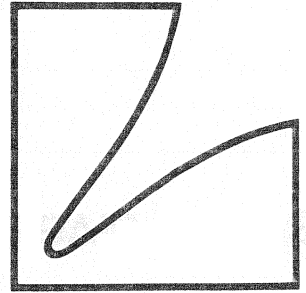


SERVICE MANUAL



DIGITAL FREQUENCY SYNTHESIZED
FM STEREO TUNER

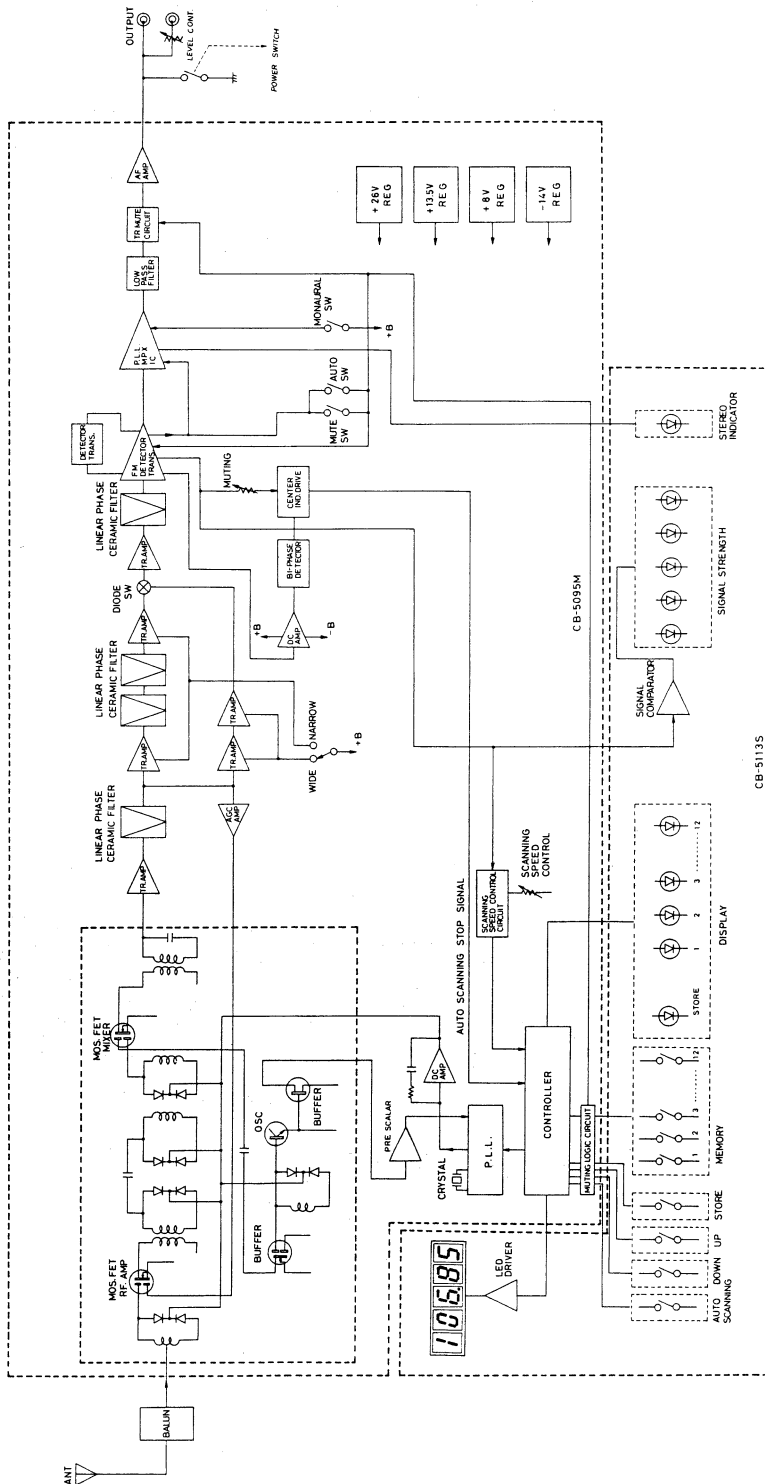
T-14



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 REPLACEMENT PARTS 8 ~ 11
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BLOCK DIAGRAM



ALIGNMENT PROCEDURE

Adjustment Point on CB-5095M

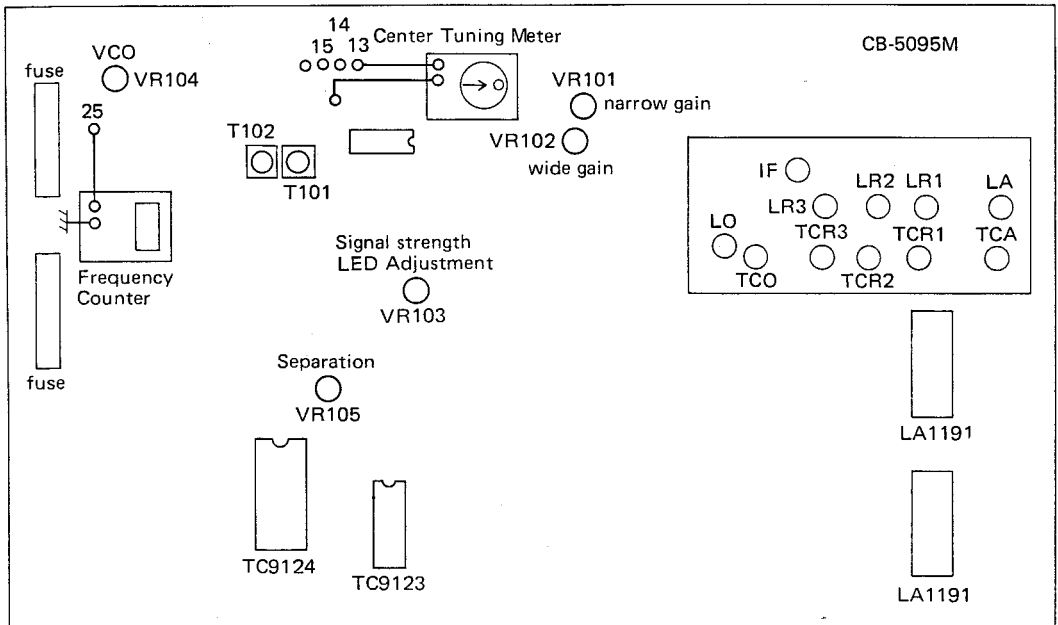


Fig. 2

T-14 SYNTHESIZED FM TUNER ALIGNMENT PROCEDURES

[1] Testing Equipments

Connect all the testing equipments as per Fig. 1.

