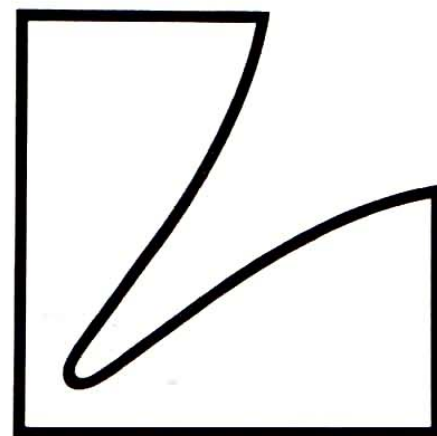
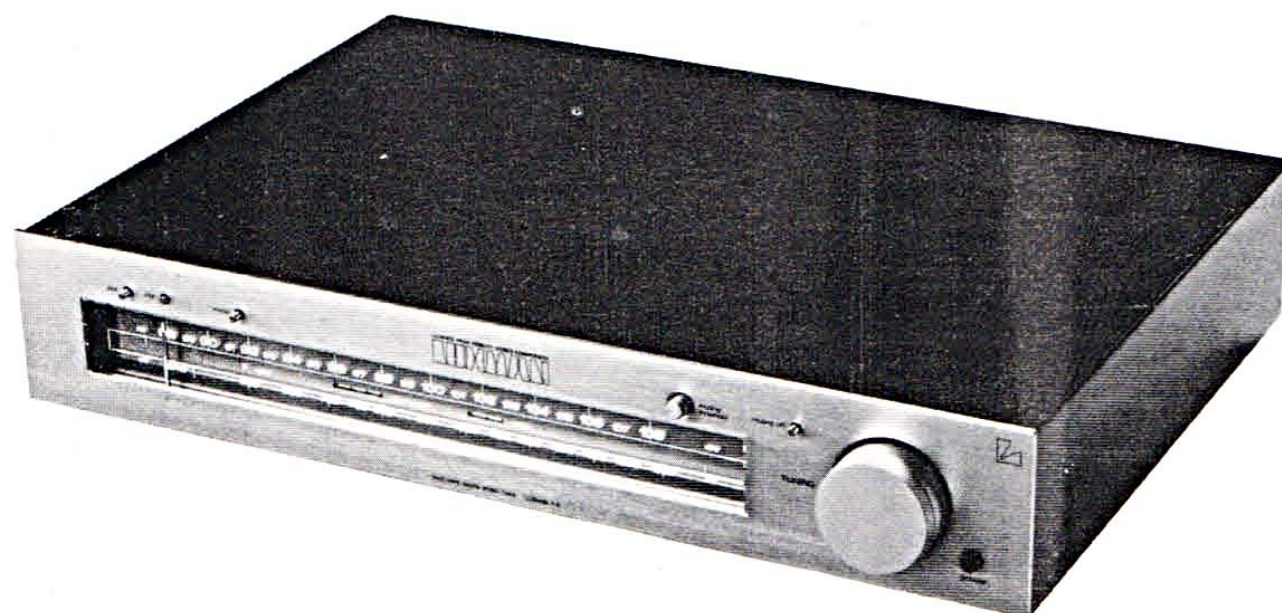
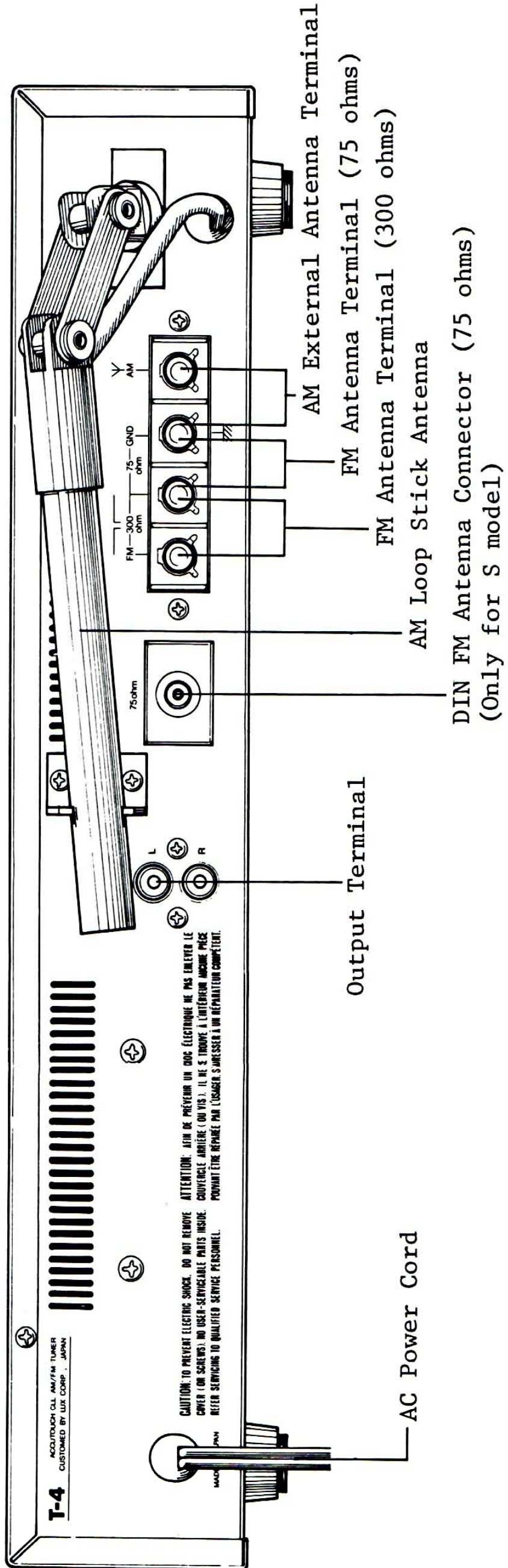
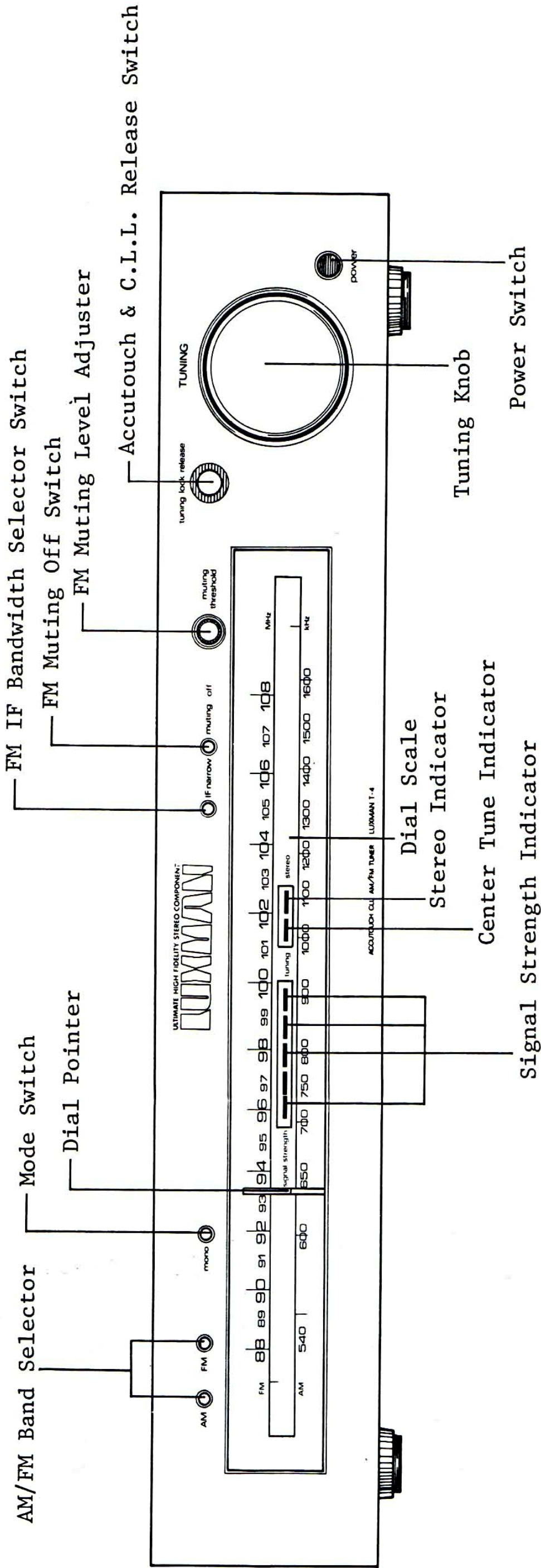


SERVICE MANUAL



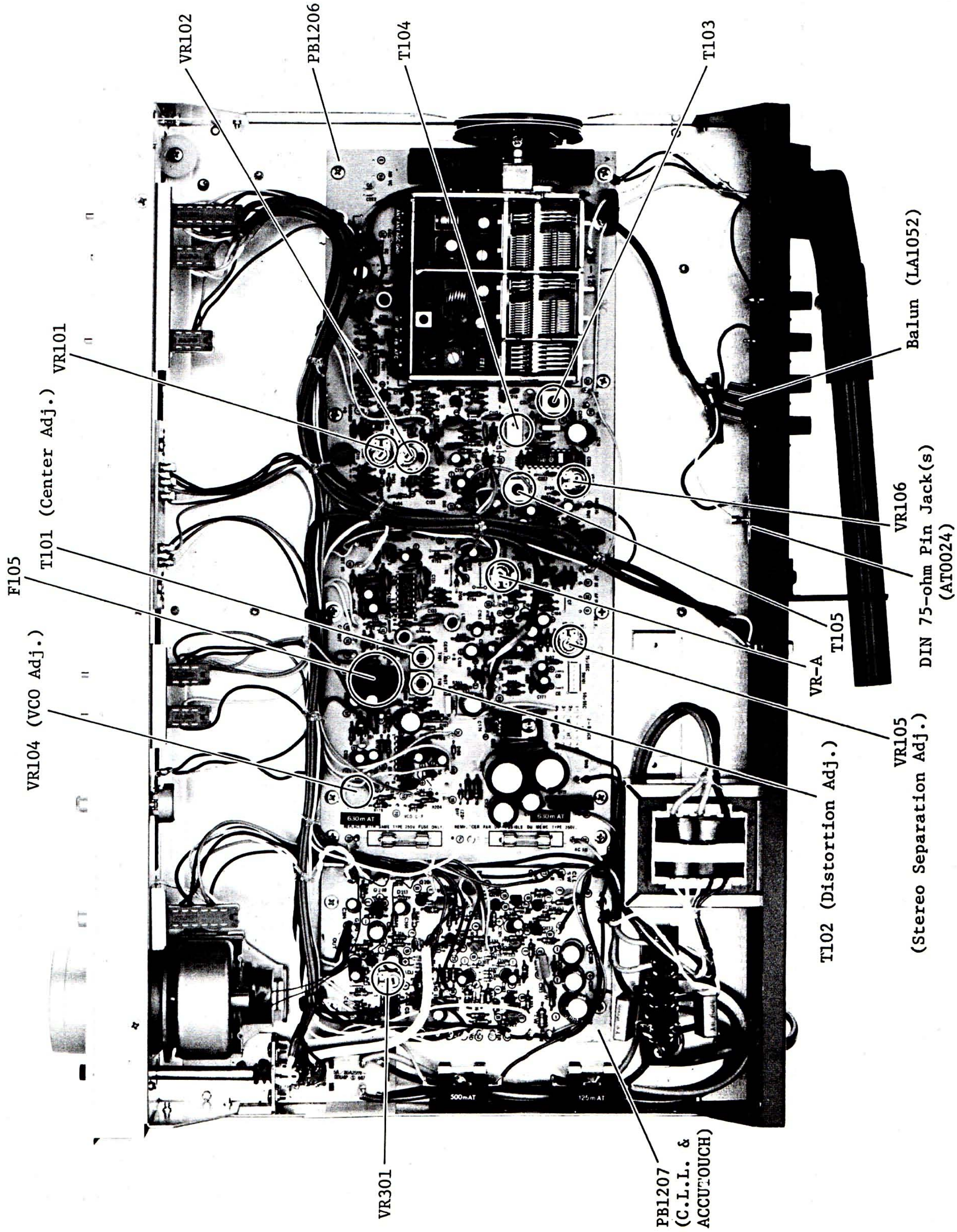
ACCUTOUCH C.L.L. AM/FM
STEREO TUNER **T-4**





