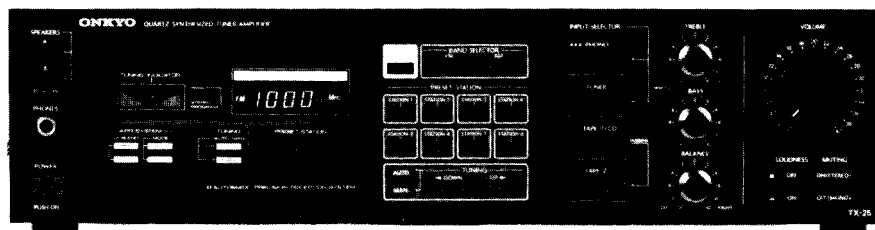


# ONKYO SERVICE MANUAL

## QUARTZ SYNTHESIZED TUNER AMPLIFIER MODEL TX-25



UD, UDN, BUD, BUDN	120V AC, 60Hz
UG, UGV, BUG, BUGV	220V AC, 50Hz
UW	120 or 220V AC, 50/60Hz
UQB	240V AC, 50Hz

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  $\triangle$  ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

### SPECIFICATIONS

#### AMPLIFIER SECTION

Power Output:	33 watts per channel, min. RMS, at 8 ohms, both channels driven, from 20 Hz to 20 kHz, with no more than 0.08% THD.
Music Power Output:	2 x 75 watts at 4 ohms, 1 kHz (DIN) 2 x 50 watts at 8 ohms, 1 kHz (DIN)
Continuous Power Output:	2 x 45 watts at 4 ohms, 1 kHz (DIN) 2 x 38 watts at 8 ohms, 1 kHz (DIN)
Total Harmonic Distortion:	0.08% at rated power 0.08% at 1 watt output
IM Distortion:	0.08% at rated power 0.08% at 1 watt output
Damping Factor:	35 at 8 ohms
Frequency Response:	20 - 30,000 Hz $\pm 1$ dB
RIAA Deviation:	20 - 20,000 Hz $\pm 0.8$ dB
Sensitivity and Impedance:	Phono: 2.5 mV/50 kohms Tape Play: 150 mV/50 kohms Tape Rec: 150 mV/3.5 kohms (phono)
Phono Overload:	180 mV RMS at 1kHz, 0.08% THD
Signal-to-Noise Ratio:	Phono: 85 dB (at 10 mV input, A weighted) 75 dB (IHF A-202) Tape: 95 dB (A weighted) 80 dB (IHF A-202)
Tone Controls:	Bass: $\pm 8$ dB at 100 Hz Treble: $\pm 8$ dB at 10 kHz
Loudness (-30 dB):	+7 dB at 70Hz, +5 dB at 10 kHz

# ONKYO

## AUDIO COMPONENTS

**TUNER SECTION**

<b>FM:</b>	<b>120V model</b>	<b>220/240V model</b>
Tuning Range:	87.5 – 108.0 MHz (100 kHz steps)	87.5 – 108.0 MHz (50 kHz steps)
Usable sensitivity:	Mono: 11.2 dBf, 2.0 $\mu$ V	Mono: 11.2 dBf, 2.0 $\mu$ V
	Stereo: 17.2 dBf, 4.0 $\mu$ V	Stereo: 17.2 dBf, 4.0 $\mu$ V
50 dB Quieting Sensitivity:	Mono: 17.2 dBf, 4.0 $\mu$ V	Mono: 17.2 dBf, 4.0 $\mu$ V
	Stereo: 37.2 dBf, 40 $\mu$ V	Stereo: 37.2 dBf, 40 $\mu$ V
Capture Ratio:	1.5 dB	1.5dB
Image Rejection Ratio:	40 dB	85 dB
IF Rejection Ratio:	90 dB	90 dB
Signal-to Noise Ratio:	Mono: 71 dB	Mono: 71 dB
	Stereo: 66 dB	Stereo: 66 dB
Selectivity:	55 dB	50 dB DIN ( $\pm$ 300 kHz 40 kHz dev.)
AM Suppression Ratio:	50 dB	50 dB
Harmonic Distortion:	Mono: 0.15%	Mono: 0.15%
	Stereo: 0.3%	Stereo: 0.3%
Frequency Response:	30 – 15,000 Hz $\pm$ 1.5 dB	30 – 15,000 Hz $\pm$ 1.5 dB
Stereo Separation:	40 dB at 1 kHz	40 dB at 1 kHz
	30 dB at 100 – 10,000 Hz	30 dB at 100 – 10,000 Hz
Tuning Level (Hi/Lo):	—	—
Muting Level:	17.2 dBf, 4.0 $\mu$ V	17.2 dBf, 4.0 $\mu$ V
Stereo Threshold:	17.2 dBf, 4.0 $\mu$ V	17.2 dBf, 4.0 $\mu$ V
<b>AM:</b>		
Tuning Range:	520 – 1,710 kHz (10 kHz steps)	522 – 1,611 kHz (9 kHz steps)
Usable Sensitivity:	30 $\mu$ V	30 $\mu$ V
Image Rejection Ratio:	40 dB	40 dB
IF Rejection Ratio:	30 dB	30 dB
Signal-to-Noise Ratio:	40 dB	40 dB
Harmonic Distortion:	0.8%	0.8%
<b>GENERAL:</b>		
Semiconductors:	EETs: 6 TR: 30 ICs: 10	EETs: 6 TR: 34 ICs: 10
	Diodes: 74	Diodes: 79
Dimensions (WxHxD):	418 x 112 x 340 mm	418 x 112 x 340 mm
	(16 1/2" x 4 1/2" x 13 3/8")	(16 1/2" x 4 1/2" x 13 3/8")
Weight:	7.3 kg., 16.1 lbs.	7.3 kg., 16.1 lbs.

**TABLE OF CONTENTS**

Specifications . . . . .	1	Pc board parts list and view from component side	
Service procedures . . . . .	3	FM/AM tuner pc board . . . . .	19
Block diagram – Amplifier section– . . . . .	4	Digital circuit pc board . . . . .	23
Block diagram – D (120V) model– . . . . .	5	Fluorescent indicator tube pc board . . . . .	23
Block diagram – G (220V) and Q (240V) models– . . . . .	6	Tuner switch pc board . . . . .	24
Block diagram – W (120 or 220V) model– . . . . .	7	Power supply and amplifier pc board . . . . .	27
Exploded view . . . . .	8	Speaker switch pc board . . . . .	27
Parts list . . . . .	9	Fuse terminal pc board . . . . .	27
Circuit description . . . . .	10	Equalizer amplifier pc board . . . . .	31
Adjustment procedures . . . . .	15	Tone control/Switch pc boards . . . . .	32
Schematic diagram of tuner section		Block diagram of IC . . . . .	35
–W model – . . . . .	17	Packing view . . . . .	36
–D model– . . . . .	21		
–G/Q models– . . . . .	25		
Schematic diagram of amplifier section			
–D/W models– . . . . .	27		
–G/Q models– . . . . .	29		

# SERVICE PROCEDURES

## 1. Replacing the fuses

For continued protection against fire hazard, replace only with same type and same rating fuse.

D (120V) model

Circuit no.	Parts no.	Description
F501, F601	252059	4A (SS-2), Speaker
F901	252049	4A (ST-6), Primary

G (220V) and Q (240V) models

Circuit no.	Parts no.	Description
F501, F601	252076	3, 15A-SE-EAK, Speaker
F902	252074	2A-SE-EAK, Primary
F903, F904	252078	5A-SE-EAK, Secondary
F905, F906	252070	1A-SE-EAK, Secondary
F907	252088	0.25A-SE-EAK, Secondary

W(120 or 220V) model

Circuit no.	Parts no.	Description
F501, F601	252014	4A-T, Speaker
F901	252014	4A-T, Primary
F902	252074	2A-SE-EAK, Secondary

## 2. Replacing the lamps

This unit uses the lamps listed below.

Circuit no.	Parts no.	Description
PL901, PL902	210162	PL 6.3V, 250mA, Dial plate illumination

Remove the top cover.

Remove the front panel.

Remove the holder.

(See fig. 2)

## 3. Insulation resistance measurement

Connect the insulating-resistance tester between the plug of power supply cable and terminal GND.

Specifications: D model:  $3.3 \pm 0.3M$  ohm

Other models: More than 10Mohm

## 4. Disassembling procedures

### Selector switch pc board

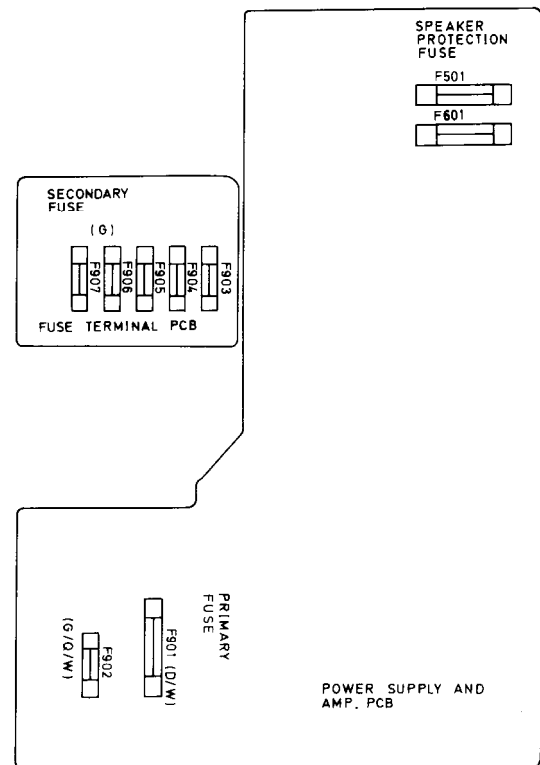
Remove the top cover.

Remove the all screws on the back panel.

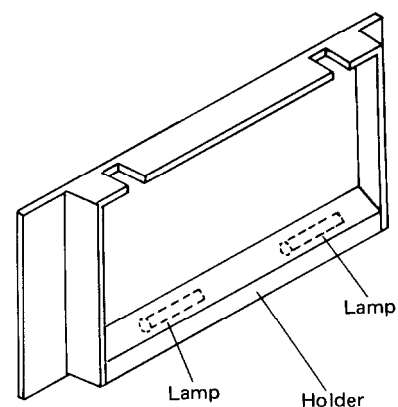
Remove a screw holding the radiator and bracket, pcb.

## 5. Change of AM scan step

W models are equipped with a switch to change the AM scan step frequency from 9kHz to 10kHz. The switch is located on the back panel. This switch is set to 9kHz at the factory; change to 10kHz if gives better results in your locality.



(fig. 1)



(fig. 2)

## 6. Change of De-emphasis

W models are equipped with a  $50\mu\text{sec}$ - $75\mu\text{sec}$  selector switch. This switch is located on the back panel. This switch is set to  $50\mu\text{sec}$  at the factory, but may have to be reset to  $75\mu\text{sec}$  depending on the area where the unit is used.

Europe:  $50\mu\text{sec}$

U.S.A.:  $75\mu\text{sec}$

## 7. Change of voltage

W models are equipped with a voltage selector to conform with local power supplies. This switch is located on the back panel. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on.

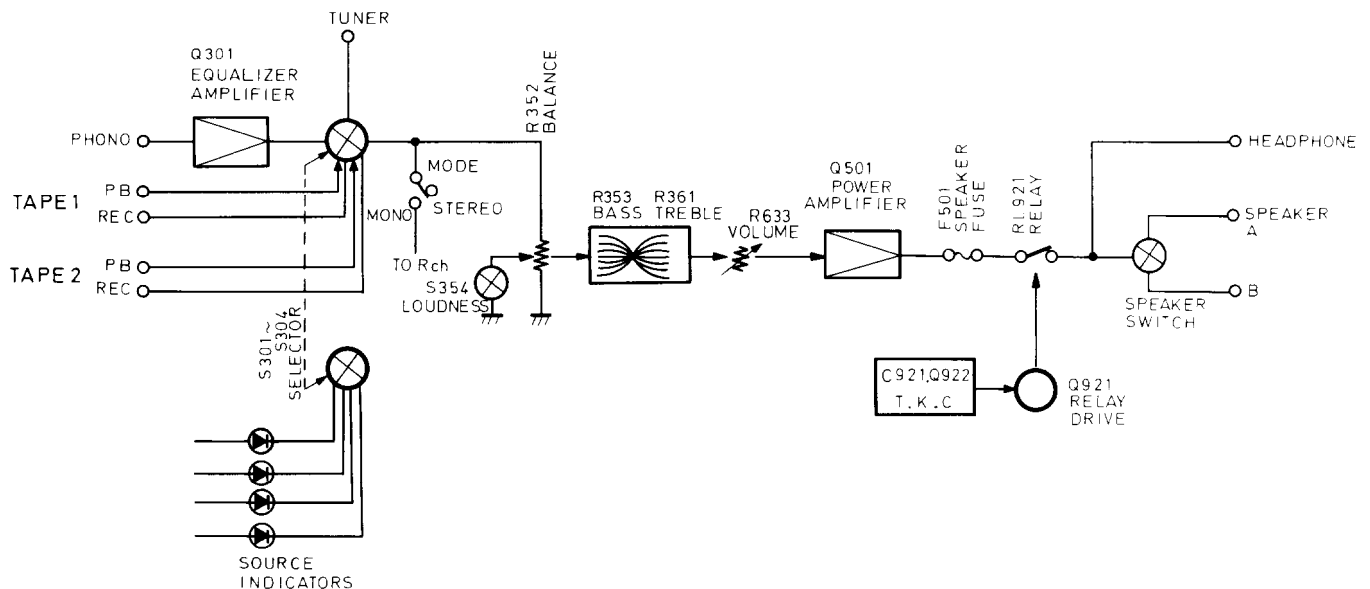
This switch is set to 220V at the factory. Voltage is changed by sliding the groove in the switch with the screwdriver to the right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on.

## 8. Memory Preservation

This unit does not require memory preservation batteries. A built-in memory power back-up system preserves contents of the memory during power failures and even when the unit is unplugged. The unit must be plugged in and the power switch turned on and off once in order to charge the back-up system. Note that since this is not a permanent memory, the power switch must be turned on and off a few times each month to keep the back-up system operable. The period of time during which memory contents are preserved after power has last been turned off varies depending on climate and the location and placement of the unit. On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shorter when the unit is exposed to very high humidity or used in an area with an extremely humid climate.

