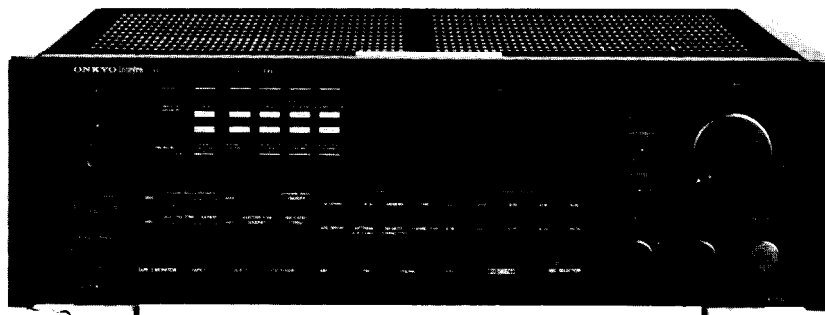


# ONKYO SERVICE MANUAL

## QUARTZ SYNTHESIZED TUNER AMPLIFIER MODELS TX-890/TX-890M



Black model

BHUD, BHUDN, MBHUDN	120V AC, 60Hz
MBHUWX	120/220V AC, 50/60Hz

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  $\Delta$  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 PART 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.

## TABLE OF CONTENTS

Specifications . . . . .	2
Service procedures . . . . .	3
Exploded view . . . . .	4
Parts list . . . . .	5
Block diagram-Tuner section . . . . .	6
Block diagram-Amplifier section . . . . .	7
IC block diagram and descriptions . . . . .	8
Adjustment procedures . . . . .	18
Pc board view/parts list . . . . .	21
FM/AM tuner . . . . .	21
Display/Operation switch . . . . .	23
Pre. and power amplifier . . . . .	25
Tone control . . . . .	28
Power supply . . . . .	29
Volume/Volume indicator . . . . .	30
Packing view . . . . .	31

**ONKYO**  
**AUDIO COMPONENTS**

# SPECIFICATIONS

## AMPLIFIER SECTION

Power Output:	125 watts per channel, min. RMS, at 8 ohms, both channels driven, from 20Hz to 20kHz, with no more than 0.02% total harmonic distortion.
Total Harmonic Distortion:	0.02% at rated power
IM Distortion:	0.02% at rated power
Damping Factor:	80 at 8 ohms
Frequency Response:	20-30,000Hz $\pm$ 1dB
RIAA Deviation:	20-20,000Hz $\pm$ 0.5dB
Sensitivity and Impedance:	Phono (MM): 2.5mV/50 kohms Phono (MC): 350 $\mu$ V/330 ohms CD/Tape Play: 150mV/50 kohms Tape Rec: 150mV/3.5 kohms Main In: 1V/47 kohms
Phono Overload:	150mV RMS at 1kHz, 0.02% THD
Signal-to-Noise Ratio:	Phono(MM): 93dB (at 10mV input, A weighted) 76dB (IHF A-202) Phono(MC): 88dB (at 5mV input, A weighted) 67dB (IHF A-202) CD/Tape: 98dB (A weighted) 80dB (IHF A-202)
Tone Controls:	Bass: $\pm$ 10dB at 100Hz Treble: $\pm$ 10dB at 10kHz
Muting:	-20dB

## TUNER SECTION

### FM:

Tuning Range:	87.5-108.0MHz (50kHz steps or 25kHz steps)
Usable Sensitivity:	Mono: 10.8dBf, 0.9 $\mu$ V Stereo: 17.2dBf, 2.0 $\mu$ V (75ohms)
50dB Quieting Sensitivity:	Mono: 17.2dBf, 2.0 $\mu$ V Stereo: 37.2dBf, 20 $\mu$ V (75ohms)
Capture Ratio:	1.3dB
Image Rejection Ratio:	45dB
IF Rejection Ratio:	90dB
Signal-to-Noise Ratio:	Mono: 76dB Stereo: 70dB
Alternate Channel Attenuation:	65dB
AM Suppression Ratio:	50dB
Harmonic Distortion:	Mono: 0.1% Stereo: 0.18%
Frequency Response:	30-15,000Hz $\pm$ 1.5dB
Stereo Separation:	45dB at 1kHz/30dB at 100-10,000Hz
Tuning Level:	27/17dBf

