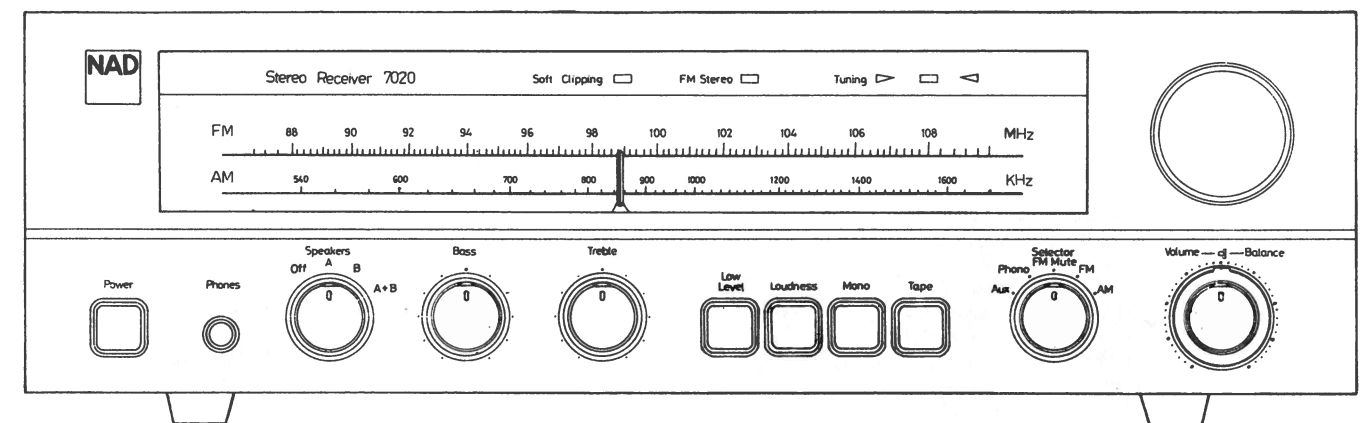


SERVICE MANUAL

NAD MODEL 7020

AM/FM STEREO RECEIVER

STARTING AT SERIAL NO: 7218469



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SPECIFICATION

FM Tuner Section

Input Sensitivity	IHF, 30 dB quieting	1.8 μ V
	IHF, 50 dB S/N Mono/Stereo	3.5 μ V/45 μ V
Signal to Noise Ratio (A weighted, at 65 dBf) Mono/Stereo		75dB/70dB
Frequency Response, 30–15K Hz		\pm 0.5dB
De-emphasis Accuracy 75 μ Sec		\pm 0.5dB
Channel Separation 1K Hz		42dB
	30–15K Hz	32dB
Selectivity, Alternate Channel (400KHz)		62dB
Capture Ratio at 45 dBf and 65 dBf		1.5dB
AM Suppression at 45 dBf and 65 dBf		60dB
Image Rejection		50dB
I.F. Rejection		75dB
SCA Rejection		70dB
Pilot Signal Suppression		55dB
THD at 100% Modulation 1KHz Mono/Stereo		0.2%/0.3%
	100 Hz Mono/Stereo	0.2%/0.3%
	6KHz Mono/Stereo	0.3%/0.4%
THD Stereo 1KHz 50%/150%		0.3%/0.4%

AM Tuner Section

Usable Sensitivity	350 μ V
Sensitivity	30dB
Image Rejection	45dB
IF Rejection	40dB

Audio Section

*measurements identified by an asterisk are taken in accordance with the new IHF A-202 amplifier measurement standard.

Power Amplifier Section

*Continuous average power output at 8 ohm 20–20K Hz both channel driven	> 20W
Rated distortion	< 0.02%
*Clipping headroom at 8 ohm	+1.5dB
Clipping power at 8 ohm/4 ohm/2 ohm	28W/37t/42W
Dynamic headroom at 8 ohm	+3dB
Dynamic power at 8 ohm/4 ohm/2 ohm	40t/58W/72W
*Reactive load rating	+1.7dB
*Transient Overload Recovery Time	< 1 μ Sec
*Slew Factor	> 50
Slew Rate	18V/ μ Sec
Damping factor at 50 Hz (Ref. 8 ohm)	> 55
T.H.D 20-20K Hz From 250m W to 20W	< 0.02%
S.M.P.T.E I.M.D (60Hz + 7KHz, 4:1) From 250mW to 20W	< 0.02%
I.H.F I.M.D (19K Hz + 20K Hz) at 20W	< 0.02%
T.I.M (15K Hz Sine + 3.18K Hz Square Wave) at 20W	< 0.02%
Frequency Response, 20-20K Hz (From Lab. IN)	\pm 0.5dB
Frequency Response Range \pm 3dB	10–70K Hz

Preamplifier Section

*Input Impedance Resistance/Capacitance	47K Ω /100pF
Input Sensitivity (1K Hz) *For 1 Watt out/20 Watt out	0.5mV/2.5mV
Input Overload at 20Hz/1K Hz/20K Hz	27mV/270mV/2V
T.H.D (20–20K Hz) and I.M.D at +30dB input level	< 0.02%
RIAA Response Accuracy 20Hz–20KHz	within \pm 0.5dB
Signal to Noise Ratio A Weighted	
(a) With phono cartridge connected Ref 10mV/*Ref 5mV	80dB/75dB
(b) With short-circuit input Ref 10mV	84dB

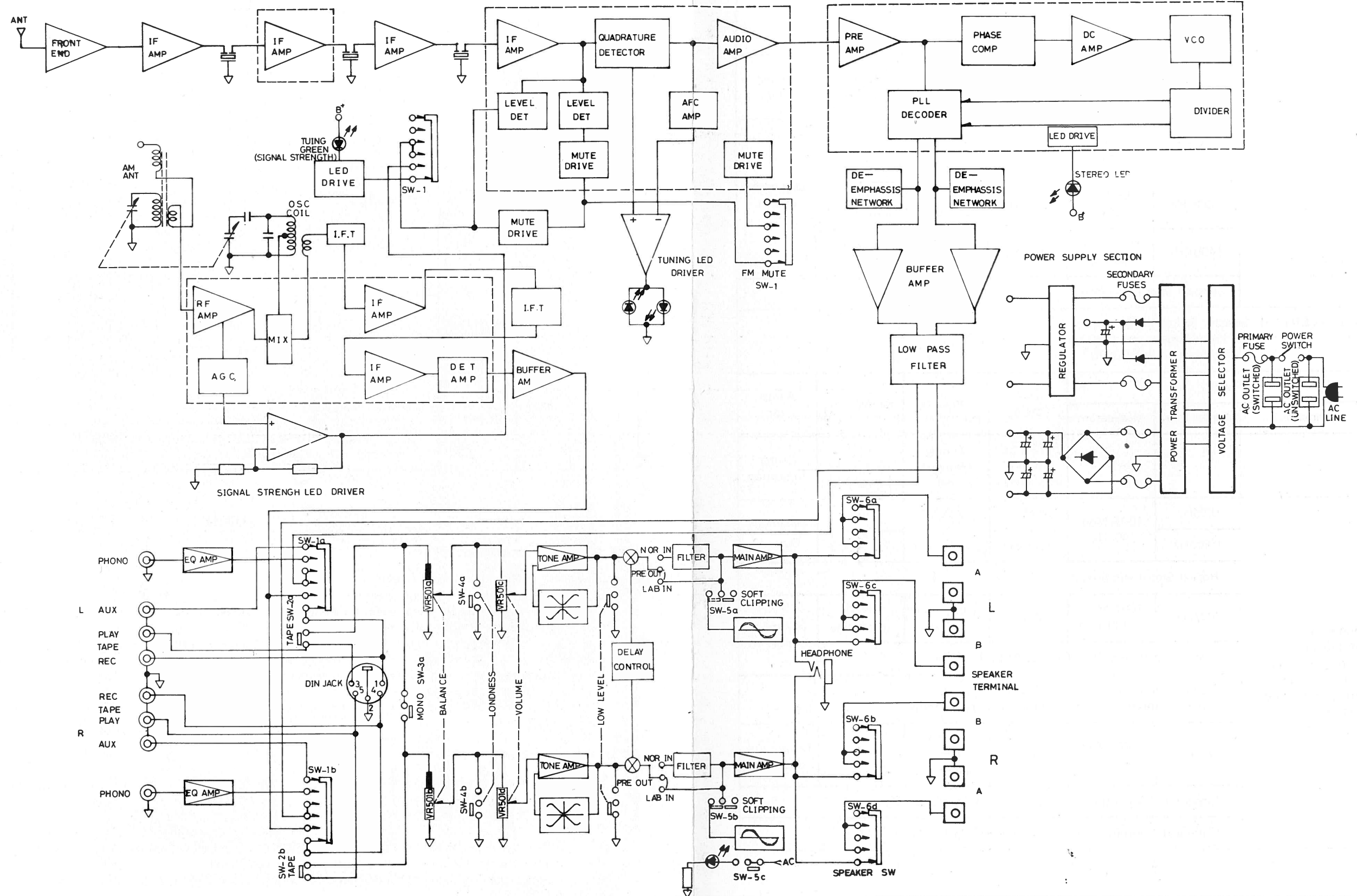
High Level Input

*Input impedance Resistance/Capacitance	20K Ω /100pF
Input Sensitivity *For 1 Watt out/For 20 Watt out	30mV/150mV
Signal to Noise Ratio, A–Weighted *Ref 1 Watt out	> 80dB
Ref 20 Watt out	> 110dB
*Maximum input signal	Infinite
Frequency Response, 20–20K Hz	\pm 0.5dB

Controls

Bass control range at 50Hz	\pm 10dB
Treble control range at 10K Hz	\pm 7dB
Infrasonic filter Turn Over frequency (From Normal IN)	15Hz
Slope (dB/octave)	12
Power Consumption	150VA
Weight	7.5Kg
Dimension Height x Width x Depth (mm)	120 x 420 x 240

7020 BLOCK DIAGRAM



ALIGNMENT (TUNER)