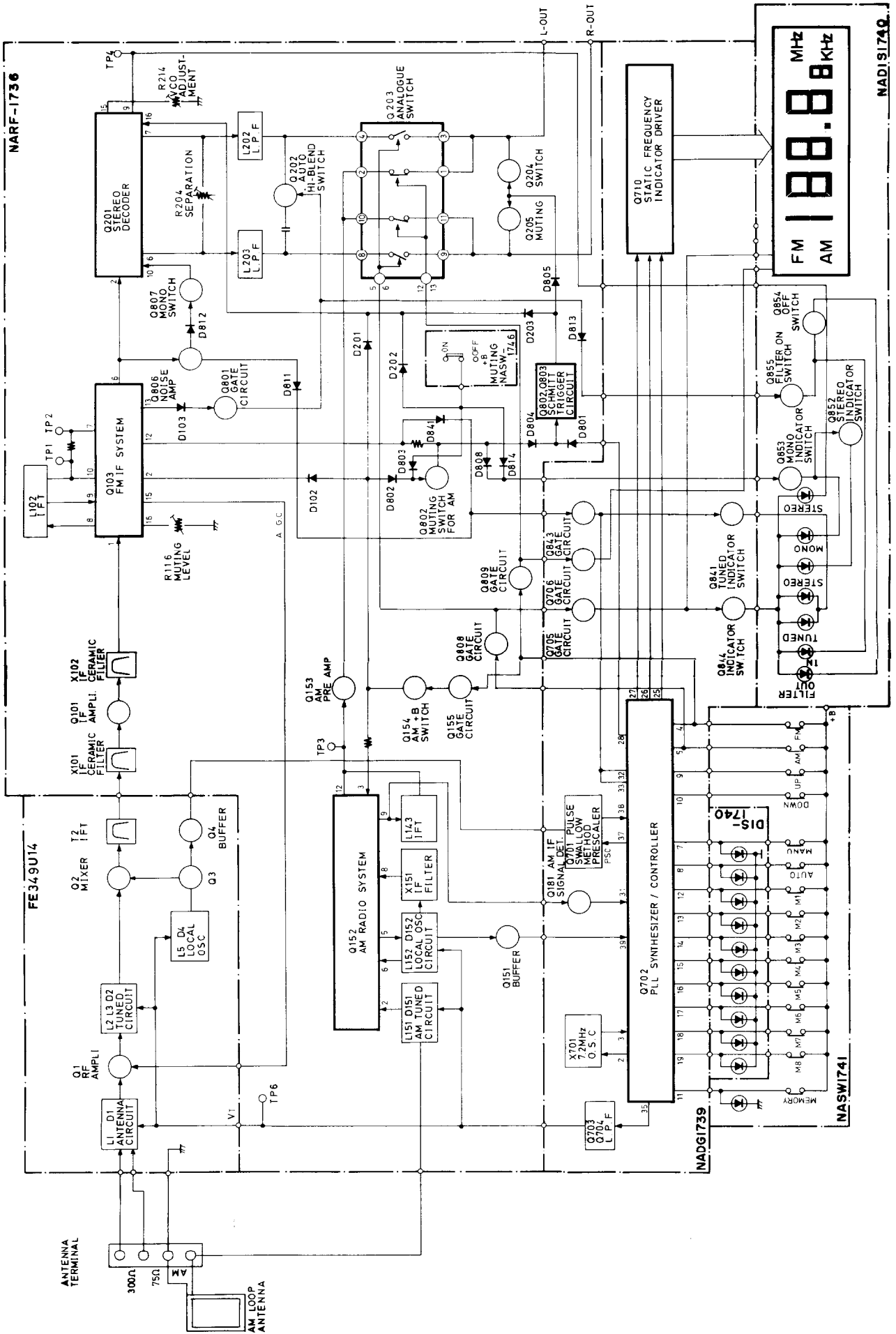
# BLOCK DIAGRAM

## Amplifier section



# BLOCK DIAGRAM

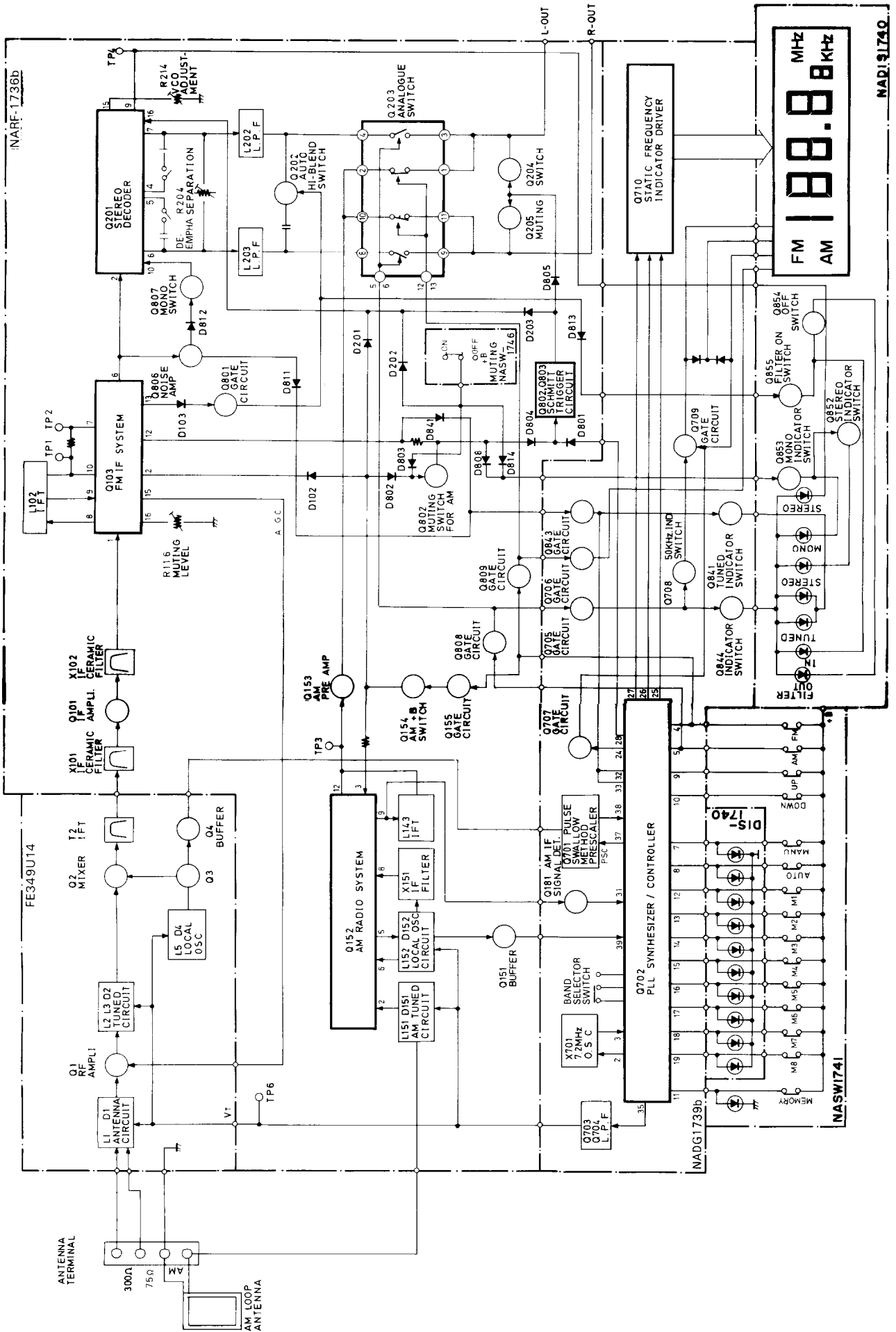
-D model-



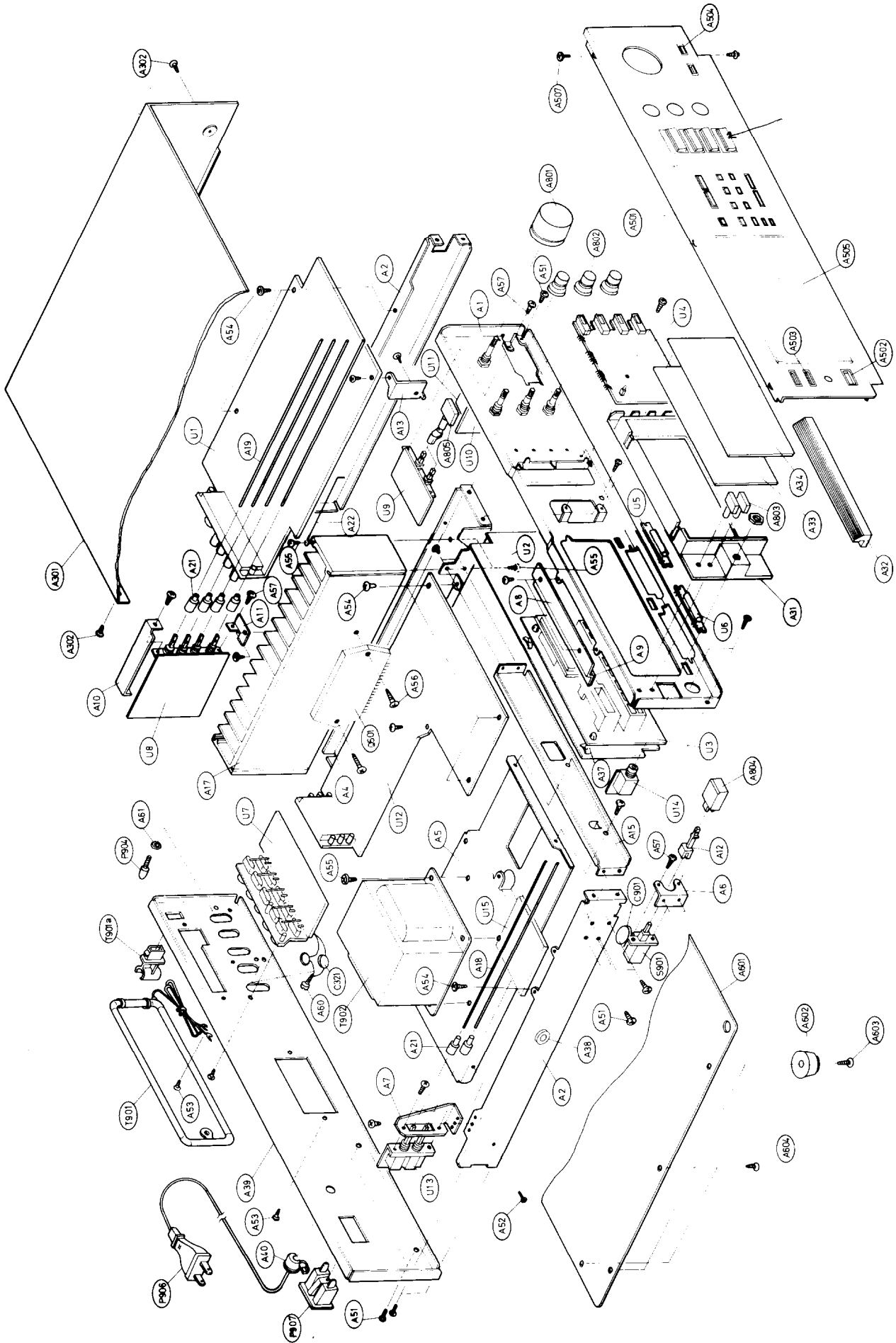


# BLOCK DIAGRAM

—W model—



**EXPLODED VIEW**





# PARTS LIST

REF. NO.	PARTS NO.	DESCRIPTION
A1	27110202-1	Front bracket
A2	27115145A	Side bracket
A4	27130339A	Bracket, radiator
A5	27130340	Bracket, power transformer
A6	27140805	Bracket, power
A7	27140806	Bracket, speaker
A8	27140807	Bracket, holder
A9	28140260	1.5tx10x100mm, Cushion
A10	27140808	Bracket, selector
A11	27140809	Bracket S
A12	27260062	Shaft, switch
A13	27140810A	Bracket, pcb
A15	27130341	Bracket F
A17	27160132	Radiator
A18	27260123	Shaft
A19	27260124	Shaft
A21	28320135	Connector
A22	27300656	Holder, lead wire
A31	27190220	Holder, pcb
A32	27190221	Holder, lamp
A33	28133081	Back plate
A34	28130194	Dial plate
A37	27190011	Holder
A38	27175011C	Leg
A39	27120518A	Back panel (D)
	27120519A	Back panel (G/Q)
	27120520A	Back panel (W)
△, A40	270280	SR-4K-4, Strainrelief
A51	834430068	3TTS+6B (BC), Tapping screw
A52	838430068	3TTB+6B (BC), Tapping screw
A53	833430080	3TTP+8P (BC), Tapping screw
A54	831430088	3TTW+8B (BC), Tapping screw
A55	838440089	4TTB+8C (BC), Tapping screw
A56	834430168	3TTS+16B (BC), Tapping screw
A57	82143006	3P+6FN (BC), Pan head screw
A60	834230108	3TTS+10B (ND), Tapping screw
A61	87613010	W3x10F, Washer
A301	28184201	Top cover
	28184202	Top cover (B)
A302	838430068	3TTS+6B (BC), Tapping screw
A501	18008121	Front panel ass'y
	27267215	Guide, power
	27267280	Guide, speaker
	27267282	Guide, push
	28191201	Clear plate
A501	28321209-1	Knob ass'y
	18028121	Front panel ass'y (B)
	28191202	Clear plate
	28321210	Knob ass'y

REF. NO.	PARTS NO.	DESCRIPTION
A507	834430068	3TTS+6B (BC), Tapping screw
A601	27170160	Bottom board
A602	27175009A	Leg
A603	834430128	3TTS+12B (BC), Tapping screw
A604	831430088	3TTW+8B (BC), Tapping screw
A801	28320543-1	Knob, volume
	28320892	Knob, volume (B)
A802	28321205	Knob, balance
	28321206	Knob, balance (B)
A803	28321207	Knob, push
	28321208	Knob, push (B)
A804	28320852	Knob, power
	28321160	Knob, power (B)
A805	28321215	Knob, push
	28321216	Knob, push (B)
△, C901	3500065A	DE7150FZ103PAC400/125V, Capacitor IS
△, C901a	27300601	Cover for C901
C321, C322	330924730	0.047µF, 50V, Capacitor, ceramic (D)
△, F501, F601	252059	4A (SS-2), Fuse, speaker protection (D)
△, F501, F601	252076	3.15A-SE-EAK, Fuse, speaker protection (G/Q)
△, F501, F601	252014	4A-T, Fuse, speaker protection (W)
△, F901	252049	4A (ST-6), Fuse, primary (D)
△, F901	252014	4A-T, Fuse, primary (W)
△, F902	252074	2A-SF-EAK, Fuse, primary (G/Q/W)
△, F903, F904	252078	5A-SE-EAK, Fuse, secondary (G/Q)
△, F905, F906	252070	1A-SF-EAK, Fuse, secondary (G/Q)
△, F907	252088	0.25A-SE-EAWK, Fuse, secondary (G/Q)
P904	25060044	Ground terminal
△, P906	253112	AS-UC-4#18, Power supply cable (D)
△	253083-1	AS-CEE, Power supply cable (G/W)
△	728320	Power supply cable (Q)
△, P907	25050046	NSCT-2P15, AC outlet terminal (D)
Q501, Q601	222035	STK4833, Power amplifier IC
△, S901	25035398	NPS-111-1362P, Power switch
△, S902	25065123	NPS-1258P, Voltage selector switch (W)
T901	232085	NMA-3034, AM loop antenna
T901a	27190105	Antenna holder
△, T902	230737	NPT-815D, Power transformer (D)
△	230738	NPT-815G, Power transformer (G)
△	230739	NPT-815DG, Power transformer (W)
△	230740	NPT-815Q, Power transformer (Q)
△, U1	18008536	NARF-1736, FM/AM tuner pc board ass'y (D)
	18034536A	NARF-1736a, FM/AM tuner pc board ass'y (G/Q)

REF. NO.	PARTS NO.	DESCRIPTION
U2	18010536B	NARF-1736b, FM/AM tuner pc board ass'y (W)
	18008539	NADG-1739, Digital circuit pc board ass'y (D)
	18034539A	NADG-1739a, Digital circuit pc board ass'y (G/Q)
	18010539B	NADG-1739b, Digital circuit pc board ass'y (W)
U3	18008540	NADIS-1740, Fluorescent indicator tube pc board ass'y
U4	18008541	NASW-1741, Tuner switch circuit pc board ass'y
U5	18008543	NAPL-1743, Dial plate illumination lamp pc board ass'y
U6	18008544	NAPL-1744, Dial plate illumination lamp pc board ass'y
U7	18008545	NAFQ-1745, Equalizer amplifier pc board ass'y (D/W)
	18034545A	NAEQ-1745a, Equalizer amplifier pc board ass'y (G/Q)
U8	18008546	NASW-1746, Selector switch pc board ass'y
U9	18008547	NASW-1747, Mode/Loudness switch pc board ass'y
U10	18008548	NATC-1748, Tone control circuit pc board ass'y
U11	18008549	NAVVR-1749, Volume control pc board ass'y
U12	18008550	NAAI-1750, Power supply and power amplifier circuit pc board ass'y (D)
	18034550A	NAAF-1750a, Power supply and power amplifier circuit pc board ass'y (G/Q)
	18010550B	NAAF-1750b, Power supply and power amplifier circuit pc board ass'y (W)
U13	18008551	NASW-1751, Speaker selector switch pc board ass'y
U14	18008552	NAHP-1752, Headphone terminal pc board ass'y
U15	18034553	NAFU-1753, Fuse terminal pc board ass'y (G/Q)
U16	18010537	NASW-1737, De-emphasis switch pc board ass'y (W)
U17	18010542	NASW-1742, Band selector switch pc board ass'y (W)

Notes: (D): Only 120V model  
 (G): Only 220V model  
 (W): Only 120/220V model  
 (Q): Only 240V model

NOTE: THE COMPONENTS IDENTIFIED BY MARK △ ARE CRITICAL FOR LIK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

# CIRCUIT DESCRIPTIONS

## 1. Synthesizer and controller operation

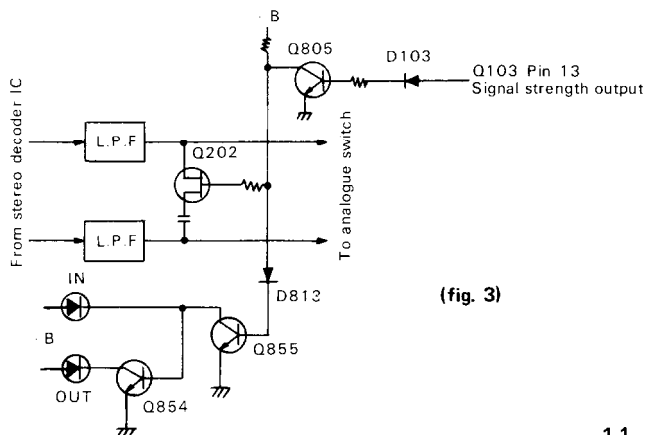
Pin No.	Symbol	Terminal	Description
1	GND	Ground	
2	XT	X'tal	Connected to the 7.2MHz crystal oscillator for the reference frequency.
3	XT		
4	FM	FM band specification input	Mutual reset type, performs switching of each band, FM/MW/LW.
5	MW	MW band specification input	
6	LW	LW band specification input	
7	MANUAL	Manual tuning mode specification input	Mutual reset type, performs auto search and manual operation mode switching during UP/DOWN tuning.
8	AUTO	Auto search tuning mode specification input	
9	UP	UP tuning key input	Connect the push key and perform UP/DOWN tuning.
10	DOWN	DOWN tuning key input	
11	STO	Memory store command input	The preset memory is set to the write mode when the key is pressed.
12-19	M1-M8	Preset memory channel specification input	Controls the write and read out of the internal 16-station preset memory along with the MC1 and MC2 input.
20	MC-1	Memory control input	Set the 16-station preset memory to the 8 FM/8 AM station mode or the FM/MW/LW 3-band 16-station random mode. The 8 FM/8 AM mode is used in this unit.
21	MC-2		
22	OSC2	AM oscillator terminal	CR connection terminal for the oscillator that determines the scan speed during the AM search mode.
23	OSC1	FM oscillator terminal	CR connection terminal for the oscillator that determines the scan speed during the FM search mode.
24	0/5	FM 50 kHz output	Output that represents the 50kHz FM band tuning step for European models. Goes to the high level for the 50 kHz setting.
25	CK2	Tuned frequency data output	Outputs the serial data and timing clock to the tuned frequency display driver.
26	CK1		
27	DATA		
28	MUTE	Muting signal output	Goes to the high level during muting output.
29	E2	Regin specification input	See table 1.
30	E1		
31	STOP 3	AM IF signal input	During AM reception, this counts the IF signal and stops auto search.
32	STOP 2	Auto search stop signal input	When the stop 1 input (pin 33) is at the high level and this terminal goes to the high level, auto search is stopped.
33	STOP 1	Scan speed slow input	When the high level is input at this terminal, the auto search speed is cut in half.

