025	2554164005	0.0062 μ F	\pm 5% 50V PLASTIC FILM
TR002	2750029025	2SK240(BL)/(V)	FIELD EFFECT TRANSISTOR	C026	2554164005	0.0062 μ F	\pm 5% 50V PLASTIC FILM
TR003	2750029025	2SK240(BL)/(V)	FIELD EFFECT TRANSISTOR	C031	2539015001	0.1 μ F	\pm 20% 25V CERAMIC
TR004	2750029025	2SK240(BL)/(V)	FIELD EFFECT TRANSISTOR	C032	2539015001	0.1 μ F	\pm 20% 25V CERAMIC
TR010	2710102005	2SA1015(Y)	TRANSISTOR	C036	2544019005	220 μ F	16V ELECTROLYTIC
TR011	2710105002	2SA966(Y)	TRANSISTOR	C037	2544079029	1000 μ F	25V ELECTROLYTIC
TR012	2750018010	2SK30A(O)	FIELD EFFECT TRANSISTOR	C038	2544041002	470 μ F	35V ELECTROLYTIC
D001	2760049008	1S2076	DIODE	C039	2521018003	22pF	\pm 5% 50V MICA FILM
D002	2760239009	S1RBA20F	DIODE	C040	2544039001	220 μ F	35V ELECTROLYTIC
D003	2760237001	RV06	DIODE	C041	2554084020	0.068 μ F	\pm 5% 100V PLASTIC FILM
RESISTORS (not included Carbon film \pm 5% $\frac{1}{4}$ W Type)							
R021	2412018002	3.9 k ohm	\pm 2% $\frac{1}{4}$ W CARBON FILM	C042	2554084020	0.068 μ F	\pm 5% 100V PLASTIC FILM
R022	2412018002	3.9 k ohm	\pm 2% $\frac{1}{4}$ W CARBON FILM	C043	2554084020	0.068 μ F	\pm 5% 100V PLASTIC FILM
R025	2412032091	47 k ohm	\pm 2% $\frac{1}{4}$ W CARBON FILM	C044	2554084020	0.068 μ F	\pm 5% 100V PLASTIC FILM
R026	2412032091	47 k ohm	\pm 2% $\frac{1}{4}$ W CARBON FILM	C045	2544043000	0.47 μ F	50V ELECTROLYTIC
R054	2440020020	18 ohm	\pm 5% 1W METAL OXIDE FILM	C046	2544043000	0.47 μ F	50V ELECTROLYTIC
R058	2440136024	39 ohm	\pm 5% 3.15W METAL OXIDE FILM	C047	2544043000	0.47 μ F	50V ELECTROLYTIC
R059	2440136024	39 ohm	\pm 5% 3.15W METAL OXIDE FILM	C048	2544043000	0.47 μ F	50V ELECTROLYTIC
R063	2440087021	120 ohm	\pm 5% 2W METAL OXIDE FILM	C049	2544043000	0.47 μ F	50V ELECTROLYTIC
R064	2440087021	120 ohm	\pm 5% 2W METAL OXIDE FILM	C050	2531024003	0.01 μ F	+80, -20% 50V CERAMIC
R069	2440017020	10 ohm	\pm 5% 1W METAL OXIDE FILM	C051	2551121067	0.022 μ F	\pm 5% 50V PLASTIC FILM
R070	2440017020	10 ohm	\pm 5% 1W METAL OXIDE FILM	C052	2551121067	0.022 μ F	\pm 5% 50V PLASTIC FILM