1. AM ALIGNMENT: 1. Selector switch in AM position 2. AC line voltage at rated voltage 3. Monitor output at REC OUT							
Section	AM SG			Dial Setting	Indicator	Adjustment Point	Adjust for
	Connection	Carrier Freq.	Modulation				
AM IF	Hot side of SG Output through 200 PF to AM antenna trimmer terminal (TP1) Hot side of SG output through 200 PF to EXT AM antenna terminal on rear panel	455KHz	30% Mod 400Hz	Point of non-interference	VTVM or Oscilloscope	T302 and T303	Maximum output
AM 1		600KHz	30% Mod. 400Hz	600KHz		T301 and Antenna Bar	
RF 2		1400KHz	30% Mod. 400Hz	1400KHz		TC-2 and TC-4	
RF 3		Repeat Step 1 and Step 2					
2. FM ALIGNMENT: 1. Selector Switch in FM position 2. AC line voltage at rated voltage 3. Monitor output at REC OUT							
Section	FM SG			Dial Setting	Indicator	Adjustment	Adjust for
	Connection	Carrier Freq.	Modulation				
FM IF	—	—	—	Point of non-interference	Tuning Meter of Set	T101 (Discr, IF primary A)	Center Indication
FM RF	Connect to FM 300 ohm antenna terminal on the rear panel through FM dummy antenna.	90MHz	100% Mod. 400Hz	90MHz	VTVM or Oscilloscope	L-1	Maximum Output
		106MHz		106MHz		TC-1 TC-3	
		Repeat Step 1 and Step 2					
FM Mono Distortion 1		98MHz	100% Mod. 400Hz	98MHz		Distortion Meter	
FM Mono Distortion 2	Repeat FM IF and FM MONO DISTORTION Step 1						
FM Mute	Connect to FM 300 ohm antenna terminal on the rear panel through FM dummy antenna.	Selector Switch in FM Muting Position Adjust attenuator of FM SG for antenna input 15dB					
		98MHz	100% Mod 400Hz	98MHz	VTVM or Oscilloscope	VR101	Output just disappear
		Increase FM SG output 4dB more to get full audio output					
		If full audio output cannot be got repeat Step 1. 2. 3.					

3. FM MPX ALIGNMENT 1. Same as FM ALIGNMENT 1. 2. 3. 2. FM SG is external modulated by STEREO SG and connected to FM 300Ω antenna terminal on the rear panel through FM dummy antenna.							
Section	Step	FM SG	Stereo SG	Dial Setting	Indicator	Adjustment	Adjust for
MPX pilot	1	—	—	Point of no signal received	Connect frequency counter through 100KΩ to TP10	VR201	19KHz ± 30Hz
	2	98MHz	10% 19KHz Pilot 90% L+R, L-R	98MHz	—	VR201	Stereo LED light
Separation	1	98MHz	10% 19KHz pilot L only	98MHz	Connect VTVM or Oscilloscope to R REC OUT	VR202	Minimum output
	2		10% 19KHz pilot R only	98MHz	Connect VTVM or Oscilloscope to L REC OUT	VR202	Minimum output
	3		Repeat Step 1 and Step 2				
	4		If there is an excessive difference between leakfree effect of both channels slightly adjust VR202 so that the level of signal leakage of both channels are equal.				

ALIGNMENT (AUDIO)

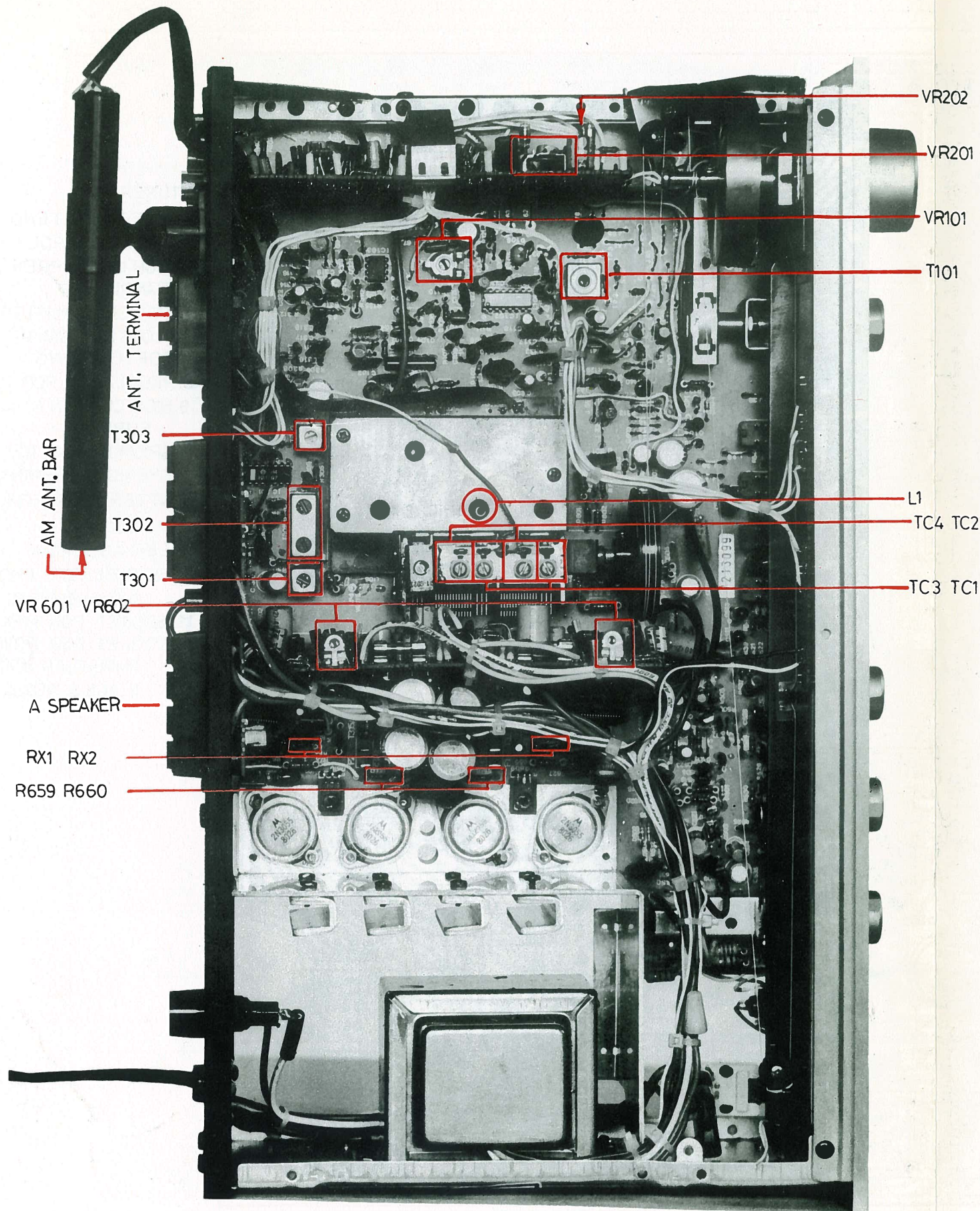
IDLE CURRENT ALIGNMENT

- 5 minutes minimum pre-heating is necessary.
- Set the volume control at minimum position.
- Connect DC milli-voltmeter across R660 for right channel and across R659 for left channel. The meter sensitivity should be set for 30–100mV full scale deflection.
- Insert 1K ohm carbon resistor in parallel with R648 (right channel) and R647 (left channel).
- After insert 1K ohm, if the reading of meter were between 300mV and 60mV, then the alignment is completed.
- If the reading were less than 30mV then the value of RX1 or RX2 should be reduced till the reading is between 30mV and 60mV.
- If the reading were more than 60mV then the value of RX1 or RX2 should be increase till the reading is between 30mV and 60mV.