Pin No.	Symbol	Terminal	Description
34	DO1	Error output	Charge pump output of the phase detector which constitutes the PLL. High level is output when the divided oscillation frequency is high than the reference frequency. In the opposite case, low level is output. Floating occurs when the frequencies match. The output is applied to the variable capacitor diode in the front end through low pass filter Q703 and Q704. The output from both terminals is the same, but only D01 is used.
35	D02		
36	TEST	Test terminal	Test mode at the high level.
37	FM IN	FM programmable counter input	Connect to the prescaler output (Pin3 of Q701)
38	PSC	Pulse swallow control output	Output to the control the division ratio of the prescaler.
39	AM IN	AM local oscillator signal input	Terminal for input of AM broadcast signal.
40	$\overline{\text{INH}}$	Inhibit input	Operates normally at the high level. Inhibit status at the low level.
41	$\overline{\text{INT}}$	Initialize input	Operates normally at the high level. At the low level, the internal status is initialized.
42	V <sub>DD</sub>	Power supply	Device power terminal; supplies 5V during the normal operation and 2.5V from the super capacitor (C715) for memory preservation.

table 1.

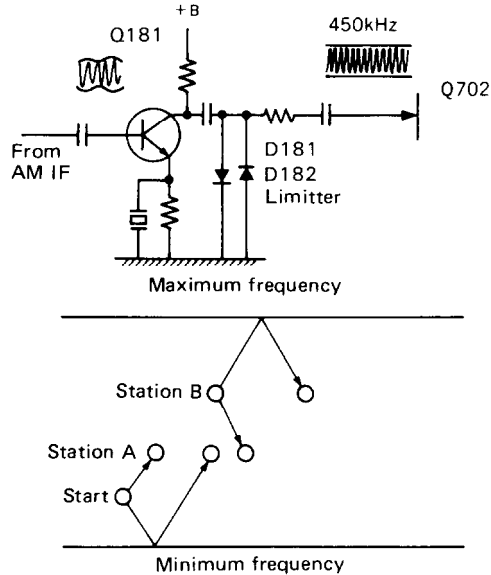
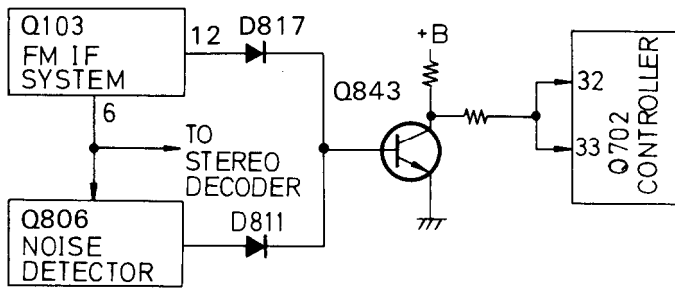
E1 (Pin 30)	E2 (Pin 29)	Regin	Band	Frequency range	Intermediate frequency	Scan step	Reference frequency
0	1	U.S.A	FM	87.5 ~ 108.0 MHz	+10.7 MHz	100 kHz	25 kHz
			AM1	520 ~ 1 710 kHz	+450 kHz	10kHz	10 kHz
1	1	U.S.A	AM2	522 ~ 1 710 kHz	+450 kHz	9kHz	9kHz
1	0		Europe	FM	87.50 ~ 108.00 MHz	+10.7 MHz	50 kHz
		MW		522 ~ 1611 kHz	+450 kHz	9 kHz	9 kHz
		LM		153 ~ 360 kHz	+450 kHz	1 kHz	1 kHz
0	0	Japan	FM	76.0 ~ 90.0 MHz	-10.7 MHz	100 kHz	25 kHz
			AM	522 ~ 1611 kHz	+450 kHz	9 kHz	9 kHz

## 2. Auto-Hi-blend circuit



There is a 3-stage IF level detection circuit in the IC of Q103. A direct current voltage approximately proportional to the electrical field intensity is output from output pin 13. This is used to turn off Q805 and turn on Q202 when the electrical field is weak and, making use of the fact that the phase of noise components in the high range of stereo broadcasts is reversed left-right, the left and right channels are mixed in the high range to reduce noise. At the same time, Q855 is turned on and Q854 is turned off, and the IN LED of filter lights on.

### 3. Auto-search tuning circuit



(fig. 4)

During FM reception, this is operated by the IF level detection and zero point detection circuits included in the FM IF system IC of Q103 and by the noise component detection circuit of Q806. When a station is tuned, the output of all outputs go to the low level so Q843 goes from on to off, causing pins 32 and 33 of the controller IC to go to the high level to complete auto search tuning.

During AM reception, the AM IF signal is taken, amplified by Q181, limited to a certain amplitude by the D181 D182 limiter circuits and auto search tuning is completed when the IF signal becomes  $450 \pm 3$  kHz.

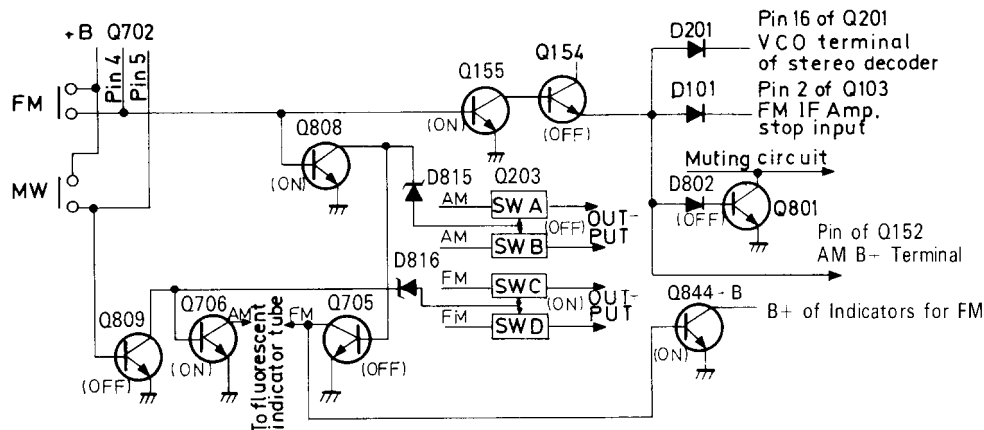
#### • Manual Tuning

When the UP or DOWN key is pressed, the frequency goes up or down by one step. When either key is held down, the frequency rapidly increases or decreases (scans) and stops when the key is released. When either end of the tuning range is reached, key input will no longer be received and the frequency will stop at the highest or lowest frequency.

#### • Auto Tuning

When the UP or DOWN key is pressed, scanning begins in the up or down direction, stopping where there is a radio station. Since auto scan is operated by a triangular wave, scanning is begun in the opposite direction the instant either end of the tuning range is reached. Also, if the UP or DOWN key is pressed when the tuned frequency is not at either end of the range, up or down scanning will begin.

### 4. FM/AM selector circuit



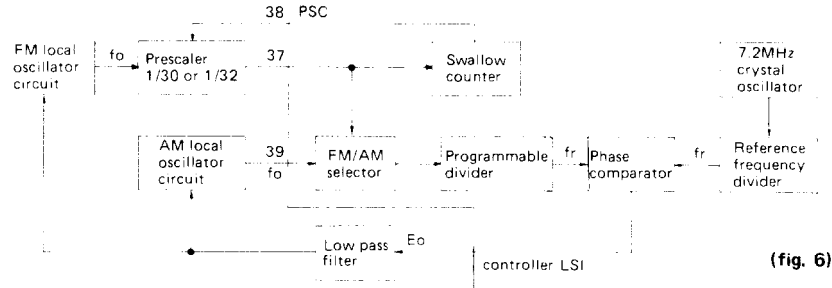
(fig. 5)

The FM/AM selector circuit is shown in the diagram. fig. 5. Pins 4 and 5 of Q702 are of the mutual reset type. For FM, pin 4 is high and pin 5 is low; for AM, pin 4 is low and pin 5 is high. Because pin 5 is high and pin 4 is low during AM reception, Q809 is on and Q808 is off, the analogue switches SW1 and SW2 of Q203 are on while SW3 and SW4 are off, so an AM signal is output. Also, since Q706 goes to on and Q705 to off, the AM, kHz segments of the fluorescent display are turned on. Q844 goes to off so the FM indicators is turned off. At the same time, Q155 is turned

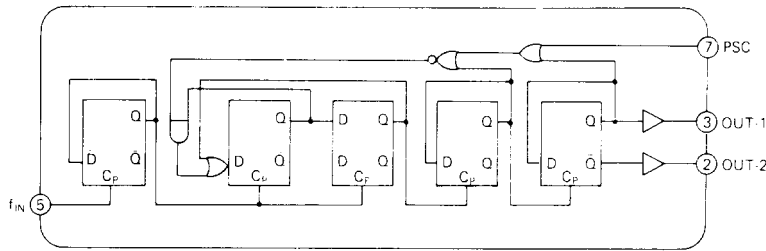
off and Q154 turned on, so +B is supplied to the power source terminal of the radio system pin 3 of Q152.

Pin 16 of Q201 goes to the high level, the VCO oscillator stops, and pin 2 of Q103 goes to the high level so the FM IF amp is also switched off. Also, during AM reception, Q801 is turned on so the muting circuit is off. During FM reception, all of the switching transistors mentioned above perform the opposite operations to switch to the FM mode. Figures in parentheses indicate transistor operation during FM reception.

## 5. PLL tuned circuit



(fig. 6)



(fig. 7) TD6104P (Prescaler)

A block diagram of the tuned circuit of the PLL is shown in figer 6.

### Operation during AM reception

The reception frequency is applied to the programmable divider where it is divided to  $1/N$  and output as  $f_v$ . This is applied to the phase comparator where it is compared with frequency reference  $f_r$  (9kHz for G/W model and 10kHz for D model). If  $f_r$  and  $f_v$  differ,  $E_o$  equal to the difference in frequency is output. Since error output  $E_o$  is a pulse waveform, it is passed through the low pass filter to change it into DC voltage  $V_D$ , which is applied to the variable capacitor diode in the front end to change the reception frequency. This continues until  $f_v$  and  $f_r$  are the same and  $E_o=0$ .

### Operation during FM reception

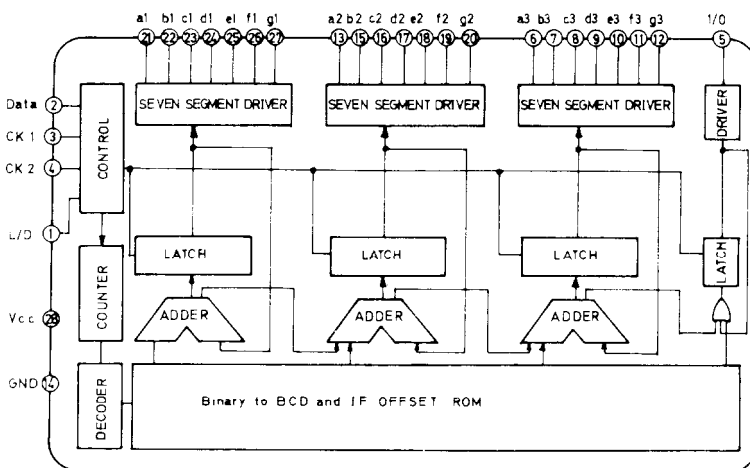
The pulse swallow method is used in the prescaler of this unit. In this type of prescaler, a supplementary number

(changed according to the program code input) and the divided reception frequency from the prescaler are combined in the control counter and the prescaler's division factor is switched  $1/30$  or  $1/32$  according to external control ( $1/32$  when the PSC terminal is "H" and  $1/30$  when it is "L").

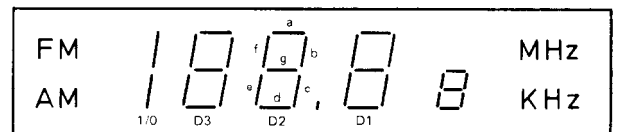
The station oscillator frequency is applied to the programmable divider, but the programmable divider has an upper frequency limit of only 30MHz, so the pulse swallow-type prescaler, which can be used up to 150 MHz, is inserted for division to  $1/N_p$ ;

The signal is applied to the programmable divider and divided to  $1/N$ . The result is compared with a 25kHz frequency reference in the phase detector and the error is output as  $E_o$  until a match is obtained as in AM operation.

## 6. Frequency indicator circuit

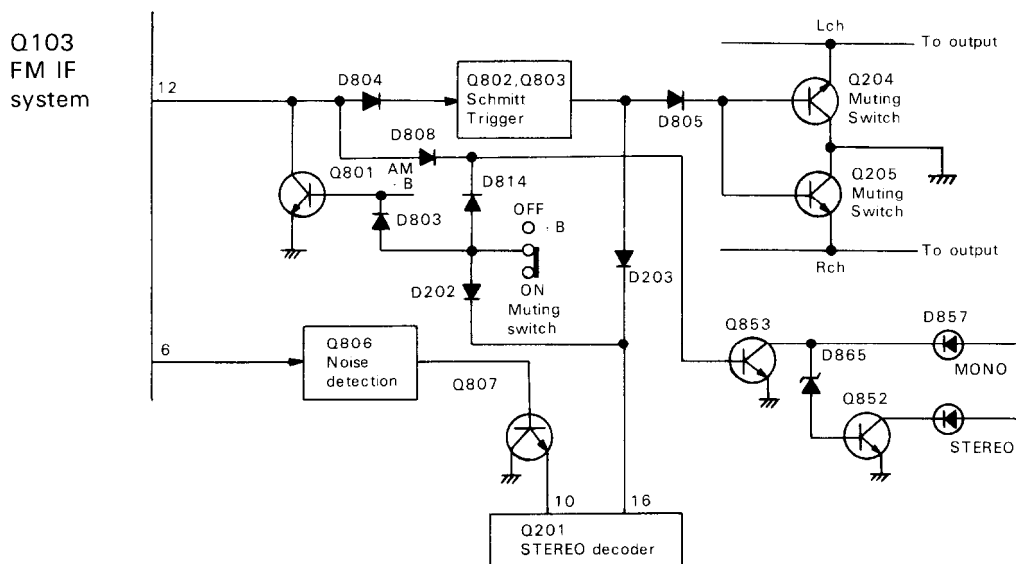


(fig. 8) TD6301AP block diagram



Pin No.	Terminal	Description
1	L/D	Output indication switching input terminal: Fluorescent display at the low level, and LED display at the high level.
2	Data	Tuned frequency data input terminal: Input from the system controller LSI to the serial.
3,4	CK1, CK2	Tuned frequency data input control timing input terminal: Transferred simultaneously with data from the system controller LSI.
5	I/O	Segment drive output terminal: Sets the number of display digit for FM (100MHz) and AM (1,000kHz) reception.
6-12	a3-g3	Seven segment drive output terminals: Sets the number of display digit for FM(10MHz) and AM (100kHz) reception.
13, 15-20	a2-g2	Seven segment drive output terminals: Sets the number of display digit for FM (1MHz) and AM (10kHz) reception
21-27	a1-g1	Seven segment drive output terminals; set the number of display digit for FM (100kHz) and AM (1kHz) reception
14	V <sub>cc</sub>	Power source terminal
28	Gnd	Ground

## 7. Muting circuit



The muting circuit operates in the following cases.

1. While pin 28 of the controller IC outputs the high level, Q204 and Q205 are turned on and muting is closed in the following cases: (1) While the manual UP/DOWN switch is being held down, (2) When a station in the memory is recalled, and (3) While a radio station is being received using auto search tuning.
2. When an FM station is not being received (and the muting switch is on).