BLOCK DIAGRAM





ALIGNMENT PROCEDURE

[FM SECTION]

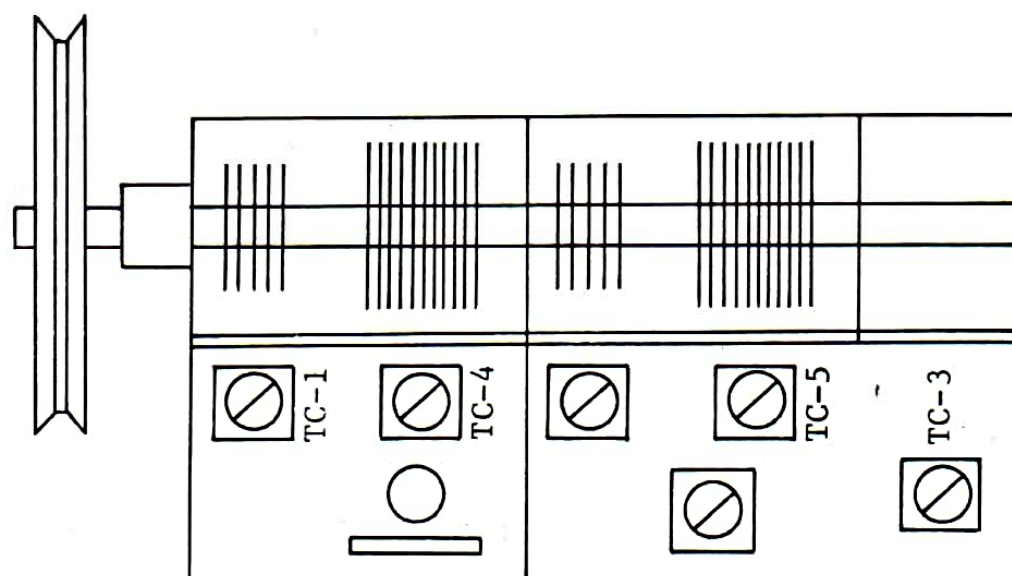
PB1206 Preliminary Settings

- (1) Turn VR101 to the endmost clockwise position.
- (2) Turn VR102 to the endmost counter-clockwise position.
- (3) Set VR103 to its rotation center.
- (4) Set VR104 to its rotation center.
- (5) Set VR105 to its rotation center.
- (6) Set VR106 to its rotation center.
- (7) Connect 33k ohms resistor in series to the center meter ($\pm 100\mu\text{A}$), then connect it to No. 11 and No. 12 on PB-1206.
- (8) All switches on the front panel should be in the following positions.
 - (a) AM/FM Switch --- depress the "FM" switch
 - (b) Mode Switch --- in the "protruded" position (auto-stereo)
 - (c) IF Bandwidth Selector --- in the "protruded" position (wide)
 - (d) FM Muting Switch --- in the "depressed" position (mute-off)
 - (e) Muting Level Control --- in the endmost counter-clockwise position.
 - (f) Tuning Lock Release Switch --- in the "depressed" position (CLL-off)
- (9) Set FM SG to "400Hz, 100% modulation", and connect it to the tuner input.
- (10) Connect millivoltmeter, distortion meter and oscilloscope to the tuner output.

N.B. Never touch the core of anti-birdie filter, if provided.

[Location of Trimmer Capacitors at the Front End]

FM Local Oscillator	TC-3
AM Local Oscillator	TC-5
FM RF Stage	TC-1
AM RF Stage	TC-4



[FRONT END ALIGNMENT]

- (1) Set the output of FM SG to the minimum level.
- (2) Make tuning to a point on the dial scale having no broadcast station, then adjust T101 so that the center meter indicates zero.
- (3) Set FM SG to "108MHz, 1.5 μ V output".
- (4) Set the dial pointer of the tuner to "108MHz" calibration on the dial scale.
- (5) Adjust the front-end trimmer so that the center meter indicates zero.
- (6) Adjust the RF trimmer capacitor and the inter-stage trimmer capacitor respectively so that the output of tuner becomes maximum.
(at this time, if the maximum output point is unknown, adjust the SG output to the point that provides easy reading of the output.)
- (7) Set FM SG to "87.5MHz, 1.5 μ V output".
- (8) Receive the 87.5MHz signal, and adjust the dial so that the center meter indicates zero.
- (9) With this condition, 87.5MHz calibrated point in the dial scale should be within the width of the dial pointer, centered at 87.5MHz point.
- (10) Repeat steps (3)-(9) two or three times, and obtain the maximum sensitivity and conformity between dial calibration and receiving frequency.
- (11) Set the tuner and the FM SG in the middle position of the dial scale having no broadcast station.
- (12) Adjust the front-end IFT to obtain the maximum output level of the tuner.
- (13) Set FM SG to "1kHz, 100% modulation", and obtain 1mV output.
- (14) Adjust T102 to obtain the minimum distortion.
- (15) Set FM SG output to the minimum level, and adjust T101 to obtain "zero" reading on the center meter.
- (16) Repeat steps (13)-(15) two or three times.
- (17) Set FM SG to "1kHz, 100% modulation, 20dB (10 μ V) output".
- (18) Set the Muting Switch to the "protruded" position.
- (19) Set the IF Bandwidth Selector Switch to the "wide" (protruded) position, and adjust VR102 so that the tuner output is available.
- (20) Set the IF Bandwidth Switch to the "narrow" (depressed) position, and adjust VR101 so that the tuner output is available.

(21) Adjust VR103 so that the first signal strength LED may light up with 10 μ V output of FM SG.

(22) Repeat steps (13)-(15) two or three times.

(In this case, first the Muting Switch has to be depressed.)

(23) Vary the FM SG output to check that the five signal strength LED's light up in order.

(24) Vary the FM SG output to check the muting volume functions.

N.B. The figures mentioned in (17) (21) are the values at the antenna terminal of the tuner.

- STEREO -

(25) Receive, with the tuner, FM SG no modulation output 1mV.

(26) Connect a frequency counter to terminal No. 70 on PB-1206 and to the GND.

(27) Adjust VR104 to obtain 76kHz^{+ 0Hz}_{-10Hz} reading on the frequency counter.

(28) Modulate the signal mixed by "pilot signal 19kHz 10% and 1kHz, L+R 90%" with the FM SG.

(29) Adjust VR105 to obtain the well-balanced maximum separation characteristic.

- C.L.L. -

(30) Set FM SG to "1kHz, 100% modulation, output 1mV".

(31) Shift the center meter by $\pm 30\mu$ A, and adjust VR301 on PB-1207 so that the center meter comes back to its center when the C.L.L. off switch is in the "protruded" position.

[AM SECTION ALIGNMENT]

(1) Depress the AM switch.

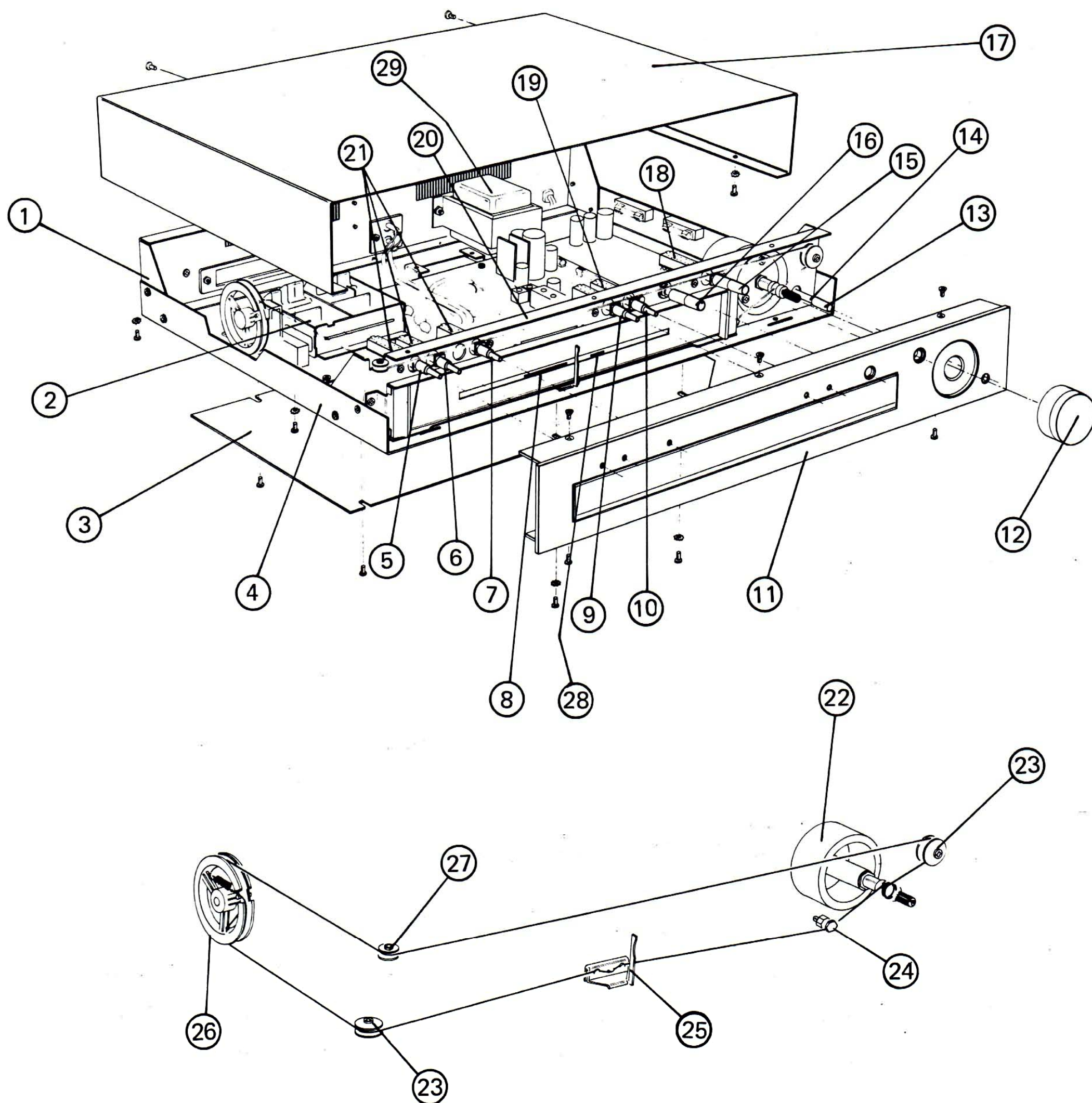
(2) Connect the output of 455kHz Sweep Generator (SPG) to the terminal No. 64 on PB-1206.