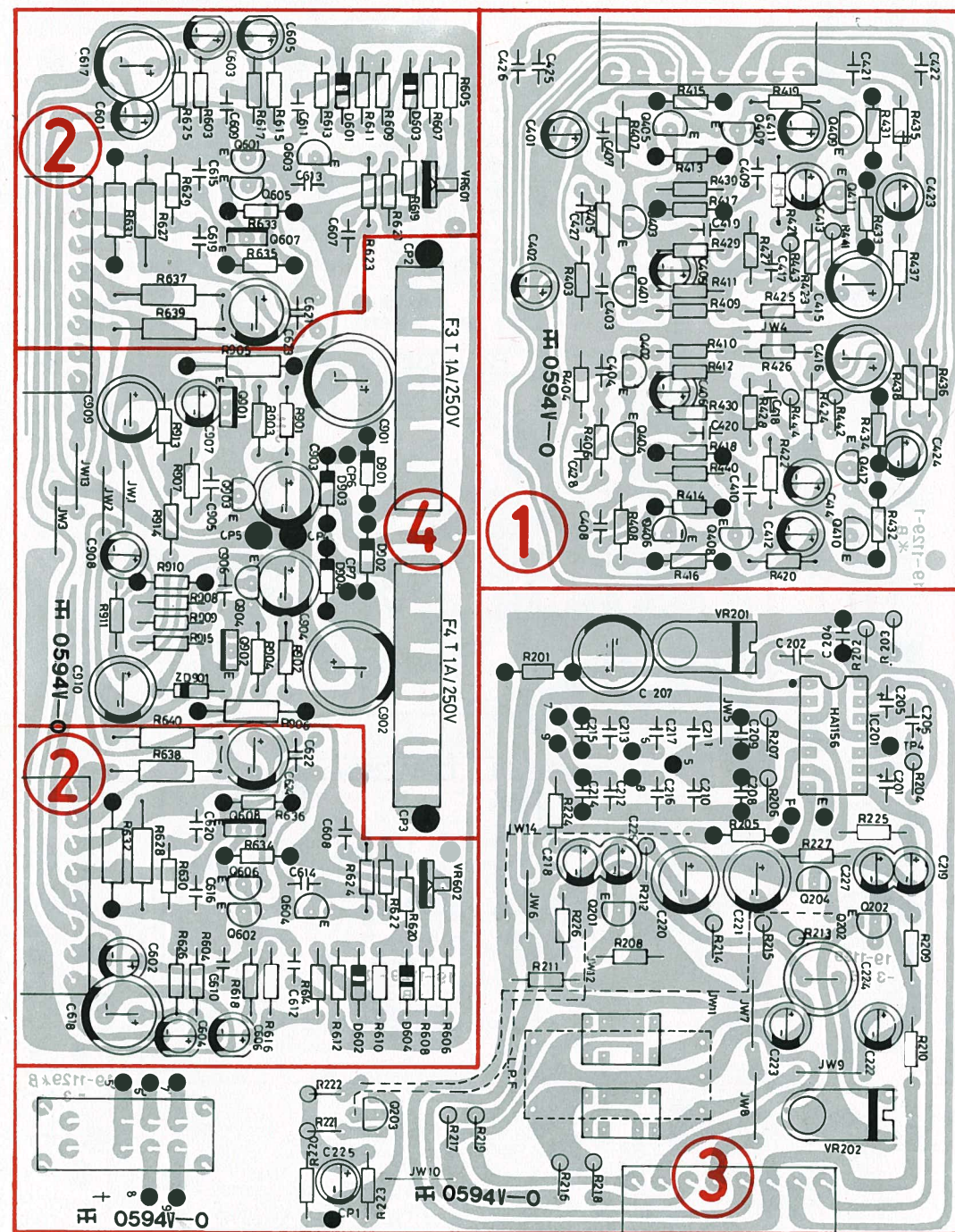
DC OFF-SET ALIGNMENT

- 5 minutes minimum pre-heating is necessary
- Set the volume control at minimum position.
- Speaker switch should be set to "A" position.
- Connect DC milli-voltmeter to the "speaker A" terminal of each channel. The meter sensitivity should be set for 100-300mV full scale deflection. The positive input of the meter should be connected to the red (+) speaker terminal.
- If the readings were within ±50mV, then the alignment is completed.
- If the reading is over the rang of ±50mV then adjust VR601 (for left channel) and VR602 (for right channel) till the meter reading is zero.

ALIGNMENT DIAGRAM & INSIDE VIEW

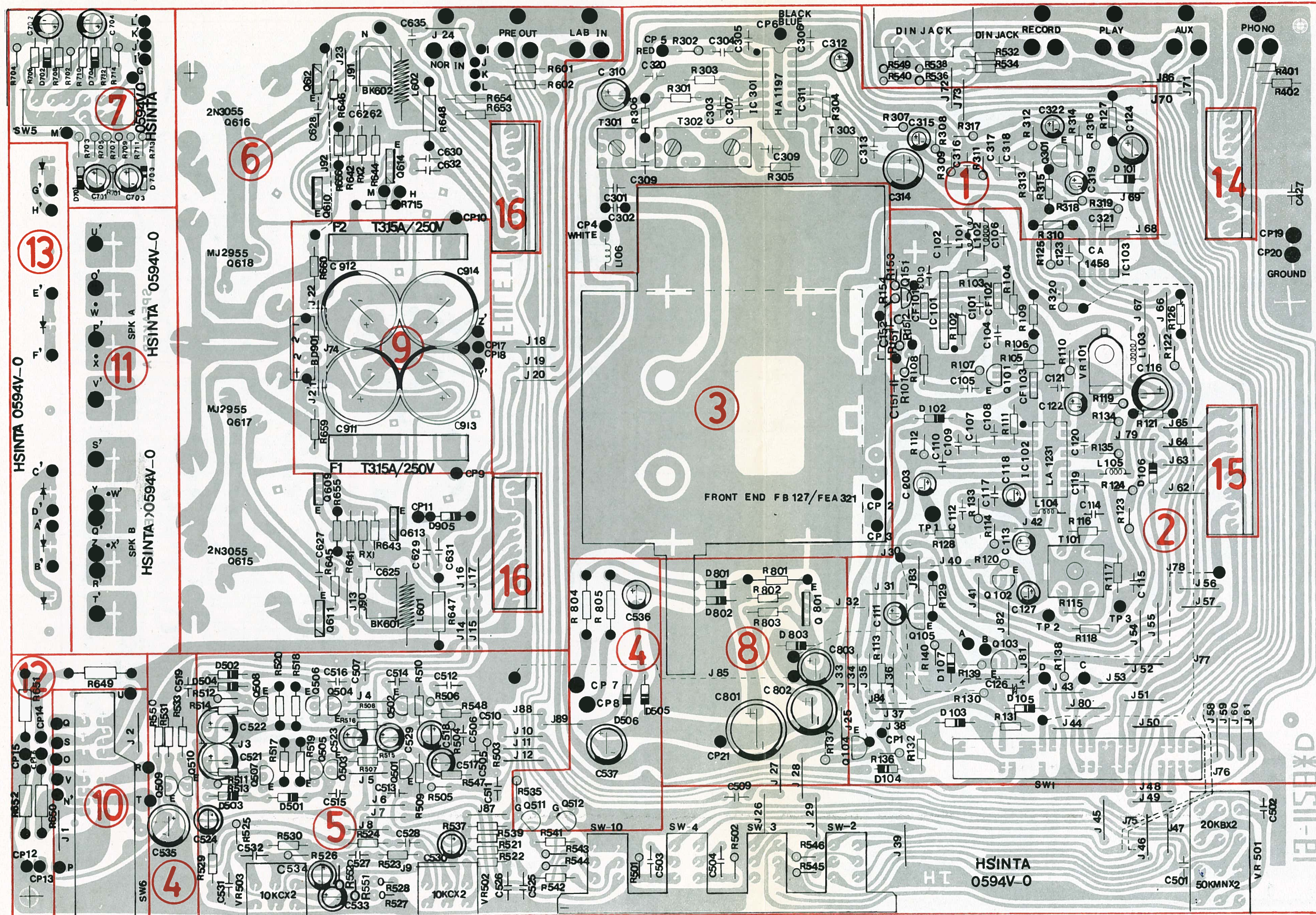


P.C.B. PARTS LOCATION-1



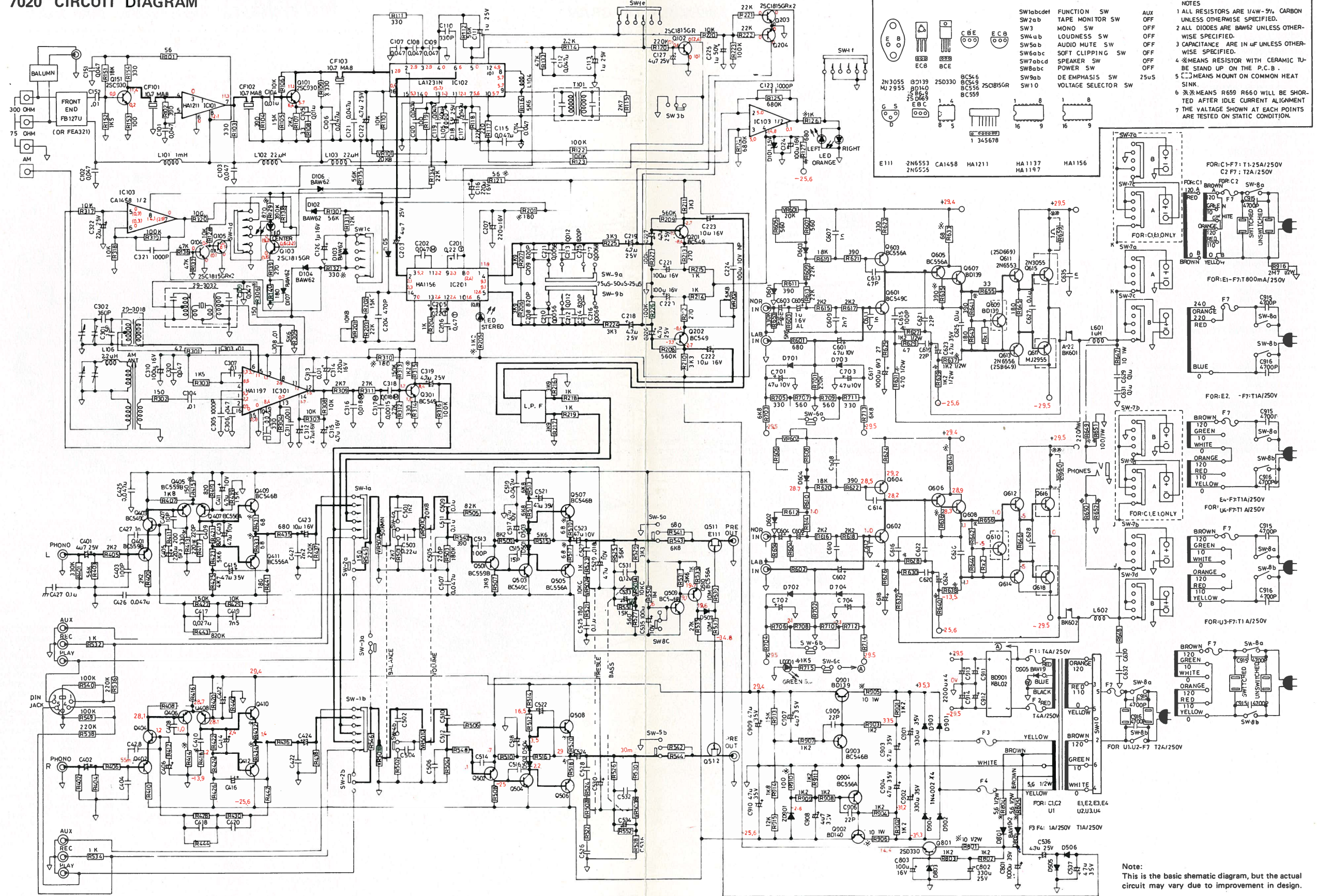
1. PHONO PREAMPLIFIER.
2. POWER AMPLIFIER DRIVING STAGE .
3. FM MPX.
4. REGULATOR .