The IF level in the FM IF system (set at R116 so muting is opened at 17 dBf) and zero point detection circuit (tuning point  $35 \pm 15\text{kHz}$ ) are output at pin 12 through

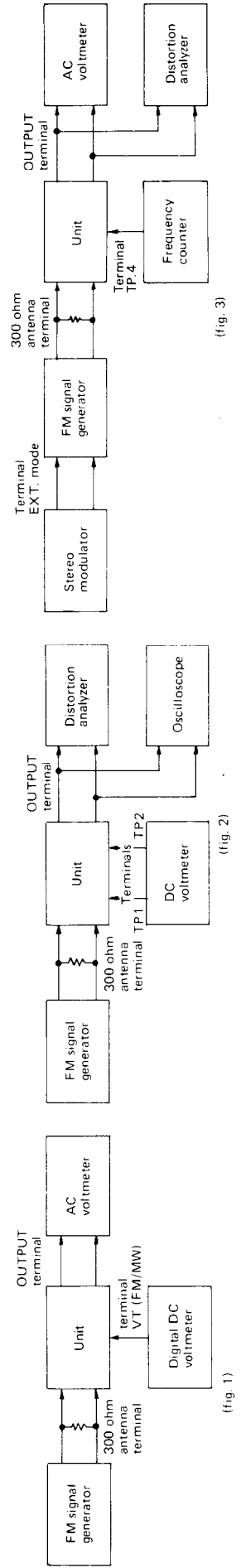
the AND circuit. When a station is tuned, the output goes to the low level.

When output goes to the low level, Q802 is turned off, Q803 is turned on and Q203 and Q204 are turned off, so muting is opened. At the same time, pin 16 of stereo decoder Q201 goes to the low level, so the VCO oscillator starts.

# ADJUSTMENT PROCEDURES

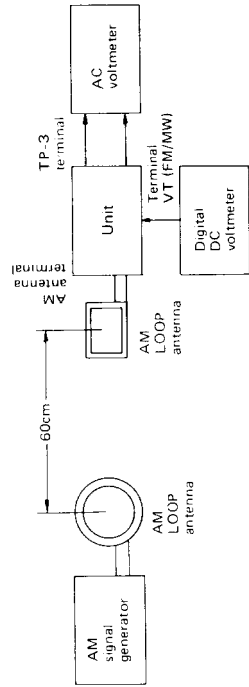
## FM section

Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Turning dial setting	Output indicator	Adjustment	Adjust for	Remarks
FM RF	1	Fig. 1	—	—	88.0 MHz	Digital DC voltmeter	T1	1.4V	
	2	Fig. 1	107.9 MHz 1 kHz, 75 kHz devi.	—	107.9 MHz	AC voltmeter	C7, C9 (G)	Maximum output	
FM IF	1	Fig. 2	—	—	No input signal	DC voltmeter	L101-L102 Primary coil	0V	Repeat the steps 1 and 2 until no further adjustment is necessary
	2	Fig. 2	98.1 MHz 1 kHz, 75 kHz devi. 65 dBf (60 dB)	—	98.1 MHz	Distortion analyzer	L101 Secondary coil	Minimum	
VCO	1	Fig. 3	98.1 MHz No modulation 65 dBf (60 dB)	—	98.1 MHz	Frequency counter	R214	76 kHz ± 76 Hz	Remove the frequency counter after adjustment
	2	Fig. 3	98.1 MHz 65 dBf (60 dB) Ext. modulation	L ch. 1 kHz R ch. 1 kHz	98.1 MHz	R ch. AC voltmeter L ch. AC voltmeter	R204	Minimum Minimum	Maximum and same separation
Distortion	1	Fig. 3	98.1 MHz 65 dBf (60 dB) Ext. modulation	L+R 1 kHz	98.1 MHz	Distortion analyzer	T2	Minimum	
Muting level	1	Fig. 2	98.1 MHz 17.2 dBf (12 dB) 1 kHz, 75 kHz devi.	—	98.1 MHz	Oscilloscope	R116	Signal output	Muting switch to on.
	2	Fig. 2	98.1 MHz 16.2 dBf (11 dB) 1 kHz, 75 kHz devi.	—	98.1 MHz	Oscilloscope		No output	

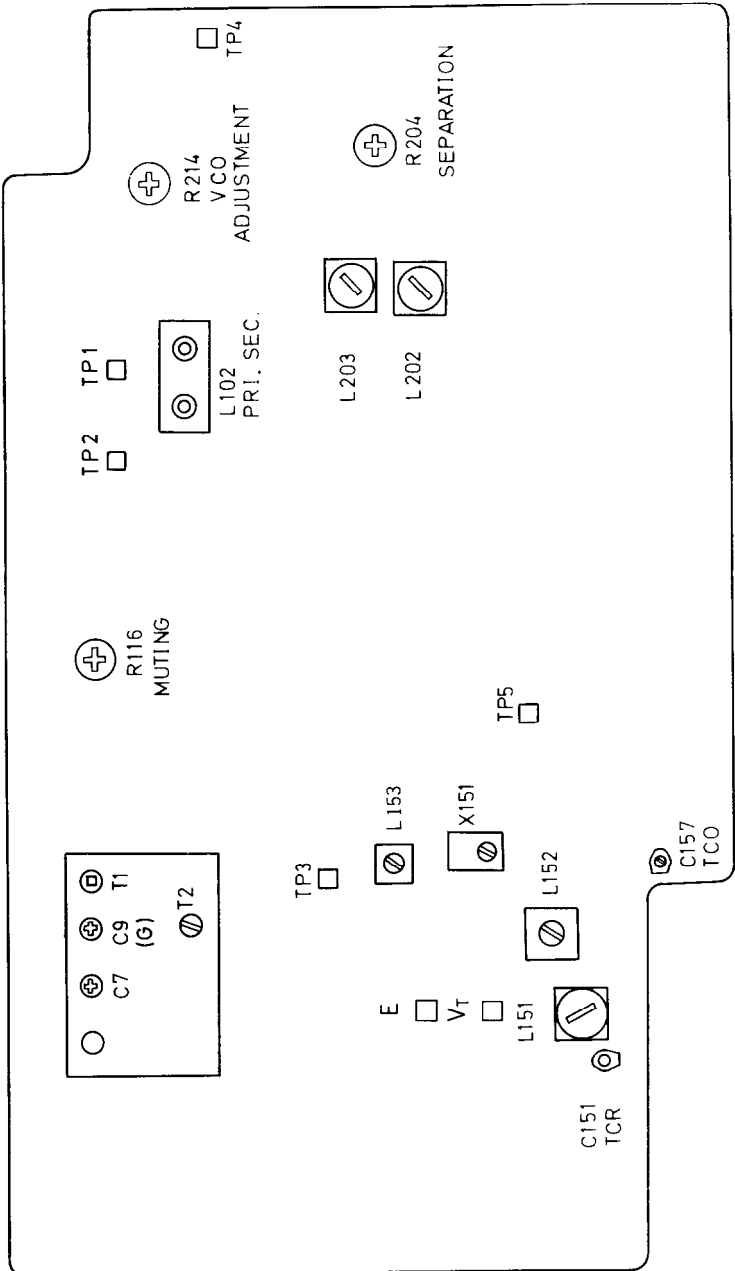


AM section

Step	AM SG output	Tuned frequency	Output indicator	Adjustment point	Adjust for	Remarks
1	999kHz (1000kHz) 400Hz 30% mod.	999kHz (1000kHz)	AC voltmeter	X151 L153	Maximum	
2		522kHz (520kHz)	Digital DC voltmeter	L152	1.2V	Repeat the steps 2 and 3 until no further adjustment is necessary.
3		1611kHz (1710kHz)	Digital DC voltmeter	C157	9.5V (10.5V)	
4	603kHz (600kHz) 400Hz 30% mod.	603kHz (600kHz)	AC voltmeter	L151	Maximum	Repeat the steps 4 and 5 until no further adjustment is necessary.
5	1404kHz (1404kHz) 400Hz 30% mod.	1404kHz (1400kHz)	AC voltmeter	C151	Maximum	



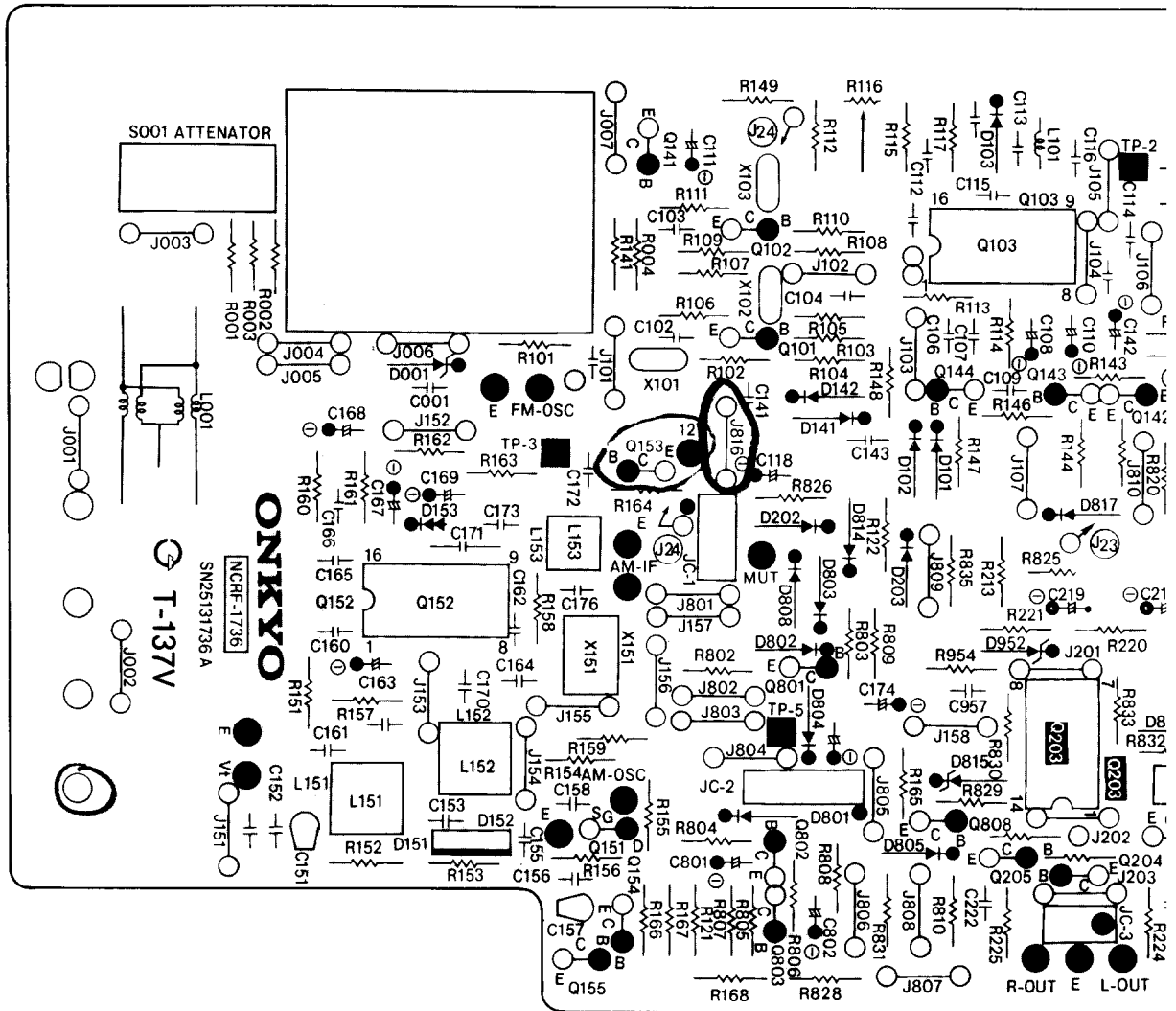
( ) : 120V model





# PCB PARTS LIST/VIEW FROM COMPONENT SIDE

## FM/AM TUNER PCB VIEW



### FM/AM TUNER PC BOARD ASS'Y (NARF-1736/a/b)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	<b>Front end</b>	
	240061	FE349U14 (D/W) USA
	240059	FE416U33 (G/Q)
	<b>ICs</b>	
Q103	222608	μPC1167C2, FM IF system
Q152	222629	μPC1243C, AM radio system
Q201	222678	μPC1161C3, Stereo decoder
Q203	222575 or 222840661	TC4066BP or 4066B, Analogue switch
Q952	222780122	78M12, Constant voltage
	<b>Transistors</b>	
Q101	2211723	2SC1923 (O)
Q102	2211723	2SC1923 (O) (G/Q)
Q151, Q202	2211945 or 2212304	2SK246 (GR) or 2SK381 (D)
Q153-Q155	2211254,	2SC1815 (Y),
Q801-Q803	2211255 or	2SC1815 (GR) or
Q807-Q809	2210746	2SC945 A (P)

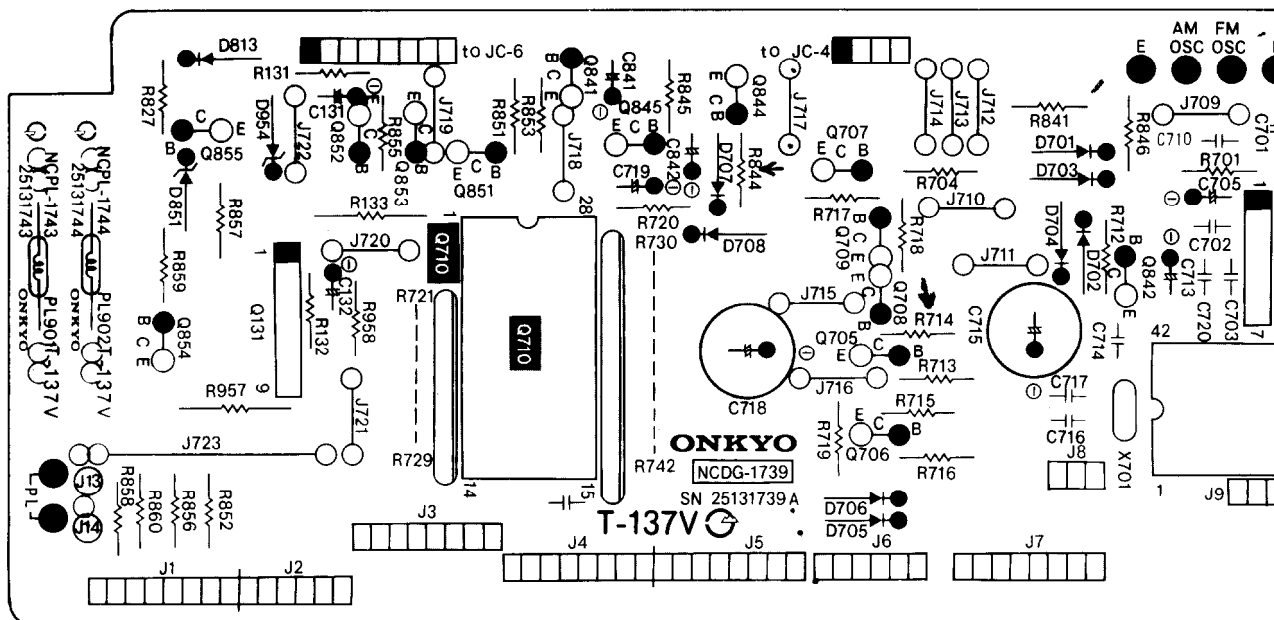
CIRCUIT NO.	PARTS NO.	DESCRIPTION
	<b>Transistors</b>	
Q204, Q205	2211705	2SD655 (E)
Q805, Q806	2211255	2SC1815 (GR)
Q951, Q953	2211255	2SC1815 (GR)
	<b>Diodes</b>	
D001	2239552	RD8. 2EB2 (G/Q)
D102	223105,	1S1555,
D201-D203	223133 or 223145	DS442X or 1S2076TD
D103, D153	4000068	VD1222
D151, D152	223140	KV1236
D801-D805	223105,	1S1555
D808-D812	223133 or	DS442X or
D814, D817	223145	1S2076TD
D815, D816	2241291	RD3. 3EB1
D951	2239792	RD27EB2
D952	2239433	RD4. 7EB3
D953	2239493	RD6. 2EB3

