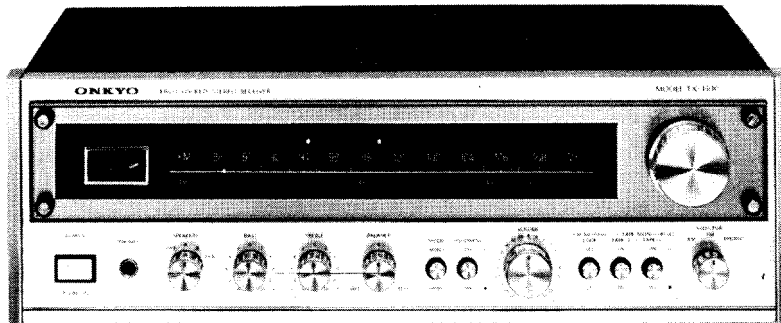


ONKYO® SERVICE MANUAL

SERVO LOCKED FM/AM STEREO RECEIVER Model TX-1500



INDEX

Description	Page
Specifications	2
Service Procedures	3
Stringing Diagram	3
Component Location	4
PC Board Parts List	4
Alignment Procedures	6
Chassis Layout	8
Board View - U.S.A. Model	9
Schematic Diagram - U.S. A. Model	<i>TRO</i> 11
Board View - Universal Model	13
Schematic Diagram - Universal Model	15
Packing Procedures	17

ONKYO®
AUDIO COMPONENTS

SPECIFICATIONS

U.S.A. Model

Amplifier section

Power Output	15 watts per channel, min. RMS, at 8 ohms or 4 ohms, both channels driven, from 20 Hz to 20 kHz, with no more than 0.5 % total harmonic distortion. 17 watts per channel, min. RMS, at 8 ohms both channels driven, 1 kHz, 0.5 % THD. 20 watts per channel, min. RMS, at 4 ohms both channels driven, 1 kHz, 0.5 % THD.
Total Harmonic Distortion	0.5 % at rated power 0.3 % at 1 watt output
IM Distortion	0.5 % at rated power 0.3 % at 1 watt output
Damping Factor	20 (8 ohms 1 kHz 10 watts)
Frequency Response	20 - 30,000 Hz (± 1 dB)
Sensitivity and Impedance	PHONO: 2.5 mV 50 kohms TAPE PLAY: 150 mV 50 kohms TAPE REC: 150 mV 50 kohms
Phono Overload	100 mV RMS 1 kHz 0.5 % THD
Bass Control	± 12 dB at 100 Hz
Treble Control	± 10 dB at 10 kHz
Signal-to-Noise Ratio	PHONO: 65 dB (IHF C NETWORK) TAPE: 80 dB (IHF C NETWORK)
RIAA Curve Deviation	± 0.8 dB at 30 Hz to 15 kHz

Tuner section

Tuning Range	FM: 88 - 108 MHz AM: 530 - 1605 kHz
Usable Sensitivity	FM mono: 2.3 μ V 12.4 dBf FM stereo: 5 μ V 19.2 dBf AM: 25 μ V
50 dB Quieting Sensitivity	FM mono: 4.5 μ V 18.3 dBf FM stereo: 50 μ V 39.2 dBf
Intermediate Frequency	FM: 10.7 MHz AM: 455 kHz
Capture Ratio	FM: 2 dB
Image Rejection	FM: 45 dB AM: 40 dB
IF Rejection	FM: 80 dB AM: 30 dB
Signal-to-Noise Ratio	FM mono: 65 dB FM stereo: 60 dB AM: 40 dB
Alternate Channel Att.	FM: 60 dB
AM Suppression	FM: 50 dB
Harmonic Distortion	FM mono: 0.25 % AM: 0.9 % FM stereo: 0.5 %
Frequency Response	FM: 30 - 15,000 Hz ± 1.5 dB
Stereo Separation	FM: 35 dB at 1 kHz 30 dB at 100 - 10,000 Hz
Muting Level	FM: 3 μ V (14.7 dBf)
Stereo Lamp Level	FM: 3 μ V (14.7 dBf)
Locking Level	FM: 3 μ V (14.7 dBf)
Tuning Meter	Signal Strength Meter

General

Power Supply	AC 120 V 60 Hz.
Dimensions (W x H x D)	17-5/16" x 5-7/8" x 12-3/16"
Weight	439 x 149 x 310 mm 16.1 lbs. 7.3 kg.

Universal Model

Amplifier section

Power Output	70 watts total at 4 ohms 0.5 % THD. 20 watts per channel, min. RMS, at 4 ohms both channels driven, 0.5 % THD. at 1 kHz 17 watts per channel, min. RMS, at 8 ohms both channels driven, 0.5 % THD. at 1 kHz 15 watts per channel, min. RMS, at 4 ohms or 8 ohms both channels driven, from 20 Hz to 20 kHz, 0.5 % THD.
Dynamic Continuous	0.5 % at rated power 0.3 % at 1 watt output
Total Harmonic Distortion	0.5 % at rated power 0.3 % at 1 watt output
IM Distortion (70 Hz: 7 kHz= 4 : 1)	0.3 % at 1 watt output
Damping Factor	20 (8 ohms 1 kHz)
Frequency Response	20 - 20,000 Hz (± 1 dB)
Sensitivity and Impedance	PHONO: 2.5 mV 50 kohms TAPE PLAY: 150 mV 50 kohms TAPE REC: 150 mV 50 kohms
Phono Overload	100 mV RMS at 1 kHz 0.5 % THD.
Tone Control BASS	± 12 dB at 100 Hz
TREBLE	± 10 dB at 10 kHz
Signal-to-Noise Ratio	PHONO: 65 dB (IHF C NETWORK) TAPE: 80 dB (IHF C NETWORK)
RIAA Curve Deviation	± 0.8 dB at 30 Hz to 15 kHz

Tuner section

Tuning Range	FM: 88 - 108 MHz AM: 530 - 1605 kHz
Usable Sensitivity	FM mono: 2.3 μ V (12.4 dBf) IHF 1.8 μ V (S/N 26 dB, 40 kHz Devi.) DIN FM stereo: 5 μ V (19.2 dBf) IHF 50 μ V (S/N 46 dB, 40 kHz Devi.) DIN AM: 25 μ V
50 dB Quieting Sensitivity	FM mono: 4.5 μ V (18.3 dBf) FM stereo: 50 μ V (39.2 dBf)
Intermediate Frequency	FM: 10.7 MHz AM: 455 kHz
Capture Ratio	FM: 2 dB
Image Rejection Ratio	FM: 45 dB AM: 40 dB
IF Rejection Ratio	FM: 80 dB AM: 30 dB
Signal-to-Noise Ratio	FM mono: 65 dB AM: 40 dB FM stereo: 60 dB
Alternate Channel Att. Selectivity	FM: 60 dB FM: 42 dB DIN (± 300 kHz, 40 kHz Devi.)
AM Suppression Ratio	FM: 50 dB
Harmonic Distortion	FM mono: 0.25 % AM: 0.9 % FM stereo: 0.5 %
Frequency Response	FM: 30 - 15,000 Hz ± 1.5 dB
Deemphasis Switch	FM: 50 μ s/75 μ s
Stereo Separation	FM stereo: 35 dB at 1 kHz 30 dB at 100 - 10,000 Hz
Muting Level	FM: 3 μ V
Stereo Threshold	FM: 3 μ V
Servo Lock Lamp Level	FM: 3 μ V
Spurious Rejection	FM: 78 dB (1/2 IF)
Sub Carrier Suppression	FM: 40 dB
Tuning Meter	Signal strength meter

General

Power Supply Rating	AC 110/120/220/240 volts 50/60 Hz
Controls	POWER SPEAKERS (OFF, A, B, A+B) SELECTOR (AM, FM, PHONO) TAPE MONITOR 1 & 2 TUNING, VOLUME, BALANCE, TREBLE, BASS FM MUTING/SERVO LOCK SWITCH LOUDNESS, MODE
Antennas	FM: 300 ohms balanced AM: built in ferrite core antenna and external terminal
Outputs	SPEAKER A & B, HEADPHONES TAPE REC OUT 1 & 2, DIN REC OUT
Inputs	PHONO, TAPE PLAY 1 & 2, DIN PLAY FM & AM ANTENNA
Dimensions	439 W x 149 H x 310 D mm
Weight	7.3 kg.
Semiconductors	1 FET, 12 Transistors, 7 ICs, 21 Diodes

Specifications and features are subject to change without notice.