R080	2442012023	4.7 ohm	\pm 5% $\frac{1}{2}$ W METAL OXIDE FILM	OTHER PARTS			
CAPACITORS (not included Ceramic 50 V Type)							
C001	2554123004	120pF	\pm 5% 50V PLASTIC FILM	2220763109	P.W. BOARD		
C002	2554123004	120pF	\pm 5% 50V PLASTIC FILM	2050134908	TERMINAL PIN USED 22		
C003	2554145008	0.001 μ F	\pm 5% 50V PLASTIC FILM	2090047903	JUMPER WIRE USED 81		
C004	2554145008	0.001 μ F	\pm 5% 50V PLASTIC FILM	EP-5667H1	TERMINAL USED 2		
C005	2544011003	220 μ F	10V ELECTROLYTIC	2090008133	JUMPER P=7.5mm USED 5		
C006	2544011003	220 μ F	10V ELECTROLYTIC	2090008120	JUMPER P=10mm USED 1		
C007	2541035008	1 μ F	\pm 20% 35V ELECTROLYTIC	2090008117	JUMPER P=12.5mm USED 9		
C008	2541035008	1 μ F	\pm 20% 35V ELECTROLYTIC	2090008146	JUMPER P=5mm USED 3		
C009	2554145008	0.001 μ F	\pm 5% 50V PLASTIC FILM	FEP-1261	JUMPER WIRE USED 3		
C010	2554145008	0.001 μ F	\pm 5% 50V PLASTIC FILM	VR001	2116014030	SEMI FIXED RESISTOR 100 k ohm	
C011	2554085032	0.068 μ F	\pm 2% 50V PLASTIC FILM	VR002	2116014030	SEMI FIXED RESISTOR 100 k ohm	
C012	2554085032	0.068 μ F	\pm 2% 50V PLASTIC FILM	LR001	2140020003	READ RELAY L23(M)	
C013	2554085016	0.018 μ F	\pm 2% 50V PLASTIC FILM	4140116106	SHIELD COVER USED 2		
C014	2554085016	0.018 μ F	\pm 2% 50V PLASTIC FILM	L003	2320017001	INDUCTOR	
C017	2544010004	100 μ F	10V ELECTROLYTIC	L004	2320017001	INDUCTOR	
C018	2544010004	100 μ F	10V ELECTROLYTIC	4170043100	RADIATOR		
				4730354019	TAPPING SCREW (2)3x8		
				SW001	2124326105	6P PUSH SWITCH INPUT SELECTOR	
				SW002	2124330007	SLIDE SWITCH (4-2) REMOTE CARTRIDGE	
				SW003	2124331006	SLIDE SWITCH (4-6) REMOTE REC OUT	
				SW004	2124327007	2P PUSH SWITCH S.P. SWITCH	
				2048047007	HEADPHONE JACK		
				2050144008	8P TERMINAL FOR SP		
				2035622008	3P CONNECTOR BASE FOR SP LED		
				2035622024	4P MINI CON. PIN FOR LCD		
				2035622066	5P MINI CON. PIN FOR LCD		
				2035622082	6P CONNECTOR BASE FOR LCD		
				2050145007	4P CONNECTOR BASE FOR PHONO		
				2040079002	6P CONNECTOR BASE FOR AUX, TUN, TAPE		
				4140240001	EARTH PLATE		