CIRCUIT NO.	PARTS NO.	DESCRIPTION
<b>Transformers</b>		
L001	233026A	NBLN-1, Balloon (G/Q)
L102	233270	NFIF-6040
L153	232095	NMIF-6025
<b>Coils</b>		
L101	233105 or 233024	NCH-1005 or NCCH-1501
L151	232113	NMA-3049
L152	232084	NMO-2018
L201	233236	NMC-6027 (G/Q)
L202, L203	233291	NMC-5039
L801	233122	NCH-3013
L802	233031	NMC-9-1
<b>Cermic filters</b>		
X101, X102	3010071	SFE10. 7MA5 (D/W)
X101-X103	3010043	SFE10. 7MM (G/Q)
X151	3010075	SFL450B3
<b>Capacitors</b>		
C108, C110	352780109	1 $\mu$ F, 50V, Elect.
C111	352784799	0.47 $\mu$ F, 50V, Elect.
C117	352741009	10 $\mu$ F, 16V, Elect.
C151, C157	3060010	NTC20P09, Trimmer
C155	370135114	510pF $\pm$ 5%, 100V, APS
C163	352741019	100 $\mu$ F, 16V, Elect.
C167	352750479	4.7 $\mu$ F, 25V, Elect.
C168	352780339	3.3 $\mu$ F, 50V, Elect.
C169	352741009	10 $\mu$ F, 16V, Elect.
C174	352784799	0.47 $\mu$ F, 50V, Elect.
C202	352750479	4.7 $\mu$ F, 25V, Elect.
C208	352744719	470 $\mu$ F, 16V, Elect.
C209, C210	352741009	10 $\mu$ F, 16V, Elect.
C213	370134714	470pF $\pm$ 5%, 100V, APS
C214	352780109	1 $\mu$ F, 50V, Elect.
C215	352780339	3.3 $\mu$ F, 50V, Elect.
C216	352782299	0.22 $\mu$ F, 50V, Elect.
C218, C219	352780109	1 $\mu$ F, 50V, Elect.
C220	352724719	470 $\mu$ F, 6.3V, Elect.
C802	352780229	2.2 $\mu$ F, 50V, Elect.
C806	352783399	0.33 $\mu$ F, 50V, Elect.
C809	352780229	2.2 $\mu$ F, 50V, Elect.
C951	352780109	1 $\mu$ F, 50V, Elect.
C954	352751019	100 $\mu$ F, 25V, Elect.
C956	352724719	470 $\mu$ F, 6.3V, Elect.
C958	352780109	1 $\mu$ F, 50V, Elect.
<b>Resistors</b>		
R116	5215046	N08HR50KBC, Semi-fixed
R204	5215048	N08HR200KBC, Semi-fixed
R214	5215044	N08HR5KBC, Semi-fixed
R952	441721204	12ohm, 2W, Metal oxide film
R955	441523904	39ohm, 1/2W, Metal oxide film
<b>Terminal</b>		
P901	25060082	NTM-4PDMN26, Antenna (D/W)
	25060083	NTM-5PDMN27, Antenna (G/Q)

Note: (D): Only 120V model  
(G): Only 220V model  
(W): Only 120/220V model  
(G): Only 240V model

# PCB PARTS LIST / VIEW FROM COMPONENT SIDE

## DIGITAL CIRCUIT PCB VIEW



### TUNER SWITCH PC BOARD ASS'Y (NASW-1741)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	<b>LEDs</b>	
D759	225126	GL3PR1
D865, D866	225137	SEL2413E
D867, D868	225142	SEL2913K
	<b>Switches</b>	
S751-S765	25035275	NPS-111-S239
	<b>Spacer</b>	
	27270103	
	<b>Holders</b>	
	27190224	LED

### DE-EMPHASIS SWITCH PC BOARD ASS'Y (NASW-1737) (Only W model)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
S201	250142	NSS-2225, De-emphasis switch

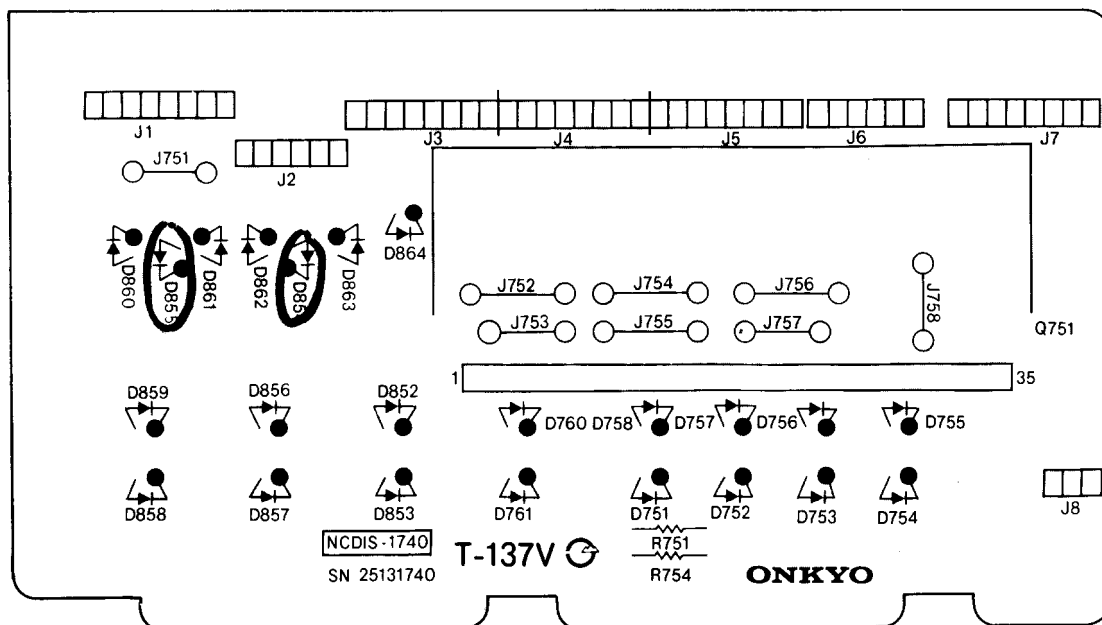
### BAND SELECTOR SWITCH PC BOARD ASS'Y (NASW-1742) (Only W model)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
S701	250142	NSS-2225, Switch

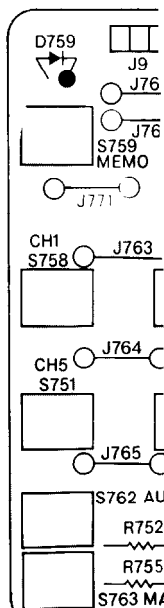
### DIAL PLATE ILLUMINATION LAMP PC BOARD ASS'Y (NAPL-1743/1744)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL901	210162	PL6. 3V0. 25A, Lamp

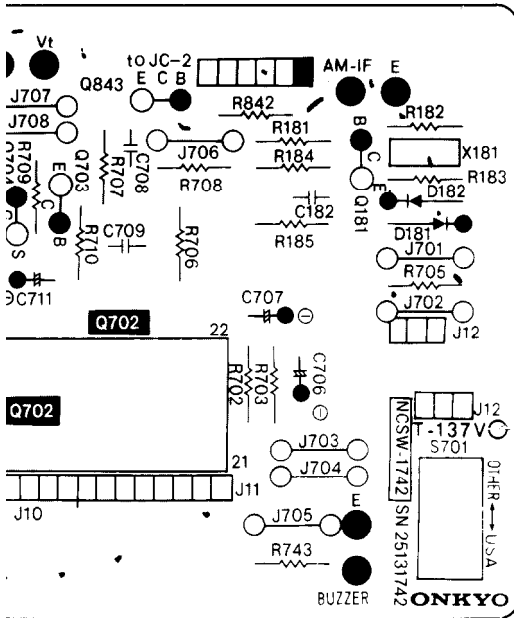
## FLUORESCENT INDICATOR TUBE PCB VIEW



## TUNER



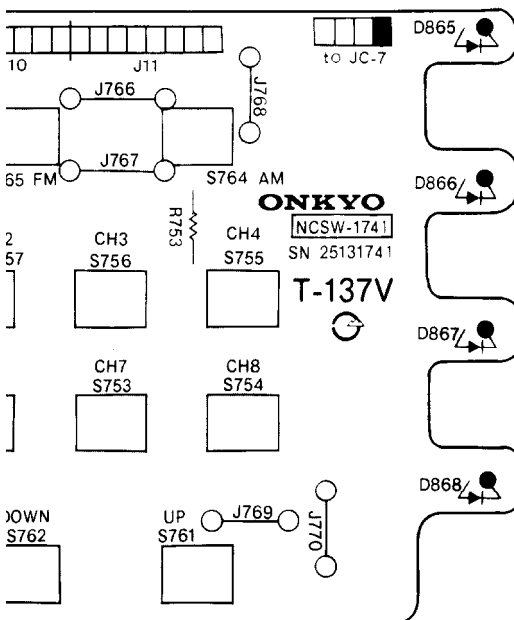
Notes: (D): Only 120V model  
 (G): Only 220V model  
 (W): Only 120/220V model  
 (Q): Only 240V model



**DIGITAL CIRCUIT PC BOARD ASS'Y  
 (NADG-1739/a/b)**

CIRCUIT NO.	PARTS NO.	DESCRIPTION
<b>ICs</b>		
Q701	222675	TD6104P, Prescaler
Q702	222674	TC9147P, PLL synthesizer/ controller
Q710	222673	TD6301AP, Static frequency indicator driver
<b>Transistors</b>		
Q703	2211255	2SC1815 (GR)
Q704	2212294	2SK108 (D)
Q705, Q706	2211254	2SC1815 (Y),
Q841, Q843	2211255 or	2SC1815 (GR) or
Q844	2210746	2SC945A (P)
Q852-Q855		
Q707, Q708	2211255	2SC1815 (GR) (G/Q/W)
Q709	2211455	2SA1015 (GR) (G/Q/W)
Q181	2210823	2SC1675 (L-1)
<b>Diodes</b>		
D181, D182	223105	1S1555
D701-D704	223133 or	DS442X or
D707, D708	223145	1S2076TD
D813		
D705, D706	223105,	1S1555,
	223133 or	DS442X or
	223145	1S2076TD (G/Q/W)
D851, D852	224178,	05Z9, 1Y,
	2241052 or	GZA9, 1EB3 or
	2239573	RD9, 1EB3
D954	2239433	RD4, 7EB3
<b>Ceramic filter</b>		
X181	3010076	BFU450C
<b>X'tal</b>		
X701	3010073	XTL-7.2M
<b>Capacitors</b>		
C705	352734709	47 $\mu$ F, 10V, Elect.
C706	352780109	1 $\mu$ F, 50V, Elect.
C707	352780229	2.2 $\mu$ F, 50V, Elect.
C711	395160107	1 $\mu$ F, 35V, Tantalum
C713	352784799	0.47 $\mu$ F, 50V, Elect.
C715	3020018	0.047F, 5V, Super
C718	352722229	2,200 $\mu$ F, 6.3V, Elect.
C719	352751009	10 $\mu$ F, 25V, Elect.
C841	352780339	3.3 $\mu$ F, 50V, Elect.
<b>Resistors</b>		
R721-R729	49121333509	33kohm $\times$ 9, 1/8W, Network
R730-R742	49121333513	33kohm $\times$ 13, 1/8W, Network
R957	441523904	39ohm, 1/2W, Metaloxide film

**TCH PCB VIEW**



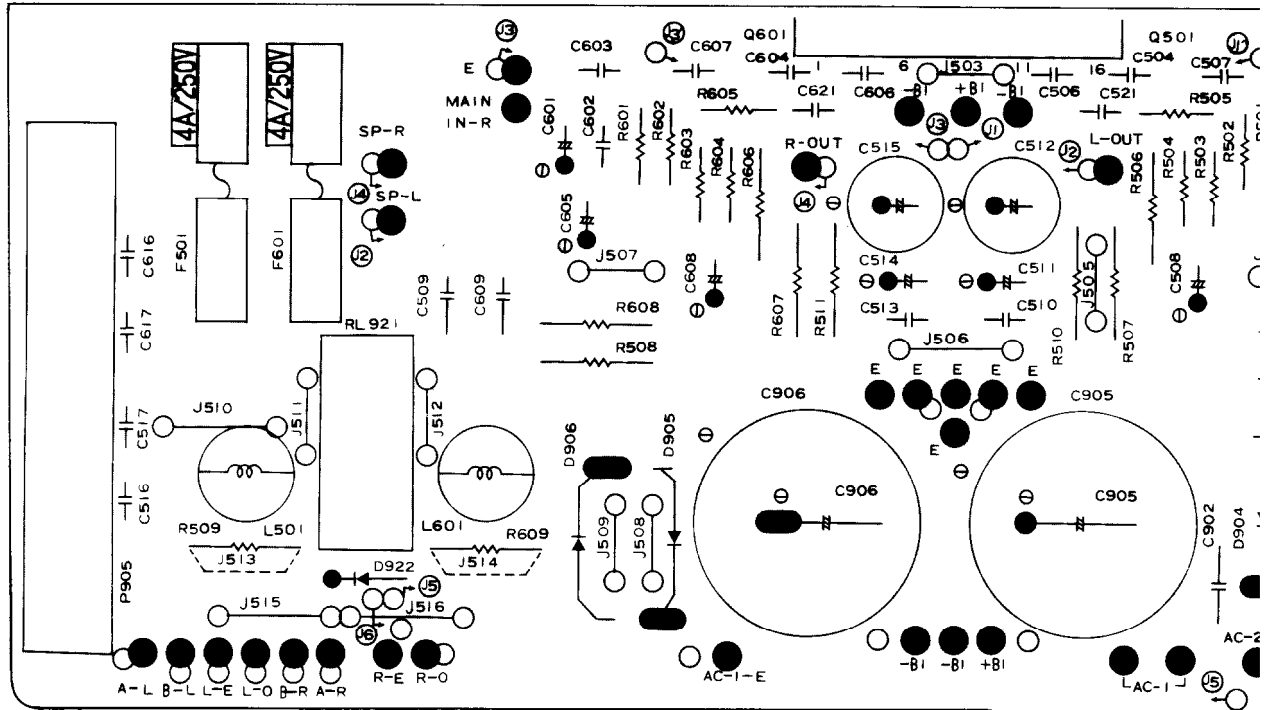
**FLUORESCENT INDICATOR TUBE PC BOARD ASS'Y  
 (NADIS-1740)**

CIRCUIT NO.	PARTS NO.	DESCRIPTION
<b>Fluorescent indicator tube</b>		
Q751	212016	FIP7B8CS
<b>LEDs</b>		
D751-D758	225142	SEL2913K
D761		
D760, D859	225137	SEL2413E
D854, D855		
D856-D858	225142	SEL2913K
D864	225141	SEL2213C
<b>Holders</b>		
	27190222	LED16
	27190223	LED3
<b>Cushion</b>		
	28140417	