SERVICE PROCEDURES

1. REMOVAL OF DIAL GLASS

- (1) Pull TUNING knob off the TUNING shaft.
- (2) Remove four hex bolts.

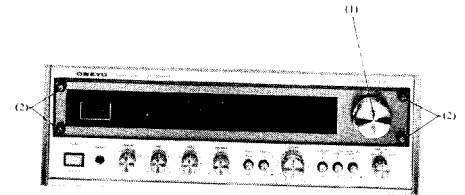


fig-1

2. REMOVAL OF FRONT PANEL

- (1) Pull all knobs off control shafts.
- (2) Remove two hex bolts.
- (2) Remove three screws.

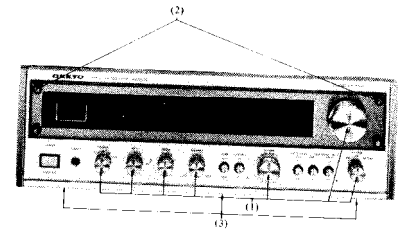


fig-2

3. REPLACING STEREO / LOCKED INDICATOR (L.E.D.)

- (1) Remove four screws which hold the top cover to the chassis and lift off the top cover.
- (2) Remove a screw which hold the PC board to the front bracket.
- (3) There is a cathode mark on the foot of L.E.D.

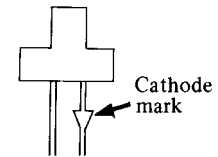


fig-3

4. REPLACING DIAL LAMP

- (1) Remove four screws which hold the top cover to the chassis and lift off the top cover.
- (2) Remove the two screws which hold the lamp case to the front bracket.

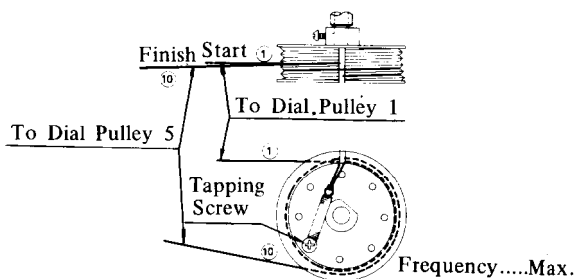
5. REPLACING POWER FUSE (U.S.A. MODEL)

- (1) Remove four screws which hold the top cover to the chassis and lift off the top cover.
- (2) Replace a fuse between a back panel and a power transformer.

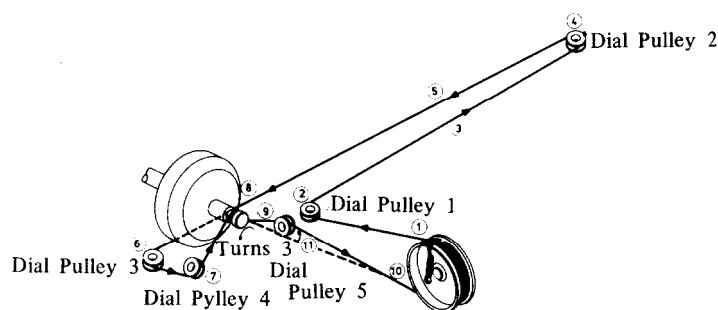
6. REPLACING SPEAKER FUSE

- (1) Remove a screw which hold the fuse cover to the back panel.

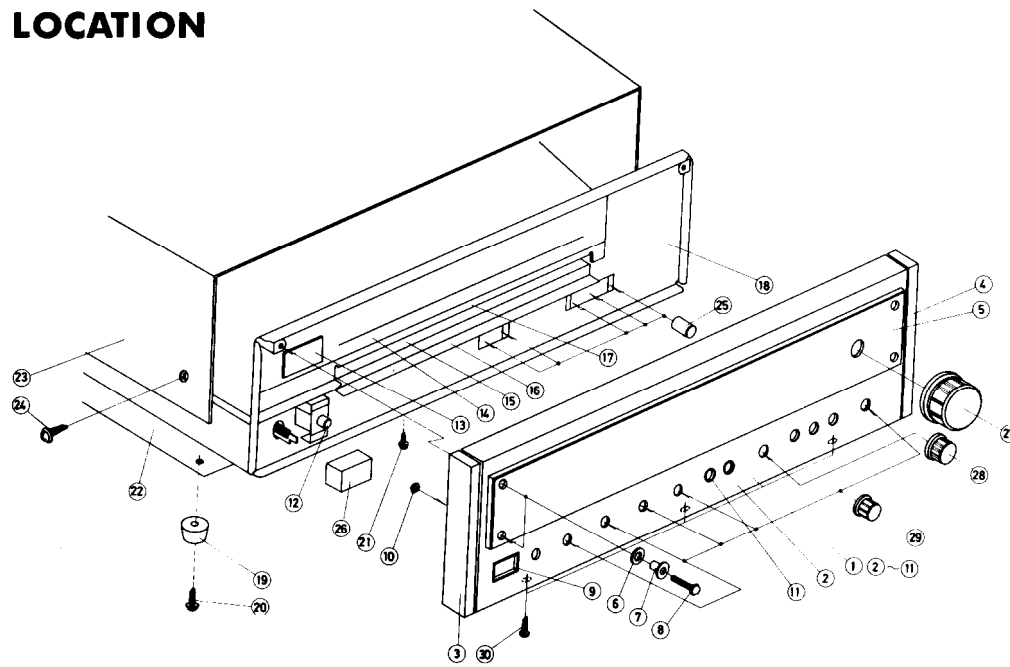
STRINGING DIAGRAM



1. Open the variable capacitor complete and tie dial cord to the spring of the drum.
2. Thread dial cord in the direction of arrow from ① to ⑧ and wind dial cord three turns around the tuning shaft counter-clockwise.
3. Thread dial cord in the direction of arrow from ⑨ to ⑩.
4. Thread dial cord to the dial pulley 5.