• For PMA-750

ETC-452K (For E2, EK), 452M (For E1) INPUT & EQ. UNIT

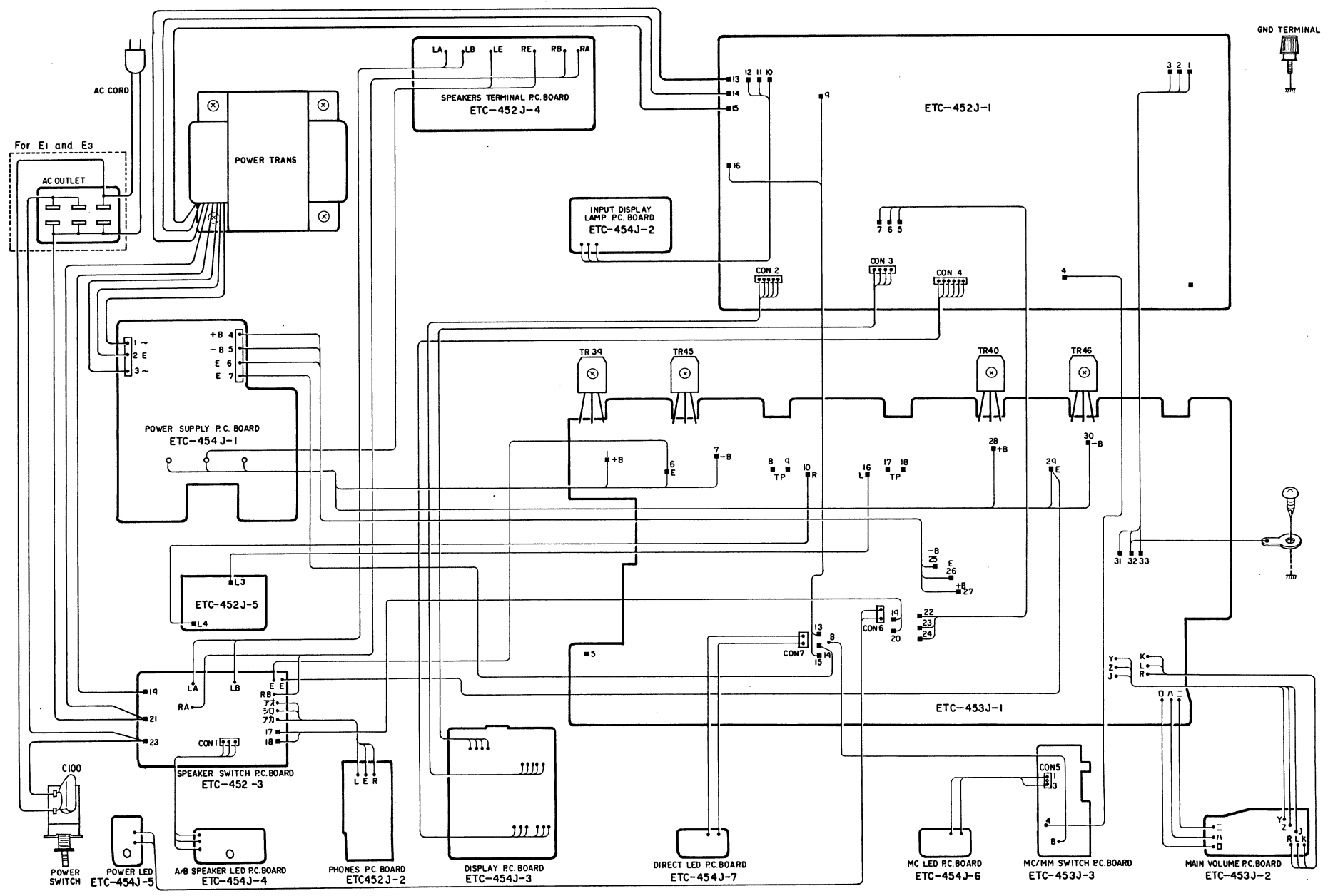


ETC-452K INPUT & EQ. UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions	
SEMICONDUCTORS			
IC001	2650034013	NJM4559D	INTEGRATED CIRCUIT
IC005	2630155006	μ PC78M15	INTEGRATED CIRCUIT
TR001	2750029025	2SK240(BL)/(V)	FIELD EFFECT TRANSISTOR
TR002	2750029025	2SK240(BL)/(V)	FIELD EFFECT TRANSISTOR
TR010	2710102005	2SA1015(Y)	TRANSISTOR
TR011	2710105002	2SA966(Y)	TRANSISTOR
TR012	2750018010	2SK30A(O)	FIELD EFFECT TRANSISTOR
D002	2760239009	S1RBA20F	DIODE
D003	2760237001	RV06	DIODE
D005	2760049008	1S2076	DIODE
D006	2760049008	1S2076	DIODE
RESISTORS (not included Carbon Film \pm 5% $\frac{1}{4}$ W Type)			
R021	2412018002	3.9 k ohm \pm 2% $\frac{1}{4}$ W	CARBON FILM
R022	2412018002	3.9 k ohm \pm 2% $\frac{1}{4}$ W	CARBON FILM
R025	2412032091	47 k ohm \pm 2% $\frac{1}{4}$ W	CARBON FILM
R026	2412032091	47 k ohm \pm 2% $\frac{1}{4}$ W	CARBON FILM
R045	2420203003	10 M ohm \pm 10% $\frac{1}{4}$ W	CARBON COMPOSIT