# PCB PARTS LIST/VIEW FROM COMPONENT SIDE

## POWER SUPPLY AND AMPLIFIER PCB VIEW

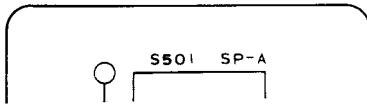
1



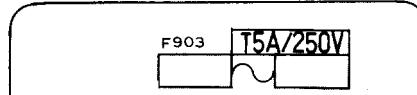
2

### SPEAKER SELECTOR

### SWITCH PCB VIEW



### FUSE PCB VIEW



3

MODEL TX-25

### SUBSTITUTIVE PARTS LIST

NOTE: USE THE REGULAR PARTS WHEN REPLACEMENT

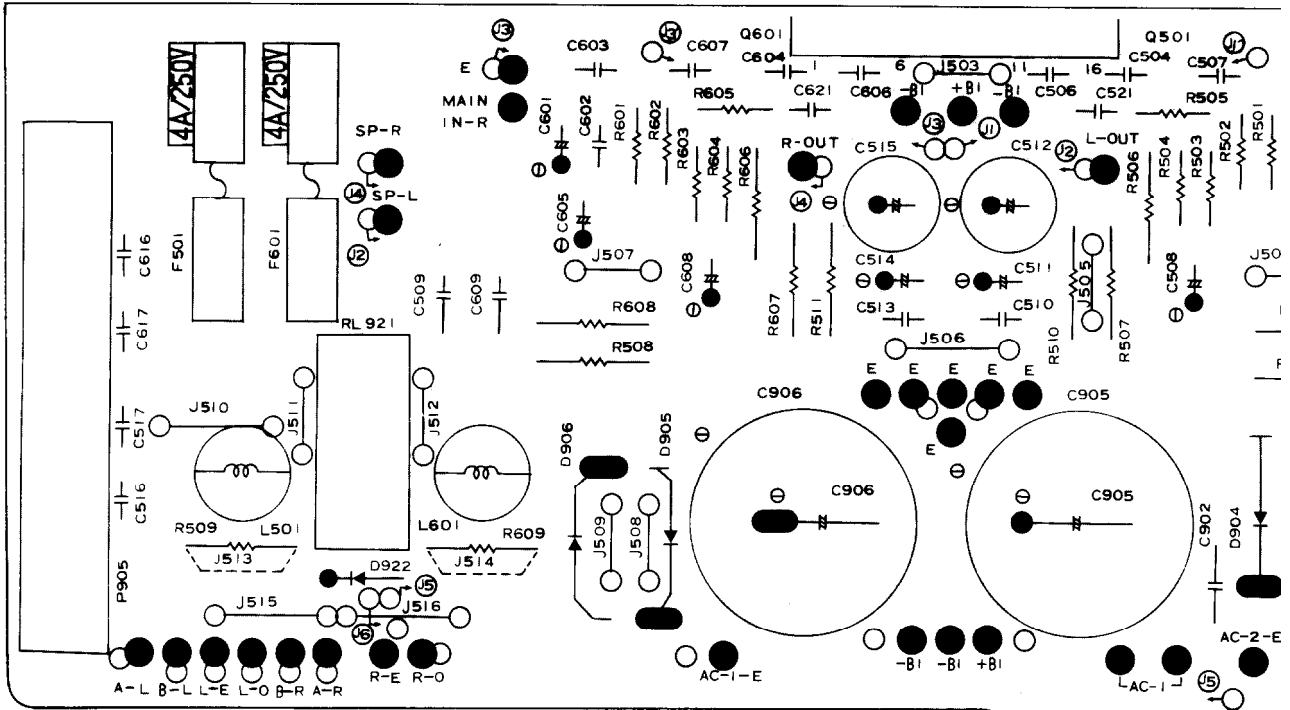
TYPE	CIRCUIT NO.	DESCRIPTION	REGULAR PARTS	SUBSTITUTIVE PARTS	APPLICATION
UG	D760,854,855	LED	SEL2413E	SEL2310G	8841-9540
UG	D859,865,866	LED	SEL2413E	SEL2310G	8841-9540
UD	D760,854,855	LED	SEL2413E	SEL2310G	7611-9610
UD	D859,865,866	LED	SEL2413E	SEL2310G	7611-9610
UG	Q103	IC	MPC-1167C2	MPC-1167C2(RED)	8841-9540
UD	D910,D911	DIODE	GZA18X OR Y	EQAD2-17B	9611-12510
UG	Q301	IC	NJM4559DX	NJM4559DD	8241-8840
UG	D851,D856	DIODE	RD9.1EB3 OR D529.1Y	EQAD2-D9C	8241-9540
UD	D851	DIODE	D529.1Y	EQAD2-D9C	7011-7610
UD	D910,D911	DIODE	GZA18X OR Y	EQAD2-17B	13011-14010
UG	D910,D911	DIODE	GZA18X OR Y	EQAD2-17B	10741-11340
UD	Q921	TRANSISTOR	2SC1815(GR)	2SC945A(P)	11611-12510
UD	D760,854,855	LED	SEL2413E	SEL2310G	11111-12510
UD	D859,865,866	LED	SEL2413E	SEL2310G	11111-12510
UD	Q301	IC	NJM4559DX	NJM4560DX	14511-15210
UD	Q204,Q205	TRANSISTOR	2SD655(E)	2SD655(F)	14511-15210
UD	Q922	TRANSISTOR	2SC1815(Y)	2SC1815(GR)	11611-12510
UD	D953	DIODE	RD6.2EB3	GZA6.2Y	13011-13510
UD	D910,D911	DIODE	GZA18X OR Y	EQAD2-17B	13011-13510

INKYO. 1F-1750

# PCB PARTS LIST/VIEW FROM COMPONENT SIDE

## POWER SUPPLY AND AMPLIFIER PCB VIEW

1

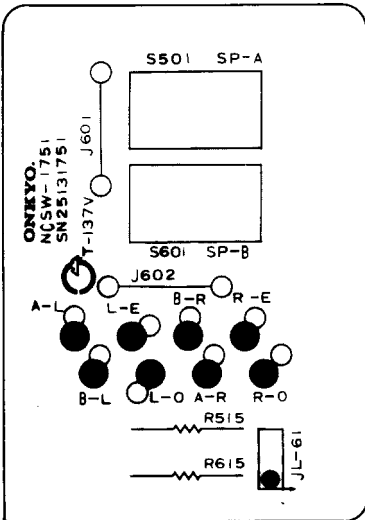


2

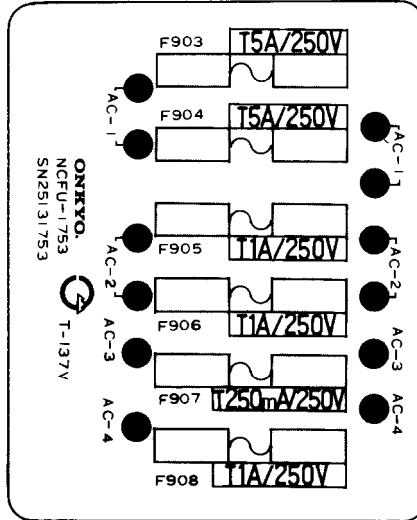
3

### SPEAKER SELECTOR

#### SWITCH PCB VIEW



#### FUSE PCB VIEW



4

### SPEAKER SELECTOR SWITCH PC BOARD ASS'Y (NASW-1751)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	<b>Resistors</b>	
R515, R615	441522714	270ohm, 1/2W, Metal oxide film
	<b>Switches</b>	
S501, S601	25035397	NPS-222-L361

### HEADPHONE TERMINAL PC BOARD ASS'Y (NAHP-1752)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
P906	25045138	HLJ0520-01-010

### FUSE TERMINAL PC BOARD ASS'Y (NAFU-1753)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	<b>Fuseholders</b>	
	25050065	YSH403T
	<b>Fuses</b>	
△ F903, F904	252078	5A-SE-EAK
△ F905, F906	252070	1A-SE-EAK
△ F907	252088	0.25A-SE-EAWK
		(Only 220/240V models)

5

Note: (D): Only 120V model  
 (G): Only 220V model  
 (W): Only 120/220V model  
 (Q): Only 240V model

**POWER SUPPLY AND POWER AMPLIFIER CIRCUIT  
 PC BOARD ASS'Y (NAAF-1750/a/b)**

CIRCUIT NO.	PARTS NO.	DESCRIPTION
Q501, Q601	222035	STK-4833, Power amplifier
<b>IC</b>		
<b>Transistors</b>		
Q921	2211255	2SC1815 (GR)
Q922	2211254	2SC1815 (Y)
<b>Diodes</b>		
D901-D906	223845	GP-20D
D907	223862	WL-01
D908, D909	223880	GP101N4003
D910, D911	2241191 or 2241192	GZA-18X or GZA-18Y
D921, D922	223145, 223133 or 223105	1S2076TD, DS442X or 1S1555
<b>Coils</b>		
L501, L601	231001	S1. 3B (G/Q)
<b>Capacitors</b>		
C501, C601	352780479	4.7 $\mu$ F, 50V, Elect.
C505, C605	352731019	100 $\mu$ F, 10V, Elect.
C508, C608	352764709	47 $\mu$ F, 35V, Elect.
C511, C514	352781009	10 $\mu$ F, 50V, Elect.
C512, C515	352781019	100 $\mu$ F, 50V, Elect.
C905, C906	3504169	6,800 $\mu$ F, 40V, Elect.
C907, C908	352761019	100 $\mu$ F, 35V, Elect.
C909, C910	352752219	220 $\mu$ F, 25V, Elect.
C911	352764709	47 $\mu$ F, 35V, Elect.
C912	352764719	470 $\mu$ F, 35V, Elect.
C913	352783319	330 $\mu$ F, 50V, Elect.
C914	352752229	2,200 $\mu$ F, 25V, Elect.
C921	352753309	33 $\mu$ F, 25V, Elect.
C923	352780339	3.3 $\mu$ F, 50V, Elect.
<b>Resistors</b>		
R506, R606	441523324	3.3kohm, 1/2W, Metal oxide film
R507, R607	441521024	1kohm, 1/2W, Metal oxide film
R508, R608	441520474	4.7ohm, 1/2W, Metal oxide film
R509, R609	441520474	4.7ohm, 1/2W, Metal oxide film (G/Q)
R510	441521014	100ohm, 1/2W, Metal oxide film
R511	441525614	560ohm, 1/2W, Metal oxide film
R901-R904	441524714	470ohm, 1/2W, Metal oxide film
△ R905	431523355	3.3Mohm, 1/2W, Solid (D)
R921	441621024	1kohm, 1W, Metal oxide film
R925	441522704	27ohm, 1/2W, Metal oxide film
<b>Relay</b>		
RL921	25065108	NRL-2P3A-DC24-05
<b>Terminal</b>		
P905	25060058	NTM-8PDML25, Speaker
<b>Fuseholders</b>		
△ F901a, F501a F601a	250113	SN5051 (D/W)
F902a	25050065	YSH403T (G/Q/W)
F501a, F601a	25050065	YSH403T (G/Q)
<b>Fuses</b>		
△ F501, F601	252059	4A (SS-2), Speaker (D)
	252076	3.15A-SE-EAK, Speaker (G/Q)
	252014	4A-T, Speaker (W)
△ F901	252049	4A (ST-6), Primary (D)
	252014	4A-T, Primary (W)
△ F902	252074	2A-SE-EAK, Primary (G/Q/W)

NOTE: THE COMPONENTS IDENTIFIED BY MARK  
 △ ARE CRITICAL FOR LISK OF FIRE AND  
 ELECTRIC SHOCK. REPLACE ONLY WITH  
 PARTS NUMBER SPECIFIED.

1

2

3

4

5

A

B

C

D

E

F

G

TX-25

SCHEMATIC DIAGRAM

— G/Q MODELS —

NOTES

- ALL RESISTORS ARE IN OHMS UNLESS OTHERWISE NOTED.
- ON CAPACITORS ARE IN  $\mu$ F UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS ARE IN  $\mu$ FV.
- VOLTAGE MEASURED WITH VT, AND NO INPUT SIGNAL.
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

THE COMPONENTS IDENTIFIED BY MARK  $\Delta$  ARE CRITICAL FOR SAFETY.

Q301, Q302 Q501, Q601

Q921, Q922

Q931, Q932 Q501, Q601

(TOP VIEW)

Q931, Q932 Q501, Q601

(TOP VIEW)

NO.	FUNCTION	POSITION
S901	POWER SELECTOR	ON OFF
S101	SELECTOR	FM/AM
S102	MONITOR	SOURCE
S103	MONITOR	SOURCE
S104	MONITOR	SOURCE
S105	MODE	MONO/STEREO
S106	LOUDNESS ON/OFF	
S107	SPEAKERS ON/OFF	A B
S108	SPEAKERS OFF	A B

The schematic diagram illustrates the internal circuitry of an audio receiver, organized into several functional sections:

- Input Section (A-C):** Features FM and AM antennas (75 $\Omega$  and 300 $\Omega$ ), a tuning eye (NAFL-1744), and a detector (NADG-17392).
- IF and AF Stages (D-E):** Includes an IF amplifier (Q301, NJM5590X), a detector (Q302, NJM5590X), and an AF amplifier (Q501, STK-4933).
- Control and Tone Section (F-G):** Contains a tone control (NATC-1748), bass and treble controls, and a volume control (NAVR-1749).
- Power and Output Section (H-I):** Features a main amplifier (MAIN-AMP), a relay drive circuit (NAAF-1750), and two speaker drivers (SPEAKERS-A and SPEAKERS-B).
- Power Supply (I):** Shows a DC power supply section with a transformer (P906) and various filter capacitors (C901-C905).

Key components and their values are specified throughout the diagram, such as resistors (R101-R108, R201-R208, R301-R308, R401-R408, R501-R508, R601-R608, R701-R708, R801-R808, R901-R908) and capacitors (C101-C108, C201-C208, C301-C308, C401-C408, C501-C508, C601-C608, C701-C708, C801-C808, C901-C905).

ONKYO CORPORATION

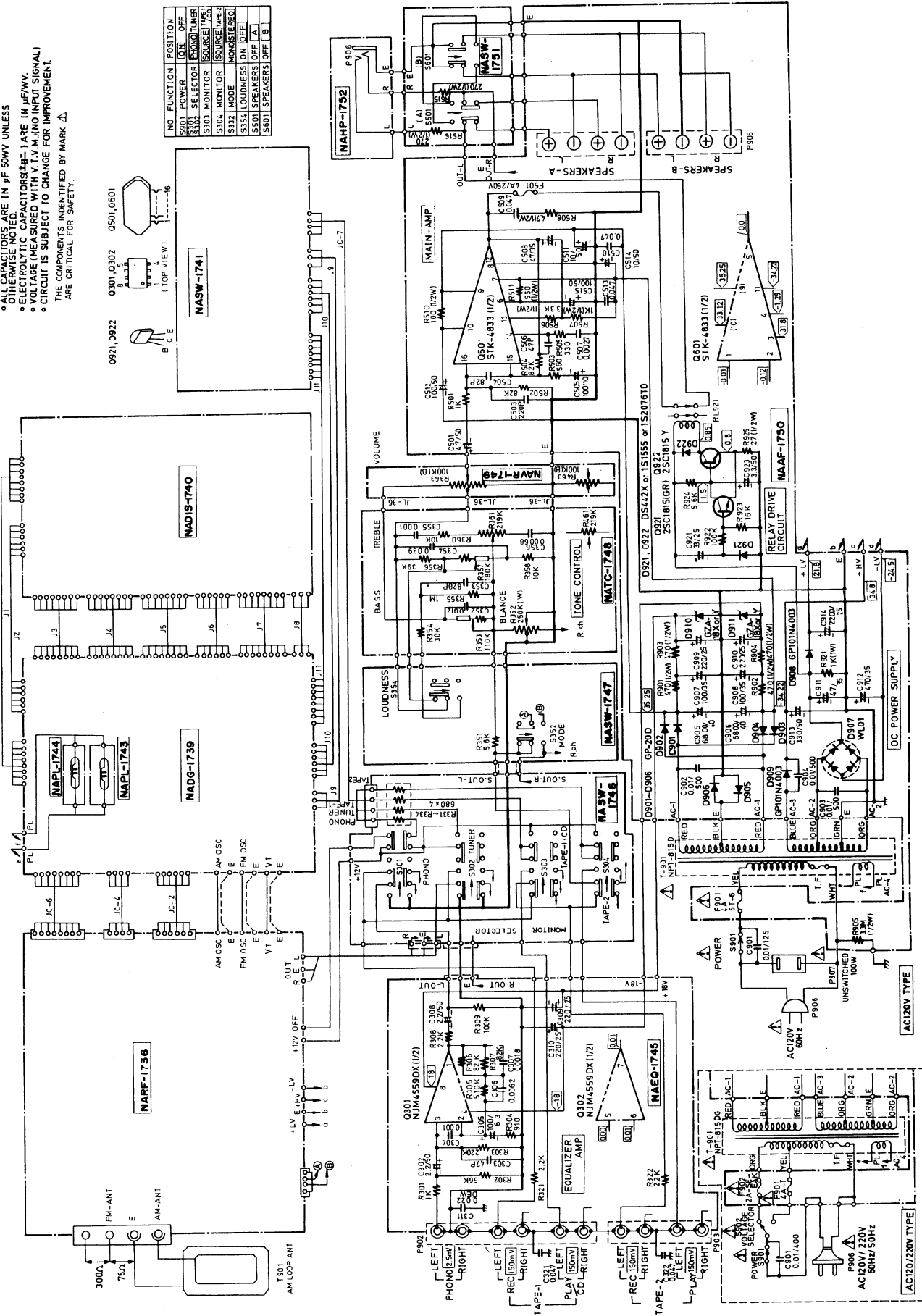


# SCHEMATIC DIAGRAM

- D/W MODELS -

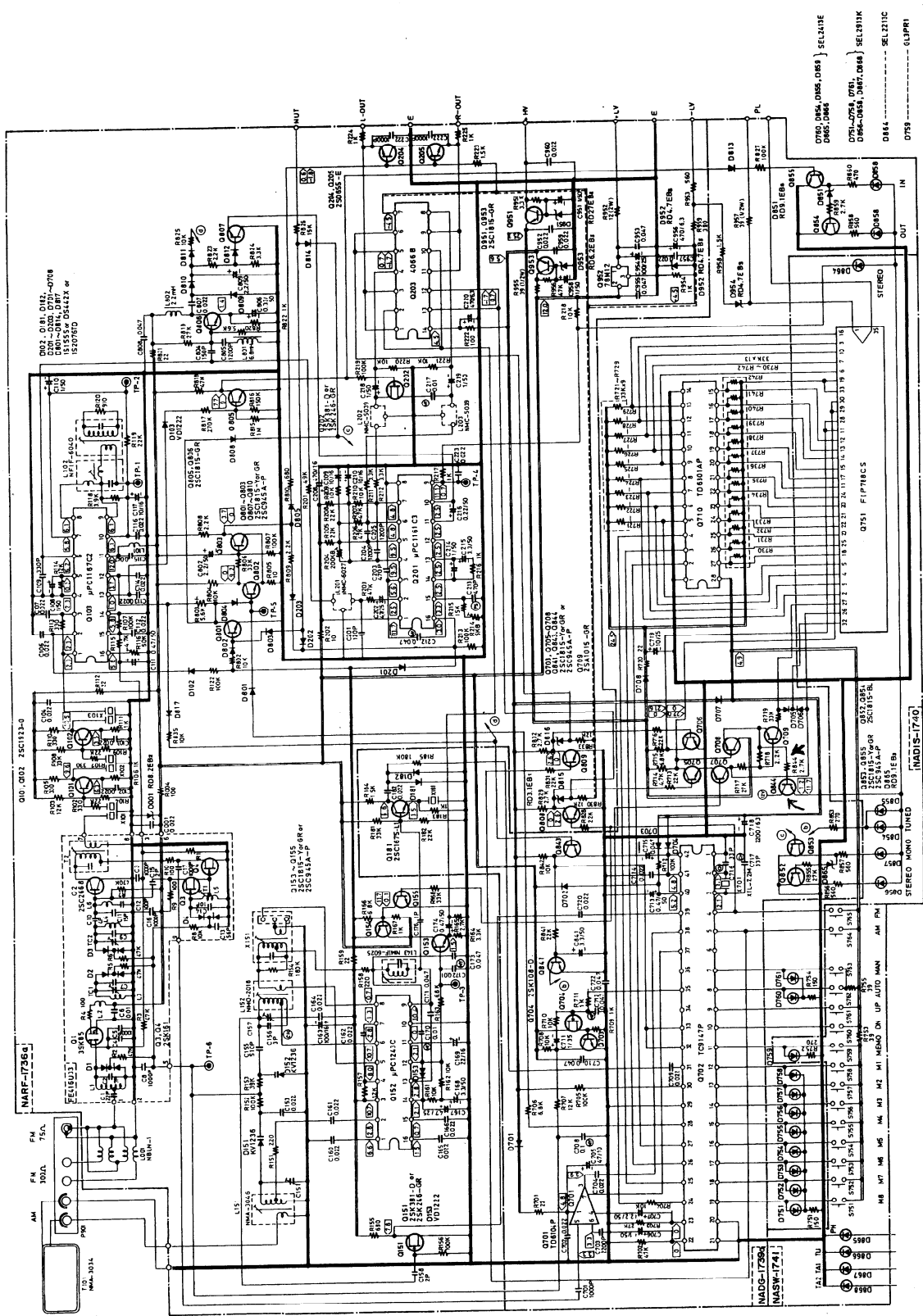
- NOTES**
- ALL RESISTORS ARE IN OHMS UNLESS OTHERWISE NOTED.
  - ALL CAPACITORS ARE IN PF UNLESS OTHERWISE NOTED.
  - ELECTROLYTIC CAPACITORS (E-1) ARE IN  $\mu$ F W/V.
  - VOLTAGE MEASURED WITH V.T.V.M. (NO INPUT SIGNAL).
  - CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.
  - THE COMPONENTS IDENTIFIED BY MARK  $\Delta$  ARE CRITICAL FOR SAFETY.