P.C.B. PARTS LOCATION-2



1. TUNER AM.
2. TUNER FM.
3. TUNER FRONT END.
4. DELAY CONTROL.
5. HIGH LEVEL PRE-AMPLIFIER.
6. POWER AMPLIFIER OUTPUT STAGE.
7. SOFTCLIPPING.
8. REGULATOR FOR TUNE
9. HIGH CURRENT POWER SUPPLY.
10. SPEAKER SWITCH.
11. SPEAKER TERMINAL.
12. ATTENUATOR FOR PHONES.
13. LED ASSEMBLY.
14. SOCKET FOR PHONO PREAMPLIFIER.
15. SOCKET FOR MPX.
16. SOCKET FOR POWER AMPLIFIR DRIVING STAGE & REGULATO

7020 CIRCUIT DIAGRAM



SW1abcdet	FUNCTION	SW	AUX
SW2ab	TAPE MONITOR	SW	OFF
SW3	MONO	SW	OFF
SW4ab	LOUDNESS	SW	OFF
SW5ab	AUDIO MUTE	SW	OFF
SW6abc	SOFT CLIPPING	SW	OFF
SW7abcd	SPEAKER	SW	OFF
SW8abc	POWER SW	SW	OFF
SW9ab	DE EMPHASIS	SW	25uS
SW10	VOLTAGE SELECTOR	SW	

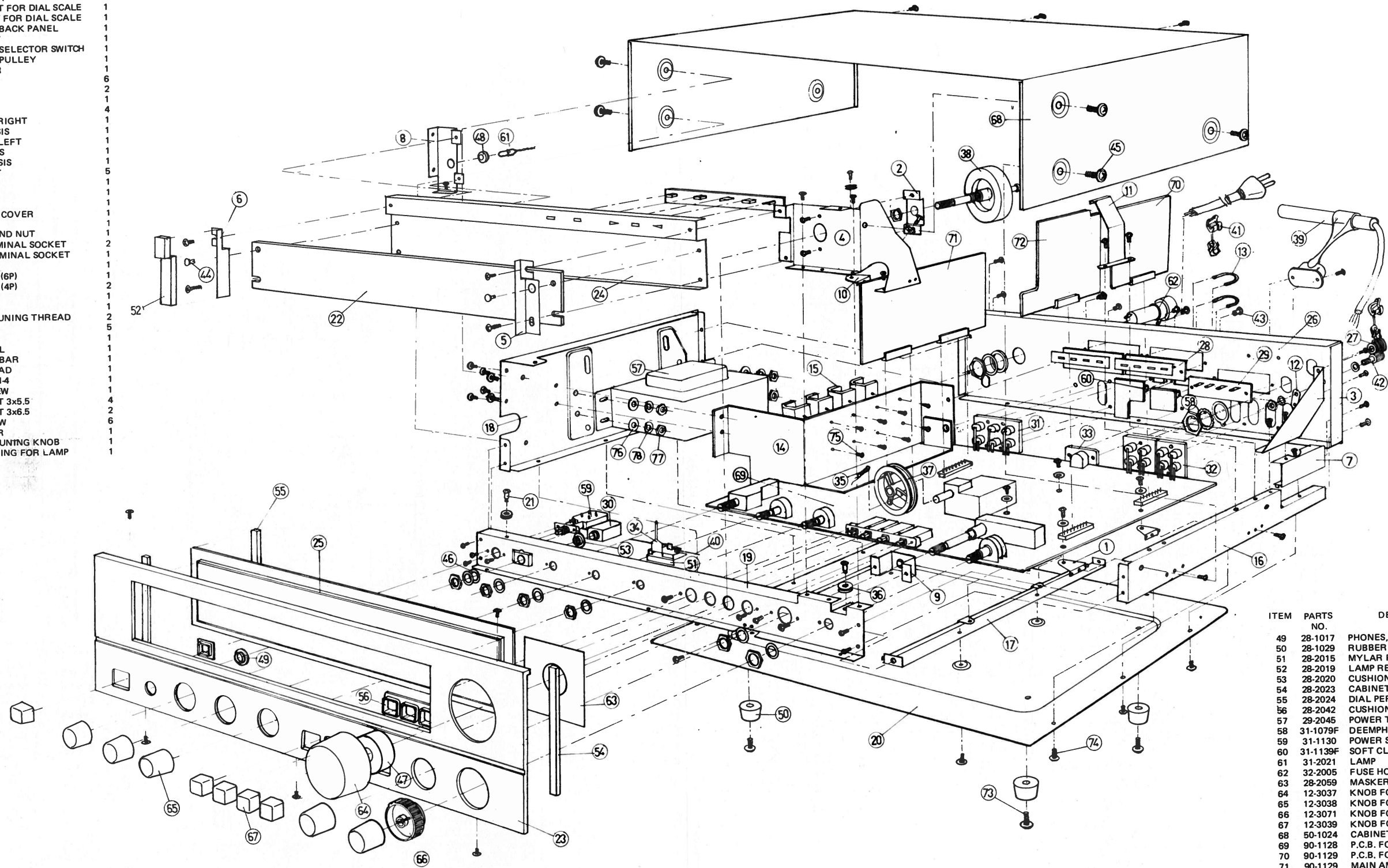
NOTES

- 1 ALL RESISTORS ARE 1/4W-5% CARBON UNLESS OTHERWISE SPECIFIED.
- 2 ALL DIODES ARE BAW62 UNLESS OTHERWISE SPECIFIED.
- 3 CAPACITANCE ARE IN uF UNLESS OTHERWISE SPECIFIED.
- 4 * MEANS RESISTOR WITH CERAMIC TUBE STAND UP ON THE P.C.B.
- 5 C MEANS MOUNT ON COMMON HEAT SINK.
- 6 ** MEANS R659 R660 WILL BE SHORTED AFTER IDLE CURRENT ALIGNMENT
- 7 THE VOLTAGE SHOWN AT EACH POINT ARE TESTED ON STATIC CONDITION.

Note: This is the basic schematic diagram, but the actual circuit may vary due to improvement in design.