COMPONENT LOCATION



PARTS LIST

REF. NO.	PARTS NO.	DESCRIPTION	REF. NO.	PARTS NO.	DESCRIPTION
1	13779121	Front Panel Ass'y	16	27300036	Pointer Rail
2	27210067	Front Panel	17	28165031	Pointer
3	28125039A	End Cap, Left	18	27110037	Front Bracket
4	28125040A	End Cap, Right	19	280379	Leg
5	28191016A	Dial Glass	20	831130162	3STW+16BQ
6	870054	Washer	21	831130062	3STW+6BQ
7	27270017A	Spacer	22	27170024	Bottom Board
8	84334015	M4x15 Hex Volt	23	28184023A	Amp. Cover (U.S.A. Model)
9	27267026	Power Switch Guide		28184024	Amp. Cover (Universal Model)
10	863140	N-4F-N Nut	24	838440109	4TTB+10C (BC)
11	27267010	Push Switch Guide	25	28320133	Push Button A
12	25045018	LJ-100-H Stereo Headphone Jack	26	28320171A	POWER Knob
13	243069	NIND-0500S69 Strength Meter	27	28320170	TUNING Knob
14	28130048A	Dial Plate	28	2830132	VOLUME Knob
15	27240011	Bracket, Dial Plate	29	28320131	TONE Knob
			30	834130062	3STS+6BQ

PC BOARD PARTS LIST

NAAR-395 PC. BOARD-PARTS LIST

CIRCUIT NO.	DESCRIPTION	STOCK NO.	CIRCUIT NO.	DESCRIPTION	STOCK NO.
	TRANSISTORS			ICS	
Q001	2SC380(O) or FM RF. Amp.	2210123	Q102	LA1230, Quadrature Det.	222455
		2210124	Q103	LA3350, MPX.	222449
Q002	2SC785(O-1), Mixer	2210380	Q104	HA-1151, AM	222418
Q003	2SC394(O), FM OSC.	2210393	Q301, Q401	TA7129(ONK), EQ. Amp.	222451
Q101	2SC380(O) or FM IF Amp.	2210123	Q501, Q502	STK-075, Power Amp.	222010
		2210124			
Q105	2SC1317(R) or Locked Lamp Switch	2210943		DIODES	
		2211182	D001	1S2687, Variable Capacitor	223110
Q106	2SC1317(Q) or Mono-ST. Switch	2210942	D101, D102		
		2210244	D105, D108	1S1555	223105
Q107	2SC945(K) or Muting	2210741	D702-D704		
		2211184	D106	VD1212, Varistor	4000022
Q108	2SC1740(S), Locked Lamp Switch	2211184	D109	1N60	223103
Q302, Q402	2SC1312(G) or Tone Amp.	2210137	D701	1S1554	223106
		2210975	D901, D903	GP-15B	223842
Q701, Q702	2SC733(BL) or Transient Killer	2210086	D905, D907		
		2211184	D909, D910	10D2	223805
		2211043	D911	1S1886	223806
Q703	2SC1318(R) or Rectifier	2211044			
			D912	BZ-130	223929
			D913	WZ-150	223915

NAAR-395 PC. BOARD-PARTS LIST

CIRCUIT NO.	DESCRIPTION	STOCK NO.	CIRCUIT NO.	DESCRIPTION	STOCK NO.
COILS					
L001	NFA 3001 NFA-3009 or FM RF.	233088-1 233106 or	C701	4.7 μ F50V, Elect.	352780471
L002	NFRF-3005, FM RF.	233103	C702	220 μ F16V, Elect.	352742211
L003	NFT-1501, FM RF.	233037	C705	22 μ F35V, Elect.	352762201
L004	NFO-3003, FM OSC.	233090	C706	220 μ F35V, Elect.	352762211
L101	NCCH-1501 NCCH-1005 or 3.3 μ H	233024 233105 or	C914	470 μ F50V, Elect.	352784711
L102	NCCH-1506 18 μ H	233074	C915	470 μ F35V, Elect.	352764711
L103, L104	NMC-8-5, L.P.F.	233021	C916	100 μ F16V, Elect.	352741011
L106	NMO-2503, AM OSC.	232013	VARIABLE RESISTORS		
TRANSFORMERS					
T001	NIT-0518, FM IF.	233085	R149	N10HR1KBC, Separation Adjust.	5225018
T101	NIT-3516 NFIIF-6003 or FM Det.	233083 233101 or	R152	N10HR5KBC, 19 kHz Adjustment	5225056
T102	NIT-0519, AM Det.	232041	R336, R436	N24RGP250KBT30-41C, Volume	5172042
CERAMIC FILTERS					
X101, X102	SFE-10.7MA, FM IF.	3010003	R342	N16RL100KW30, Balance	5104046
X103	CFZ-455C, AM IF.	3010004	R345, R351 R445, R451	N16RGM100KB30, Tone	5148014
CAPACITORS					
VC001- VC005	NVC2-327SA, Variable	3050004	RESISTORS		
TC005	NTC-10P02, Trimmer	3060003	R701	1.2k Ω 2W, Oxide Film	441721224
C107	4.7 μ F, 25V, Elect.	35275047	R709	620 Ω 1W, Oxide Film	431626214
C106	22 μ F10V, Elect.	35273220	R904	100 Ω 2W, Oxide Film	441721014
C110, C142	10 μ F16V, Elect.	352741001	R905	220 Ω 2W, Oxide Film	441722214
C143	1 μ F50V, Elect.	352780101	R157	560 Ω 1W, Oxide Film	431625614
C144, C145	0.22 μ F \pm 20% 50V, LL	392882297	SWITCHES		
C153	150pF \pm 10% 50V, Polystyren	372321525	S801	NRS-143-30ZV, Source Selector	25030075
C154	0.47 μ F \pm 20% 50V, LL	392884797	S802- S804	NPS-122X3LA, Mut. Tape-1, 2	25035032
C155	0.22 μ F \pm 20% 50V, LL	392882297	S805, S806	NPS-222-L14A, Loudness, Mode	25035049
C156	0.33 μ F \pm 20% 50V, LL	392883397	TERMINALS		
C158	220 μ F16V, Elect.	352742211	P801	NPJ-2PDBL10, Phono Input	25045034
C160	47 μ F10V, Elect.	352734711	P802, P803	NPJ-4PDBL11, Tape	25045020
C166	360pF \pm 5% 50V, Polystyren	372323614	SHIELDED PLATES		
C170	1 μ F50V, Elect.	352780101	Front End Top		27150056A
C173	3.3 μ F50V, Elect.	352780331	FM OSC.		27150057
C175	0.039 μ F \pm 20% 50V, DE	374123937	The Universal type adds from the USA model at the following parts.		
C176	10 μ F16V, Elect.	352741001	S807	NSS-2225, De Emphasis Selector Switch	250142
C177	100 μ F16V, Elect.	352741011	P804	S-13316, DIN Socket	250199
C178	100 μ F6.3V, Elect.	352721011	PILOT LAMP PC. BOARD-PARTS LIST		
C302, C402	4.7 μ F25V, Elect.	352750471	CIRCUIT NO.	DESCRIPTION	STOCK NO.
C303, C304	100 μ F, 6.3V, Elect.	352721011	PILOT LAMPS		
C308, C408	0.47 μ F50V, Elect.	352784791	PL801- PL803	250mA, 6.3V, Dial Illumination	210026
C309, C409	0.33 μ F \pm 20% 50V, LL	392883397	Fuse Holder, SN5051		
C311	330 μ F35V, Elect.	352763311	<i>PL804</i> <i>DIAL POINTER LAMP</i> <i>210015A</i>		
C332, C432	0.047 μ F \pm 10% 50V, DE	374124735	L.E.D.PC. BOARD-PARTS LIST		
C333, C433	2.2 μ F \pm 20% 50V, LL	392880227	CIRCUIT NO.	DESCRIPTION	STOCK NO.
C335, C435	220 μ F16V, Elect.	352742211	D801, D802	SE1103R, L.E.D.	225010
C336, C436	3.3 μ F50V, Elect.	352780331	POWER FUSE PC. BOARD-PARTS LIST		
C337, C437	3.3 μ F50V, Elect.	352780331	(Only U.S.A. Model)		
C501, C601	1 μ F \pm 20% 50V, LL	392880107	F901	2A(ST-2), Fuse	252044
C502, C602	33 μ F10V, Elect.	352733301	Fuse Holder, SN5051		
C506, C606	100 μ F16V, Elect.	352741011			
C507, C607	47 μ F50V, Elect.	352780471			
C508, C608	4.7 μ F50V, Elect.	352780471			
C511, C611	4.7 μ F50V, Elect.	352780471			

ALIGNMENT PROCEDURES

INSTRUMENTS REQUIRED

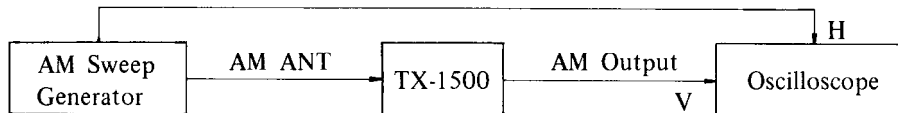
1. AM Sweep Generator
2. AM and FM Signal Generator
3. Vacume Tube Voltage Meter (VTVM) AC, DC
4. Oscilloscope
5. Distortion Analyzer
6. Stereo Modulator
7. Frequency Counter

GENERAL ALIGNMENT CONDITIONS

1. Signal input should be kept as low as possible.
2. Standard modulation is 400Hz 30% (AM), 400Hz 100% (FM MONO) pilot 10% sub and main 90% (FM STEREO).