R046	2420203003	10 M ohm \pm 10% $\frac{1}{4}$ W	CARBON COMPOSIT
R058	2440077028	18 ohm \pm 5% 2W	METAL OXIDE FILM
R059	2440077028	18 ohm \pm 5% 2W	METAL OXIDE FILM
063	2440029021	100 ohm \pm 5% 1W	METAL OXIDE FILM
064	2440029021	100 ohm \pm 5% 2W	METAL OXIDE FILM
R069	2440017020	10 ohm \pm 5% 2W	METAL OXIDE FILM
R070	2440017020	10 ohm \pm 5% 2W	METAL OXIDE FILM
R080	2442012023	4.7 ohm \pm 5% $\frac{1}{2}$ W	METAL OXIDE FILM
CAPACITORS (not included Ceramic 50V Type)			
C005	2544131006	220 μ F 10V	ELECTROLYTIC
C006	2544131006	220 μ F 10V	ELECTROLYTIC
C007	2541003001	10 μ F \pm 20% 6.3V	ELECTROLYTIC
C008	2541003001	10 μ F \pm 20% 6.3V	ELECTROLYTIC
C009	2554145008	0.001 μ F \pm 5% 50V	PLASTIC FILM
C010	2554145008	0.001 μ F \pm 5% 50V	PLASTIC FILM
C011	2554189006	0.068 μ F \pm 5% 50V	PLASTIC FILM
C012	2554189006	0.068 μ F \pm 5% 50V	PLASTIC FILM
C013	2554175007	0.018 μ F \pm 5% 50V	PLASTIC FILM
C014	2554175007	0.018 μ F \pm 5% 50V	PLASTIC FILM
C023	2551120084	0.0047 μ F \pm 5% 50V	PLASTIC FILM
C024	2551120084	0.0047 μ F \pm 5% 50V	PLASTIC FILM