7020 ASSEMBLY DIAGRAM

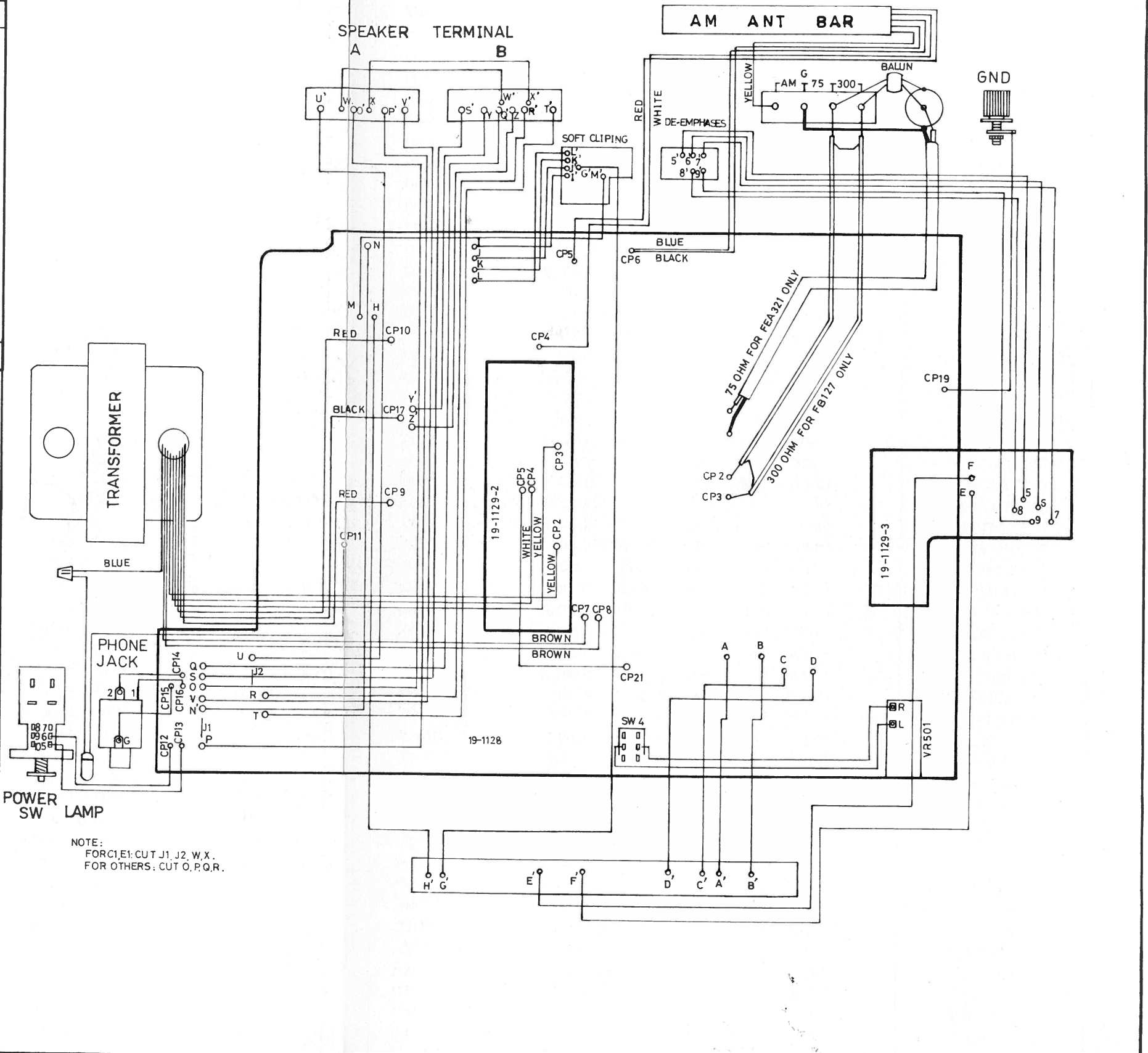
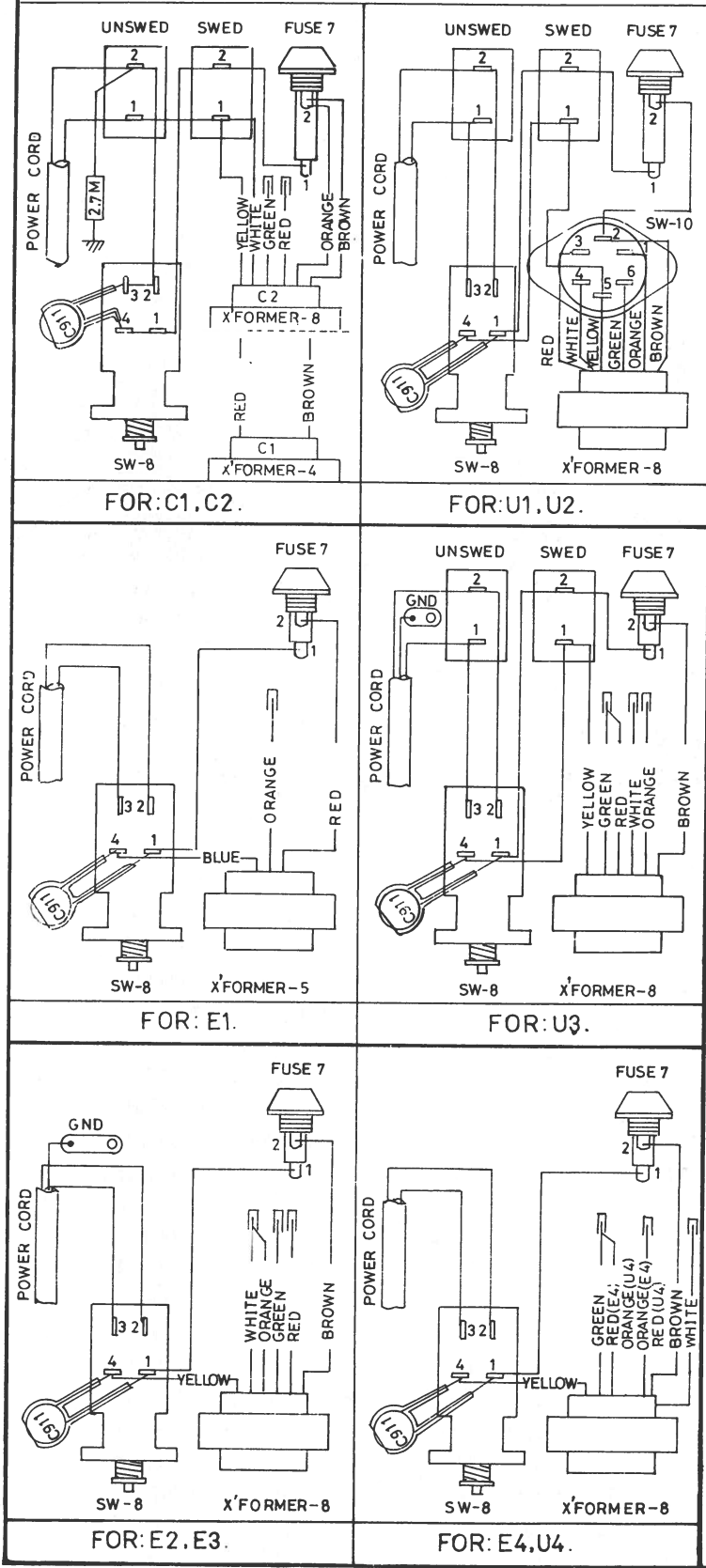
ITEM	PARTS NO.	DESCRIPTION	QTY
1	11-2047	BRACKET FOR PCB	2
2	11-2086	BRACKET FOR TUNING SHAFT	1
3	11-2104	BRACKET	1
4	11-2141	BRACKET RIGHT	1
5	11-2142	RIGHT BRACKET FOR DIAL SCALE	1
6	11-2143	LEFT BRACKET FOR DIAL SCALE	1
7	11-2173	BRACKET FOR BACK PANEL	1
8	11-2182	BRACKET LEFT	1
9	11-2186	BRACKET FOR SELECTOR SWITCH	1
10	11-2217	BRACKET FOR PULLEY	1
11	11-2219	P. C. B. HOLDER	1
12	11-3026	LUG	6
13	11-4007	I/O JUMPER	2
14	11-5056	HEAT SINK A	1
15	11-5057	HEAT SINK B	4
16	11-6039	AUX. CHASSIS RIGHT	1
17	11-6044	CENTER CHASSIS	1
18	11-6052	AUX. CHASSIS LEFT	1
19	11-6053	FRONT CHASSIS	1
20	11-6072	BOTTOM CHASSIS	1
21	11-7032	PULLEY SHAFT	5
22	11-8098-1	DIAL SCALE	1
23	11-8099	FRONT PANEL	1
24	11-8100	DIAL PLATE	1
25	11-8119-1	DIAL PERSPEX COVER	1
26	11-8170	BACK PANEL	1
27	12-1029	CONNECTOR AND NUT	1
28	12-2007	SPEAKER TERMINAL SOCKET	2
29	12-2012	ANTENNA TERMINAL SOCKET	1
30	13-2041	PHONE JACK	1
31	12-2105	SOCKET ASS'Y (6P)	1
32	12-2106	SOCKET ASS'Y (4P)	2
33	12-2076	DIN JACK	1
34	12-4014	POINTER	1
35	12-5019	SPRING FOR TUNING THREAD	2
36	13-5004	PULLEY	5
37	13-5029	DIAL DRUM	1
38	13-5018	TUNING WHEEL	1
39	29-5008	AM ANTENNA BAR	1
40	14-3001	TUNING THREAD	1
41	14-5003	CORD BUSH 4N-4	1
42	15-2037	GROUND SCREW	1
43	15-2048	PLASTIC RIVET 3x5.5	4
44	15-2049	PLASTIC RIVET 3x6.5	2
45	15-2051	SPECIAL SCREW	6
46	15-4010	FIBER WASHER	1
47	23-3004	DICAST FOR TUNING KNOB	1
48	28-1016	RUBBER BUSHING FOR LAMP	1



ITEM	PARTS NO.	DESCRIPTION	QTY
49	28-1017	PHONES, INSULATION BUSH	1
50	28-1029	RUBBER FOOT	4
51	28-2015	MYLAR FOR POINTER	1
52	28-2019	LAMP RETAINER	2
53	28-2020	CUSHION FOR MIC	1
54	28-2023	CABINET RETAINER	2
55	28-2024	DIAL PERSPEX COVER RETAINER	1
56	28-2042	CUSHION	5
57	29-2045	POWER TRANSFORMER	1
58	31-1079F	DEEMPHASSIS SWITCH	1
59	31-1130	POWER SWITCH	1
60	31-1139F	SOFT CLIPPING SWITCH	1
61	31-2021	LAMP	1
62	32-2005	FUSE HOLDER	1
63	28-2059	MASKER FOR PANEL (A)	1
64	12-3037	KNOB FOR TUNING	1
65	12-3038	KNOB FOR CONTROL	5
66	12-3071	KNOB FOR BALANCE	1
67	12-3039	KNOB FOR PUSH	5
68	50-1024	CABINET	1
69	90-1128	P.C.B. FOR TUNER AND AMP.	1
70	90-1129	P.C.B. FOR PHONO	1
71	90-1129	MAIN AMP.	1
72	90-1129	P.C.B. FOR MPX	1
73	S1B04+	MACHINE SCREW	8
	I10SL-2		
74	S2B03+	TAPPING SCREW	17
	IQ8SL-2		
75	S5B03+	TRIANGLE SCREW	34
	I08SL-2		
76	A04A07	WASHER	4
	SL01		
77	N04B07	NUT	4
	I3.2SZ		
78	A046	SPRING WASHER	4
	T07SL01		

7020A WIRING DIAGRAM

PRIMARY SECTION



NOTE:
FOR C1, E1: CUT J1, J2, W, X.
FOR OTHERS: CUT O, P, Q, R.

PARTS LIST

SYMBOL NO.	PARTS NO.	DESCRIPTION	REF.
BD901	30-1049	BRIDGE DIODE KBL02	76.00
BK601, BK602	15-3011	BREAKER A-22	88.00
C101	17-5DR473M	CAPA CER. 50V +-20% 0.047μF	5.00
C102	17-5DR473M	DO - 0.047μF	5.00
C103	17-5DR473M	DO - 0.047μF	5.00
C104	17-5DR103M	DO - 0.01 μF	3.40
C105	17-5DR103M	DO - 0.01 μF	3.40
C106	17-5DR473M	DO - 0.047μF	5.00
C107	17-5DR473M	DO - 0.047μF	5.00
C108	17-5DR473M	DO - 0.047μF	5.00
C109	17-5DR473M	DO - 0.047μF	5.00
C110	17-5DR331M	DO - 330P	4.00
C111	17-2.5ER105Y	CAPA EL. 25V +75-10% 1μF	8.00
C112	17-5DR473M	CAPA CER. 50V +-20% 0.047μF	5.00
C113	17-2.5ER105Y	CAPA CER. 25V +75-10% 1μF	8.00
C114	17-5DR473M	CAPA CER. 50V +-20% 0.047μF	5.00
C115	17-5DR473M	DO - 0.047μF	5.00
C116	17-1.6E227Y	CAPA CER. 16V +50-10% 220μF	33.50
C117	17-5DR473M	CAPA CER. 50V +-20% 0.047μF	5.00
C118	17-2.5ER105Y	CAPA EL. 25V +75-10% 1μF	5.00
C119	17-5DR473M	CAPA CER. 50V +-20% 0.047μF	5.00
C120	17-5DR473M	DO - 0.047μF	5.00
C121	17-5DR473M	DO - 0.047μF	5.00
C122	17-2.5ER475Y	CAPA EL. 25V +75-10% 4.7μF	8.00
C123	17-5DR102M	CAPA CER. 50V +-20% 1000PF	4.00
C124	17-1.6ER107Y	CAPA EL. 16V +50-10% 100μF	14.00
C125	17-5DR473M	CAPA CER. 50V +-20% 0.047μF	5.00
C127	17-2.5ER475Y	CAPA EL. 25V +75-10% 4.7μF	8.00
C201	17-1.6OR224M	CAPA TA. 16V +-20% 0.22μF	16.40
C202	17-5FR473	CAPA MY. 50V +-5% 0.047μF	8.90
C203	17-2.5ER475M	CAPA EL. 25V +75-10% 4.7μF	8.00
C204	17-5U471J	CAPA STY. 50V +-5% 470PF	9.60
C205	17-1.6OR224M	CAPA TA. 16V +-20% 0.22μF	16.40
C206	17-1.6OR474M	DO - 0.47μF	16.40
C207	17-1.6E227Y	CAPA EL. 16V +50-10% 220μF	33.50
C208, C209	17-5U821J	CAPA STY. 50V +-5% 820PF	9.60
C210, C211	17-5FR562J	CAPA MY. 50V +-5% 0.0056μF	6.50
C212, C213	17-5FR123J	DO - 0.012μF	8.90
C214, C215	17-5U821J	CAPA STY. 50V +-5% 820P	9.60
C216, C217	17-5FR682J	CAPA MY. 50V +-5% 0.0068μF	6.50
C218, C219	17-2.5ER475Y	CAPA EL. 25V +75-10% 4.7μF	8.00
C220, C221	17-1.6ER107Y	CAPA EL. 16V +50-10% 100 μF	14.00
C222, C223	17-1.6ER106Y	DO - 10μF	8.00
C224	17-1.0S107Y	CAPA ELNP 10V +50-10% 100μF	14.00
C225	17-5ER105Y	CAPA EL. 25V +75-10% 4.7μF	8.00
C226, C227	17-2.5ER475Y	DO - 4.7μF	8.00
C301	17-5DR150DSL	CAPA CER. 50V +-0.25P 15PF	3.50