(1) AM IF ALIGNMENT

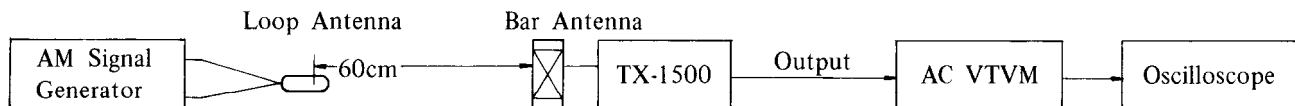
1. Set SELECTOR switch to AM.
2. Set radio dial to quiet point.



Set signal	Adjust	Oscilloscope	Remarks
455 KHz	X103 (CFZ-455C)	Maximum Symmetrical Response	Usually not necessary to adjust

(2) AM RF ALIGNMENT

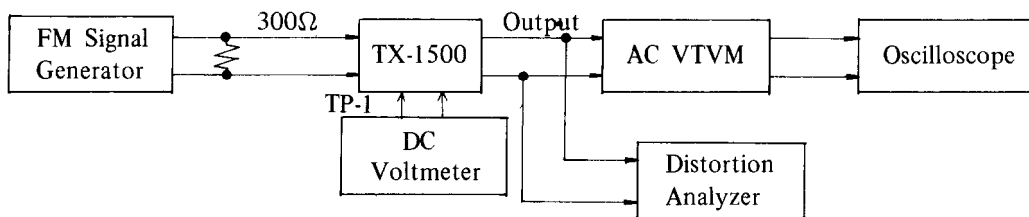
1. Remove a screw on the AM antenna cover.



Step	Set Signal	Set Radio Dial	Adjust	VTVM reading	Remarks
1	515 KHz 400 Hz 30 %	Lower end (515 KHz)	L103 NMO-2503	Maximum	Repeat step 1 and 2 as necessary
2	1680 KHz 400 Hz 30 %	Upper end (1680 KHz)	TC-002	Maximum	
3	600 KHz 400 Hz 30 %	600 KHz	L005 NMA-1008	Maximum	Repeat step 3 and 4 as necessary
4	1400 KHz 400 Hz 30 %	1400 KHz	TC-001	Maximum	

(3) FM FRONT END ALIGNMENT

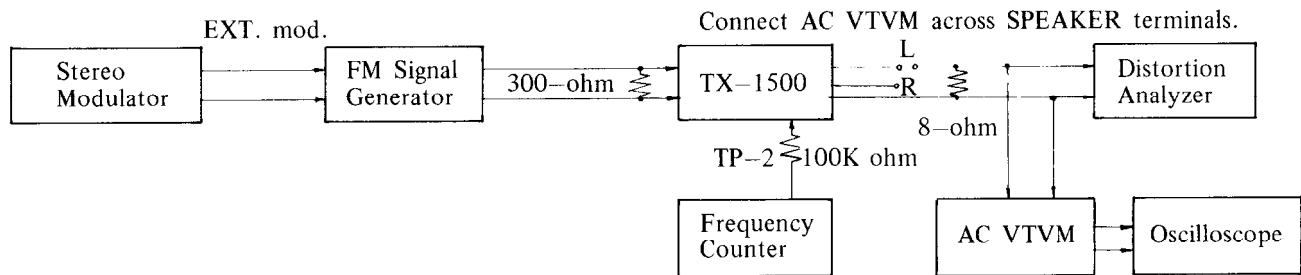
1. Set SELECTOR switch to FM.
2. Push MUTING switch to off.
3. Connect FM Signal Generator to 300-ohm antenna terminals.
4. Connect DC Voltmeter to TP-1 terminals.



Step	FM Signal Generator	Dial to set	Adjust	Output Indicator	Adjust for	Remarks
1	No signal	Quiet Point	T101 Bottom	DC Voltmeter	OV	Repeat step 1 and 2 as necessary.
2	98 MHz 60 dB 400 Hz 100% mod.	98 MHz	T101 Top	Distortion Analyzer	Minimum	
3	90 MHz 60 dB 400 Hz 100% mod.	90 MHz	L004 OSC Coil NFO-3003	AC VTVM or Oscilloscope	Maximum	Repeat step 3 and 4 as necessary.
4	106 MHz 400 Hz 60 dB 100% mod.	106 MHz	TC005		Maximum	
5	90 MHz 400 Hz 100% mod.	90 MHz	L001, L002		Maximum	Repeat step 5 and 6 as necessary.
6	106 MHz 400 Hz 100% mod.	106 MHz	TC003 TC004		Maximum	
7	98 MHz 400 Hz 100% mod.	98 MHz	T001 NIT-0518		Maximum	

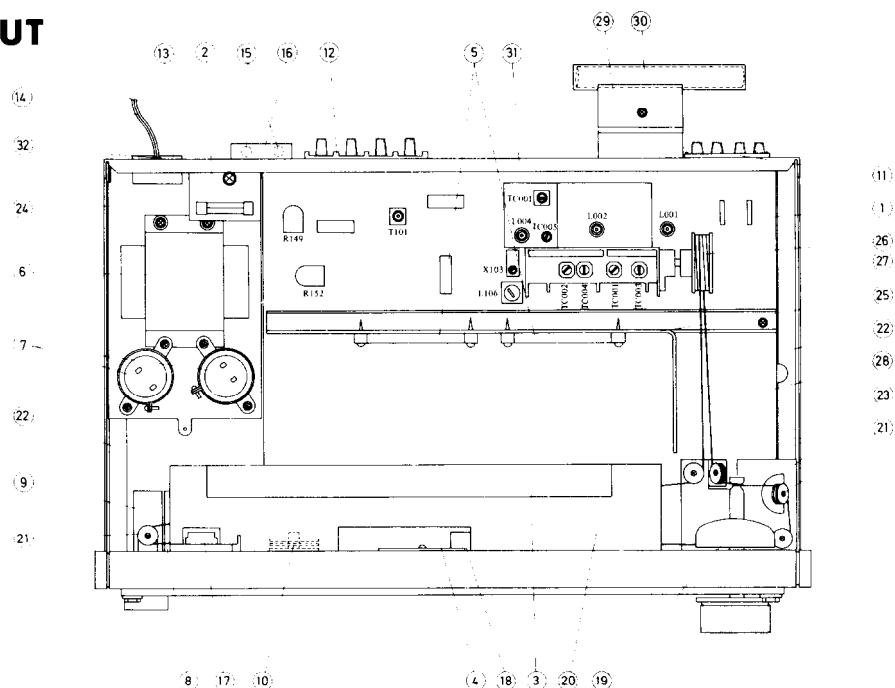
NOTES: When adjust step 5 and 6, set FM Signal Generator level as low as possible.