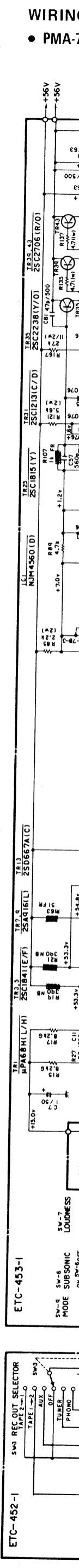
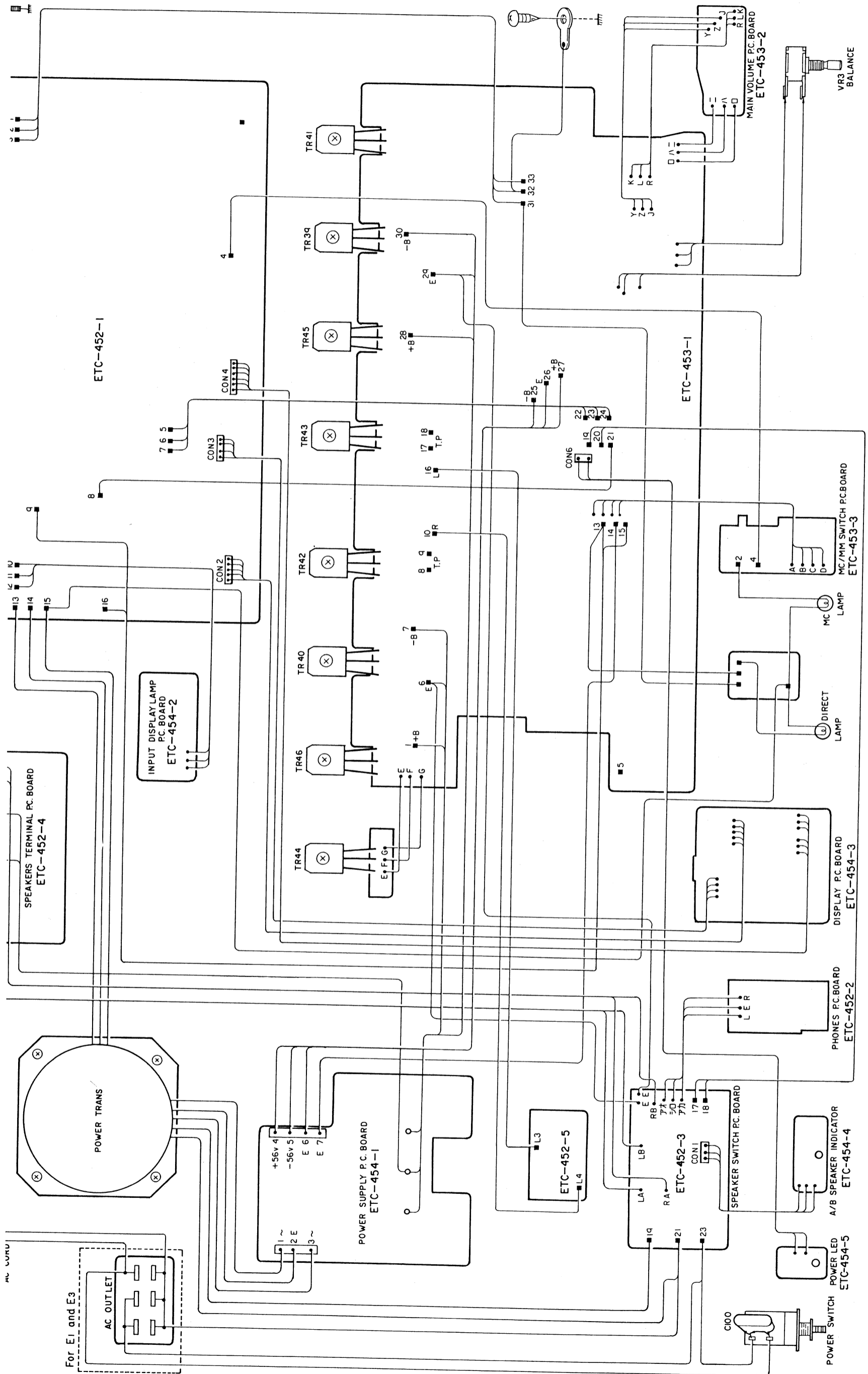
Ref. No.	Part No.	Part Name & Descriptions	
C025	2554164005	0.0062 μ F \pm 5%	50V PLASTIC FILM
C026	2554164005	0.0062 μ F \pm 5%	50V PLASTIC FILM
C031	2539015001	0.1 μ F \pm 20%	25V CERAMIC
C032	2539015001	0.1 μ F \pm 20%	25V CERAMIC
C035	2561017019	0.01 μ F \pm 10%	630V METALLIZED
C036	2544132005	10 μ F	16V ELECTROLYTIC
C037	2544079029	1000 μ F	25V ELECTROLYTIC
C040	2544039001	220 μ F	35V ELECTROLYTIC
C045	2544145005	0.47 μ F	50V ELECTROLYTIC
C046	2544145005	0.47 μ F	50V ELECTROLYTIC
C047	2544145005	0.47 μ F	50V ELECTROLYTIC
C049	2544145005	0.47 μ F	50V ELECTROLYTIC
C051	2551121067	0.022 μ F \pm 5%	50V PLASTIC FILM
C052	2551121067	0.022 μ F \pm 5%	50V PLASTIC FILM
OTHER PARTS			
	2220763109	P.W. BOARD	
	2050134908	TERMINAL PIN USED 21	
	2090047903	JUMPER WIRE USED 76	
	EP-5667H1	TERMINAL USED 2	