PARTS LIST

SYMBOL NO.	PARTS NO.	DESCRIPTION	REF.
C302	17-5U361J	CAPA STY. 50V +-5% 360PF	9.40
C303	17-5DR103M	CAPA CER. 50V +-20% 0.01μF	3.40
C304	17-5DR103M	DO - 0.01μF	3.40
C305	17-5DR102M	DO - 1000PF	4.00
C307	17-5DR103M	DO - 0.01μF	3.40
C308	17-5DR103M	DO - 0.01μF	3.40
C309	17-5DR473M	DO - 0.047μF	5.00
C310	17-1.6ER107Y	CAPA EL. 16V +50-10% 100μF	14.00
C311	17-5DR102M	CAPA CER. 50V +-20% 1000PF	4.00
C312	17-2.5ER475Y	CAPA EL. 25V +75-10% 4.7μF	8.00
C313	17-5DR103M	CAPA CER. 50V +-20% 0.01μF	3.40
C314	17-1.6E227Y	CAPA EL. 16V +50-10% 220μF	33.50
C315	17-1.6ER475Y	CAPA EL. 16V +75-10% 4.7μF	8.00
C316	17-5FR183J	CAPA MY. 50V +-5% 0.018μF	8.90
C317	17-5FR152J	DO - 0.0015μF	6.50
C318	17-5FR183J	DO - 0.018μF	8.90
C319	17-2.5ER475Y	CAPA EL. 25V +75-10% 4.7μF	8.00
C320	17-5DR473M	CAPA CER. 50V +-20% 0.047μF	5.00
C321	17-5DR102M	DO - 1000PF	4.00
C322	17-2.5ER225Y	CAPA EL. 25V +75-10% 2.2μF	8.00
C401, C402	17-2.5ER475Y	DO - 4.7μF	8.00
C403, C404	17-5DR101MSL	CAPA CER. 50V +-20% 100PF	3.50
C405, C406	17-0.63ER227Y	CAPA EL. 6.3V +50-10% 220μF	14.00
C407, C408	17-5DR100DSL	CAPA CER. 50V +-0.25PF 10PF	3.50
C409, C410	17-5DR221MSL	CAPA CER. 50V +-20% 220PF	4.00
C411, C412	17-1ER476Y	CAPA EL. 10V +50-10% 47μF	9.00
C413, C414	17-1ER476Y	DO - 47μF	9.00
C415, C416	17-3.5ER476Y	CAPA EL. 35V +50-10% 47μF	14.00
C417, C418	17-5FR473J	CAPA MY. 50V +-5% 0.027μF	8.90
C419, C420	17-5FR752J	DO - 0.0075μF	6.50
C421, C422	17-5FR222J	DO - 0.0022μF	6.50
C423, C424	17-1.6ER106Y	CAPA EL. 16V +75-10% 10μF	10.00
C425	17-5DR473M	CAPA CER. 50V +-20% 0.047μF	5.00
C426	17-5DR473M	DO - 0.047μF	5.00
C427, C428	17-5FR102J	CAPA MY. 50V +-5% 0.001μF	6.50
C501, C502	17-5FR122J	DO - 0.0012μF	6.50
C503, C504	17-5FR224J	DO - 0.22μF	20.00
C505, C506	17-5DR221MSL	CAPA CER. 50V +-20% 220PF	4.00
C507, C508	17-5DR473M	DO - 0.047μF	5.00
C509, C510	17-5F104J	CAPA MY. 50V +-5% 0.1μF	13.00
C511, C512	17-5F104J	DO - 0.1μF	13.00
C513, C514	17-5DR101MSL	CAPA CER. 50V +-20% 100PF	3.50
C515, C516	17-5DR150DSL	CAPA CER. 50V +-0.25P 15PF	3.50
C517, C518	17-1ER476Y	CAPA EL. 10V +50-10% 47μF	9.00
C519	17-5DR473M	CAPA CER. 50V +-20% 0.047μF	5.00
C521, C422	17-3.5ER476Y	CAPA EL. 35V +50-10% 47μF	14.00
C523, C524	17-1ER476Y	CAPA EL. 10V +50-10% 47μF	9.00

PARTS LIST

SYMBOL NO.	PARTS NO.	DESCRIPTION	REF.
C525, C526	17-5F104J	CAPA MY. 50V +-5% 0.1μF	13.00
C527, C528	17-5FR183J	DO - 0.018μF	8.90
C529, C530	17-1ER476Y	CAPA EL. 10V +75-10% 47μF	9.00
C531, C532	17-5F124J	CAPA MY. 50V +-5% 0.12μF	13.00
C533, C534	17-1.6R684K	CAPA AL. 16V +-10% 0.68μF	38.00
C535	17-1ER107Y	CAPA EL. 10V +50-10% 100μF	14.60
C601, C602	17-1ER476Y	CAPA EL. 10V +75-10% 47μF	9.00
C603, C604	17-1.6R105K	CAPA AL. 16V +-10% 1μF	25.00
C605, C606	17-1.6R105K	DO - 1μF	25.00
C607, C608	17-5FR102J	CAPA MY. 50V +-5% 0.001μF	6.50
C609, C610	17-5FR272J	DO - 0.0027μF	6.50
C611, C612	17-5FR102J	DO - 0.001μF	6.50
C613, C614	17-5DR470MSL	CAPA CER. 50V +-20% 47PF	3.50
C615, C616	17-5DR101MSL	DO - 100PF	3.50
C617, C618	17-0.63E108Y	CAPA EL. 6.3V +50-10% 1000μF	32.50
C619, C620	17-5DR220JSL	CAPA CER. 50V +-5% 22PF	3.50
C621, C622	17-5DR220JSL	DO - 22PF	3.50
C623, C624	17-3.5ER476Y	CAPA EL. 35V +75-10% 47μF	14.00
C625, C626	17-5F104J	CAPA MY. 50V +-5% 0.1μF	13.00
C627, C628	17-5F104J	DO - 0.1μF	13.00
C629, C630	17-5D104M	CAPA CER. 50V +-20% 0.1μF	10.00
C631, C632	17-5D104M	DO - 0.1μF	10.00
C635	17-5FR102J	CAPA MY. 50V +-5% 0.001μF	6.50
C536	17-2.5ER475Y	CAPA EL. 25V +75-10% 4.7μF	8.00
C537	17-3.5ER476Y	CAPA EL. 35V +75-10% 47μF	14.00
C701, C702	17-1ER476Y	CAPA EL. 10V +75-10% 47μF	9.00
C703, C704	17-1ER476Y	DO - 47μF	9.00
C801	17-3.5E108Y	CAPA EL. 35V +50-10% 1000μF	93.00
C802	17-2.5E337Y	CAPA EL. 25V +50-10% 330μF	33.50
C803	17-1.6ER107Y	CAPA EL. 16V +50-10% 100μF	14.00
C901, C902	17-3.5E337Y	CAPA EL. 35V +50-10% 330μF	33.50
C903, C904	17-3.5E476Y	DO - 47μF	14.00
C905, C906	17-5DR221JSL	CAPA CER. 50V +-5% 22PF	3.50
C907, C908	17-3.5ER475Y	CAPA EL. 35V +75-10% 4.7μF	8.00
C909, C910	17-3.5ER476Y	DO - +50-10% 47μF	14.00
CF101	29-3027	CER. FILTER SFE 10.7MA8	61.50
CF102	29-3027	DO -	61.50
CF103	29-3027	DO -	61.50
D101	30-1044	ZENER DIODE 15V 500mW+-5%	14.80
D102	30-1019	DIODE BAW62	11.00
D103	30-1019	DO -	11.00
D104	30-1019	DO -	11.00
D105	30-1019	DO -	11.00
D106	30-1019	DO -	11.00
D107	30-1019	DO -	11.00
D501, D502	30-1019	DO -	11.00
D503, D504	30-1019	DO -	11.00

PARTS LIST

SYMBOL NO.	PARTS NO.	DESCRIPTION	REF.
D505	30-1019	DIODE BAW62	11.00
D506	30-1019	DO -	11.00
D601, D602	30-1019	DO -	11.00
D603, D604	30-1019	DO -	11.00
D701, D702	30-1019	DO -	11.00
D703, D704	30-1019	DO -	11.00
D801, D802	30-1078	DIODE BAV19	12.80
D803	30-1044	ZENER DIODE 15V 500mW+-5%	14.00
D901, D902	30-1002	DIODE 1N4002	14.00
D903, D904	30-1002	DO -	14.00
IC101	30-3035	IC HA1211	115.00
IC012	30-3070	IC LA1231N	280.00
IC103	30-3032	IC CA1458	108.00
IC210	30-3015	IC HA1156	180.00
IC301	30-3036	IC HA1197	236.00
L101	29-1037	INDUCTOR 1mH+-10%	16.00
L102	29-1034	DO - 22μH+-10%	15.00
L103	29-1034	DO - 22μH+-10%	15.00
L104	29-1039	DO - 18μH+-10%	11.00
L105	29-1038	DO - 40μH+-10%	15.00
L106	92-1051	DO - 2.2μH+-10%	10.00
L601, L602	29-1040	DO - 1μH+-10%	3.50
LD101	30-1071	LED ORANGE TRIANGULAR	15.00
LD102	30-1071	DO -	15.00
LD103	30-1073	LED GREEN RETANGULAR	15.00
LD201	30-1073	DO -	15.00
LD701	30-1073	DO -	15.00
LDF201, LDF202	29-3049	LOW PASS FILTER 19.38KHZ	180.00
Q101	30-2019	TRANSISTOR 2SC930C	23.00
Q102	30-2156	DO - 2SC1815GR	14.00
Q103	30-2156	DO - 2SC1815GR	14.00
Q210	30-2084-3	DO - BC549C	22.80
Q202	30-2084-3	DO - BC549C	22.80
Q203	30-2156	DO - 2SC1815GR	14.00
Q204	30-2156	DO - 2SC1815GR	14.00
Q301	30-2084-3	DO - BC549C	22.80
Q401, Q402	30-2085-2	DO - BC559B	22.80
Q403, Q404	30-2084-3	DO - BC549C	22.80
Q405, Q406	30-2085-2	DO - BC559B	22.80
Q407, Q408	30-2096	DO - BC556A	24.70
Q409, Q410	30-2090-2	DO - BC546B	24.70
Q411, Q412	30-2096	DO - BC556A	24.70
Q501, Q502	30-2085-2	DO - BC559B	22.80
Q503, Q504	30-2084-3	DO - BC549C	22.80
Q505, Q506	30-2096	DO - BC556A	24.70
Q507, Q508	30-2090-2	DO - BC546B	24.70
Q509	30-2090-2	DO - BC546B	24.70