(3) Connect the SPG input to the terminal No. 69.

(4) Set SPG to "output 40-50dB, sweep velocity 10Hz".

(5) Adjust T104 (LA1098) and T105 (LA1100) so that the IF wave-form can be symmetrical for the left and right sides. At this time, observation is easier when the FM Variable Capacitor is in the least capacity position.

- (6) Disconnect the SPG. The following alignment should be performed in the usual measurement method.
- (7) Adjust the local oscillator trimmer capacitor and the local oscillator coil so that the dial calibration may meet the 600kHz and 1400kHz tracking points.
- (8) Adjust the loopstick antenna and the trimmer capacitor so that the maximum sensitivity is obtained at each tracking point.
- (9) Set SG to "1MHz, 80dB/m output", and adjust VR106 so that the five signal strength LED's light up.



EXPLODED VIEW PARTS LIST

1. UC1100 Rear Panel (E)
- UC1101 " " (S)
- UC1126 " " (U)
2. LA1913 Front End (E)(S)(U)
3. UE1097 Bottom Plate
4. UA1052 Chassis
5. WJ1107 Mould Knob(AM select)
6. WJ1107 " " (FM select)
7. WJ1107 " " (mono sw.)
8. TD0150 LED
9. WJ1107 Mould Knob(IF narrow)
10. WJ1107 " " (muting)
11. WA1137 Front Panel(E)(S)
- WA1146 " " (U)
12. WH1082 Tuning Knob(U)
- WH1075 " " (E)(S)
13. WJ1089 Mould Knob(power)
14. SP0113 Push Switch (power)(U)
- SP0114 " " (power)(E)(S)
15. WH1084 Knob Set(tuning lock release)(U)
- WH1077 " " (" " ") (E)(S)
16. WH1083 " " (muting)(U)
- WH1076 " " (") (E)(S)
17. UG1011 Bonnet(U)
- UG1018 " (E)(S)
18. SP0112 Push Switch (tuning lock release)
19. SP0111 2-key Push Switch(IF narrow/Muting off)
20. UB1045 Sub Panel
21. SP0110 3-key Push Switch (AM/FM/mono)
22. UX1009 Fly wheel
23. BX0022 Pulley
24. US1054 Stand
25. UZ1163 Dial Pointer
26. BX0016 Dial Drum
27. BX0029 Pulley (small)
28. TD0149 LED
29. PT2301 Power Trans. (U)
- PT2302A Power Trans. (S)
- PT2344 Power Trans. (E)

Replacement Parts List

REMARKS

Capacitors: C.....ceramic, E.....electrolytic, M.....mylar, G.....G capacitor
 S.....styrol, T.....tantalum, Mi.....mica, MP.....MP capacitor
 O.....oil capacitor, TRIM.....trimmer capacitor, AC.....AC capacitor
 BP.....electrolytic Bi-Polar type

Resistors: $\pm 5\%$, 1/4W, unless specified otherwise

Type: (S)..... model for north European countries
 (U)..... model for U.S.A. and CANADA
 (E)..... standard model
 (J)..... model for JAPAN

PB1206

SYMBOL NO.	STOCK NO.	DESCRIPTION	LOCA-TION
C101	CK0155	0.01 μ F C	AZ
102	CK0158	0.047 μ C	"
103	CE0077	47 μ 16V E	"
104	CK0158	0.047 C	"
105	CK0158	0.047 C	"
106	-----	-----	-----
107	CK0158	0.047 C	AZ
108	CK0158	0.047 C	BZ
109	CK0155	0.01 C	"
110	CK0158	0.047 C	"
111	CK0158	0.047 C	"
112	CK0155	0.01 C	"
113	CK0158	0.047 C	BY
114	CK0155	0.01 C	"
115	CK0155	0.01 C	"
116	CK0158	0.047 C	"
117	"	" " " "	"
118	"	" " " "	"
119	CE0213	0.47 μ 50V E	"
120	CK0158	0.047 C	BZ
121	CK0155	0.01 C	"
122	"	" " " "	BY
123	CK0158	0.047 C	"
124	"	" " " "	"
125	"	" " " "	"
126	CK0156	0.022 μ C	BZ
127	CK0158	0.047 μ C	BY
128	"	" " " "	CZ
129	"	" " " "	"
130	"	" " " "	"
131	"	" " " "	CY
132	"	" " " "	"
133	"	" " " "	"
134	CE0099	2.2 μ F 50V E	CZ
135	CK0158	0.047 μ F C	CY
136	"	" " " "	CZ
137	CE0213	0.47 μ 50V E	"
138	CC0007	100P C	"
139	CK0158	0.047 μ F C	"
140	"	" " " "	"
141	CE0074	10 μ 16V E	"
142	CE0142	0.47 50V E	CY
143	CE0099	2.2 μ 50V E	BZ

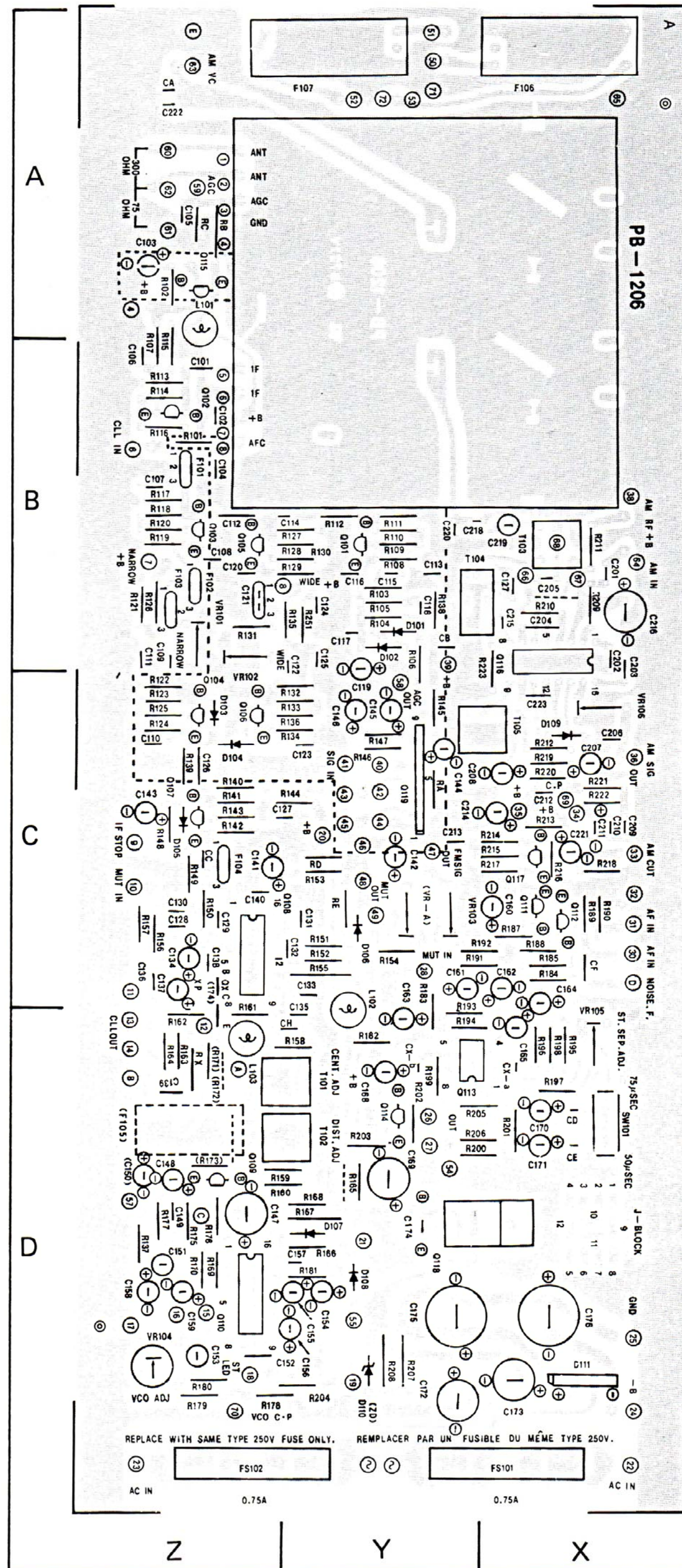
SYMBOL NO.	STOCK NO.	DESCRIPTION	LOCA-TION
C144	CE0074	10 μ 16V E	BY
145	CE0168	3.3 μ 50V E	"
146	"	" " " "	"
147	CE0079	220 μ 16V "	DZ
148	CE0075	22 μ 16V "	"
		(E) (S) (U)	
149	CC0011	470P C	"
		(S)	
150	CE0075	22 μ 16V E	CZ
		(S)	
151	CQ0170	470P S	DZ
152	CQ0009	0.047 M	DY
153	CQ0170	470P S	DZ
154	CE0168	3.3 μ 50V E	DY
155	CE0098	1 μ 50V E	"
156	CS0019	0.22 μ F 35V T	"
157	CK0155	0.01 μ C	"
158	CE0099	2.2 μ 50V E	DZ
159	"	" " " "	"
160	CE0098	1 μ 50V E	CX
161	CS0019	0.22 35V T	CY
162	"	" " " "	CX
163	CE0084	4.7 μ F 25V E	CY
164	CE0075	22 μ F 16V E	CX
		(E) (S) (U)	
165	"	" " " "	"
		(E) (S) (U)	
166	CX		
167	CX		
168	CE0075	22 μ F 16V E	CY
		(E) (S) (U)	
169	CE0079	220 μ 16V E	"
170	CE0084	4.7 μ 25V E	CX
171	"	" " " "	"
172	CE0087	220 μ 25V E	DY
173	CE0079	220 μ 16V E	DX
174	CK0155	0.01 C	DY
175	CE1034	2200 μ 25V E	"
176	CE0090	1000 μ 25V E	DX
201	CK0156	0.022 μ C	BX
202	CK0158	0.047 μ C	
203	"	" " " "	