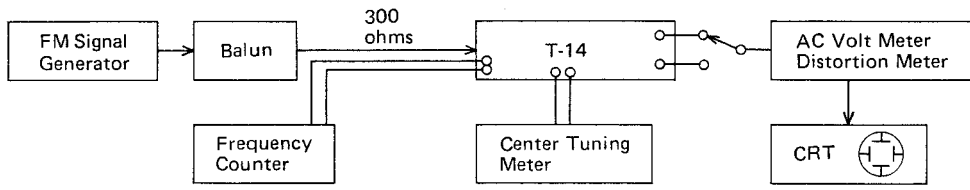


FIG. 1

[2] Pre-Setting of Volumes.

- VR101: Turn clockwise to the maximum for IF narrow gain adjustment
- VR102: Turn counter-clockwise to the maximum for IF wide gain adjustment.
- VR103: Turn to the center position for signal strength level.
- VR104: Turn to the center position for MPX VCO adjustment.
- VR105: Turn to the center position for MPX separation adjustment.

[3] Setting of Front Panel Functions.

- Muting Threshold VR: Turn counter-clockwise to the maximum.
- Power Switch :: Off
- IF Band Switch : Off (wide)
- Auto Scanning Switch: Off (manual)
- Mode Switch : Off (stereo)
- Muting Switch : Off

Connect Center Tuning Meter and Frequency Counter as per Fig. 2.

Connect Distortion Meter, AC Volt Meter and Oscilloscope to the output terminal of the T-14 as per Fig. 1.

Set Power Switch "ON".

[4] IF Adjustment

- (1) Set Signal Generator at 98MHz with output, 1mV 100% modulation.
- (2) Tune the T-14 at 98MHz.
- (3) Confirm the 1KHz signal coming at the output terminal of the T-14.
- (4) Adjust T101, FM Transformer to null point of Center Tuning Meter
- (5) Adjust T102, FM Transformer to make distortion minimum.
- (6) Repeat the above procedures 4 and 5 three or four times to obtain the "null" point of Center Tuning Meter and minimum distortion at the same time.

[5] Tracking Adjustment

- (1) Set output of signal Generator at $2\mu\text{V}$ and adjust IF coil of the front-end to make the tuner's output and sensitivity maximum.
- (2) Set signal Generator at 106MHz, output $2\mu\text{V}$, 1KHz 100% modulation and tune T-14 at 106MHz.
- (3) Turn TCA, TCR1 ~ 3 , the trimmers of the front-end to obtain maximum output level and sensitivity.
- (4) Also set Signal Generator at 90MHz, output $2\mu\text{V}$, 1KHz 100% modulation and turn the T-14 at 90MHz.
- (5) Adjust LA, LR1 ~ 3 , the coil of the front-end to obtain maximum output level and sensitivity.
- (6) Repeat step 2 through 5 as necessary to obtain maximum sensitivity on station.

[6] Muting and Signal Strength Adjustment

- (1) Set signal Generator at 98MHz, 1KHz 100% modulation.
- (2) Push muting SW. at "ON" and set output of signal Generator to $2\mu\text{V}$ and adjust VR102 to appear the signal of 1KHz.
- (3) Set IF band SW. at "narrow" and adjust VR101 to same as step (2).
- (4) Adjust VR103 to make 5th L.E.D. of signal strength indicator light at $50\mu\text{V}$.
- (5) Make output Signal Generator null and confirm L.E.D. unlit.

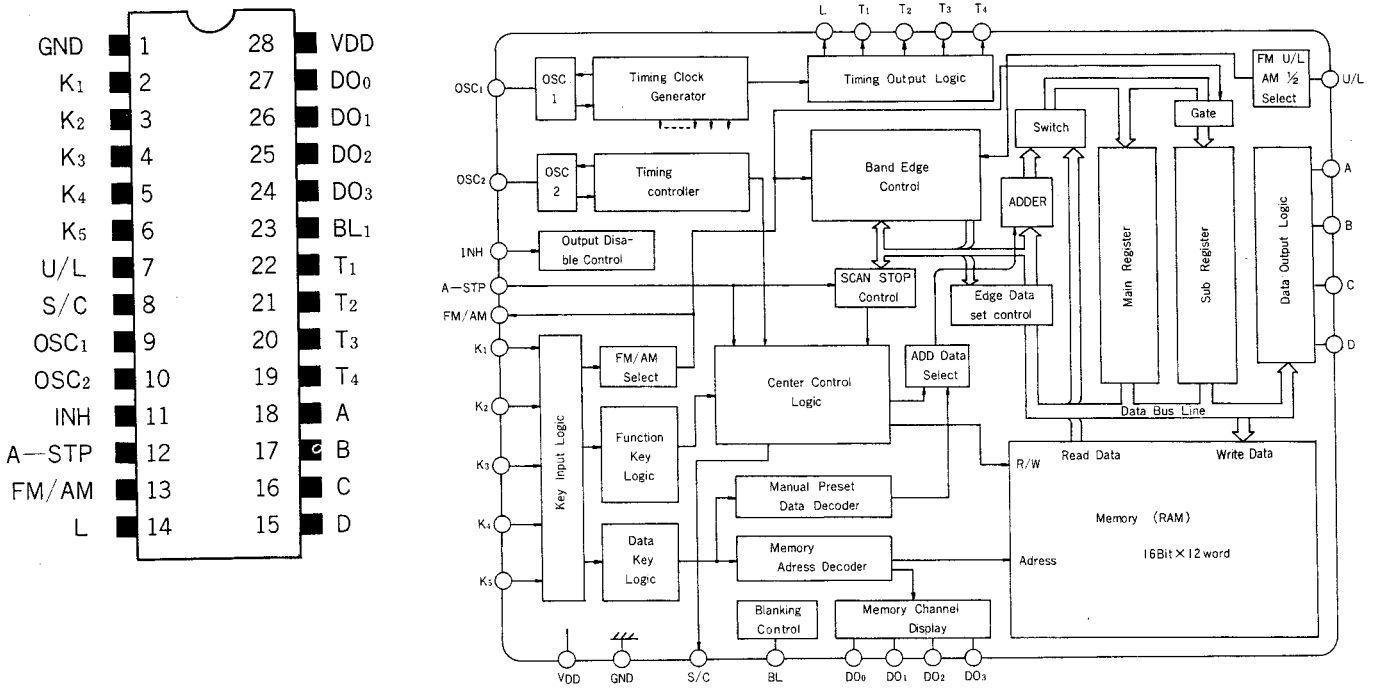
[7] MPX Adjustment

- (1) Set Signal Generator at 98MHz non-modulation, output 1mV and adjust VR104 to get VCO frequency 76KHz^{+0}_{-50} Hz frequency counter reading.
- (2) Make left or right stereo modulation at 1KHz 90%, pilot signal 10%, with Signal Generator and adjust VR105 to make separation maximum and balanced on left and right channels.