	2090008146	JUMPER P=5mm USED 4	
	2090008133	JUMPER P=7.5mm USED 7	
	2090008120	JUMPER P=10mm USED 1	
	2090008117	JUMPER P=12.5mm USED 6	
	2090008104	JUMPER P=15mm USED 2	
	2090008159	JUMPER P=17.5mm USED 1	
VR001	EP-5462H1	SOLID VR 100 ohm	
VR002	EP-5462H1	SOLID VR 100 ohm	
L003	2320017001	INDUCTOR	
L004	2320017001	INDUCTOR	
SW001	2124347100	5P PUSH SWITCH INPUT SELECTOR	
SW002	2124330007	SLIDE SWITCH (4-2) REMOTE CARTRIDGE	
SW003	2124331006	SLIDE SWITCH (4-6) REMOTE REC OUT	
SW004	2124327007	2P PUSH SWITCH S.P.SW.	
	2048047007	HEADPHONE JACK	
	2050144008	8P TERMINAL	
	2035622008	3P CONNECTOR BASE FOR SP LED	
	2050136029	4P CONNECTOR BASE FOR LCD	
	2050136032	5P CONNECTOR BASE FOR LCD	
	2050136045	6P CONNECTOR BASE FOR LCD	
	2036084001	4P CONNECTOR BASE FOR PHONO	
	2040079002	6P CONNECTOR BASE FOR AUX, TUN, TAPE	
	4140240001	EARTH PLATE	
	FEP1261	JUMPER WIRE USED 3	