(4) FM MONO DISTORTION AND MULTIPLEX ALIGNMENT



Alignment	Step	FM Signal Generator	Stereo Modulator	Dial to set	Adjust	Output Indicator	Adjust for	Remarks
Mono Distortion		98 MHz 400 Hz 100% mod. 60 dB	—————	98 MHz	T101 Bottom	Distortion Analyzer	Minimum	
19 KHz	1	98 MHz 400 Hz no mod. 60 dB	—————	98 MHz	R152	Frequency Counter	19000±19 Hz	
	2	STEREO INDICATOR should light up when stereo program is being received.						
Multiplex	1	98 MHz EXT. Mod.	Pilot Sig. 10% Main & Sub Sig. 1 KHz Lch 90%	98 MHz	R149	AC VTVM Right ch.	Minimum	Repeat step 1 & 2 as necessary
	2	Same as above	Pilot Sig. 10% Main & Sub Sig. 1 KHz Rch 90%	98 MHz	R149	AC VTVM Left ch.	Minimum	

CHASSIS LAYOUT



PARTS LIST U.S.A. Model

REF. NO.	PARTS NO.	DESCRIPTION
1	13779595	NAAR-395 Tuner and Pre/Main Amp. P.C.B.
2	13779596	NAFU-396 Power Fuse P.C.B.
3	13779597	NAPL-397 Dial Illumination Lamp P.C.B.
4	13779599	NAPL-399 STEREO/LOCKED Indicator P.C.B.
5	222010	STK-075 Power Amp. IC
6	230185	NPT-616D Power Transformer
7	3504081	4700 μ F35V Elect. Capacitor
8	3504012	0.01 μ F \pm 20% 125V UL Capacitor
9	25035047	NPS-111-L12P Power Switch
10	25030074	NRS-144-30Y Speaker Selector Switch
11	25060003	NTM-4PUN1-L Antenna Terminal
12	25060001A	NTM-4WPUN1 Speaker Terminal
13	25050008A	S-16432 AC Outlet
14	253072	AS-UC AC Cord
15	252025	2.5A-T Speaker Fuse
16	25050004	Fuse Holder with Cover
17	243069	NIND-0500S69 Strength Meter
18	27110037	Front Bracket
19	27205006	Drive Shaft Ass'y
20	27250011A	Lamp Case
21	27185003	Dial Pulley
22	27115018	Side Bracket
23	27140144	Bracket, Dial Pulley
24	27130098	Bracket, Power Transformer
25	27160024	Heat Sink
26	27200019	Dial Drum
27	273803	Dial Drum Spring
28	273903	Dial Cord
29	27190024	AM Antenna Case
30	232063	NMA-1008 AM Bar Antenna
31	27120065A	Back Panel
32	270025	SP-3P-4 Strainrelief

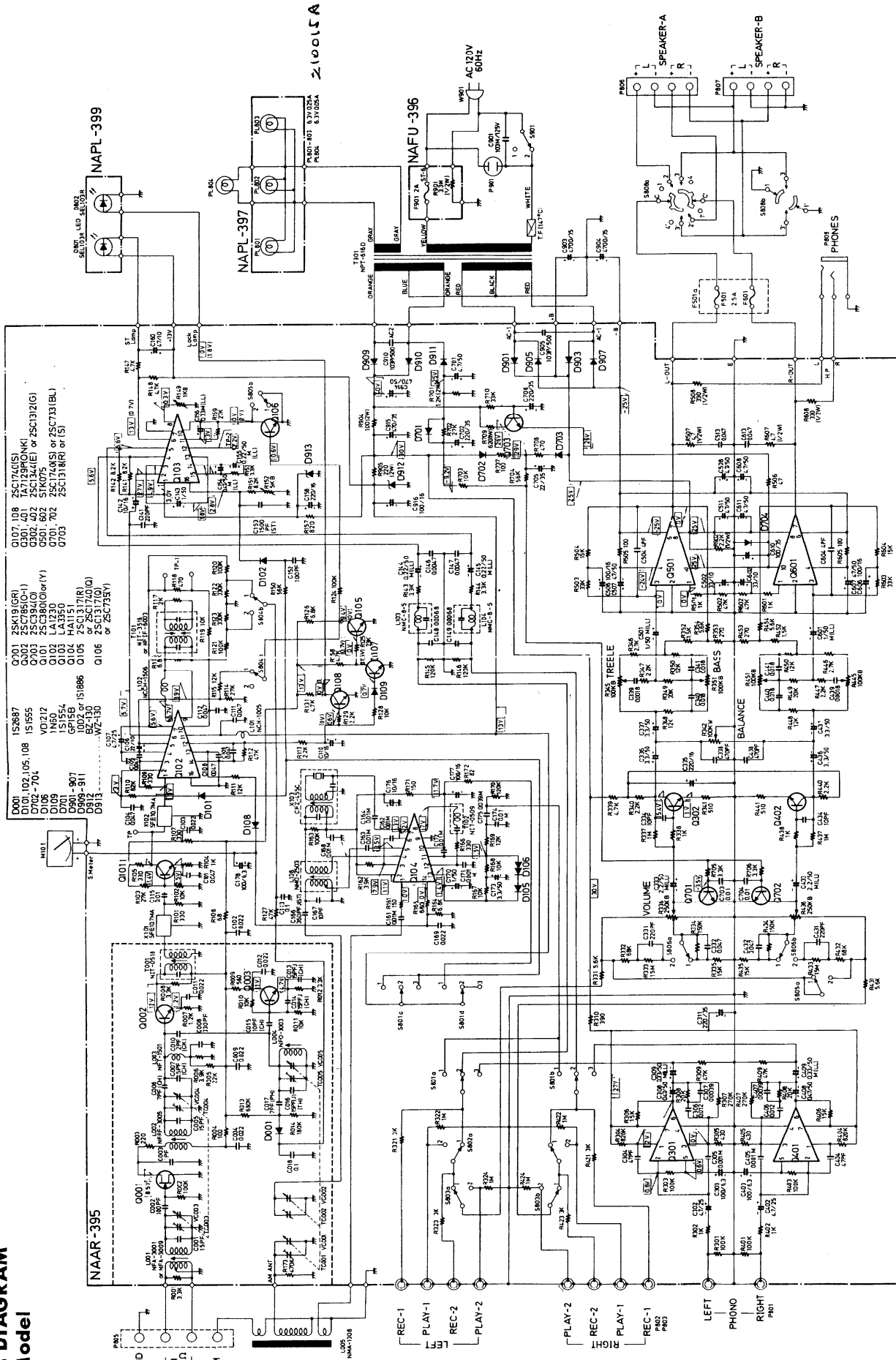
Universal Model

REF. NO.	PARTS NO.	DESCRIPTION
1	13780595A	NAAR-395a Tuner and Pre/Main Amp. P.C.B.
2	None	
3	13779597	NAPL-397 Dial Illumination Lamp P.C.B.
4	13779599	NAPL-399 STEREO/LOCKED Indicator P.C.B.
5	222010	STK-075 Power Amp. IC
6	230186	NPT-616ADGQ Power Transformer
7	3504081	4700 μ F35V Elect. Capacitor
8	3500052	PME271Y510CEE IS Capacitor
9	25035034	NPS-121-L Power Switch
10	25030074	NRS-144-30Y Speaker Selector Switch
11	25060003	NTM-4PUN1-L Antenna Terminal
12	25060001A	NTM-4WPUN1 Speaker Terminal
13	None	
14	None	
15	252025	2.5A-T Speaker Fuse
16	25050004	Fuse Holder with Cover
17	243069	NIND-0500S69 Strength Meter
18	27110037	Front Bracket
19	27205006	Drive Shaft Ass'y
20	27250011A	Lamp Case
21	27185003	Dial Pulley
22	27115018	Side Bracket
23	27140144	Bracket, Dial Pulley
24	27130098	Bracket, Power Transformer
25	27160024	Heat Sink
26	27200019	Dial Drum
27	273803	Dial Drum Spring
28	273903	Dial Cord
29	27190024	AM Antenna Case
30	232063	NMA-1008 AM Bar Antenna
31	27120066	Back Panel
32	None	

The Universal Model adds from the U.S.A. Model at the following parts.