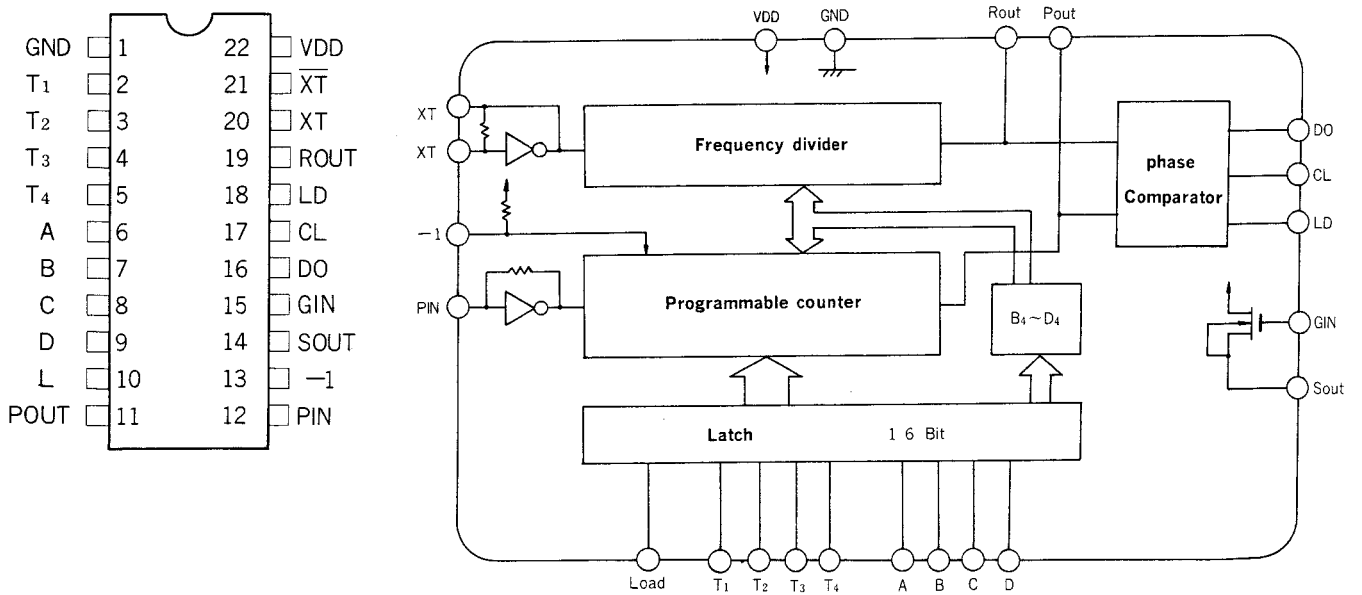
[8] Confirmation

- a) S/N and other specifications to meet rated specifications.
- b) L.E.D.'s of Signal Strength Indicator not to light at no signal input and to light in order from 1st to 5th according to input signal of T-14.
- c) Muting level to Vary from 10 to $100\mu\text{V}$ with muting threshold VR.
- d) Stereo indication L.E.D. to light within 1 second upon stereo reception.
- e) Pre-set tuning on right function and memory store as well.
- f) Memory frequency not to change or store, by ON-OFF operation of power SW.
- g) To scan between 87.55MHz and 108.00MHz under auto-tuning at no signal input.
- h) To automatically stop under auto-tuning when the signal in the procedure [7] - (2) is given.
- i) To start scanning when tuning button is continuously pressed for a few seconds and to stop when tuning button is released under manual-tuning.
- j) Tuning frequency to increase or decrease by every 50kHz on one push of UP-DOWN key manual tuning.
- k) Receiving frequency not to be less than 87.55MHz and more than 108.00MHz.
- l) Scanning speed to be slow or fast by turning of scanning VR. on the rear panel.