PARTS LIST

SYMBOL NO.	PARTS NO.	DESCRIPTION	REF.
Q510	30-2096	TRANSISTOR BC556A	24.70
Q511, Q512	30-2230	FET E111	104.00
Q601, Q602	30-2084-3	TRANSISTOR BC549C	22.80
Q603, Q605	30-2096	DO - BC556A	24.70
Q605, Q606	30-2096	DO - BC556A	24.70
Q607, Q608	30-2083	DO - BD139	53.20
Q609, Q610	30-2083	DO - BD139	53.20
Q611, Q612	30-2169	DO - 2N6553	80.00
Q613, Q614	30-2170	DO - 2N6556	80.00
Q614, Q616	30-2004	DO - 2N3055	152.00
Q617, Q618	30-2114	DO - MJ2955	152.00
Q801	30-2178	DO - 2SD330	76.00
Q901	30-2083	DO - BD139	53.20
Q902	30-2082	DO - BD140	58.90
Q903	30-2090-2	DO - BC546B	24.70
Q904	30-2096	DO - BC556A	24.70
R101	16-¼CA330J	RES. C. ¼W ±5% 330OHM	1.70
R102	16-¼CA391J	DO - 390OHM	1.70
R103	16-¼CA391J	DO - 330OHM	1.70
R104	16-¼CA391J	DO - 390OHM	1.70
R105	16-¼CA153J	DO - 15KOHM	1.70
R106	16-¼CR103J	DO - 10KOHM	1.70
R107	16-¼CR222J	DO - 2K20OHM	1.70
R108	16-¼CA330J	DO - 330OHM	1.70
R109	16-¼CA331J	DO - 330OHM	1.70
R110	16-¼CR103J	DO - 10KOHM	1.70
R111	16-¼CA331J	DO - 330OHM	1.70
R112	16-¼CR563J	DO - 56KOHM	1.70
R113	16-¼CA123J	DO - 12KOHM	1.70
R114	16-¼CR222J	DO - 2K20OHM	1.70
R115	16-¼CR272J	DO - 2K70OHM	1.70
R116	16-¼CR562J	DO - 5K60OHM	1.70
R117	16-¼CR221J	DO - 220OHM	1.70
R118	16-¼CA223J	DO - 22KOHM	1.70
R119	16-¼CR101J	DO - 100OHM	1.70
R120	16-¼CR224J	DO - 220KOHM	1.70
R121	16-¼CA560J	DO - 560OHM	1.70
R122	16-¼CR104J	DO - 100KOHM	1.70
R123	16-¼CR104J	DO - 100KOHM	1.70
R124	16-¼CR684J	DO - 680KOHM	1.70
R125	16-¼CR684J	DO - 680KOHM	1.70
R126	16-¼CA102J	DO - 1KOHM	1.70
R127	16-½CP681J	RES. C. ½W ±5% 680OHM	2.40
R128	16-¼CA103J	RES. C. ¼W ±5% 10KOHM	1.70
R129	16-¼CA821J	DO - 820OHM	1.70
R130	16-¼CR563J	DO - 56KOHM	1.70
R131	16-¼CA123J	DO - 12KOHM	1.70

PARTS LIST

SYMBOL NO.	PARTS NO.	DESCRIPTION	REF.
R132	16-¼CA331J	RES. C. ¼W ±5% 330OHM	1.70
R133	16-¼CR473J	DO - 47KOHM	1.70
R134	16-¼CR223J	DO - 22KOHM	1.70
R135	16-¼CR563J	DO - 56KOHM	1.70
R136	16-¼CR473J	DO - 47KOHM	1.70
R137	16-¼CR473J	DO - 47KOHM	1.70
R138	16-¼CR394J	DO - 390KOHM	1.70
R139	16-¼CR271J	DO - 270OHM	1.70
R140	16-¼CR181J	DO - 180OHM	1.70
R201	16-¼CA181J	DO - 180OHM	1.70
R202	16-¼CR153J	DO - 15KOHM	1.70
R203	16-¼CR223J	DO - 22KOHM	1.70
R204	16-¼CR102J	DO - 1KOHM	1.70
R205	16-¼CA122J	DO - 1K2OHM	1.70
R206, R207	16-¼CR392J	DO - 3K9OHM	1.70
R208, R209	16-¼CA564J	DO - 560KOHM	1.70
R210, R211	16-¼CA332J	DO - 3K3OHM	1.70
R212, R213	16-¼CR271J	DO - 270OHM	1.70
R214, R215,	16-¼CR102J	DO - 1KOHM	1.70
R216, R217	16-¼CR392J	DO - 3K9OHM	1.70
R218, R219	16-¼CR102J	DO - 1KOHM	1.70
R220	16-¼CA103J	DO - 10KOHM	1.70
R221	16-¼CR223J	DO - 22KOHM	1.70
R222	16-¼CR223J	DO - 22KOHM	1.70
R223	16-¼CA104J	DO - 100KOHM	1.70
R224, R225	16-¼CA332J	DO - 3K3OHM	1.70
R226, R227	16-¼CA104J	DO - 100KOHM	1.70
R301	16-¼CA470J	DO - 47OHM	1.70
R302	16-¼CR151J	DO - 150OHM	1.70
R303	16-¼CA152J	DO - 1K5OHM	1.70
R304	16-¼CA331J	DO - 330OHM	1.70
R305	16-¼CA562J	DO - 5K6OHM	1.70
R306	16-¼CA151J	DO - 150OHM	1.70
R307	16-¼CR103J	DO - 10KOHM	1.70
R308	16-¼CR103J	DO - 10KOHM	1.70
R309	16-¼CR272J	DO - 2K7OHM	1.70
R310	16-¼CA181J	DO - 180OHM	1.70
R311	16-¼CR273J	DO - 27KOHM	1.70
R312	16-¼CR273J	DO - 27KOHM	1.70
R313	16-¼CA154J	DO - 150KOHM	1.70
R314	16-¼CA331J	DO - 330OHM	1.70
R315	16-¼CA122J	DO - 1K2OHM	1.70
R316	16-¼CR104J	DO - 100KOHM	1.70
R317	16-¼CR103J	DO - 10KOHM	1.70
R318	16-¼CR103J	DO - 10KOHM	1.70
R319	16-¼CR104J	DO - 100KOHM	1.70
R320	16-¼CR101J	DO - 100OHM	1.70

PARTS LIST

SYMBOL NO.	PARTS NO.	DESCRIPTION	REF.
R401, R402	16-¼CA334J	REC. C. ¼W ±5% 330KOHM	1.70
R403, R404	16-¼CA563J	DO - 56KOHM	1.70
R405, R406	16-¼CA222J	DO - 2K2OHM	1.70
R407, R408	16-¼CA182J	DO - 1K8OHM	1.70
R409, R410	16-¼CA222J	DO - 2K2OHM	1.70
R411, R412	16-¼CA201J	DO - 200OHM	1.70
R413, R414	16-¼CA331J	DO - 330OHM	1.70
R415, R416	16-¼CA151J	DO - 150OHM	1.70
R417, R418	16-¼CA221J	DO - 220OHM	1.70
R419, R420	16-¼CA821J	DO - 820OHM	1.70
R421, R422	16-¼CA821J	DO - 820OHM	1.70
R423, R424	16-¼CA562J	DO - 5K6OHM	1.70
R425, R426	16-¼CA472J	DO - 4K7OHM	1.70
R427, R428	16-¼CA154J	DO - 150KOHM	1.70
R429, R430	16-¼CA103J	DO - 10KOHM	1.70
R431, R432	17-¼CA680J	DO - 68OHM	1.70
R433, R434	16-¼CA680J	DO - 68OHM	1.70
R435, R436	16-¼CA681J	DO - 680OHM	1.70
R437, R438	16-¼CA224J	DO - 220OHM	1.70
R439, R440	16-¼CA153J	DO - 15KOHM	1.70
R441, R442	16-¼CR181J	DO - 180OHM	1.70
R443, R444	16-¼CR824J	DO - 820KOHM	1.70
R501, R502	16-¼CR272J	DO - 2K7OHM	1.70
R503, R504	16-¼CR184J	DO - 180KOHM	1.70
R505, R506	16-¼CR823J	DO - 82KOHM	1.70
R507, R508	16-¼CA392J	DO - 3K9OHM	1.70
R509, R510	16-¼CA822J	DO - 8K2OHM	1.70
R511, R512	16-¼CR682J	DO - 6K8OHM	1.70
R513, R514	16-¼CA682J	DO - 6K8OHM	1.70
R515, R516	16-¼CA562J	DO - 5K6OHM	1.70
R517, R518	16-¼CA680J	DO - 68OHM	1.70
R519, R520	16-¼CA680J	DO - 68OHM	1.70
R521, R522	16-¼CA181J	DO - 180OHM	1.70
R523, R524	16-¼CA102J	DO - 1KOHM	1.70
R525, R526	16-¼CR563J	DO - 56KOHM	1.70
R527, R528	16-¼CA561J	DO - 560OHM	1.70
R529, R530	16-¼CA332J	DO - 3K3OHM	1.70
R531	16-¼CA105J	DO - 1MOHM	1.70
R532, R534	16-¼CA102J	DO - 1KOHM	1.70
R533	16-¼CA331J	DO - 330OHM	1.70
R535	16-¼CR273J	DO - 27KOHM	1.70
R536, R538	16-¼CR224J	DO - 220KOHM	1.70
R537, R539	16-¼CA106J	DO - 10MOHM	1.70
R540, R549	16-¼CR104J	DO - 100KOHM	1.70
R541, R542	16-¼CA681J	DO - 680OHM	1.70
R543, R544	16-¼CR682J	DO - 6K8OHM	1.70
R545, R546	16-¼CR151J	DO - 150OHM	1.70