SYMBOL NO.	STOCK NO.	DESCRIPTION	LOCATION
C 204	CK0156	0.022 μ 25V "	
205	"	" " "	
206	CK0158	0.047 μ 25V "	
207	CE0074	10 μ 16V E	
208			
209	CQ0157	0.018 50V M	
210	CQ0024	0.015 " "	
211	CQ0157	0.018 " "	
212	CK0155	0.01 μ C	
213	CK0158	0.047 25V "	BY
214	CE0074	10 μ 16V E	BX
215	CK0156	0.022 25V C	"
216	CE0079	220 μ 16V E	"
217	CK0158	0.047 25V C	"
218	CC0004	22P 50V C	BY
219	CQ0172	330P 50V S	BX
		(E) (S) (U)	
220	CC0013	15P 25V C	BY
221	CE0084	4.7 μ 25V E	CX
	CQ0172	330P 50V S	
		(S)	
R101	RB0101	100K	AZ
102	0182	1K	"
103	0216	27K	BY
104	0230	100K	"
105	0210	15K	"
106	0222	47K	"
107	0158	100 Ω	AZ
108	0170	330 Ω	BY
109	0190	2.2K	"
110	0230	100K	"
111	0210	15K	"
112	0182	1K	"
113	0174	470 Ω	AZ
114	0200	5.6K	"
115	0158	100 Ω	"
116	0170	330 Ω	"
117	0186	1.5K	"
118	0210	15K	BZ
119	0174	470 Ω	"
120	0170	330 Ω	"
121	0158	100 Ω	"
122	0198	4.7K	"
123	0222	47K	"
124	0166	220 Ω	"
125	0190	2.2K	"
126	0158	100 Ω	"
127	0186	1.5K	BY
128	0210	15K	"
129	0174	470 Ω	"
130	0170	330 Ω	"
131	0198	4.7K	BZ
132	0174	470 Ω	BY
133	0198	4.7K	"
134	0166	220 Ω	"
135	0158	100 Ω	"
136	0190	2.2K	"

SYMBOL NO.	STOCK NO.	DESCRIPTION	LOCATION
R137	0210	15K	DZ
138	-----	-----	-----
139	RB0198	47K	BZ
140	0182	1K	"
141	0206	10K	"
142	0158	100 Ω	"
143	RB0170	330 Ω	"
144	0158	100 Ω	BY
145	0158	100 Ω	"
146	0198	4.7K	"
147	"	"	"
148	0218	33K	BZ
149	0218	33K	CZ
150	0174	470 Ω	"
151	0158	100 Ω	CY
152	"	"	"
153	0206	10K	"
154	0222	47K	"
155	RB0142	22 Ω	CY
156	0224	56K	CZ
157	0214	22K	"
158	0204	8.2K	CY
159	0188	1.8K	"
160	0214	22K	DY
161	0166	220 Ω	CZ
162	0214	22K	"
163	0222	47K	"
164	0222	47K	"
165	"	"	DY
166	0206	10K	"
167	0150	47 Ω	"
		(E.J.S.U)	
	0150	47 Ω	"
		(S)	
168	0174	470 Ω	"
169	0194	3.3K	DZ
		(E.S.U)	
170	"	(")	"
		(E.S.U)	
171	0206	10K	CZ
172	"	"	"
173	0206	10K (S)	"
174	0174	470 Ω (E.U)	
175	0198	4.7K	DZ
176	0150	47 Ω	"
		(S) (U)	
177	0210	15K (S)	
	0218	33K (E.U)	
178	0206	10K	"
179	0230	100K	"
180	0210	15K	"
181	0182	1K	DY
182	0222	47K	CY
183	"	"	"
184	0194	3.3K	CX
		(E) (S) (U)	

SYMBOL NO.	STOCK NO.	DESCRIPTION	LOCATION
R185	0194	3.3K (E) (S) (U)	CX
186			
187	0206	10K	CX
188	0206	10K	
189	0194	3.3K	
190	"	"	
191	TD0116	1S2075	
192	RB0222	47K	
193	0230	100K	CY
194	0230	100K	
195	0190	2.2K	CX
196	0190	2.2K	
197	0198	4.7K	
198	0218	33K	
199	"	"	CY
200	RB0206	10K	"
201	0206	10K	
202	0222	47K	CY
203	0134	10Ω	"
204	0190	2.2K	DY
205	0142	22Ω	CY
206	0142	22Ω	"
207	RD0051	270Ω	DY
208	0260	270Ω 1/2	"
209	RB0134	10Ω	BX
210	0206	10K	
211	0166	220Ω	BX
212	0170	330Ω	"
213	0158	100Ω	"
214	0234	150K	"
215	0184	1.2K	CX
216	0216	27K	"
217	0164	180Ω	"
218	0222	47K (S) (U)	"
219	0206	10K	BX
220	0206	10K	"
221	0192	2.7K	"
222	0216	27K	"
223	0200	5.6K	"
R251	RB0158	100Ω	
RX	0198	4.7K (S)(J)	
L101	LA1143	S470K	AZ
102	LA1149	S180J	CY
103	LA1149	"	CZ
T101	LA1147	LUX1147	CY
102	LA1148	LUX1148	"
103	LA1073	LUX1073	BX
104	LA1098	LUX1067	"
105	LA1100	LUX1100	"
F101	LA1823	KMFC80-M-22	AZ
102	"	"	BZ
103	"	"	"
104	"	"	CZ

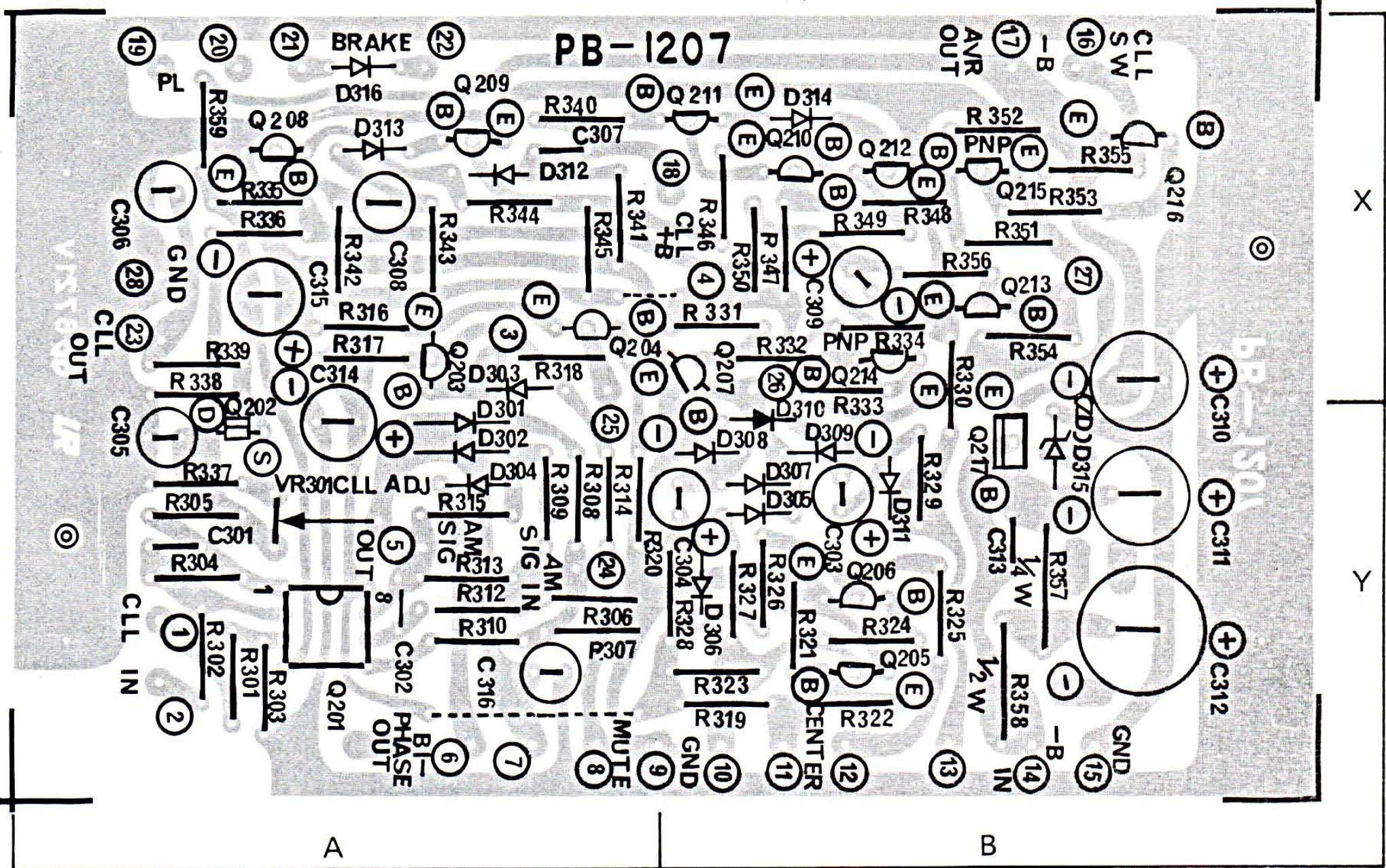
SYMBOL NO.	STOCK NO.	DESCRIPTION	LOCATION
F105	LA1192	LUX1192 (S) (J)	CZ
106	LA1191	LUX1191	AX
107	LA1191	LUX1191	AY
Q101	TR0085	2SC1923 O	BY
102	TR0233	2SC535 B	AZ
104	TR0085	2SC1923 O	
105	"	" "	BZ
106	"	" "	
107	"	" "	
108	TC0099	LA1231	CZ
Q109	TR0025	2SC1345 E	DZ
110	TC0100	μPC1173C	"
111	TR0198	2SC1815 GR	CX
112	"	" "	"
113	TC5002	NJM4558D	CY
114	TR0198	2SC1815 GR	"
115	"	" "	AZ
116	TC0021	HA1197	BX
117	TR0198	2SC1815 GR	CX
118	TR0047	2SD235 Y	DY
119	TC0085	BA656	
QX	TR0025	2SC1345 E	
D101	TD0018	1K188 S	BY
102	"	"	"
103	TD0116	1S2075	BZ
104	"	"	"
105	"	"	"
106	TV0004	KB265	CY
107	TD0116	1S2075	DY
108	"	"	"
109	TV0004	KB265	BX
110	TD0079	WZ140	DX
111	TD0144	SVB10-100	DY
VR101	RT0050	500Ω	BZ
102	RT0055	1K	"
103	RT0052	20K	CY
104	RT0025	47K	DZ
105	RT0085	100K	CX
106	RT0056	50K	BX