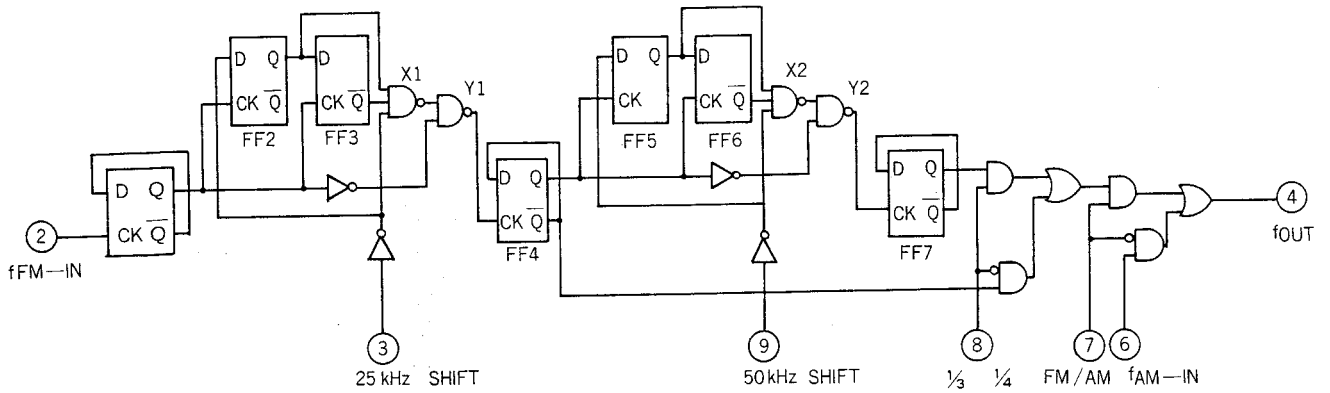
BLOCK DIAGRAM TC9124AP



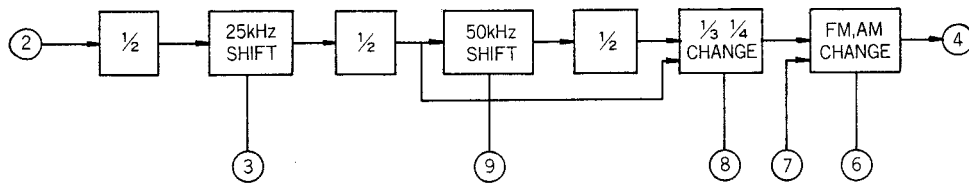
BLOCK DIAGRAM TC9123P



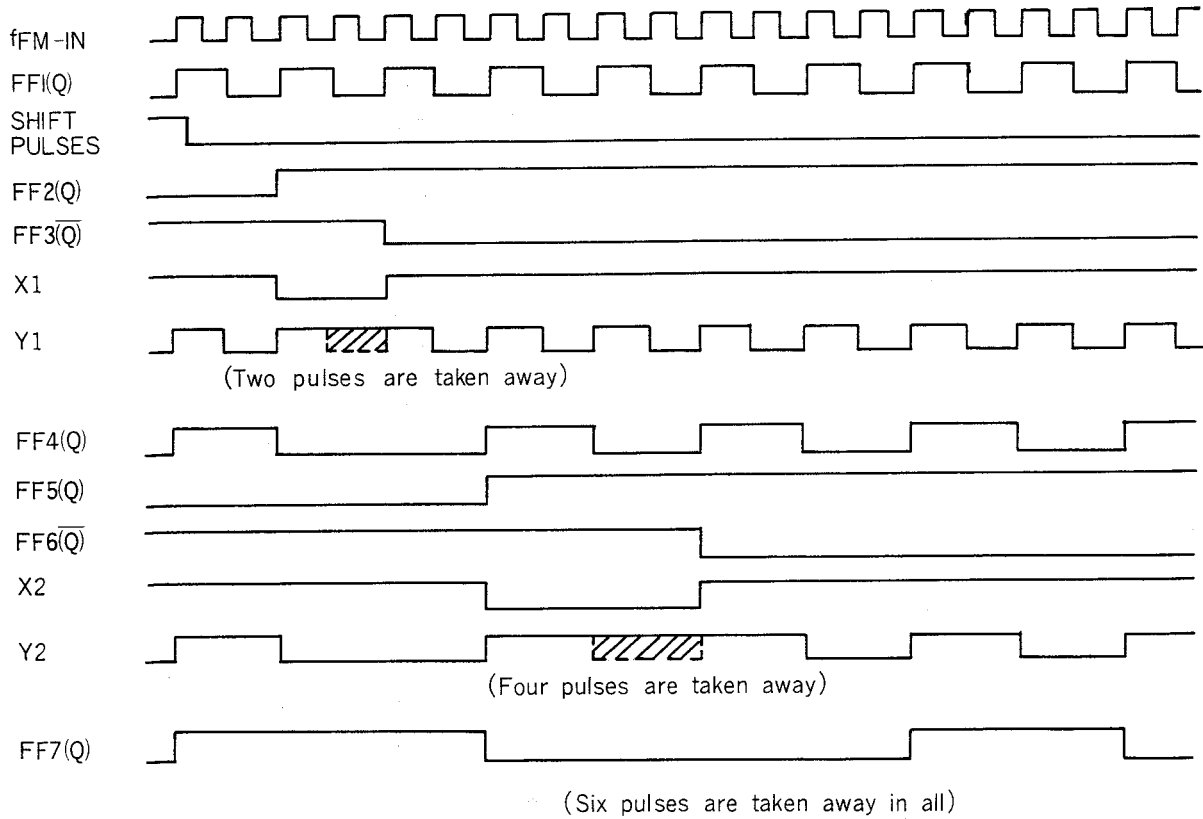
LOGIC DIAGRAM TD6102P



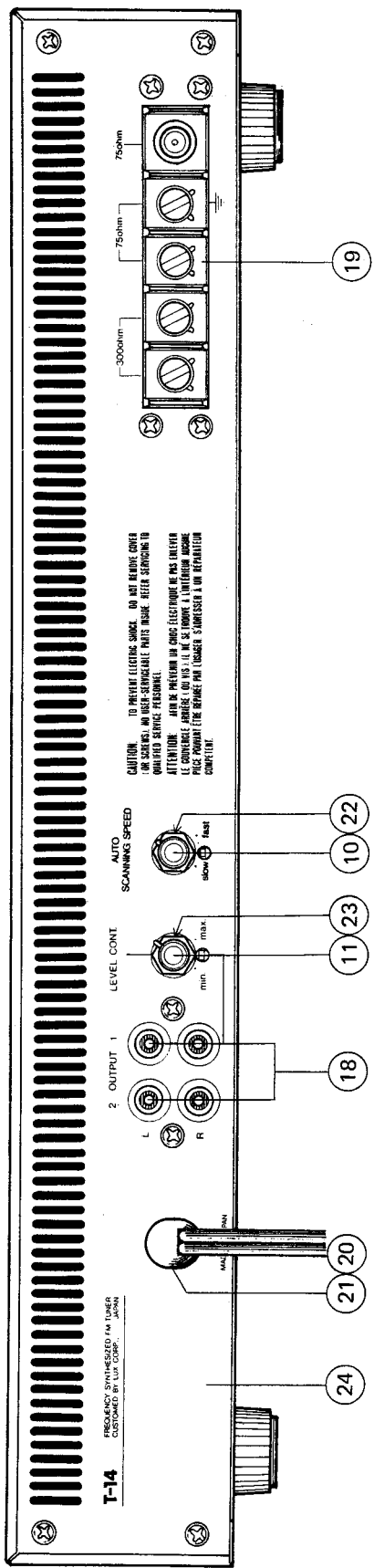
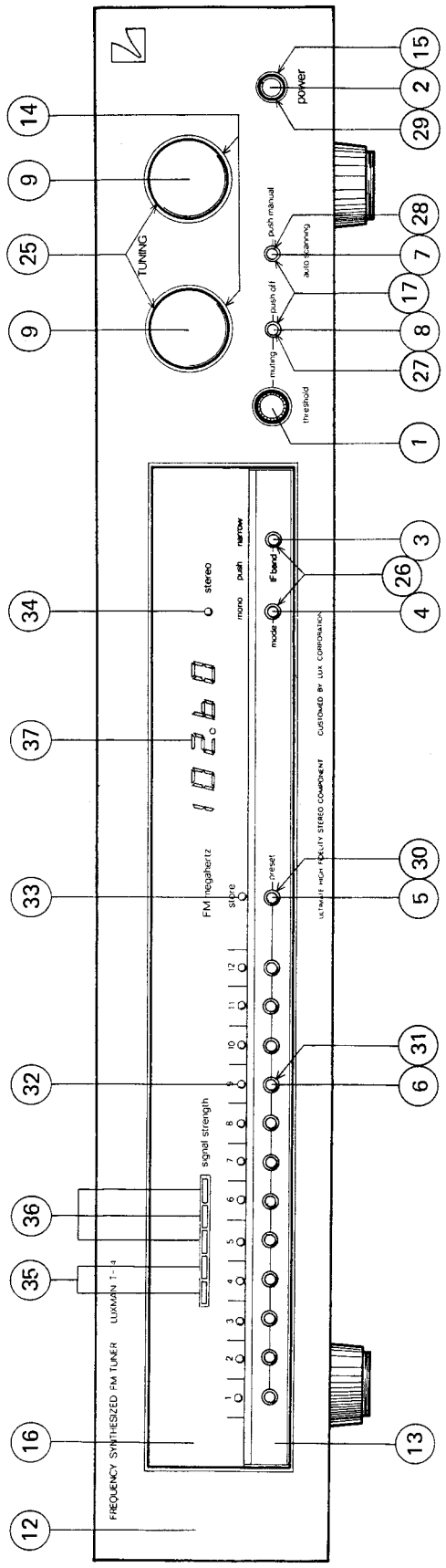
BLOCK DIAGRAM