CONNECTION DIAGRAM
• PMA-750



CTION DIAGRAM

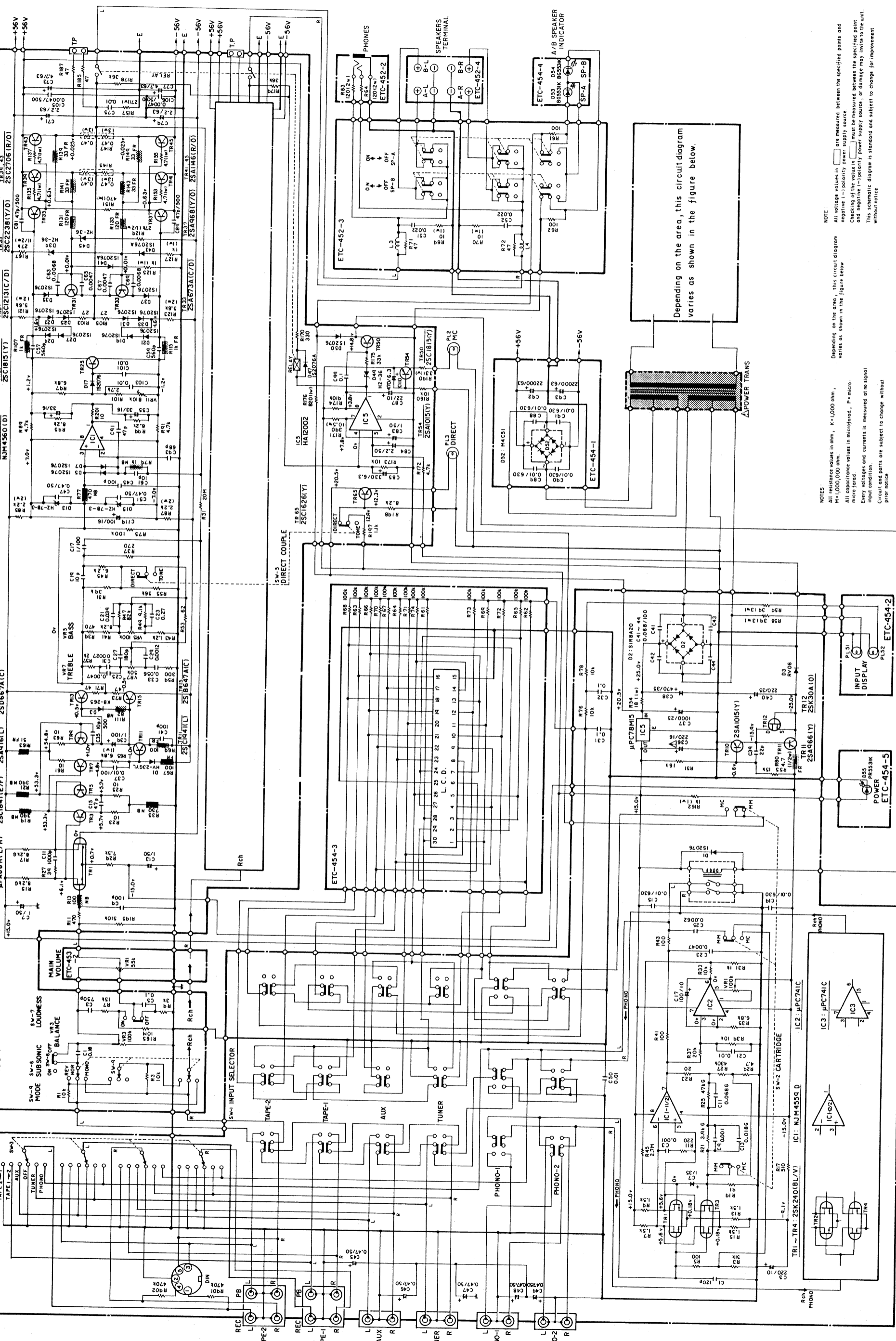
770



WIRING DIAGRAM

• PMA-770

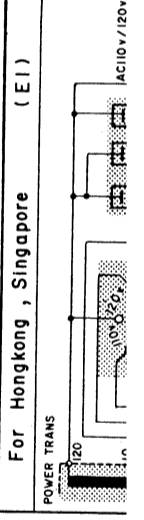
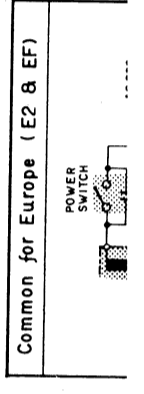
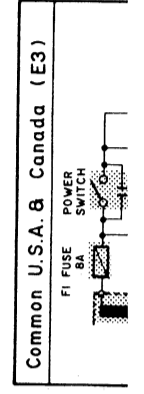
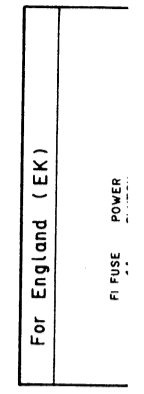
⚠ Means important safety item, which when necessary, by a part specified or meeting by the manufacturer.



Depending on the area, this circuit diagram varies as shown in the figure below.

NOTE:
 All voltage values in this circuit diagram are measured between the specified points and negative (-) polarity power supply source.
 Checking of the value in this diagram must be measured between the specified point and negative (-) polarity power supply source, or damage may occur to the unit.
 This schematic diagram is standard and subject to change for improvement without notice.