25050018	PA-125, 3P Inlet
252015	1.5A-T Power Fuse
250227	SFO40A3 PS Plug
253083	AS-CEE AC Cord
250186	SI-7205-7 VS Socket

SCHEMATIC DIAGRAM U.S.A. Model



- SWITCH (SELECTOR)
- S801 (TAPE MONITOR - 1) 1 - AM, 2 - FM, 3 - PHONO
 - S802 (TAPE MONITOR - 2) 1 - OFF, 2 - ON
 - S803 (TAPE MONITOR - 2) 1 - OFF, 2 - ON
 - S804 (MUTING LOCK) 1 - ON, 2 - OFF
 - S805 (MODE) 1 - STEREO, 2 - MONO
 - S806 (LOUDNESS) 1 - OFF, 2 - ON
 - S807 (TUNERS) 1 - OFF, 2 - ON
 - S808 (POWER) 1 - OFF, 2 - ON

NOTES:

- ALL RESISTORS ARE IN OHMS, 1/4 WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN P.F. UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS ARE IN μ F/70V.
- VOLTAGE (MEASURED WITH V.T.V. METER).
- V DC VOLTAGE (NO INPUT SIGNAL).
- V DC VOLTAGE (FM STEREO).

- O107 108 25C174(S)
- O301 401 2A7129(P)NK1
- O302 402 25C134(E) or 25C1312(G)
- O501 602 5YK075
- O701 702 25C131(MR) or (S)
- O703 25C131(MR) or (S)

- O101 102, 105, 108 1S2687
- D702 - 704
- D106
- VD217
- S1554
- GR15B
- HAI151
- 25C1317(R)
- 100Z or 1S1886
- 25C1317(Q)
- 5Z-130
- 25C733(V)

- D901
- D902
- D903
- D904
- D905
- D906
- D907
- D908
- D909
- D910
- D911
- D912
- D913

- R100 100K
- R101 100K
- R102 100K
- R103 100K
- R104 100K
- R105 100K
- R106 100K
- R107 100K
- R108 100K
- R109 100K
- R110 100K
- R111 100K
- R112 100K
- R113 100K
- R114 100K
- R115 100K
- R116 100K
- R117 100K
- R118 100K
- R119 100K
- R120 100K
- R121 100K
- R122 100K
- R123 100K
- R124 100K
- R125 100K
- R126 100K
- R127 100K
- R128 100K
- R129 100K
- R130 100K
- R131 100K
- R132 100K
- R133 100K
- R134 100K
- R135 100K
- R136 100K
- R137 100K
- R138 100K
- R139 100K
- R140 100K
- R141 100K
- R142 100K
- R143 100K
- R144 100K
- R145 100K
- R146 100K
- R147 100K
- R148 100K
- R149 100K
- R150 100K
- R151 100K
- R152 100K
- R153 100K
- R154 100K
- R155 100K
- R156 100K
- R157 100K
- R158 100K
- R159 100K
- R160 100K
- R161 100K
- R162 100K
- R163 100K
- R164 100K
- R165 100K
- R166 100K
- R167 100K
- R168 100K
- R169 100K
- R170 100K
- R171 100K
- R172 100K
- R173 100K
- R174 100K
- R175 100K
- R176 100K
- R177 100K
- R178 100K
- R179 100K
- R180 100K
- R181 100K
- R182 100K
- R183 100K
- R184 100K
- R185 100K
- R186 100K
- R187 100K
- R188 100K
- R189 100K
- R190 100K
- R191 100K
- R192 100K
- R193 100K
- R194 100K
- R195 100K
- R196 100K
- R197 100K
- R198 100K
- R199 100K
- R200 100K
- R201 100K
- R202 100K
- R203 100K
- R204 100K
- R205 100K
- R206 100K
- R207 100K
- R208 100K
- R209 100K
- R210 100K
- R211 100K
- R212 100K
- R213 100K
- R214 100K
- R215 100K
- R216 100K
- R217 100K
- R218 100K
- R219 100K
- R220 100K
- R221 100K
- R222 100K
- R223 100K
- R224 100K
- R225 100K
- R226 100K
- R227 100K
- R228 100K
- R229 100K
- R230 100K
- R231 100K
- R232 100K
- R233 100K
- R234 100K
- R235 100K
- R236 100K
- R237 100K
- R238 100K
- R239 100K
- R240 100K
- R241 100K
- R242 100K
- R243 100K
- R244 100K
- R245 100K
- R246 100K
- R247 100K
- R248 100K
- R249 100K
- R250 100K
- R251 100K
- R252 100K
- R253 100K
- R254 100K
- R255 100K
- R256 100K
- R257 100K
- R258 100K
- R259 100K
- R260 100K
- R261 100K
- R262 100K
- R263 100K
- R264 100K
- R265 100K
- R266 100K
- R267 100K
- R268 100K
- R269 100K
- R270 100K
- R271 100K
- R272 100K
- R273 100K
- R274 100K
- R275 100K
- R276 100K
- R277 100K
- R278 100K
- R279 100K
- R280 100K
- R281 100K
- R282 100K
- R283 100K
- R284 100K
- R285 100K
- R286 100K
- R287 100K
- R288 100K
- R289 100K
- R290 100K
- R291 100K
- R292 100K
- R293 100K
- R294 100K
- R295 100K
- R296 100K
- R297 100K
- R298 100K
- R299 100K
- R300 100K
- R301 100K
- R302 100K
- R303 100K
- R304 100K
- R305 100K
- R306 100K
- R307 100K
- R308 100K
- R309 100K
- R310 100K
- R311 100K
- R312 100K
- R313 100K
- R314 100K
- R315 100K
- R316 100K
- R317 100K
- R318 100K
- R319 100K
- R320 100K
- R321 100K
- R322 100K
- R323 100K
- R324 100K
- R325 100K
- R326 100K
- R327 100K
- R328 100K
- R329 100K
- R330 100K
- R331 100K
- R332 100K
- R333 100K
- R334 100K
- R335 100K
- R336 100K
- R337 100K
- R338 100K
- R339 100K
- R340 100K
- R341 100K
- R342 100K
- R343 100K
- R344 100K
- R345 100K
- R346 100K
- R347 100K
- R348 100K
- R349 100K
- R350 100K
- R351 100K
- R352 100K
- R353 100K
- R354 100K
- R355 100K
- R356 100K
- R357 100K
- R358 100K
- R359 100K
- R360 100K
- R361 100K
- R362 100K
- R363 100K
- R364 100K
- R365 100K
- R366 100K
- R367 100K
- R368 100K
- R369 100K
- R370 100K
- R371 100K
- R372 100K
- R373 100K
- R374 100K
- R375 100K
- R376 100K
- R377 100K
- R378 100K
- R379 100K
- R380 100K
- R381 100K
- R382 100K
- R383 100K
- R384 100K
- R385 100K
- R386 100K
- R387 100K
- R388 100K
- R389 100K
- R390 100K
- R391 100K
- R392 100K
- R393 100K
- R394 100K
- R395 100K
- R396 100K
- R397 100K
- R398 100K
- R399 100K
- R400 100K
- R401 100K
- R402 100K
- R403 100K
- R404 100K
- R405 100K
- R406 100K
- R407 100K
- R408 100K
- R409 100K
- R410 100K
- R411 100K
- R412 100K
- R413 100K
- R414 100K
- R415 100K
- R416 100K
- R417 100K
- R418 100K
- R419 100K
- R420 100K
- R421 100K
- R422 100K
- R423 100K
- R424 100K
- R425 100K
- R426 100K
- R427 100K
- R428 100K
- R429 100K
- R430 100K
- R431 100K
- R432 100K
- R433 100K
- R434 100K
- R435 100K
- R436 100K
- R437 100K
- R438 100K
- R439 100K
- R440 100K
- R441 100K
- R442 100K
- R443 100K
- R444 100K
- R445 100K
- R446 100K
- R447 100K
- R448 100K
- R449 100K
- R450 100K
- R451 100K
- R452 100K
- R453 100K
- R454 100K
- R455 100K
- R456 100K
- R457 100K
- R458 100K
- R459 100K
- R460 100K
- R461 100K
- R462 100K
- R463 100K
- R464 100K
- R465 100K
- R466 100K
- R467 100K
- R468 100K
- R469 100K
- R470 100K
- R471 100K
- R472 100K
- R473 100K
- R474 100K
- R475 100K
- R476 100K
- R477 100K
- R478 100K
- R479 100K
- R480 100K
- R481 100K
- R482 100K
- R483 100K
- R484 100K
- R485 100K
- R486 100K
- R487 100K
- R488 100K
- R489 100K
- R490 100K
- R491 100K
- R492 100K
- R493 100K
- R494 100K
- R495 100K
- R496 100K
- R497 100K
- R498 100K
- R499 100K
- R500 100K