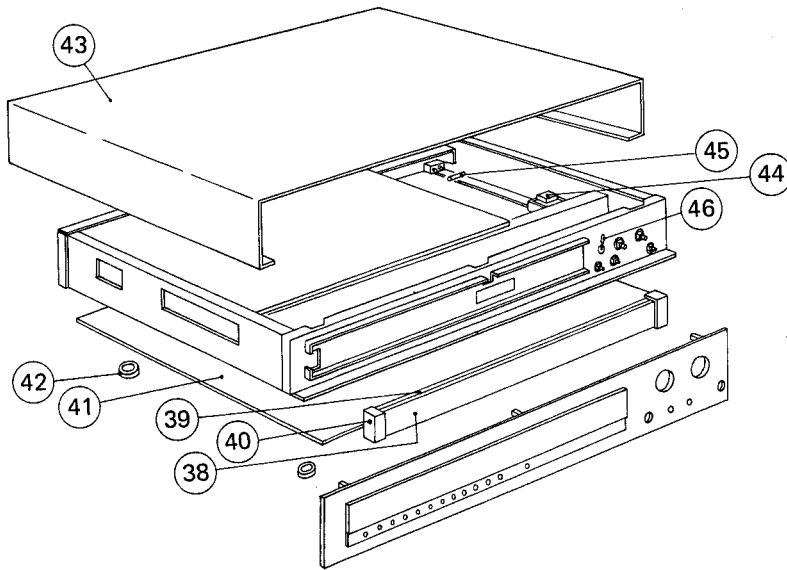


TIMING CHART TD6102P



EXPLODED VIEW





EXPLODED VIEW. Parts List.

REF. NO.	STOCK NO.	DESCRIPTION
[Knob]		
1	WH1083	Threshold
2	WJ1089	Power
3	WJ1120	IF Band
4	WJ1120	Mode
5	WJ1128	Store
6	WJ1128	Preset
7	WK1097	Auto Scanning
8	WK1097	Muting (Push Off)
9	WK1123	Tuning
10	WJ0001	Auto Scanning Speed
11	WJ0001	Level Control
[Front Panel Ass'y]		
12	WA1176	Front Panel
13	WD1117	Escutcheon
14	WE1056	Protector (Tuning)
15	WE1066	Protector (Power)
16	WE1084	Protector
17	WE1086	Protector (Tuning, Muting)
[Rear Panel Ass'y]		
18	AT0012	Terminal (Out Put)
19	AT0121	Terminal (Antenna)
20	BK0023	Power Cord (SG)
	BK0022	Power Cord (SK, EK)
	BK0018	Power Cord (EZ)
21	BU0033	Cord Stopper (SK, EK, EZ)
	BU0039	Cord Stopper (SG)
22	RV0208	VR. 50K-B (Auto Scanning Speed)
23	RV5060	VR. 50KBx2 (Level Control)
24	UC1149	Rear Panel
[Switch]		
25	SP5029	Tuning
26	SP5036	IF Band, Mode

REF. NO.	STOCK NO.	DESCRIPTION
27	SP5037	Muting (Push Off)
28	SP5038	Auto Scanning
29	SP0114	Power
30	SP5034	Store
31	SP5034	Preset
[L.E.D.]		
32	TD0096	Preset
33	TD0096	Store
34	TD0096	Stereo
35	TD0149-B	Signal Strength
36	TD0150-B	Signal Strength
37	TD5024	Digital Frequency Indication
[Cosmetic]		
38	WM1055	Dial Scale
39	WU1024	Filter
40	UN1022	Rubber
41	UE5002	Bottom Plate
42	WN0007	Foot
43	UG1023	Bonnet
	WB1086	Wooden Case
[Mechanism]		
44	PT5076	Power Trans (SK, SG)
	PT5077	Power Trans (EK, EZ)
45	BF0201	Fuse 0.1AT (SK, SG)
	BF0071	Fuse 0.2A (EK)
	BF0073	Fuse 0.4A (EZ)
46	AL5005	Lamp 30V 40mA
[Packing Material]		
	XA1241	Carton
	XE5009	Pad
	ME5012	Owner's Manual

REPLACEMENT PARTS

PARTS LIST . . . (P.C.B.)

REMARKS

Capacitor: El . . . Electrolytic,
St . . . Styrol,
Ce . . . Ceramic
Ta . . . Tantalum,

SYMBOL NO.	PART NO.	DESCRIPTION
[Semi-Fixed Resistor]		
VR101	RT0050	500 ohm
VR102	RT0055	1K ohm
VR103	RT0052	20K ohm
VR104	RT0025	4.7K ohm
VR105	RT0085	100K ohm
[Coil]		
L101	LA1143	S-470K
L102	LA1149	S-180J
L103	LA1149	S-180J
L104	LA1143	S-470K
[Filter]		
F101	LA5016	Ceramic KMFC89-A-11
F102	LA5016	Ceramic KMFC89-A-11
F103	LA5016	Ceramic KMFC89-A-11
F104	LA5016	Ceramic KMFC89-A-11
F105	LA1191	Low Pass LUX-1191
F106	LA1191	Low Pass LUX-1191
[FM Trans]		
T101	LA5021	LUX-5021
T102	LA5021	LUX-5021
[Transistor & IC]		
Q101	TR0198	2SC1815
Q102	TR0233	2SC535
Q103	TR0019	2SC1923
Q104	TR0019	2SC1923
Q105	TR0019	2SC1923
Q106	TR0019	2SC1923
Q107	TR0019	2SC1923
Q109	TR0019	2SC1923
Q110	TC0099	FM IC LA1231NS
Q111	TR0174	2SC1345
Q112	TC0100	MPX IC MPC1173C
Q113	TR0198	2SC1815
Q114	TR0198	2SC1815
Q115	TR0198	2SC1815
Q116	TC5002	IC NJM4558D
Q117	TR0198	2SC1815
Q118	TC5002	IC NJM4558D
Q119	TR0198	2SC1815
Q120	TR0198	2SC1815
Q121	TR0198	2SC1815
Q122	TR0198	2SC1815