### AM:

Tuning Range:	530-1620kHz (10kHz steps) and/or 522-1611kHz (9kHz steps) (Worldwide model)
Usable Sensitivity:	30 $\mu$ V
Image Rejection Ratio:	40dB
IF Rejection Ratio:	40dB
Signal-to-Noise Ratio:	40dB
Harmonic Distortion:	0.7%

## GENERAL

Power Supply:	
USA & Canadian models:	AC 120V, 60Hz
Worldwide models:	120 and 220V switchable, 50/60Hz
Dimensions (W x H x D):	465 x 158 x 432mm 18-5/16" x 6-3/16" x 17"
Weight:	14.8kg., 32.6lbs

**REMOTE CONTROL TRANSMITTER RC-118S**

Transmitter: Infrared  
 Signal range: Approx. 5meters(16ft.4")  
 Power supply: TWO "AA" batteries (1.5V×2)  
 Dimensions(W×H×D): 64×18×176mm  
 2-1/2" × 3/4" × 7"  
 Weight: 140grams 5.0oz.(including batteries)

Specifications and features are subject to change without notice.

**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.	Part no.	Description
F901	252052	7 A (ST-6), Primary

W (Worldwide) model

Circuit no.	Part no.	Description
F901	252052	7 A (ST-6), Primary
F902	252077	4 A-SE-EAK, Primary

**2. Change of AM band step.**

With the exception of the models below, a BAND STEP selector switch is not provided.

BAND STEP	D763, JL009
10kHz→ 9kHz	Additional
9kHz→10kHz	Eliminated

In D763 ISS133 (Part No. 223163) is used. Between #1 and #2 of JL009 a jumper lead must be inserted. (Refer to page 23)

– Worldwide model –

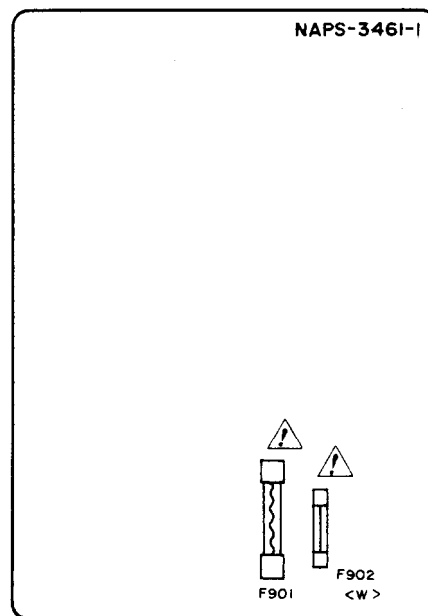
Worldwide models are equipped with a step band selector switch. This switch is located on the back panel. This switch is set to 10kHz and 9kHz at the factory, but may have to be reset to 9kHz or 10kHz depending on the area where the unit is used.

	De-emphasis	AM step
Europe:	50μsec	9kHz
U.S.A.:	75μsec	10kHz

**Change of voltage**

Worldwide 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.