SYMBOL NO.	STOCK NO.	DESCRIPTION	LOCATION
C302	CK0126	1000P 50V C	AY
303	CE0213	3.3 μ LR E	BY
305	CE0310	2.2 μ 25V E	AY
		B.P	
306	CE0448	0.47 50V E	AX
		B.P	
307	CK0158	0.047 25V C	
308	CE0439	10 μ 16V E	
		B.P	
309	CE0074	10 μ 16V E	BX
310	CE0079	220 μ 16V E	
311	CE0079	"	BY
312	CE0082	" 25V E	
313	CK0155	0.01 25V C	
314	CE0077	47 μ 16V E	AY
315	CE0077	" 16V "	AX
316	CE0448	0.47 50V E	AY
		B.P	
R301	RB0224	56K	AY
302	0224		"
303	0250	680K	"
304	"	"	"
305	0198	4.7K	"
306	0208	12K	"
307	"	"	"
308	0182	1K	"
309	0210	15K	"
310	0206	10K	"
311			
312	0206	10K	AY
313	0234	150K	"
314	0214	22K	"
315	"	"	"
316	0152	56 Ω	AX
317	0188	1.8K	"
318	0210	15K	"
319	0319	1.5K	BY
320	0222	47K	AY
321	0182	1K	BY
322	0206	10K	"
323	0206	10K	"
324	0222	47K	"
325	0206	10K	"
326	0206	10K	"
327	0222	47K	"
329	0230	100K	"
330	0206	10K	BX
331	0190	2.2K	"
332	0218	33K	"
333	0198	4.7K	"
334	0206	10K	"
335	RB0214	22K	AX
336	0248	560K	"
337	0198	4.7K	AY
338	0230	100K	AX
339	0254	1M	"

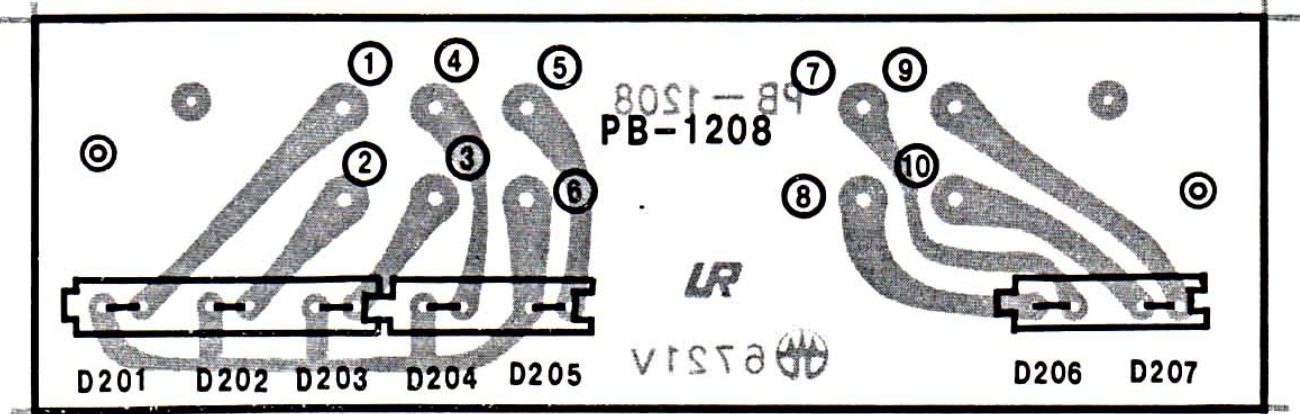
SYMBOL NO.	STOCK NO.	DESCRIPTION	LOCATION
R340	0222	47K	AX
341	0206	10K	"
342	0198	4.7K	"
343	0198	4.7K	"
344	0230	100K	"
345	0198	4.7K	"
346	0222	47K	BX
347	0206	10K	"
348	0222	47K	"
349	0206	10K	"
350	0246	470K	"
351	0204	8.2K	"
352	0206	10K	"
353	0206	10K	"
354	"	"	"
355	"	"	"
356	0158	100 Ω	"
357	RD0051	270 Ω 1/4	BY
358	RD0260	270 Ω 1/2	"
359	0158	100 Ω	AX
Q201	TC5002	NJM4558D	AY
202	TF0010	2SK40	"
203	TR0198	2SC1815	AX
204	"	"	
205	"	"	
206	"	"	
207	"	"	
208	"	"	
209	"	"	
210	"	"	
211	"	"	
212	"	"	
213	"	"	
214	TR0017	2SA1015	Y BX
215	"	"	Y "
216	TR0147	2SC1741	R "
217	TR0122	2SA816	OY BY
D301	TD0018	1K188FM-1	AY
302	"	1K188FM-1	"
303	TD0116	1S2075	
304	"	"	
305	"	"	
309	TD0116	1S2075	
D310	TD0116	1S2075	
D314	TD0116	1S2075	
315	TD0079	WZ140	BY
316	TD0116	1S2075	
VR301	RT0056	50K	AY

PB1207



PB1208

SYMBOL NO.	STOCK NO.	DESCRIPTION	LOCATION
D201	TD0149	LD002R	
202	"	"	
203	TD0150	LD003R	
204	"	"	
205	"	"	
206	TD0149	LD002R	
207	"	"	



CHASSIS

SYMBOL NO.	STOCK NO.	DESCRIPTION	LOCATION
	AT0013	2P Pin Jack	
	AT0053	SP Terminal	
	BX0027	Bar ANT Holder	
	LA1446	Bar ANT	
	PT2300	P-2300 (J)	
	PT2301	P-2301 (U)	
	PT2302A	P-2302A (S)	
	PT2344	P-2344 (E)	

OTHER COMPONENTSPB1206

AH0003	Fuse Holder (E)(U)
AH0004	Fuse Holder (S)
BF0085	Fuse 0.75A (E)(U)
BF0207	" 630mAT (S)
LA1073	AM Trans
LA1098	AM Trans
LA1100	AM Trans
LA1143	Choke Coil
LA1147	FM Trans
LA1148	FM Trans
LA1191	Low Pass Filter
LA1192	Anti-Birdie Filter(S)
LA1823	FM Ceramic Filter KIT
SS0012	Slide Switch (E)

Rear Panel

AS0156	Coaxial ANT. Connector (S)
AT0013	2P Pin Jack
AT0053	SP Terminal
BX0027	Loop Stick Antenna Holder
BX0033	" " " Stopper
LA1446	Loop Stick Antenna

Sub Panel

AL0050	Lamp 12V. 0.1A
RV0208	VR50k-B (muting)
WM1043	Dial Scale

Chassis

AC0013	AC Selector Socket
AC0014	" " Plug
AH0016	1P Fuse Holder (E)(U)
AH0019	Fuse Holder (S)
BF0072	Fuse 0.3A (EK)
BF0073	" 0.4A (EZ)(U)
BF0074	" 0.5A (E)(U)
BF0206	" 5x20 500mAT (S)
BF0216	" 5x20 125mAT (S)
CU0006	AC Capacitor 0.022 μ F (E)(S)
CU0033	AC Capacitor 0.022 μ F (U)
LA1052	Balun
RB0222	Resistor R-25 47k
RD0110	" R-50 22k
UE1097	Extension Shaft
AT0024	DIN 75-ohm Pin Jack (S)
BK0005	Pin Plug Cord
BK0007	FM Dipole Antenna

Zener Diode
WZ-140(TD0079)

ZENER VOLTAGE VZ(V)			OPERATING RESISTANCE Rd(Ω)		REVERSE CURRENT IR(μ A)	
MIN.	MAX.	@IZ(mA)	MAX.	@IZ(mA)	MAX.	@VR(V)
13.4	14.6	5	15	5	1	11

1S2075(K) (TD0116)

Absolute Maximum Ratings (Ta = 25°C)

ITEMS	V _R	I _O	i _F (peak)	i _F (surge)	P _d	T _j	T _{stg}	V _R (peak)
UNIT	V	mA	mA	mA	mW	°C	°C	V
RATING	-30	100	450	600	250	175	-65 +175	-35

Electrical Characteristics (Ta = 25°C)

ITEMS	SYMBOL	CONDITION	RATING MAX.	UNIT
Reverse Current	I _R	V _R = -30V	-0.1	μ A
Forward Voltage	V _F	I _F = 10mA	0.8	V
Capacitance	C _d	V _R = -1V, f = 1MHz	3.5	pF
Reverse Recovery Time	T _{rr}	I _F = -I _R = 10mA, I _{rr} = -1mA	8.0	ns

Silicon Rectifier Diode
SVB10-100(TR0144)

Absolute Maximum Ratings (Ta = 40°C)

ITEMS	SYMBOL	MAXIMUM RATING 10-100	UNIT
Peak Reverse Voltage	V _{RRM}	100	V
Input Voltage (RMS)	V _{IN}	70	V
Resistance Load Ave. Output Current	I _O	1.0	A
Capacitance Load Ave. Output Current	I _O	0.8	A
Surge Current	I _{FSM}	30	A
Operating Junction Temperature	T _j	-40 to +140	°C
Storage Temperature	T _{stg}	-40 to +140	°C
Frequency	f	1000	Hz

Operating Characteristics

ITEMS	SYMBOL	MAX. VALUE	UNIT	TEST CONDITION
Peak Reverse Current	I_{RRM}	50	uA	$T_a=25^{\circ}\text{C}$, $V_R=V_{RRM}$
		500	uA	$T_a=140^{\circ}\text{C}$, $V_R=V_{RRM}$
Peak Forward Voltage	V_{FM}	1.10	V	$T_a=25^{\circ}\text{C}$, $I_F=1.0\text{A}$

Silicon Varistor KB-265(TV0004)

MAX RATINGS

P (mW)	V_R (V)	I_F (mA)	FORWARD VOLTAGE (V_F)	FORWARD CURRENT(mA)	TEMPERATURE COEFFICIENT OF V_F		CATHODE INDICATION
					γ_F (mV/ $^{\circ}\text{C}$)	condition (mA)	
40	6	30	1.24 - 1.38	3	-4.0	3	RED

1K188FM-1(TD0018)

Maximum Absolute Ratings							Electrical Characteristics($T_a=25^{\circ}\text{C}$)			
$V_R(P)$ (V)	V_R (V)	$I_F(\text{surge})$ (A)	$I_F(P)$ (mA)	I_O (mA)	T_j ($^{\circ}\text{C}$)	T_{stg} ($^{\circ}\text{C}$)	$I_F(1\text{V})$ Min mA	$I_{R1}(-10\text{V})$ Max μA	$C_j(f=1\text{MHz}$ $V_R=1\text{V})$ Max pF	η Min f (MHz)
40	35	0.5	150	50	70	-55 +70	5	12	1.0	40 50

2SC1345(TR0025)

V_{CEO} (V)	I_C (mA)	P_C (mW)	h_{FE}	f_T (MHz)	Test Condition		NF (dB)	Test Condition		
					V_{CE} (V)	I_C (mA)		V_{CE} (V)	I_C (mA)	f (Hz)
50	100	200	250 to 1200	230	12	2	1	6	0.1	1k

2SC1741(TR0147)

Absolute Maximum Ratings

SYMBOL	RATING	UNIT
V_{CBO}	40	V
V_{CEO}	32	V
V_{EBO}	5	V
I_C	500	mA
P_C (with fin) (without fin)	400 600	mW
T_j	125	$^{\circ}\text{C}$
T_{stg}	-55~125	$^{\circ}\text{C}$