SYMBOL NO.	PART NO.	DESCRIPTION
Q123	TC5023	IC TC4081BP
Q124	TR0198	2SC1815
Q125	TR0198	2SC1815
Q126	TC5015	IC TD6102P
Q127	TR0198	2SC1815
Q128	TC5016	IC TC9123P-GR
Q129	TC5017	IC TC9124P
Q130	TR0118	2SD234
Q131	TR0118	2SD234
Q132	TR0121	2SC1626
Q501	TC0085	IC BA656
Q502	TC5018	TC5022BP
Q503	TR0259	2SC2120
Q504	TR0259	2SC2120
Q505	TR0259	2SC2120
Q506	TR0259	2SC2120
Q507	TR0198	2SC1815
Q508	TR0087	2SA1015
Qaa	TR0198	2SC1815
Qab	TR0198	2SC1815
Qac	TR0198	2SC1815
[Diode]		
D101	TD0018	1K 188FM-1
D102	TD0018	1K 188FM-1
D103	TD0116	1S2075
D104	TD0116	1S2075
D105	TV0030	KB-265C4
D106	TD0116	1S2075
D108	TD0116	1S2075
D109	TD0116	1S2075
D110	TD0116	1S2075
D111	TD0116	1S2075
D112	TD0116	1S2075
D113	TD0116	1S2075
D114	TD0116	1S2075
D115	TD0116	1S2075
D116	TD0116	1S2075
D117	TD0116	1S2075
D118	TD0116	1S2075
D120	TD0116	1S2075
D122	TD0116	1S2075
D123	TD0116	1S2075
D124	TD0116	1S2075
D125	TD0116	1S2075
D126	TD0116	1S2075
D127	TD0116	1S2075
D128	TD0116	1S2075
D129	TD0116	1S2075
D131	TD5023	WZ040
D132	TD5023	WZ040

SYMBOL NO.	PART NO.	DESCRIPTION
D133	TD0079	WZ140
D134	TD0079	WZ140
D135	TD0025	WZ090
D136	TD0036	WZ260
D137	TD0002	1N4002
D138	TD0002	1N4002
D139	TD0138	1B4B41
D501	TD0116	1S2075
D502	TD0116	1S2075
D503	TD0116	1S2075
D504	TD0116	1S2075
D505	TD0116	1S2075
D506	TD0116	1S2075
D507	TD0116	1S2075
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D515	TD0116	1S2075
D516	TD0116	1S2075
D517	TD0116	1S2075
D518	TD0116	1S2075
D519	TD0116	1S2075
D520	TD0116	1S2075
[Capacitor]		
C101	CK0158	25WV 47000pF (Ce
C102	CE0077	16WV 47μF El
C103	CK0158	25WV 47000pF Ce
C104	CK0158	25WV 47000pF Ce
C105	CK0155	25WV 10000pF Ce
C106	CK0158	25WV 47000pF Ce
C107	CS0455	35WV 0.33μF Ta
C108	CK0158	25WV 47000pF Ce
C109	CK0155	25WV 10000pF Ce
C110	CK0158	25WV 47000pF Ce
C111	CK0155	25WV 10000pF Ce
C112	CK0158	25WV 47000pF Ce
C113	CK0155	25WV 10000pF Ce
C114	CK0158	25WV 47000pF Ce
C115	CK0155	25WV 10000pF Ce
C116	CK0158	25WV 47000pF Ce
C117	CK0158	25WV 47000pF Ce
C118	CK0158	25WV 47000pF Ce
C119	CK0158	25WV 47000pF Ce
C120	CE0213	50WV 0.47μF El
C121	CK0158	25WV 47000pF Ce
C122	CK0155	25WV 10000pF Ce
C123	CK0158	25WV 47000pF Ce
C124	CK0155	25WV 10000pF Ce
C125	CK0158	25WV 47000pF Ce
C126	CK0158	25WV 47000pF Ce
C127	CK0158	25WV 47000pF Ce

SYMBOL NO.	PART NO.	DESCRIPTION
C129	CE0098	50WV 1μF El
C131	CK0158	25WV 47000pF Ce
C132	CK0158	25WV 47000pF Ce
C133	CK0158	25WV 47000pF Ce
C134	CK0158	25WV 47000pF Ce
C135	CC0007	50WV 100pF Ce
C136	CE0099	50WV 2.2μF El
C137	CE0074	16WV 10μF El
C138	CK0158	25WV 47000pF Ce
C139	CK0158	25WV 47000pF Ce
C140	CE0213	50WV 0.47μF El
C141	CK0158	25WV 47000pF Ce
C142	CK0158	25WV 47000pF Ce
C143	CK0158	25WV 47000pF Ce
C144	CK0158	25WV 47000pF Ce
C145	CK0158	25WV 47000pF Ce
C146	CE0075	16WV 22μF El
C147	CE0079	16WV 220μF El
C148	CQ5078	50WV 470pF St
C149	CE0099	50WV 2.2μF El
C150	CE0099	50WV 2.2μF El
C151	CK0155	25WV 10000pF Ce
C152	CE0098	50WV 1μF El
C153	CE0168	50WV 3.3μF El
C154	CS0445	35WV 0.22μF Ta
C155	CK0158	25WV 47000pF Ce
C156	CQ5078	50WV 470pF St
C157	CE0098	50WV 1μF El
C158	CE0098	50WV 1μF El
C159	CS0445	35WV 0.22μF Ta
C160	CS0445	35WV 0.22μF Ta
C161	CE0075	16WV 22μF El
C162	CE0075	16WV 22μF El
C163	CQ5080	50WV 1500pF St
C164	CQ5080	50WV 1500pF St
C165	CE0077	16WV 47μF El
C166	CE0084	25WV 4.7μF El
C167	CE0084	25WV 4.7μF El
C168	CK0126	50WV 1000pF Ce
C169	CK0126	50WV 1000pF Ce
C170	CK0155	25WV 10000pF Ce
C171	CE0098	50WV 1μF El
C172	CE0084	25WV 4.7μF El
C173	CE0084	25WV 4.7μF El
C174	CK0155	25WV 10000pF Ce
C175	CK0155	25WV 1000pF Ce
C176	CK0155	25WV 10000pF Ce
C177	CE0068	10WV 47μF El
C178	CK0126	50WV 1000pF Ce
C179	CC0005	50WV 33pF Ce
C180	CC0005	50WV 33pF Ce
C181	CK0155	25WV 1000pF Ce
C183	CE0070	10WV 220μF El
C184	CE0099	50WV 2.2μF El
C185	CQ5081	50WV 2200pF St
C186	CE0070	10WV 220μF El
C187	CE0090	25WV 1000μF El
C188	CE0088	25WV 330μF El
C189	CE0079	16WV 220μF El
C190	CE0079	16WV 220μF El

SYMBOL NO.	PART NO.	DESCRIPTION
C191	CE0087	25WV 220 μ F EI
C192	CE0077	16WV 47 μ F EI
C193	CE0087	25WV 220 μ F EI
C194	CE0079	16WV 220 μ F EI
C195	CE0080	16WV 470 μ F EI
C196	CE0096	35WV 220 μ F EI
C197	CE0103	50WV 100 μ F EI
C198	CE0094	35WV 47 μ F EI
C199	CE0094	35WV 47 μ F EI
C200	CE0103	50WV 100 μ F EI
Cac	CE0075	16WV 22 μ F EI