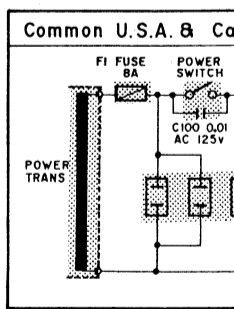
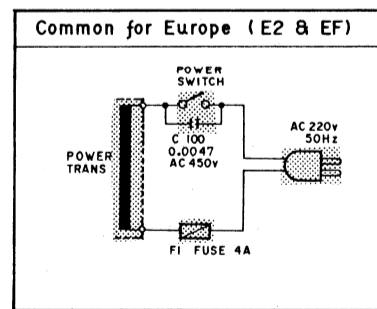
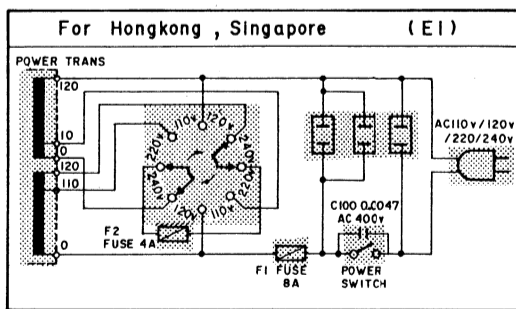
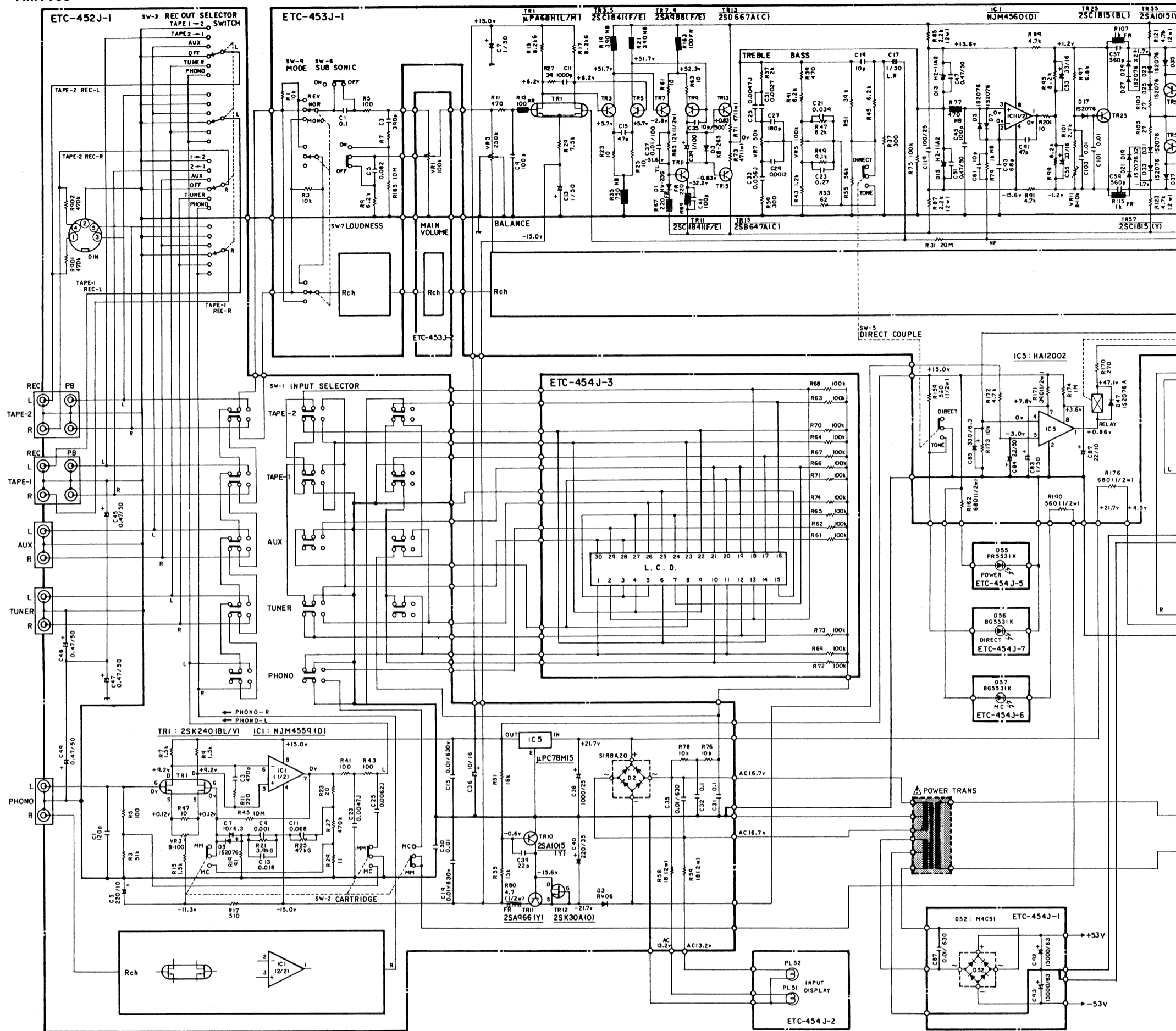
NOTES:
 All resistance values in ohm, K=1,000 ohm, M=1,000,000 ohm.
 All capacitance values in microfarad, P= microfarad.
 Every voltages and currents is measured at no signal input condition.
 Circuit and parts are subject to change without prior notice.



WIRING DIAGRAM

• PMA-750

when necessary by the manufacturer



NOTES :
 All resistance values in ohm, K=1,000 ohm, M=1,000,000 ohm.
 All capacitance values in microfarad, P= micro-micro farad.
 Every voltages and currents is measured at no signal input condition.
 Circuit and parts are subject to change without prior notice.

Depending on the area, this circuit diagram varies as shown in the figure below.

NOTE :
 All voltage values in negative (-) polarity.
 Checking of the value and negative (-) polarity.
 This schematic diagram without notice

⚠ Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.