Electrical Characteristics

SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
BV_{CEO}	32	-	-	V	$I_C=1\text{mA}$
BV_{CBO}	40	-	-	V	$I_C=100\mu\text{A}$
BV_{EBO}	5	-	-	V	$I_E=100\mu\text{A}$
I_{CBO}	-	-	1	μA	$V_{CB}=20\text{V}$
I_{EBO}	-	-	1	μA	$V_{EB}=4\text{V}$
h_{FE}	82	-	390	-	$V_{CE}=3\text{V}$, $I_C=100\text{mA}$
$V_{CE(sat)}$	-	-	0.6	V	$I_C=500\text{mA}$, $I_B=50\text{mA}$
f_T	-	250	-	MHz	$V_{CE}=5\text{V}$, $I_E=-20\text{mA}$
C_{ob}	-	6.2	-	pF	$V_{CB}=10\text{V}$, $I_E=0$, f=MHz

2SC535 (TR0233)

				Test Condition			Test Condition			
V _{CEO} (V)	I _C (mA)	P _C (mW)	f _T (MHz)	V _{CE} (V)	I _C (mA)	NF (dB)	V _{CE} (V)	I _C (mA)	f (MHz)	Remarks
20	20	100	700	6	5	3.5	6	1	100	RF Gain 20dB (6V, 1mA, 100MHz)

2SA816 (TR0122)

Absolute Maximum Ratings

SYMBOL	
V_{CEO}	80V
I_C	0.75A
P_C	1.5W
T_j	150°C

Electrical Characteristics

SYMBOL	
I_{CBO}	0.5uA @30V
h_{FE}	(O) 70 - 140, (Y)120-240 @2V/0.15A
f_T	100MHz @2V/0.15A
$V_{CE(sat)}$	0.5Vmax @0.5A/0.05A

2SA1015 (TR0087)

Absolute Maximum Ratings (Ta=25°C)

SYMBOL	RATING	UNIT
V_{CBO}	-50	V
V_{CEO}	-50	V
V_{EBO}	-5	V
I_C	-150	mA
I_E	150	mA
P_C	400	mW
T_j	125	°C
T_{stg}	-55~125	°C

Electrical Characteristics (Ta=25°C)

SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
I_{CBO}	$V_{CE}=-50V, I_E=0$	-	-	-0.1	μA
I_{EBO}	$V_{EB}=-5V, I_C=0$	-	-	-0.1	μA
$h_{FE(1)}$	$V_{CE}=-6V, I_C=-2mA$	70	-	240	-
$h_{FE(2)}$	$V_{CE}=-6V, I_C=-150mA$	25	-	-	-
$V_{CE(sat)}$	$I_C=-100mA, I_B=-10mA$	-	-0.1	-0.3	V
$V_{BE(sat)}$	$I_C=-100mA, I_B=-10mA$	-	-	-1.1	V
f_T	$V_{CE}=-10V, I_E=1mA$	80	-	-	MHz
C_{ob}	$V_{CB}=-10V, I_C=0, f=1MHz$	-	4	7	pF
r_{bb}	$V_{CB}=-10V, I_C=-1mA, f=30MHz$	-	30	-	ohm
NF	$V_{CE}=-6V, I_C=-0.1mA$ $R_g=10k\ ohms, f=1kHz$	-	1.0	10	dB

2SC1815 (TR0198)

Absolute Maximum Ratings (Ta=25°C)

SYMBOL	RATING	UNIT
V_{CBO}	60	V
V_{CEO}	50	V
V_{EBO}	5	V
I_C	150	mA
I_E	-150	mA
P_C	400	mW
T_j	125	°C
T_{stg}	-55~125	°C

Electrical Characteristics (Ta=25°C)

SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
I_{CBO}	$V_{CB}=60V, I_E=0$	-	-	0.1	μA
I_{EBO}	$V_{EB}=5V, I_C=0$	-	-	0.1	μA
$h_{FE(1)}$	$V_{CE}=6V, I_C=2mA$	70	-	700	-
$h_{FE(2)}$	$V_{CE}=6V, I_C=150mA$	25	-	-	-
$V_{CE(sat)}$	$I_C=100mA, I_B=10mA$	-	0.1	0.25	V
$V_{BE(sat)}$	$I_C=100mA, I_B=10mA$	-	-	1.0	V
f_T	$V_{CE}=10V, I_E=-1mA$	80	-	-	MHz
C_{ob}	$V_{CB}=10V, I_E=0, f=1MHz$	-	2.0	3.5	PF
r_{bb}	$V_{CB}=10V, I_E=-1mA, f=30MHz$	-	50	-	ohm
NF	$V_{CE}=6V, I_C=0.1mA$ $R_g=10k\ ohms, f=1kHz$	-	1.0	10	dB

2SC1923 (TR0085)

Absolute Maximum Ratings (Ta = 25°C)

SYMBOL	RATING	UNIT
V_{CBO}	40	V
V_{CEO}	30	V
V_{EBO}	4	V
I_C	20	mA
I_E	-20	mA
P_C	100	mW
T_j	125	°C
T_{stg}	-55 - 125	°C

2SD235 (TR0047)

Maximum Ratings (Ta = 25°C)

SYMBOL	RATING	UNIT
V_{CBO}	50	V
V_{CEO}	40	V
V_{EBO}	10	V
I_C	3	A
I_E	-3	A
$T_a=25^{\circ}C$	1.5	
P_C $T_a=25^{\circ}C$	25	W
T_j	150	°C
T_{stg}	-55 - 150	°C

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
I_{CBO}	$V_{CB}=18V, I_E=0$	-	-	0.5	μA
I_{EBO}	$V_{EB}=4V, I_C=0$	-	-	0.5	μA
h_{FE}	$V_{CE}=6V, I_C=1mA$	25	-	140	
C_{re}	$V_{CE}=6V, f=1MHz$	-	0.70	-	pF
f_T	$V_{CE}=6V, I_E=-1mA$	-	550	-	MHz
$C_c \cdot r_{bb'}$	$V_{CE}=6V, I_E=-1mA, f=30MHz$	-	-	30	pF
NF	$V_{CE}=6V, I_E=-1mA,$	-	2.5	4.0	dB
G_{pe}	$f=100MHz$ Fig. 1	15	18	-	dB

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
I_{CBO}	$V_{CB}=20V, I_E=0$	-	-	100	μA
I_{EBO}	$V_{EB}=5V, I_C=0$	-	-	100	μA
$V_{(BR) CEC}$	$I_C=100mA, I_B=0$	40	-	-	V
$V_{(BR) EBO}$	$I_E=10mA, I_C=0$	10	-	-	V
(Note)					
$h_{FE(1)}$	$V_{CE}=5V, I_C=0.5A$	40	80	240	
$h_{FE(2)}$	$V_{CE}=5V, I_C=2.5A,$ $V_{CE}=5V, I_C=1A$	20	55	-	
$V_{CE(sat)}$	$I_C=3A, I_B=0.3A,$ $I_C=1A, I_B=0.05A$	-	0.2	1.0	V
V_{BE}	$V_{CE}=5V, I_C=0.5A$	-	0.68	0.9	V
f_T	$V_{CE}=5V, I_E=-0.5A$	-	1	-	MHz
C_{ob}	$V_{CB}=10V, I_E=-0, f=1MHz$	-	250	-	pF

Characteristics for FET

2SK106(TF0016)

V_{DS} (V)	I_D (mA)	P_{ch} (mW)	Y_{fs} (mS)	I_{DSS} (mA)	@ V_{DS} (V)	NF (dB)	V_{DS} (V)	I_D (mA)	f (Hz)
50	20	300	4.5-13	0.5 to 12	10	0.5	6	0.05	1k

BA656(TC0085)

LED Level Meter Drive

Absolute Maximum Ratings(Ta=25°C)

SYMBOL	RATING	UNIT
V_{CC}	18	V
P_d	500	mW
T_{opr}	-20~+75	°C
T_{stg}	-55~+125	°C
V_{IN}	4.5	V
I_{DL}	7.5	mA

Electrical Characteristics(Ta=25°C, Vcc=12V)

SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITION
V_{CC}	9	12	15	V	
I_{CC}	-	3	-	mA	without LED load current
V_R^1	-	200	-	mV	level: $V_R=1.0V$
V_R^2	-	400	-	mV	"
V_R^3	-	600	-	mV	"
V_R^4	-	800	-	mV	"
V_R	0.5	1.0	3.0	V	
I_{DL}	-	5	-	mA	load resistance $R_L=330$ ohms

μPC1173C(TC0100)

Absolute Maximum Ratings(Ta=25°C)

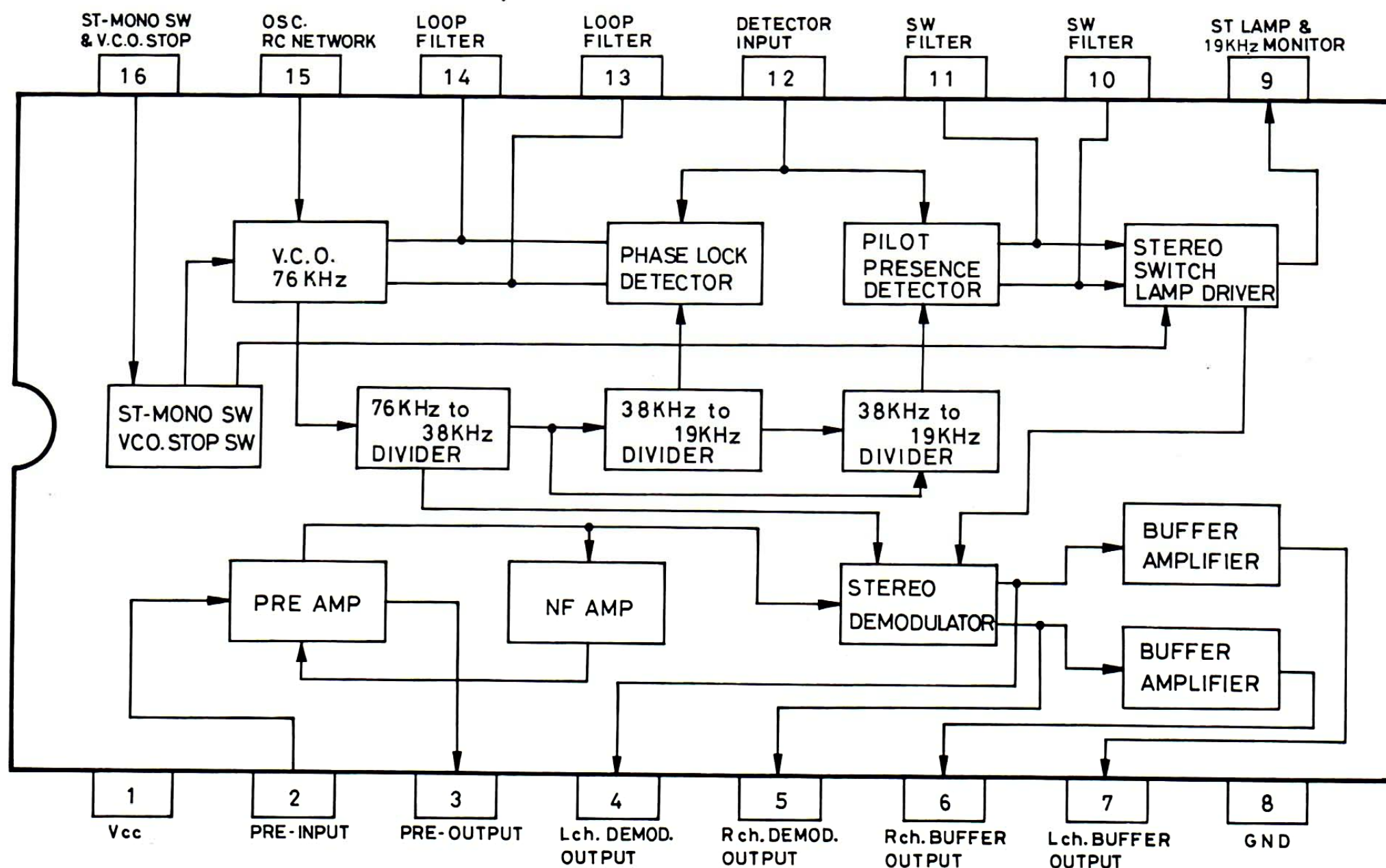
ITEM	SYMBOL	RATING	UNIT
Supply Voltage	V _{CC}	15	V
Lamp Driver Current	I _L	75	mA
Package Dissipation	P _D	400	mW
Operating Temperature	T _{opt}	-20 +70	°C
Storage Temperature	T _{stg}	-40 +125	°C