[Resistor Unit: ohm]

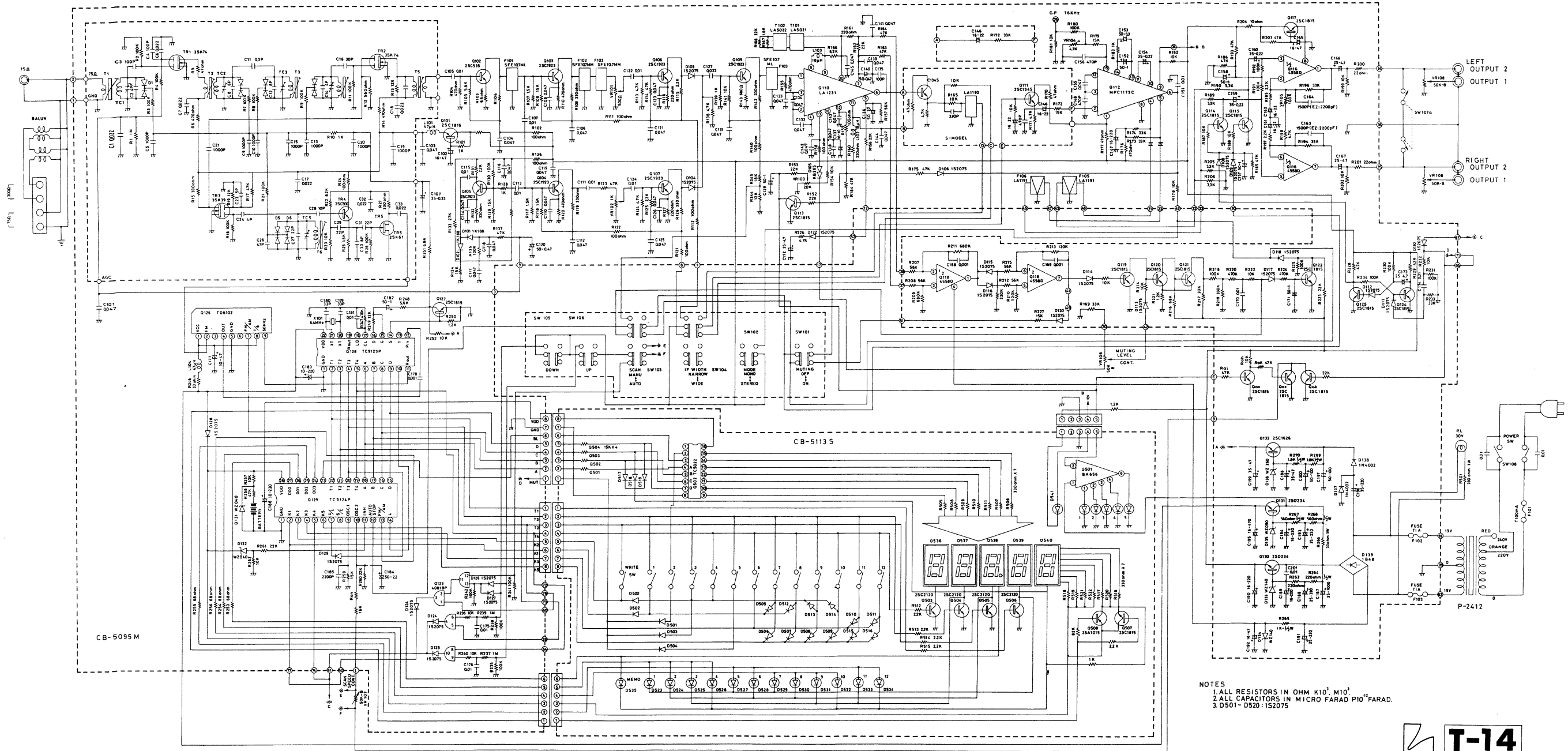
R101	RB0372	1K
R102	RB0348	100
R103	RB0344	68
R104	RB0364	470
R105	RB0390	5.6K
R106	RB0360	330
R107	RB0376	1.5K
R108	RB0400	15K
R109	RB0360	330
R110	RB0364	470
R111	RB0348	100
R112	RB0348	100
R113	RB0388	4.7K
R114	RB0412	47K
R115	RB0380	2.2K
R116	RB0356	220
R117	RB0376	1.5K
R118	RB0400	15K
R119	RB0360	330
R120	RB0364	470
R121	RB0348	100
R122	RB0348	100
R123	RB0388	4.7K
R124	RB0338	4.7K
R125	RB0380	2.2K
R126	RB0380	2.2K
R127	RB0356	220
R128	RB0372	1K
R129	RB0400	15K
R130	RB0420	100K
R131	RB0380	2.2K
R132	RB0360	330
R133	RB0406	27K
R134	RB0400	15K
R135	RB0420	100K
R136	RB0348	100
R137	RB0412	47K
R138	RB0388	4.7K
R139	RB0372	1K
R140	RB0348	100
R141	RB0396	10K
R142	RB0360	330
R152	RB0404	22K
R153	RB0404	22K
R154	RB0396	10K
R155	RB0364	470

SYMBOL NO.	PART NO.	DESCRIPTION
R156	RB0404	22K
R157	RB0414	56K
R158	RB0348	100
R159	RB0348	100
R160	RD2566	22 1/2W
R161	RB0356	220
R162	RB0404	22K
R163	RB0412	47K
R164	RB0412	47K
R165	RB0396	10K
R166	RB0394	8.2K
R167	RB0378	1.8K
R168	RB0404	22K
R169	RB0408	33K
R170	RB0340	47
R171	RB0388	4.7K
R172	RB0400	15K
R173	RB0384	3.3K
R174	RB0384	3.3K
R175	RB0412	47K
R176	RB0364	470
R177	RD2550	47 1/2W
R178	RB0396	10K
R179	RB0400	15K
R180	RB0420	100K
R181	RB0396	10K
R182	RB0396	10K
R183	RB0372	1K
R184	RB0412	47K
R185	RB0412	47K
R186	RB0412	47K
R187	RB0396	10K
R188	RB0396	10K
R189	RB0384	3.3K
R190	RB0384	3.3K
R191	RB0420	100K
R192	RB0420	100K
R193	RB0412	47K
R194	RB0408	33K
R195	RB0380	2.2K
R196	RB0408	33K
R197	RB0380	2.2K
R198	RB0388	4.7K
R199	RB0396	10K
R200	RB0332	22
R201	RB0332	22
R202	RB0396	10K
R203	RB0412	47K
R204	RB0324	10
R205	RB0384	3.3K
R206	RB0384	3.3K
R207	RB0414	56K
R208	RB0414	56K
R209	RB0440	680K
R210	RB0422	120K
R211	RB0440	680K
R212	RB0414	56K
R213	RB0422	120K
R214	RB0396	10K
R215	RB0414	56K