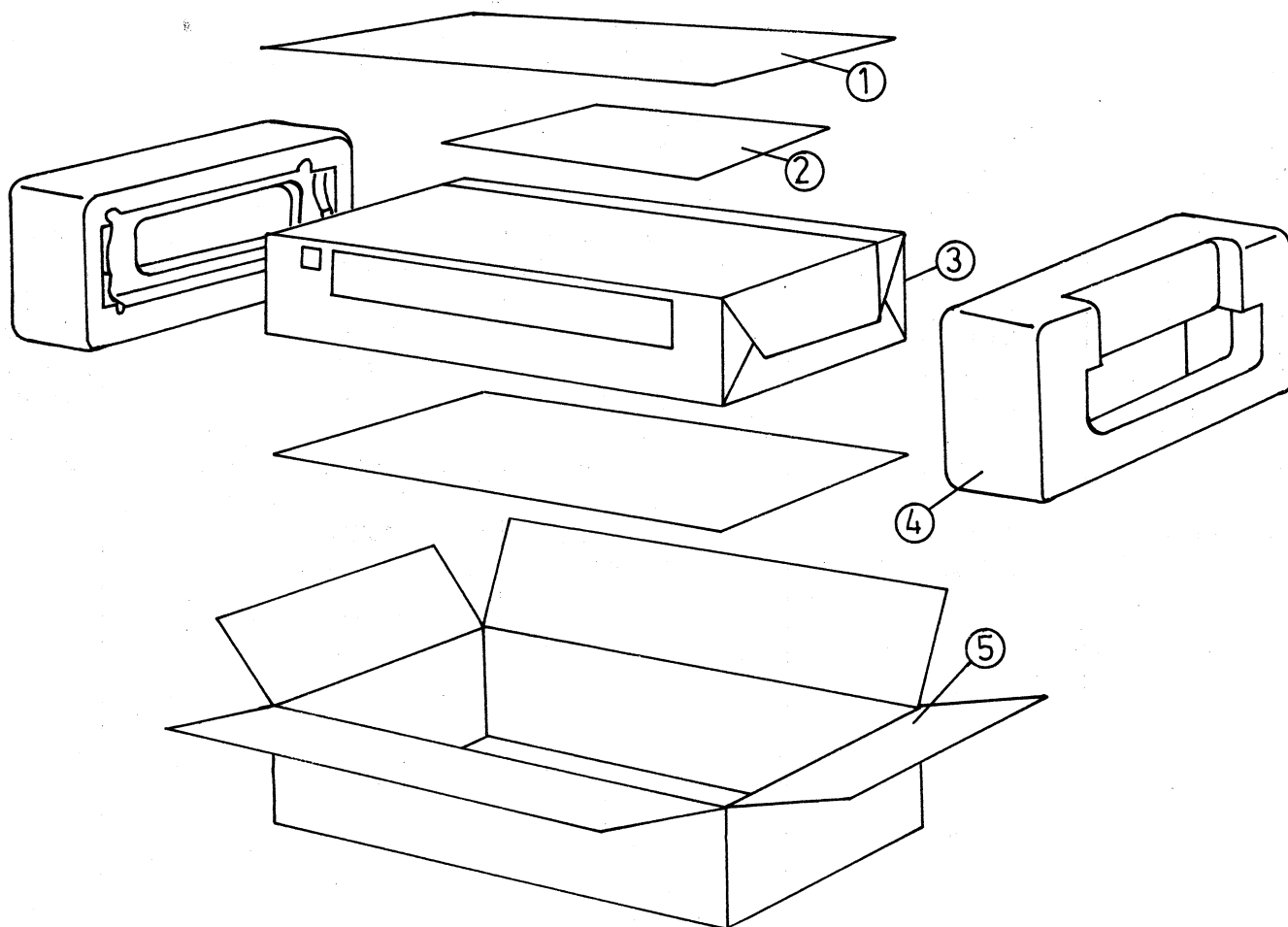
PARTS LIST

SYMBOL NO.	PARTS NO.	DESCRIPTION	REF.
R547, R548	16-¼CA391J	RES. C. ¼W ±5% 390OHM	1.70
R549	16-¼CR102J	DO - 1KOHM	1.70
R601, R602	16-¼CA681J	DO - 680OHM	1.70
R603, R604	16-¼CA562J	DO - 5K60HM	1.70
R605, R606	16-¼CA561J	DO - 560OHM	1.70
R607, R608	16-¼CA561J	DO - 560OHM	1.70
R609, R610	16-¼CA223J	DO - 22KOHM	1.70
R611, R612	16-¼CA391J	DO - 390OHM	1.70
R613, R614	16-¼CA223J	DO - 22KOHM	1.70
R615, R616	16-¼CA222J	DO - 2K2OHM	1.70
R617, R618	16-¼CA222J	DO - 2K2OHM	1.70
R619, R620	16-¼CA183J	DO - 18KOHM	1.70
R621, R622	16-¼CA391J	DO - 390OHM	1.70
R623, R624	16-¼CA331J	DO - 330OHM	1.70
R625, R626	16-¼CA270J	DO - 27OHM	1.70
R627, R628	16-½CP122J	RES. C. ½W ±5% 1K2OHM	2.40
R629, R630	16-¼CA470J	RES. C. ¼W ±5% 47OHM	1.70
R631, R632	16-½CP471J	RES. C. ½W ±5% 470OHM	2.40
R633, R634	16-¼CA680J	RES. C. ¼W ±5% 68OHM	1.70
R635, R636	16-¼CA391J	DO - 390OHM	1.70
R637, R638	16-½CP122J	RES. C. ½W ±5% 1K2OHM	2.40
R639, R640	16-½CP122J	DO - 1K2OHM	2.40
R641, R642	16-¼CA391J	RES. C. ¼W ±5% 390OHM	1.70
R643, R644	16-¼CA181J	DO - 180OHM	1.70
R645, R646	16-¼CA181J	DO - 180OHM	1.70
R647, R648	16-1A100J	RES. MOF 1W ±5% 100HM	7.50
R649, R650	16-1A221J	DO - 220OHM	7.50
R651, R652	16-1A101J	DO - 100OHM	7.50
R653, R654	16-¼CA334J	RES. C. ¼W ±5% 330KOHM	1.70
R655, R656	16-¼MA330J	RES. MF. ¼W ±5% 330HM	2.70
R659, R660	16-¼CR1R0J	RES. C. ¼W ±5% 1OHM	1.70
R701, R702	16-¼CR224J	DO - 220KOHM	1.70
R703, R704	16-¼CR682J	DO - 6K80HM	1.70
R705, R706	16-¼CA331J	DO - 330OHM	1.70
R707, R708	16-¼CA561J	DO - 560OHM	1.70
R709, R710	16-¼CA561J	DO - 560OHM	1.70
R711, R712	16-¼CA331J	DO - 330OHM	1.70
R713, R714	16-¼CR682J	DO - 6K80HM	1.70
R801	16-½CP100J	DO - 100HM	2.40
R802	16-¼CA122J	DO - 1K2OHM	1.70
R803	16-¼CA122J	DO - 1K2OHM	1.70
R804, R805	16-½A5R6J	RES. MOF ½W ±5% 5.6OHM	7.50
R901, R902	16-¼CA122J	RES. C. ¼W ±5% 1K2OHM	1.70
R903, R904	16-¼CA122J	DO - 1K2OHM	1.70
R905, R906	16-1A100J	RES. MOF 1W ±5% 100HM	7.50
R907	16-¼CA122J	RES. C. ¼W ±5% 1K2OHM	1.70
R908	16-¼CA122J	DO - 1K2OHM	1.70

PARTS LIST

SYMBOL NO.	PARTS NO.	DESCRIPTION	REF.
R909	16-¼CA122J	RES. C. ¼W ±5% 1K2OHM	1.70
R910	16-¼CA101J	DO - 100OHM	1.70
R911	16-¼CA122J	DO - 1K2OHM	1.70
R913	16-¼CA153J	DO - 15KOHM	1.70
R914	16-¼CA182J	DO - 1K80HM	1.70
R915	16-¼CA123J	DO - 12KOHM	1.70
SW1	31-1135	SWITCH ROTARY SRZ - L5	265.00
SW2 ~ SW5	31-1094F	DO - PUSH 4 Key - 2U	220.00
SW6	31-1139	DO - SLIDE SSB42	75.00
SW7	31-1024	DO - ROTARY SRZ-44	220.00
SW8	31-1129A	DO - POWER	300.00
SW9	31-1079*F	DO - SLIDE SSB23	53.00
SW10	31-1121	DO - VOLTAGE SELECTOR	169.20
T101	29-3008T	FM DETECTOR COIL 10.7MHZ	96.00
T301	29-3018	AM OSC COIL	25.00
T302	29-3032	AM IFT WITH CERAMIC FILTER	134.00
T303	29-3029	AM IFT	25.00
VR101	29-4023	SEMIFIXED RES. 20KB	18.00
VR201	29-4077F	DO - 10KB	18.00
VR202	29-4022	DO - 5KB	18.00
VR601, VR602	29-4115F	DO - 20KB	18.00
VR501	29-4103A	VOLUML & BALANCE CONTROL 20KBx2 & 50KMN	400.00
VR502, VR503	29-4075F	TONE CONTROL 10KCx2	180.00
ZD901	30-1041N	ZENER DIODE 22V 500mW+-5%	20.00

7020 PACKING DIAGRAM



ITEM	PARTS NO.	NAME	Q'TY
1	CT-5106	INNER BOARD	1
2	-	ACCESSORIES	1
3	26-0005	POLY PAPER	1
4	34-1024	POLYLON	2
5	CR-5095	INNER CARTON	1