Electrical Characteristics(Ta=25°C)

[V_{CC}=12V, f=1kHz, R_I=47k ohms, Composite Input(L+R)=270mV, Pilot=30mV(10%)]

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current	I _{CC}	no signal		17		mA
Stereo Channel Separation	Sep.	PILOT=30mV	f=100Hz	50		dB
			f=1kHz	58		dB
			f=10kHz	50		dB
Voltage Gain	A _v	mono, V _{in} =300mV, R _I =47k R _L =33k		-6		dB
Channel Balance	C.B.	mono, V _{in} =300mV	-1.5	0	+1.5	dB
		stereo, PILOT=30mV	-1.5	0	+1.5	dB
Stereo Distortion	T.H.D.	PILOT=30mV MAIN	f=100Hz	0.02		%
			f=1kHz	0.015		%
			f=10kHz	0.1		%
SCA Rejection Ratio	SCA Rej.	PILOT=30mV, SCA=30mV	70			dB
Input Overload Level	V _{in}	mono, T.H.D.=1%	0.9			V _{RMS}
S/N Ratio	S/N	V _{in} =300mV, R _I =47k, L.P.F.-ON	82			dB

EQUIVALENT BLOCK DIAGRAM μPC1173C

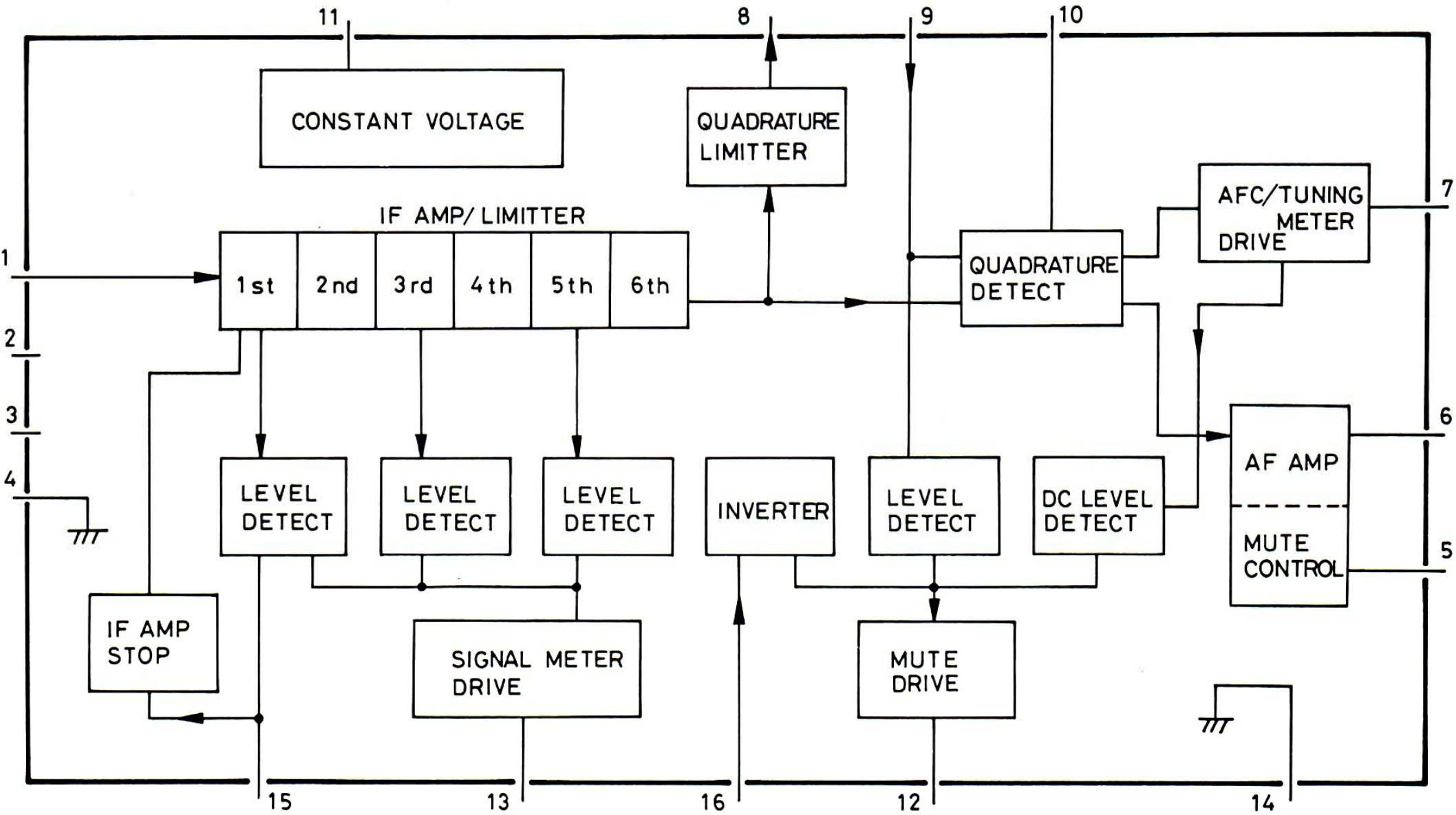


LA1231(TC0099)

Absolute Maximum Ratings(Ta=25°C)

ITEM	SYMBOL	RATING	UNIT
Supply Voltage	$V_{CC(max)}$	16	V
Input Voltage	V_I	± 1	V_{P-P}
Supply Current	I_{CC}	40	mA
Input Current	I_{15}	1	mA
	I_{16}	1	mA
Output Current	I_{10}	2	mA
	I_{12}	2	mA
	I_{13}	2	mA
	I_{15}	2	mA
Power Consumption	$P_d(max)$	650	mW
Operating Temperature	T_{opg}	-20 +70	°C
Storage Temperature	T_{stg}	-40 +125	°C

EQUIVALENT BLOCK DIAGRAM LA1231 (TC0091)



Operating Characteristics($T_a=25^{\circ}\text{C}$, $V_{CC}=12\text{V}$, $f=10.7\text{MHz}$) LA1231

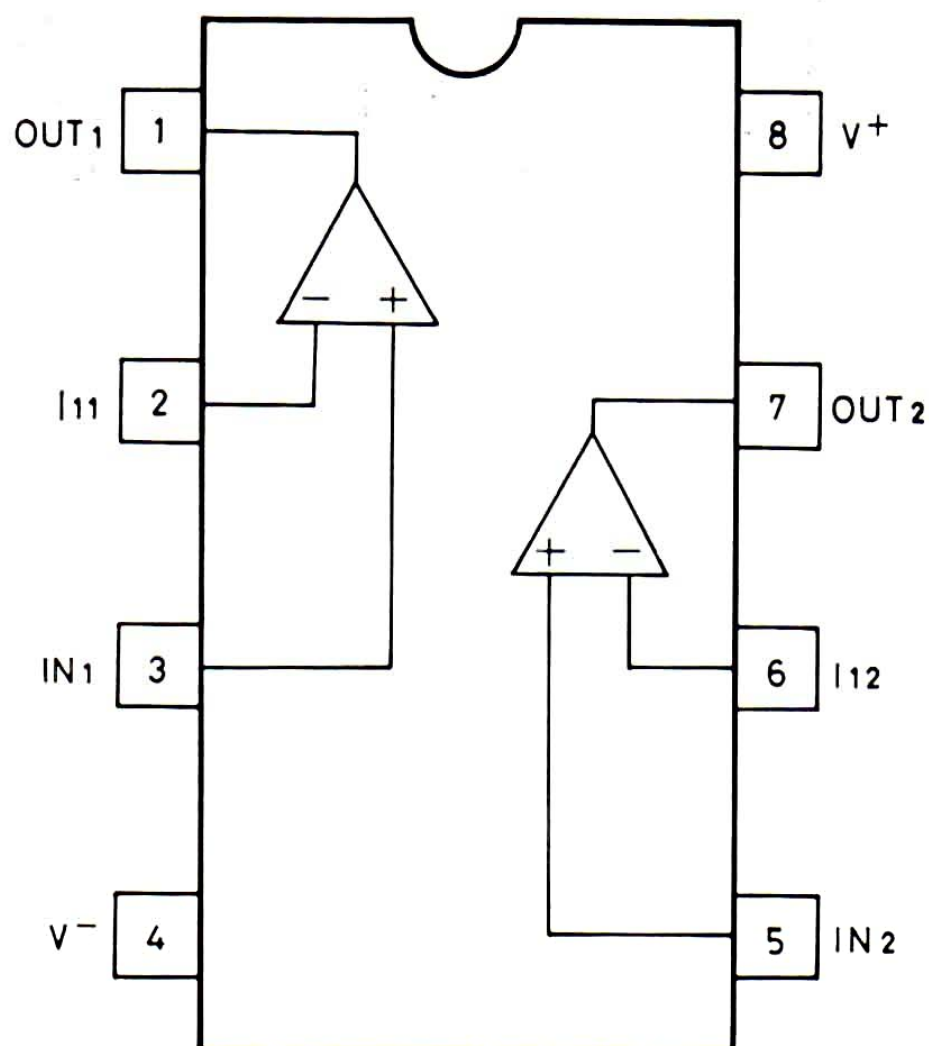
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I_{CC0}	no signal		20	30	mA
Circuit Current	I_{CC}	$V_{in}=100\text{dB}\mu$		23.5	33	mA
Output Voltage	V_O	$V_{in}=100\text{dB}\mu$, 400Hz, 100% mod.	240	330	460	mVrms
S/N	-	$V_{in}=100\text{dB}\mu$, 400Hz, 100% mod.	72	78.5		dB
Input Voltage(limit)	$V_{in(lim)}$	$V_O-3\text{dB}$, 400Hz, 100% mod.		25	31	dB μ
T.H.D.	THD	$V_{in}=100\text{dB}\mu$, 400Hz, 100% mod.		0.05	0.3	%
Muting Sensitivity	$V_{in(mute)}$	$V_{12}=1.4\text{V}$	23	29	35	dB μ
Muting Attenuation	$Mute_{(att)}$	$V_5=2\text{V}$, $V_{in}=100\text{dB}\mu$, 400Hz 100% mod.	60	65		dB
Muting Bandwidth	$BW_{(mute)}$	$V_{in}=100\text{dB}\mu$, $V_{12}=1.4\text{V}$	140	220	370	kHz
AM Suppression Ratio	AMR	$V_{in}=100\text{dB}\mu$, FM 400Hz 100% mod. AM 1kHz 30% mod.	45	60		dB
Output for Muting Drive	V_{12}	no signal	4.0	4.9	6.0	V
		$V_{in}=100\text{dB}\mu$	0	0	0.3	V
Output for Signal Meter Drive	V_{13}	no signal	0	0	0.1	V
		$V_{in}=70\text{dB}\mu$	1.5	2.3	3.5	V
		$V_{in}=100\text{dB}\mu$	4.5	5.5		V
AGC Output	V_{15}	no signal	4.2	5.0	5.5	V
		$V_{in}=100\text{dB}\mu$	0	0	0.5	V
IF Off Current	$I_{15(off)}$	no signal, $V_{8-10}\leq 20\text{mV}$	10	35	60	μA
Muting Level Voltage	$V_{16(mute)}$	$V_{in}=100\text{dB}\mu$, $V_{12}=1.4\text{V}$	0.7	0.84	1.0	V