NO.	FUNCTION	POSITION
S301	POWER	ON/OFF
S302	SELECTOR	FM/AM
S303	MONITOR	SOURCE (T/M)
S304	MONITOR	SOURCE (M/F)
S305	MODE	MONO/STEREO
S306	LOUDNESS	ON/OFF
S307	SPEAKERS	OFF/ON
S308	SPEAKERS	OFF/ON



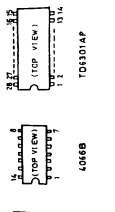
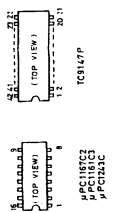
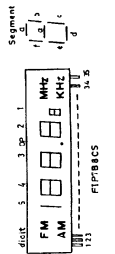
A B C D E F G

**SCHEMATIC DIAGRAM**  
—G/O MODELS—



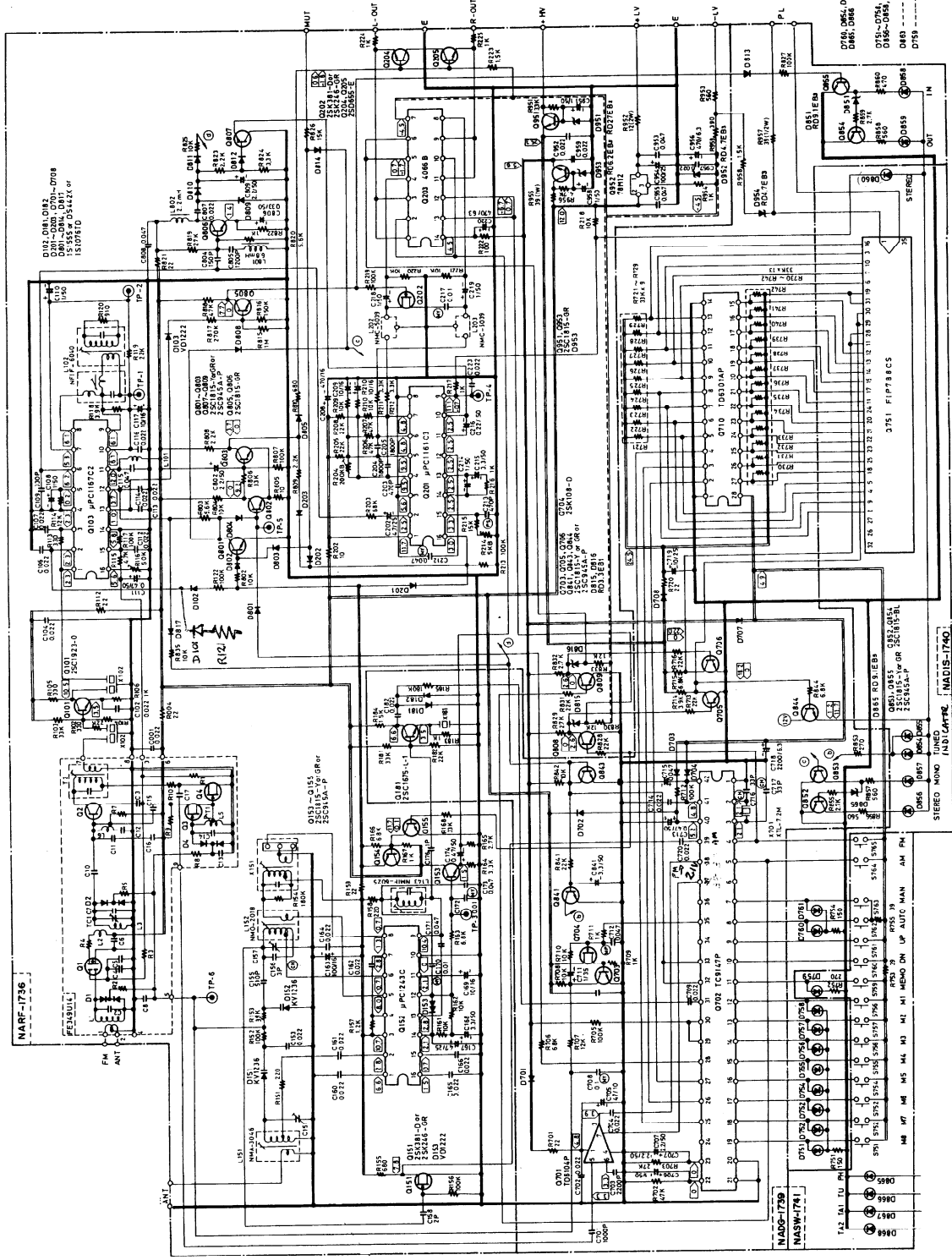
**NOTES**

- ALL RESISTORS ARE IN OHMS UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN P.F. 30KV UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (—) ARE IN JF/W.V.
- VOLTAGE MEASURED WITH V.T.V. M. (NO INPUT SIGNAL).
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

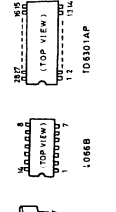
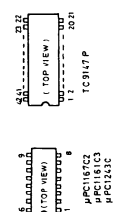
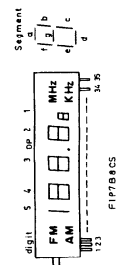


# SCHEMATIC DIAGRAM

— 120V MODEL —

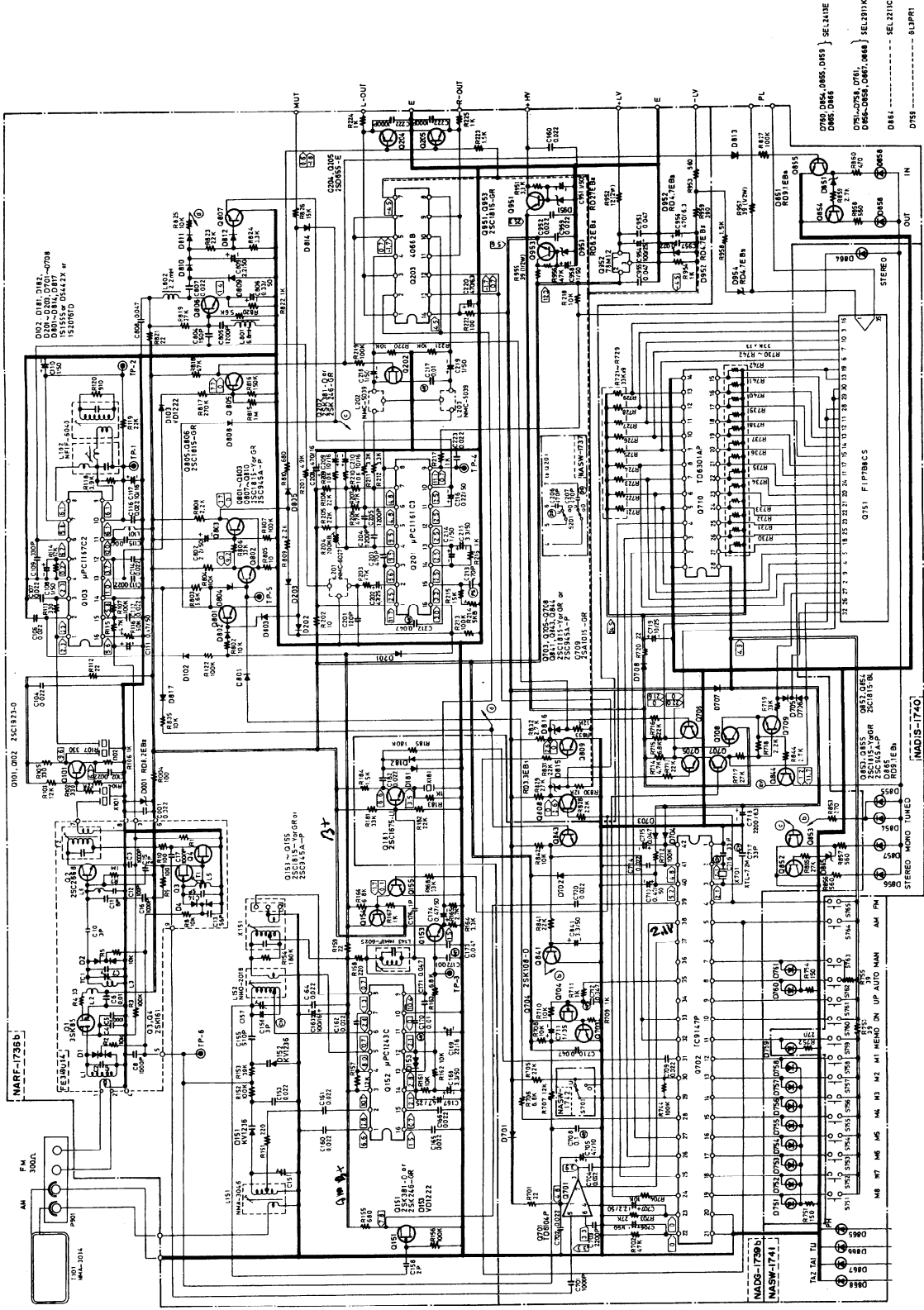


- NOTES**
- ALL RESISTORS ARE IN OHMS, 1/4WATT UNLESS OTHERWISE NOTED.
  - ALL CAPACITORS ARE IN  $\mu$ F, 50V, UNLESS OTHERWISE NOTED.
  - ELECTROLYTIC CAPACITORS (—) ARE IN  $\mu$ F/WV (MINIMAL).
  - VOLTAGE (MEASURED WITH VTY AND IMPROVEMENT).
  - CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

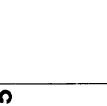
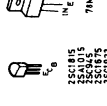
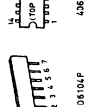
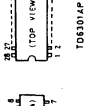
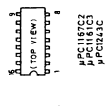
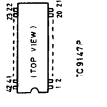
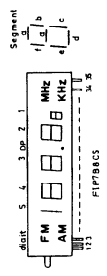


SCHEMATIC DIAGRAM

-120/220V MODEL-

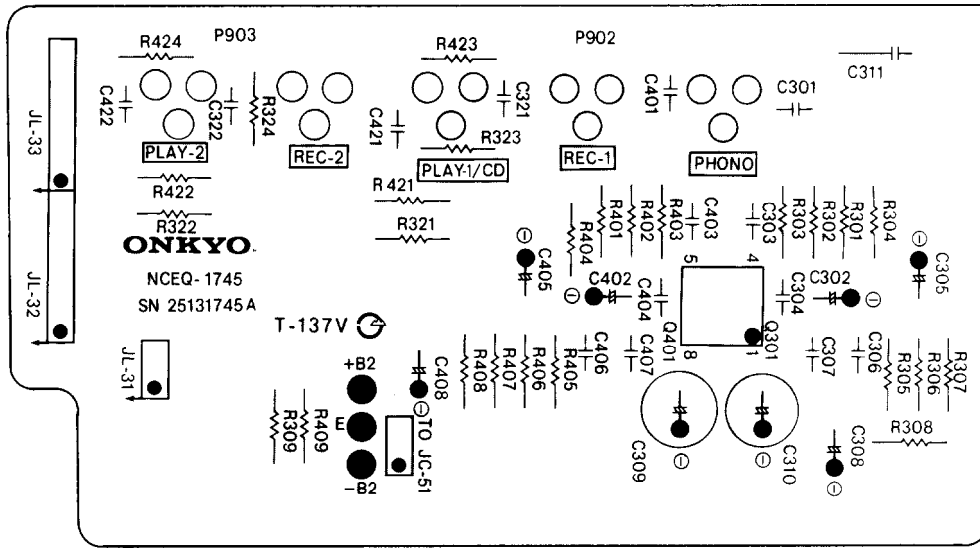


- NOTES
- ALL RESISTORS ARE IN OHMS UNLESS OTHERWISE NOTED.
  - CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE NOTED.
  - ELECTROLYTIC CAPACITORS (-E) ARE IN MICROFARADS.
  - VOLTAGE MEASURED WITH V.T.V.M. (NO INPUT SIGNAL).
  - CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.



# PCB PARTS LIST/VIEW FROM COMPONENT SIDE

## EQUALIZER AMPLIFIER PCB VIEW

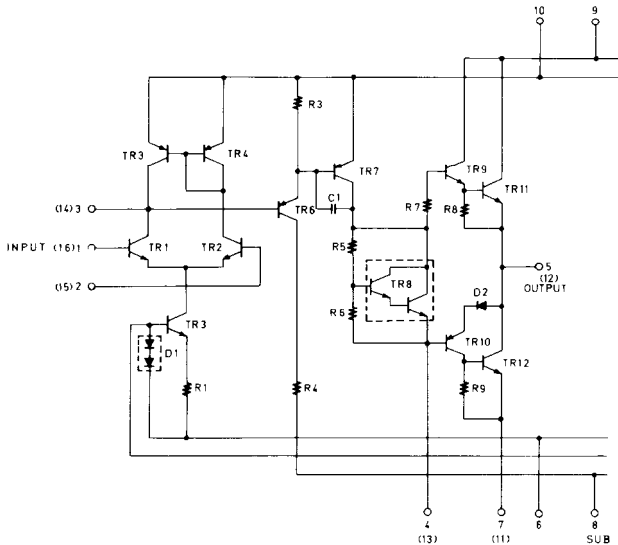


### EQUALIZER AMPLIFIER PC BOARD ASS'Y (NAEQ-1745/a)

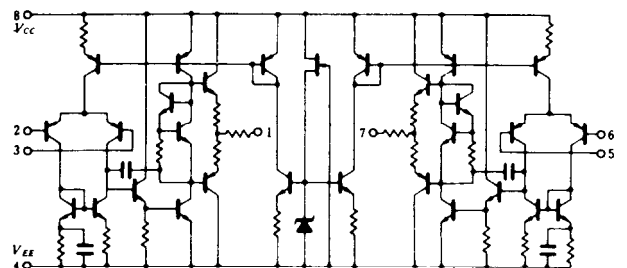
CIRCUIT NO.	PARTS NO.	DESCRIPTION
	<b>IC</b>	
Q301, Q401	222534	NJM-4559DX
	<b>Capacitors</b>	
C302, C402	352780229	2.2 $\mu$ F, 50V, Elect.
C305, C405	352721019	100 $\mu$ F, 6.3V, Elect.
C308, C408	352780229	2.2 $\mu$ F, 50V, Elect.
C309, C310	352752219	220 $\mu$ F, 25V, Elect.
	<b>Terminals</b>	
P902	25045137	NPJ-6PDBL52, Phono/Tape 1
P903	25045084	NPJ-4PDBL42, Tape 2