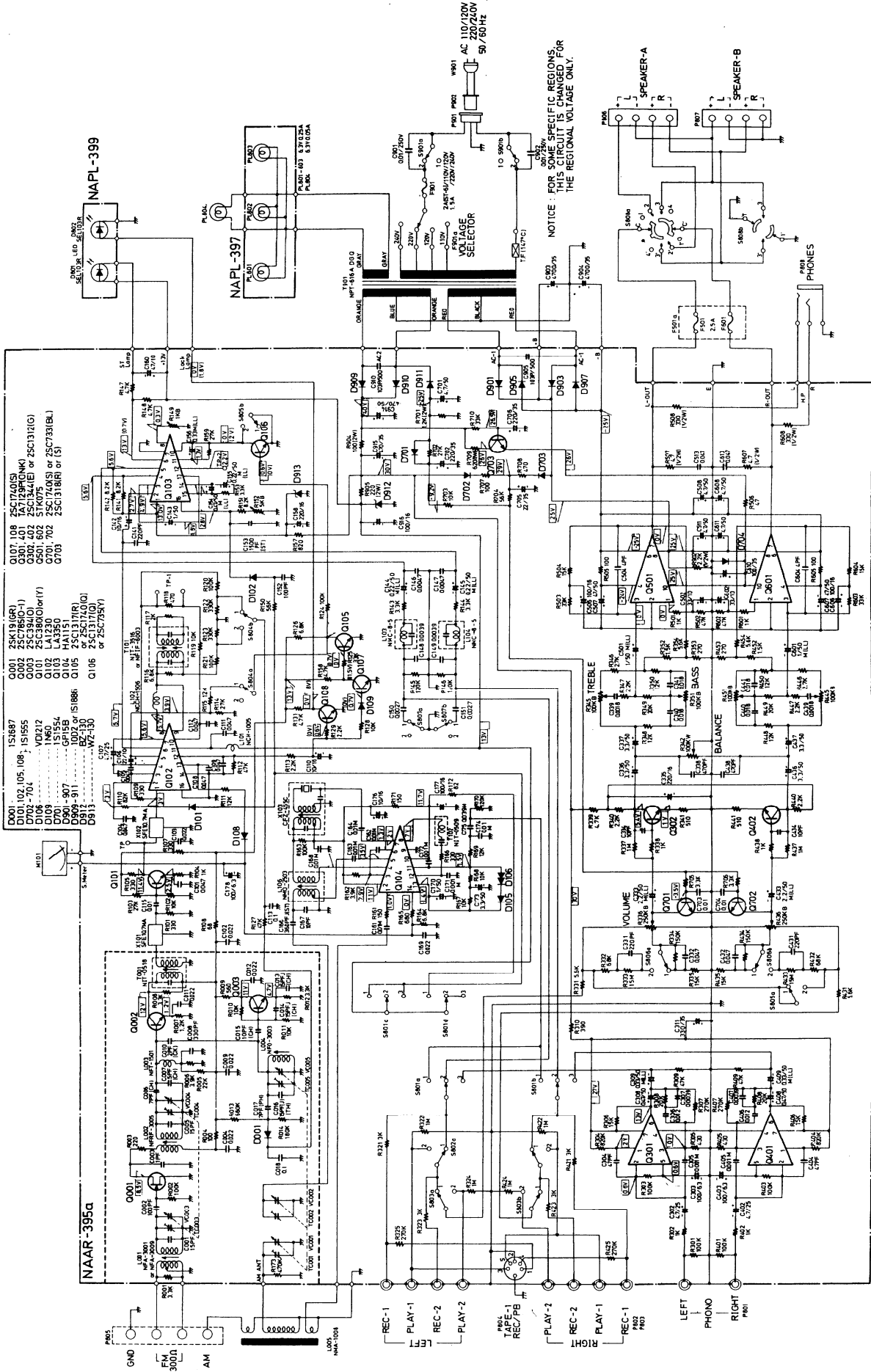
- C100 100P
- C101 100P
- C102 100P
- C103 100P
- C104 100P
- C105 100P
- C106 100P
- C107 100P
- C108 100P
- C109 100P
- C110 100P
- C111 100P
- C112 100P
- C113 100P
- C114 100P
- C115 100P
- C116 100P
- C117 100P
- C118 100P
- C119 100P
- C120 100P
- C121 100P
- C122 100P
- C123 100P
- C124 100P
- C125 100P
- C126 100P
- C127 100P
- C128 100P
- C129 100P
- C130 100P
- C131 100P
- C132 100P
- C133 100P
- C134 100P
- C135 100P
- C136 100P
- C137 100P
- C138 100P
- C139 100P
- C140 100P
- C141 100P
- C142 100P
- C143 100P
- C144 100P
- C145 100P
- C146 100P
- C147 100P
- C148 100P
- C149 100P
- C150 100P
- C151 100P
- C152 100P
- C153 100P
- C154 100P
- C155 100P
- C156 100P
- C157 100P
- C158 100P
- C159 100P
- C160 100P
- C161 100P
- C162 100P
- C163 100P
- C164 100P
- C165 100P
- C166 100P
- C167 100P
- C168 100P
- C169 100P
- C170 100P
- C171 100P
- C172 100P
- C173 100P
- C174 100P
- C175 100P
- C176 100P
- C177 100P
- C178 100P
- C179 100P
- C180 100P
- C181 100P
- C182 100P
- C183 100P
- C184 100P
- C185 100P
- C186 100P
- C187 100P
- C188 100P
- C189 100P
- C190 100P
- C191 100P
- C192 100P
- C193 100P
- C194 100P
- C195 100P
- C196 100P
- C197 100P
- C198 100P
- C199 100P
- C200 100P
- C201 100P
- C202 100P
- C203 100P
- C204 100P
- C205 100P
- C206 100P
- C207 100P
- C208 100P
- C209 100P
- C210 100P
- C211 100P
- C212 100P
- C213 100P
- C214 100P
- C215 100P
- C216 100P
- C217 100P
- C218 100P
- C219 100P
- C220 100P
- C221 100P
- C222 100P
- C223 100P
- C224 100P
- C225 100P
- C226 100P
- C227 100P
- C228 100P
- C229 100P
- C230 100P
- C231 100P
- C232 100P
- C233 100P
- C234 100P
- C235 100P
- C236 100P
- C237 100P
- C238 100P
- C239 100P
- C240 100P
- C241 100P
- C242 100P
- C243 100P
- C244 100P
- C245 100P
- C246 100P
- C247 100P
- C248 100P
- C249 100P
- C250 100P
- C251 100P
- C252 100P
- C253 100P
- C254 100P
- C255 100P
- C256 100P
- C257 100P
- C258 100P
- C259 100P
- C260 100P
- C261 100P
- C262 100P
- C263 100P
- C264 100P
- C265 100P
- C266 100P
- C267 100P
- C268 100P
- C269 100P
- C270 100P
- C271 100P
- C272 100P
- C273 100P
- C274 100P
- C275 100P
- C276 100P
- C277 100P
- C278 100P
- C279 100P
- C280 100P
- C281 100P
- C282 100P
- C283 100P
- C284 100P
- C285 100P
- C286 100P
- C287 100P
- C288 100P
- C289 100P
- C290 100P
- C291 100P
- C292 100P
- C293 100P
- C294 100P
- C295 100P
- C296 100P
- C297 100P
- C298 100P
- C299 100P
- C300 100P