$\mu\text{PC4558C(TC5006)}$

Absolute Maximum Ratings($T_a=25^{\circ}\text{C}$)

ITEM	SYMBOL	RATING	UNIT
Supply Voltage	V^+-V^-	36	V
Total Power Dissipation	P_T	350	mW
Differential Input Voltage	V_{ID}	± 30	V
Common Mode Input Voltage	V_{ICM}	± 15	V
Operating Temperature	T_{opt}	0 - +70	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-55 ~ +125	$^{\circ}\text{C}$

CONNECTION DIAGRAM (Top View)
 $\mu\text{PC4558C, TC5006}$



Electrical Characteristics ($T_a=25^{\circ}\text{C}$, $V_{-}^{\pm} = \pm 15\text{V}$, at each channel) $\mu\text{PC4558C}$

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}	$R_s \leq 10\text{k ohms}$		0.5	6.0	mV
Input Offset Current	I_{IO}			5	200	nA
Input Bias Current	I_B			60	500	nA
Large Signal Voltage Gain	A_v	$R_L \geq 2\text{k ohms}$, $V_o = \pm 10\text{V}$	20,000	100,000		
Power Consumption	P_d	both channels		90	170	mW
Common-mode Rejection Ratio	CMR	$R_s \leq 10\text{k ohms}$	70	90		dB
Supply Voltage Rejection Ratio	SVR	$R_s \leq 10\text{k ohms}$		30	150	$\mu\text{V/V}$
Maximum Output Voltage	V_{om}	$R_s \geq 10\text{k ohms}$	± 12	± 14		V
Maximum Output Voltage	V_{om}	$R_s \geq 2\text{k ohms}$	± 10	± 13		V
Common Input Voltage	V_{ICM}		± 12	± 14		V
Slew Rate		$A_v = 1$		1.0		V/ μs
Noise Level	NL	$R_s = 1\text{k ohm}$, $f=1\text{Hz}$ 1kHz		6		μV_{p-p}
Channel Separation		$f = 1\text{kHz}$		105		dB

HA1197(TC0021)

ITEM	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	15	V
Total Power Dissipation	P_T	450	mW
Operating Temperature	T_{opr}	$-20 \sim +70$	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	$-55 \sim +125$	$^{\circ}\text{C}$

Electrical Characteristic ($V_{CC}=12\text{V}$, $f=1\text{MHz}$, $f_m=400\text{Hz}$, $T_a=25^{\circ}\text{C}$)

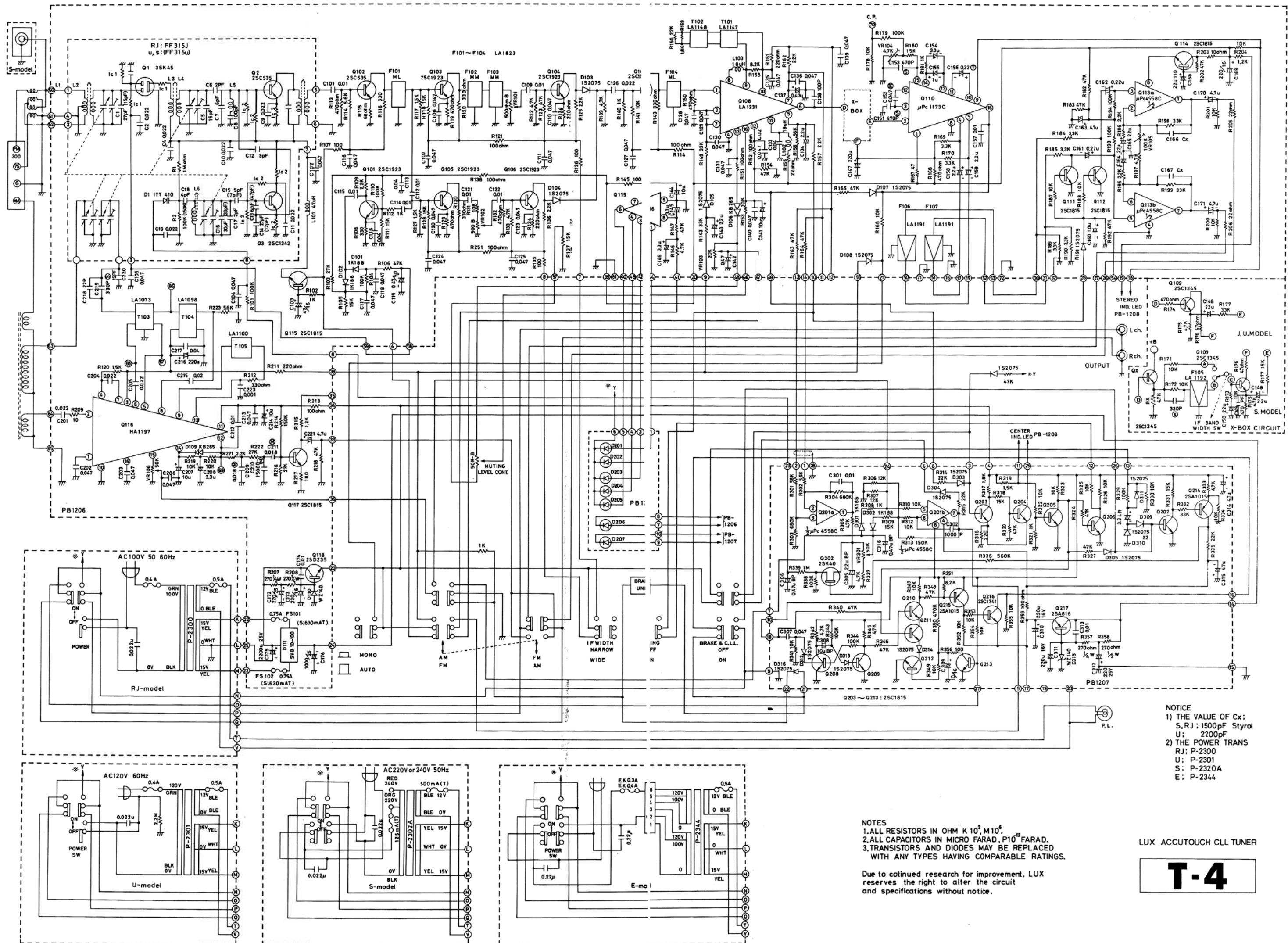
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I_Q		-	14.5	25	mA
Signal-to-Noise Ratio	S/N	Input 74dB μ , mod.30%	47	53	-	dB
		Input 34dB μ , mod.30%	29	33.5	-	
Total Harmonic Distortion	THD	Input 74dB μ , mod.90%	-	0.8	-	%
		Input 100dB μ , mod.30%	-	0.4	1.0	
AGC FOM		-10dB of output volt. at 100dB μ input	65	75	-	dB
Output Voltage	V_{out}	Input 74dB μ , mod.30%	150	212	300	mV
Tuning Meter Current	I_M	Input 100dB μ , mod.30%	-	240	-	μA

SPECIFICATIONS

[FM Section]

Receiving Frequency:	87.5MHz – 108MHz	
50dB Quieting Sensitivity:	75 μ sec. 14.2dBf (2.8 μ V), 50 μ sec. 14.8dBf (3.0 μ V)	
IHF Usable Sensitivity:	10.3dBf (1.8 μ V)	
Signal-to-Noise Ratio:	75dB	
Frequency Response:	30 – 15kHz (within \pm 1dB)	
Total Harmonic Distortion	(mono)	(stereo)
100Hz:	0.08% (wide)	0.2% (wide)
1kHz:	0.08% (wide)	0.15% (wide)
6kHz:	0.15% (wide)	0.3% (wide)
1kHz:	0.2% (narrow)	0.5% (narrow)
Capture Ratio:	1.0dB (wide)	2.0dB (narrow)
Adjacent Channel Selectivity:	10dB (narrow \pm 200kHz)	
Alternate Channel Selectivity:	80dB (narrow \pm 400kHz) 40dB (wide \pm 400kHz)	
Spurious Response Ratio:	80dB	
IF Response Ratio:	80dB	
Image Response Ratio:	55dB	
AM Suppression Ratio:	60dB	
Stereo Separation:	45dB (wide, 100Hz), 48dB (wide, 1kHz) 40dB (wide, 10kHz), 30dB (narrow 1kHz)	
Subsonic Product Ratio:	65dB	
SCA Rejection Ratio:	60dB	
Output Voltage:	1V	
Output Impedance:	100 ohms	
Muting Threshold:	5 μ V – 300 μ V	
[AM Section]		
IHF Usable Sensitivity:	250 μ V/m	
Image Ratio at 1MHz:	50dB	
IF Rejection Ratio at 1MHz:	40dB	
Signal-to-Noise Ratio:	50dB	
Total Harmonic Distortion:	0.6%	
Output Voltage 30% mod.:	0.3V	
Power Requirement:	10W	
Additional Features:	Tuning Lock System, CLL Circuit, IF Bandwidth Selector, Centre Indicator, Signal Strength Indicator, FM Muting Switch, FM Muting Level	
Dimensions:	438(W) x 331(D) x 84(H)mm (17-1/4" x 13-1/32" x 3-5/16") (including legs and rear protrusions)	
Weight:	Net: 6.5kgs (14.3 lbs.) Gross: 8.0kgs (17.6 lbs.)	

Specifications and appearance design subject to change without notice.



LUX CORPORATION, JAPAN

1-1, 1-CHOME, SHINSENRI-NISHIMACHI, TOYONAKASHI, OSAKA
PHONES:06-834-2222 CABLE:LUXELECT OSAKA TELEX:J63694