## BLOCK DIAGRAM

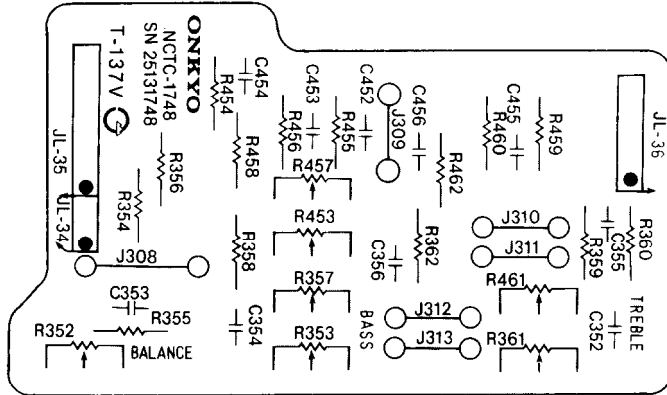
### STK-4833 (Power amplifier)



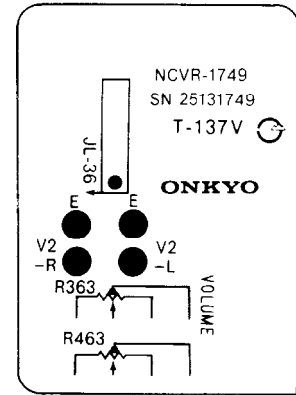
### NJM-4559DX (Equalizer amplifier)



TONE CONTROL PCB VIEW



VOLUME CONTROL PCB VIEW



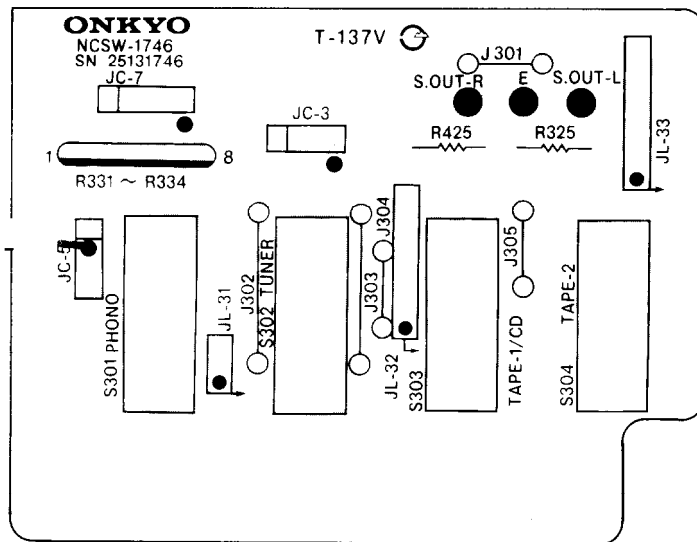
TONE CONTROL CIRCUIT PC BOARD ASS'Y (NATC-1748)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	<b>Variable resistors</b>	
R352	5146034	N16RLC250KWT30, Balance
R353, R453	5148073	N16RQMC110K180K30, Bass
R357, R457		
R361, R461	5148074	N16RGMC219K30, Treble

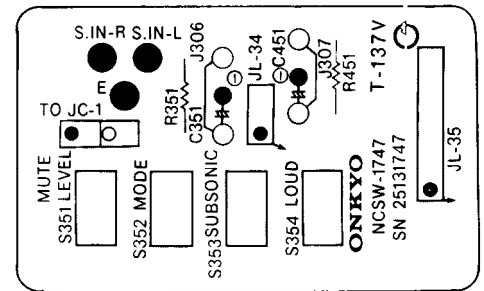
VOLUME CONTROL PC BOARD ASS'Y (NAVR-1749)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
R363, R463	5148093	N16RGM100KB35, Variable resistor

SELECTOR SWITCH PCB VIEW



MODE/LOUDNESS SWITCH PCB VIEW



SELECTOR SWITCH PC BOARD ASS'Y (NASW-1746)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	<b>Resistor</b>	
R331-R334	49241681504	680ohmx4, 1/4W, Network
	<b>Switches</b>	
S301-S304	25035395	NPS-442-L358, Push

MODE/LOUDNESS SWITCH PC BOARD ASS'Y (NASW-1747)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
S352, S354	25035396	NPS-222-L359, Push switch

## SUBSTITUTIVE PARTS LIST

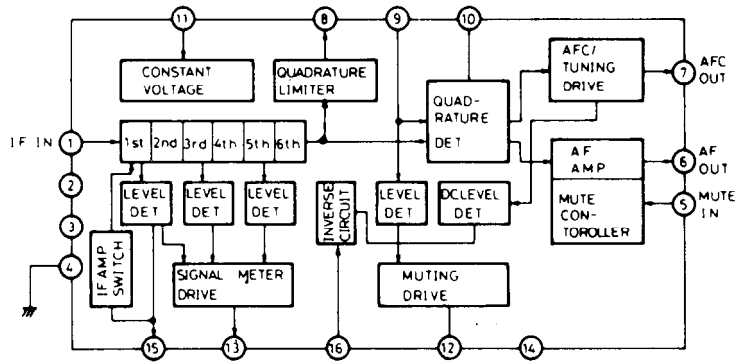
TX-25

NOTE: USE THE REGULAR PARTS WHEN REPLACEMENT

TYPE	CIRCUIT NO.	DESCRIPTION	REGULAR PARTS	SUBSTITUTIVE PARTS	APPLICATION
UG	D760,854,855	LED	SEL2413E	SEL2310G	8841-9540
UG	D859,865,866	LED	SEL2413E	SEL2310G	8841-9540
UD	D760,854,855	LED	SEL2413E	SEL2310G	7611-9610
UD	D859,865,866	LED	SEL2413E	SEL2310G	7611-9610
UG	Q103	IC	MPC-1167C2	MPC-1167C2(RED)	8841-9540
UD	D910,D911	DIODE	GZA18X OR Y	EQAD2-17B	9611-12510
UG	Q301	IC	NJM4559DX	NJM4559DD	8241-8840
UG	D851,D856	DIODE	RD9.1EB3 OR D5Z9.1Y	EQAD2-09C	8241-9540
UD	D851	DIODE	D5Z9.1Y	EQAD2-09C	7011-7610
UD	D910,D911	DIODE	GZA18X OR Y	EQAD2-17B	13011-14010
UG	D910,D911	DIODE	GZA18X OR Y	EQAD2-17B	10741-11340
UD	Q921	TRANSISTOR	2SC1815(GR)	2SC945A(P)	11611-12510
UD	D760,854,855	LED	SEL2413E	SEL2310G	11111-12510
UD	D859,865,866	LED	SEL2413E	SEL2310G	11111-12510
UD	Q301	IC	NJM4559DX	NJM4560DX	14511-15210
UD	Q204,Q205	TRANSISTOR	2SD655(E)	2SD655(F)	14511-15210
UD	Q922	TRANSISTOR	2SC1815(Y)	2SC1815(GR)	11611-12510
UD	D953	DIODE	RD6.2EB3	GZA6.2Y	13011-13510
UD	D910,D911	DIODE	GZA18X OR Y	EQAD2-17B	13011-13510
UG	D760,854,855	LED	SEL2413E	SEL2310G	11441-12740
UG	D859,865,866	LED	SEL2413E	SEL2310G	11441-12740
UG	D953	DIODE	RD6.2EB3	GZA6.2Y	11441-12740
UG	D910,D911	DIODE	GZA18X/Y	EQAD2-17B	11441-12740
UD	D910,D911	DIODE	GZA18X/Y	EQAD2-17B	12511-13010
UG	Q301	IC	NJM4559DX	NJM4560DX	10741-11340
UD	Q301	IC	NJM4559DX	NJM4560DX	12511-13010
UD	Q301	IC	NJM4559DX	NJM4560DX	19011-21410
UD	Q153-Q155	TRANSISTOR	2SC1815(Y)	2SC945A(Q)	19011-21410
UD	Q801-Q803	TRANSISTOR	2SC1815(Y)	2SC945A(Q)	19011-21410
UD	Q807-Q809	TRANSISTOR	2SC1815(Y)	2SC945A(Q)	19011-21410
UD	Q103	IC	MPC1167C-2	MPC1267C	21911-25510
UD	Q152	IC	MPC1243C	MPC1168C	24111-25510
UD	D953	DIODE	RD6.2EB3	EQAD2-06E	15211-18010
UD	D910,D911	DIODE	GZA18X/Y	RD18EB2	15211-18010
UD	D953	DIODE	RD6.2EB3	MTZ6.2C	21911-23410
UD	Q181	TRANSISTOR	2SC1675(L-1)	2SC1675(K)	11-2310
UG	Q181	TRANSISTOR	2SC1675(L-1)	2SC1675(K)	41-1740
UG	Q704	FET	2SK108(D)	2SK68(M)	41-4240
UD	Q704	FET	2SK108(D)	2SK68(M)	APL.-84
UD	D953	DIODE	RD6.2EB3	GZA6.2Y	APL.-84
UG	D953	DIODE	RD6.2EB3	MTZ6.2C	13641-14640
UD	Q805,Q806	TRANSISTOR	2SC1815GR	2SC945AP	25511-28610
UD	Q951,Q953	TRANSISTOR	2SC1815GR	2SC945AP	25511-28610
UD	D953	DIODE	RD6.2EB3	MTZ6.2C	25511-28610
UD	Q103	IC	MPC1167C2	MPC1267C	25511-28610
UD	Q152	IC	MPC1243C	MPC1168C	25511-28610

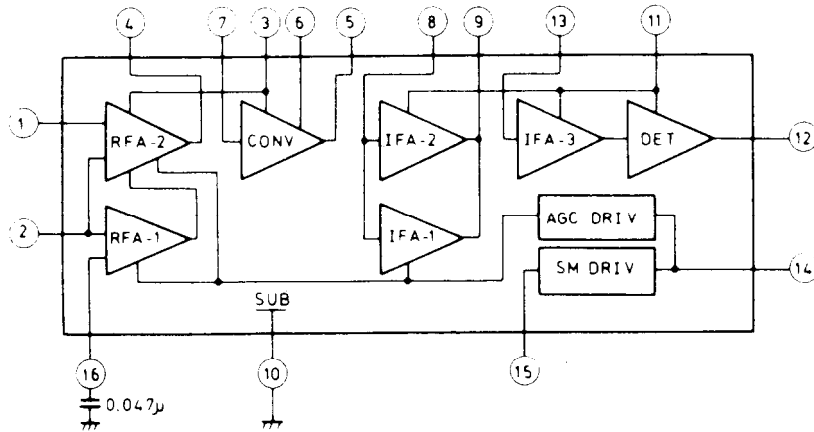
**BLOCK DIAGRAM OF IC**

**μPC1167C2 (FM IF system)**

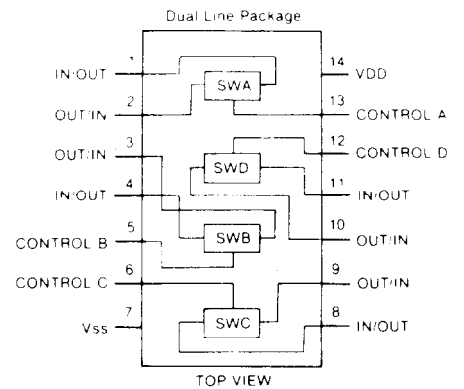


1. IF signal input
2. IF amplifier switch input  
H level: Off
5. Muting switch input
6. Composite signal output
7. AFC output
8. IF amplifier output
9. 10.7MHz input
10. Reference voltage
11. Power supply
12. Muting output  
Tuned: L level
13. Signal strength output
15. AGC output
16. Muting level

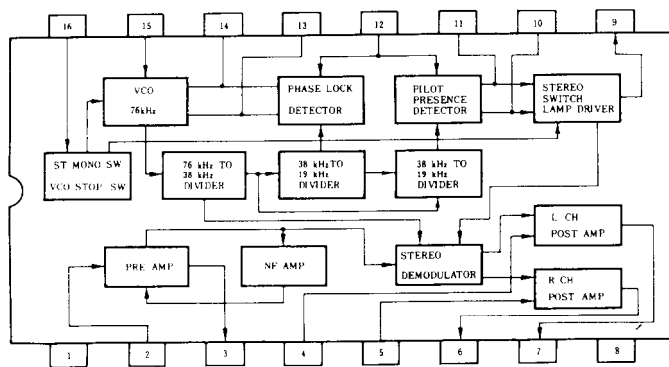
**μPC1243C (AM radio system)**



**TC4066BP (Analogue switch)**

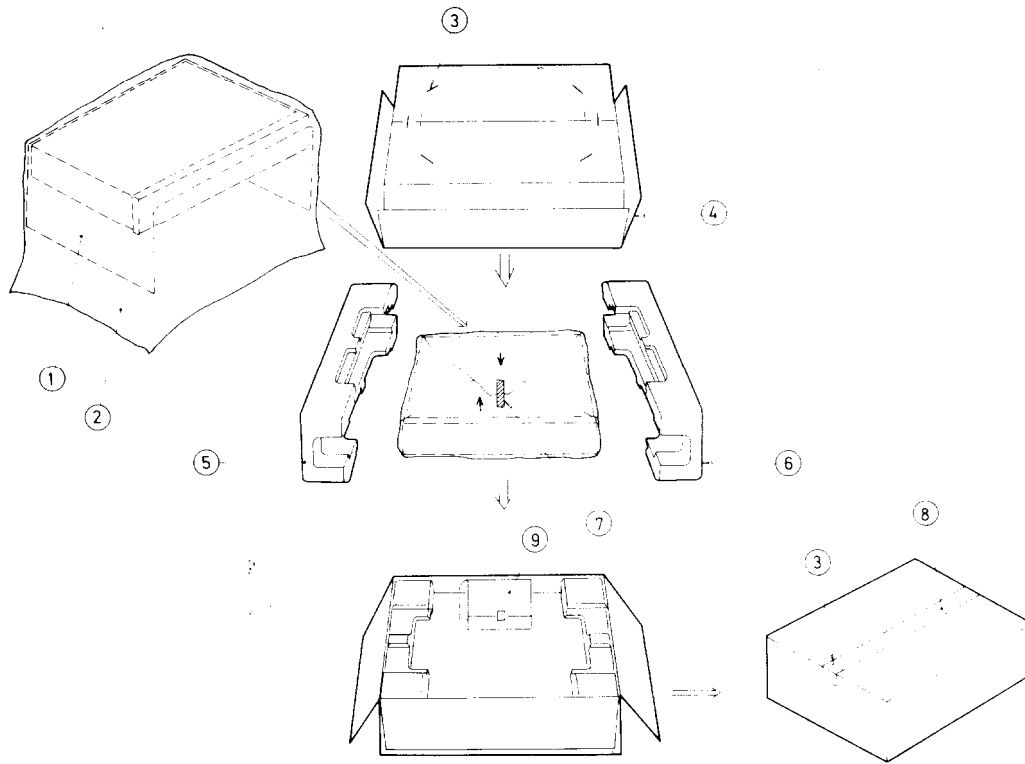


**μPC1161C3 (Stereo decoder)**





# PACKING VIEW



REF. NO.	PARTS NO.	DESCRIPTION
1	29095012-1	500x800mm, Protection sheet
2	29100034	650x850mm, Poly-vinyl bag
3	282301	Sealing hook
4	29050787	Master carton box
	29050788	Master carton box (B)
5	29090817A	Pad R
6	29090816A	Pad L
7	29110032	W=15mm, Adhesive tape
8	260012	50(W)x600mm, Damplon tape
9		Accessory bag complete
	<b>U.S.A. model</b>	
	292064A	FM antenna
	29100006	350x250mm, Poly-vinyl bag
	29340710	Instruction manual
	29365006-5	Warranty card
	29358002A	Service station list
	<b>120V model</b>	
	292064A	FM antenna
	29100006	350x250mm, Poly-vinyl bag
	29340710	Instruction manual
	29340711	Instruction manual
	29365005-3A	Warranty card
	29358004	Service station list
	<b>220V model</b>	
	292064A	FM antenna
	29100006	350x250mm, Poly-vinyl bag
	29340711	Instruction manual
	29340710	Instruction manual
	<b>120/220V model</b>	
	292064A	FM antenna
	29100006	350x250mm, Poly-vinyl bag
	29340711	Instruction manual
	25055040	CV-K-2, Conversion plug

Note: (B): Only black model

## ONKYO CORPORATION

International Division: No. 24 Mori Bldg., 23-5, 3-chome, Nishi-Shinbashi, Minato-ku, Tokyo, Japan  
 Telex: 2423551 ONKYO J. Phone: 03-432-6981

## ONKYO U.S.A. CORPORATION

200 Williams Drive, Ramsey, N.J. 07446 Tel. 201-825-7950

## ONKYO DEUTSCHLAND GMBH, ELECTRONICS

8034 München-Germering, Industriestrasse 18, West Germany. Telex: 521 726 Telefon: (089)-84-3071