- D901 9001
- D902 9001
- D903 9001
- D904 9001
- D905 9001
- D906 9001
- D907 9001
- D908 9001
- D909 9001
- D910 9001
- D911 9001
- D912 9001
- D913 9001
- D701 6X4
- D702 6X4
- D703 6X4

210015A

SCHEMATIC DIAGRAM

Universal Model

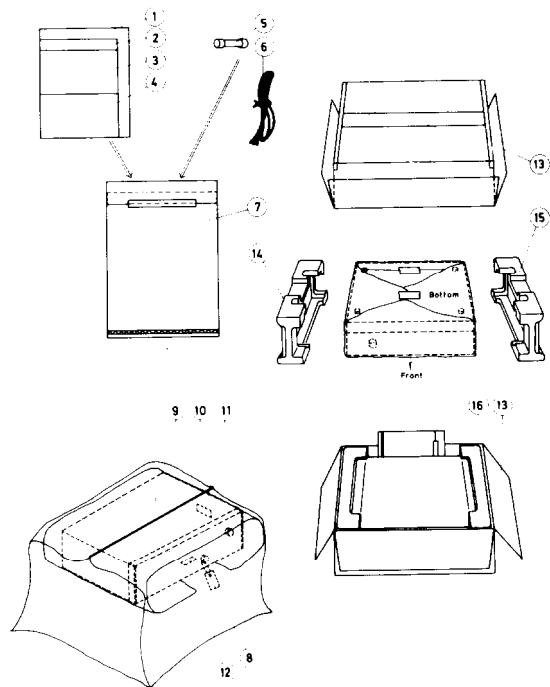


NOTES:
 ALL RESISTORS ARE IN OHMS, 1/4 WATT UNLESS OTHERWISE NOTED.
 ALL CAPACITORS ARE IN μ F, 50MV UNLESS OTHERWISE NOTED.
 ALL CAPACITORS IN THE TUNING EYE SECTION ARE IN V.T.M.
 VOLTAGE (MEASURED WITH V.T.M.)
 () DC VOLTAGE (NO INPUT SIGNAL).
 () DC VOLTAGE (FM STEREO).

SWITCH
 S801 (SELECTOR) 1 - 1-AM, 2-FM, 3-PHONO
 S802 (TUNING) 1 - 1-OFF, 2-ON
 S803 (TAPE MONITOR) 1 - 1-OFF, 2-ON
 S804 (MUTING LOCK) 1 - 1-ON, 2-OFF
 S805 (MODE) 1 - 1-STEREO, 2-MONO
 S806 (CLOCK) 1 - 1-OFF, 2-ON
 S807 (CLOCK) 1 - 1-OFF, 2-ON
 S808 (SPEAKERS) 1 - 1-OFF, 2-ON
 S809 (POWER) 1 - 1-OFF, 2-ON

PACKING PROCEDURES

U.S.A. Model

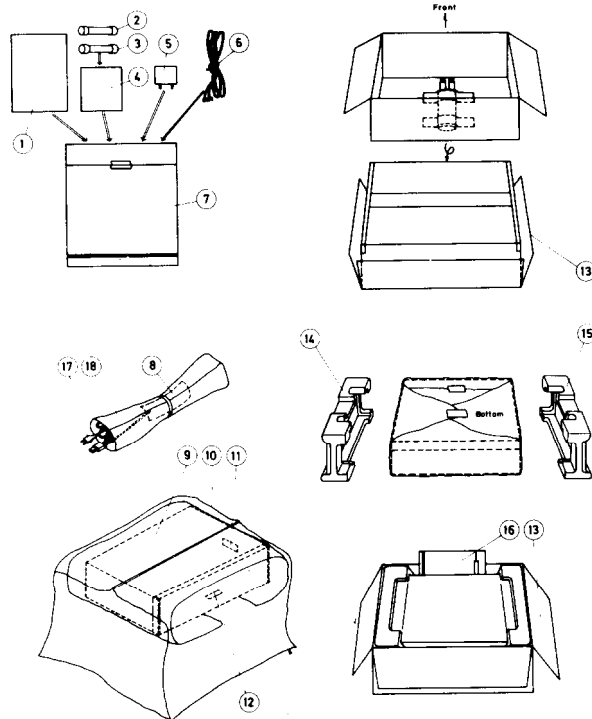


1. All printed material and accessory items are placed in a poly bag.
2. The AC Cord is wrapped in paper and wound a rubber band.
3. The cabinet composite tag is attached to the volume control.

PARTS LIST

REF. NO.	PARTS NO.	DESCRIPTION
1	29340191	Instruction Manual
2	29358001	Service Station List
3	29355046	Caution Card for Warranty Card
4	29365003	Warranty Card
5	292025	Fuse
6	292064	FM Antenna
7	29100006A	Poly Bag
8	29380024	Tag, Cabinet Composite
9	29095027	Sheet 330x1100(m/m)
10	29100018	Poly Bag 650x750(m/m)
11	282969	Caution Label A
12	293041	Caution Label
13	29050111	Carton Box
14	29090187	Pad, Right
15	29090188	Pad, Left
16		Accessory Bag Complete

Universal Model



1. All printed material and accessory items are placed in a poly bag.
2. The Voltage Tag is attached to the plug of AC Cord.
3. The AC Cord is wrapped in paper and wound a rubber band.

PARTS LIST

REF. NO.	PARTS NO.	DESCRIPTION
1	29340210	Instruction Manual
2	252044	Fuse 2A(ST-6)
3	292025	Fuse
4	29100002	Poly Bag 80x150(m/m)
5	25055018	Conversion Plug CV-K-1
6	292064	FM Antenna
7	29100002	Poly Bag
8	293268	Voltage Tag
9	29095027	Sheet 330x1100(m/m)
10	29100018	Poly Bag 650x750(m/m)
11	282969	Caution Label A
12	293041	Caution Label
13	29050111	Carton Box
14	29090187	Pad, Right
15	29090188	Pad, Left
16	13780119	Accessory Bag Complete
17	13876801	AC Cord
18	290076	AC Cord Wrapper

The Germany type differs from the Universal model at the following points.

1	29340211	Instruction Manual
3.5	None	
16	13782119	Accessory Bag Complete
17	253089	AC Cord AS-VDE-C
	29365001-1	Warranty Card (Addition)