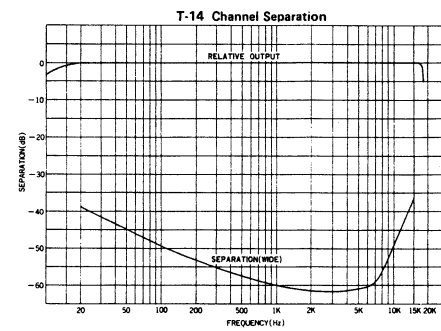
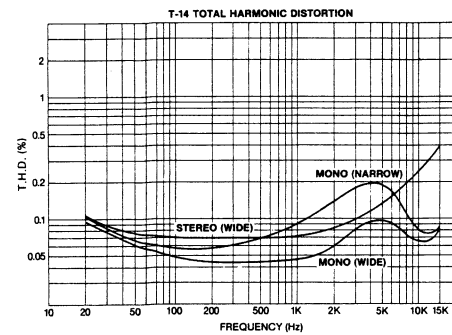
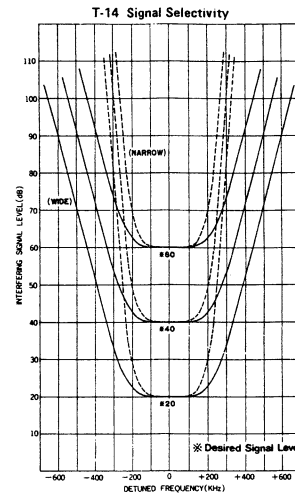
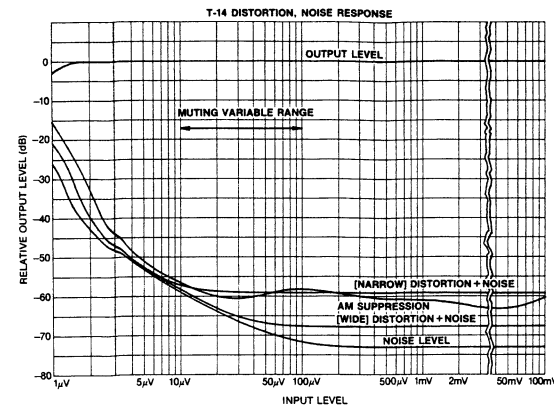
SYMBOL NO.	PART NO.	DESCRIPTION
R216	RB0416	68K
R217	RB0408	33K
R218	RB0420	100K
R219	RB0432	330K
R220	RB0436	470K
R221	RB0374	1.2K
R222	RB0396	10K
R223	RB0404	22K
R224	RB0436	470K
R225	RB0420	100K
R226	RB0388	4.7K
R227	RB0400	15K
R228	RB0388	4.7K
R229	RB0388	4.7K
R230	RB0420	100K
R231	RB0420	100K
R232	RB0396	10K
R233	RB0408	33K
R234	RB0420	100K
R235	RB0420	100K
R236	RB0396	10K
R237	RB0444	1M
R238	RB0420	100K
R239	RB0444	1M
R240	RB0396	10K
R241	RB0420	100K
R242	RB0420	100K
R243	RB0372	1K
R244	RB0398	12K
R245	RB0402	18K
R246	RB0336	33
R247	RB0436	470K
R248	RB0390	5.6K
R249	RB0398	12K
R250	RB0374	1.2K
R251	RB0392	6.8K
R252	RB0396	10K
R253	RB0344	68
R254	RB0344	68
R255	RB0344	68
R256	RB0344	68
R257	RB0396	10K
R258	RB0412	47K
R259	RB0400	15K
R260	RB0404	22K
R261	RB0404	22K
R262	RB0396	10K
R263	RD2542	220 1/2W
R264	RD2542	220 1/2W
R265	RD2582	1K 1/2W
R266	RS2949	33 2W
R267	RD2576	560 1/2W
R268	RD2576	560 1/2W
R269	RD2588	1.8K 1/2W
R270	RD2588	1.8K 1/2W
R501	RB0400	15K
R502	RB0400	15K
R503	RB0400	15K
R504	RB0400	15K
R505	RB0360	330

SYMBOL NO.	PART NO.	DESCRIPTION
R506	RB0360	330
R507	RB0360	330
R508	RB0360	330
R509	RB0360	330
R510	RB0360	330
R511	RB0360	330
R512	RB0380	2.2K
R513	RB0380	2.2K
R514	RB0380	2.2K
R515	RB0380	2.2K
R516	RB0360	330
R517	RB0360	330
R518	RB0360	330
R519	RB0360	330
R520	RB0360	330
R521	RB0360	330
R522	RB0360	330
R523	RB0380	2.2K
R524	RB0418	82K
Rah	RB0396	10K
Raj		
Rak		

T-14 SCHEMATIC DIAGRAM



STANDARD CURVES



SPECIFICATIONS

Receiving Frequency:	87.55MHz – 108MHz (in 50kHz increments)	
50dB Quieting Sensitivity:	16.6dBf (3.7 μ V)	
IHF Usable Sensitivity:	10.3dBf (1.8 μ V)	
Signal to Noise Ratio:	72dB	
Frequency Response:	30Hz – 15kHz (\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), 20dB (narrow)	
Alternate Channel Selectivity:	80dB (narrow \pm 300kHz) 40dB (wide \pm 400kHz)	
Adjacent Channel Selectivity:	10dB (narrow \pm 200kHz)	
Spurious Response Ratio:	95dB	
IF Response Ratio:	95dB	
Image Response Ratio:	100dB	
AM Suppression Ratio:	60dB	
Stereo Separation:	100Hz 45dB (wide)	
	1kHz 48dB (wide), 30dB (narrow)	
	10kHz 38dB (wide)	
Subcarrier Product Ratio:	65dB	
SCA Rejection Ratio:	60dB	
Output Impedance:	100 ohms	
Muting Threshold:	10 μ V – 100 μ V (variable)	
Weight	Net	6.5kgs (14.3 lbs.)
	Gross	8.0kgs (17.6 lbs.)
Dimensions:	438 (W) x 350 (D) x 78 (H) mm (17-1/4" x 13-3/4" x 3-1/16") (including legs and rear protrusions)	

Specifications and appearance design subject to change without notice.

LUX CORPORATION, JAPAN

1-1, 1-CHOME, SHINSENRI-NISHIMACHI, TOYONAKA-SHI, OSAKA 565
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