POWER SUPPLY CIRCUIT PC BOARD

**4. Safety-check out**

(Only U.S.A. model)

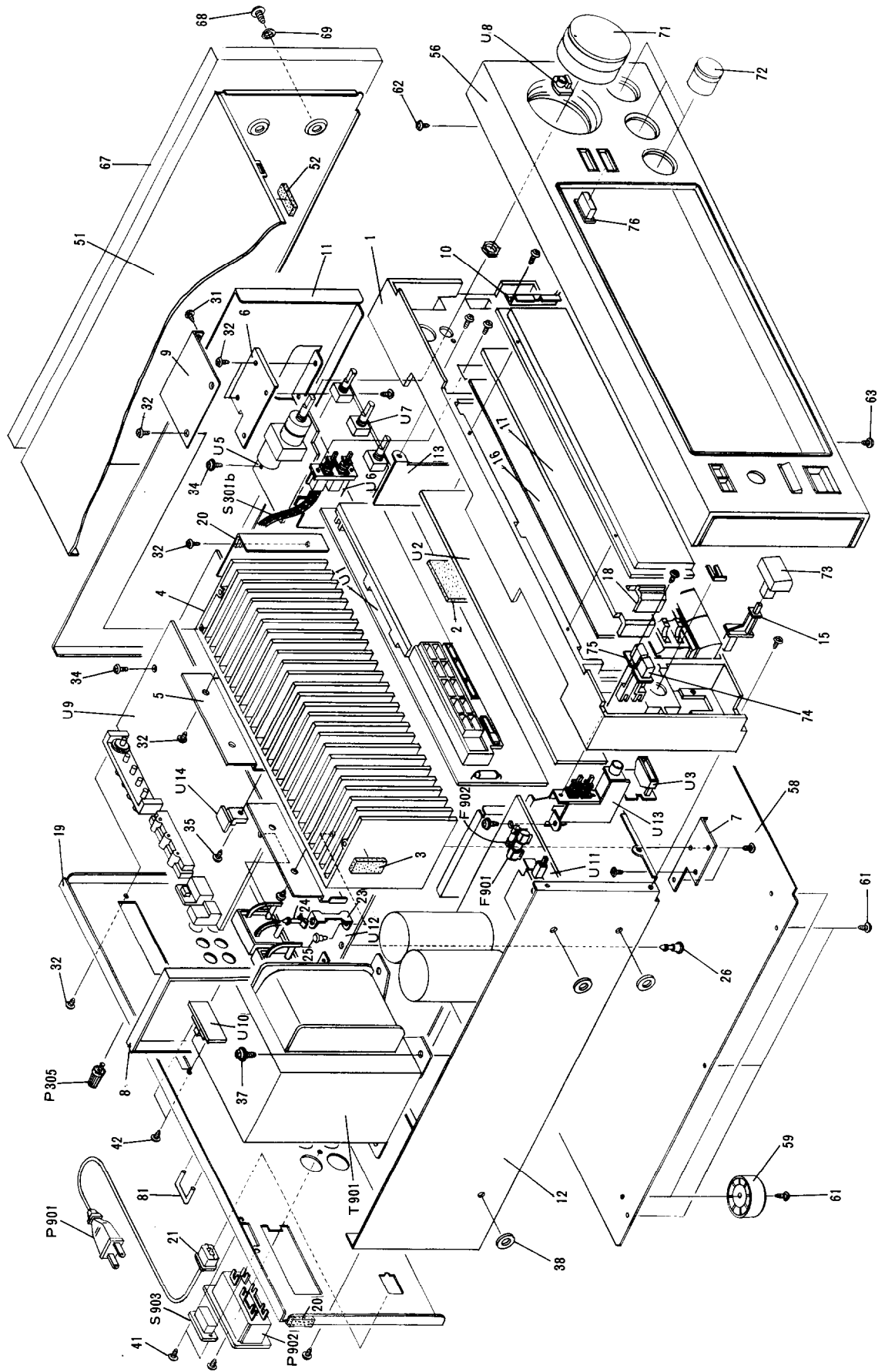
After correcting the original service problem perform the following safety check before releasing the set to the customer.

Connect the insulating-resistance tester between the plug of power supply cord and terminal GND on the back panel. Specifications: 3.3 Mohm ±10% at 500V.

**5. 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 operative. The period of time during which memory contents are preserved after power has last been turned off varies depending on climate 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.

EXPLODED VIEW



## PARTS LIST

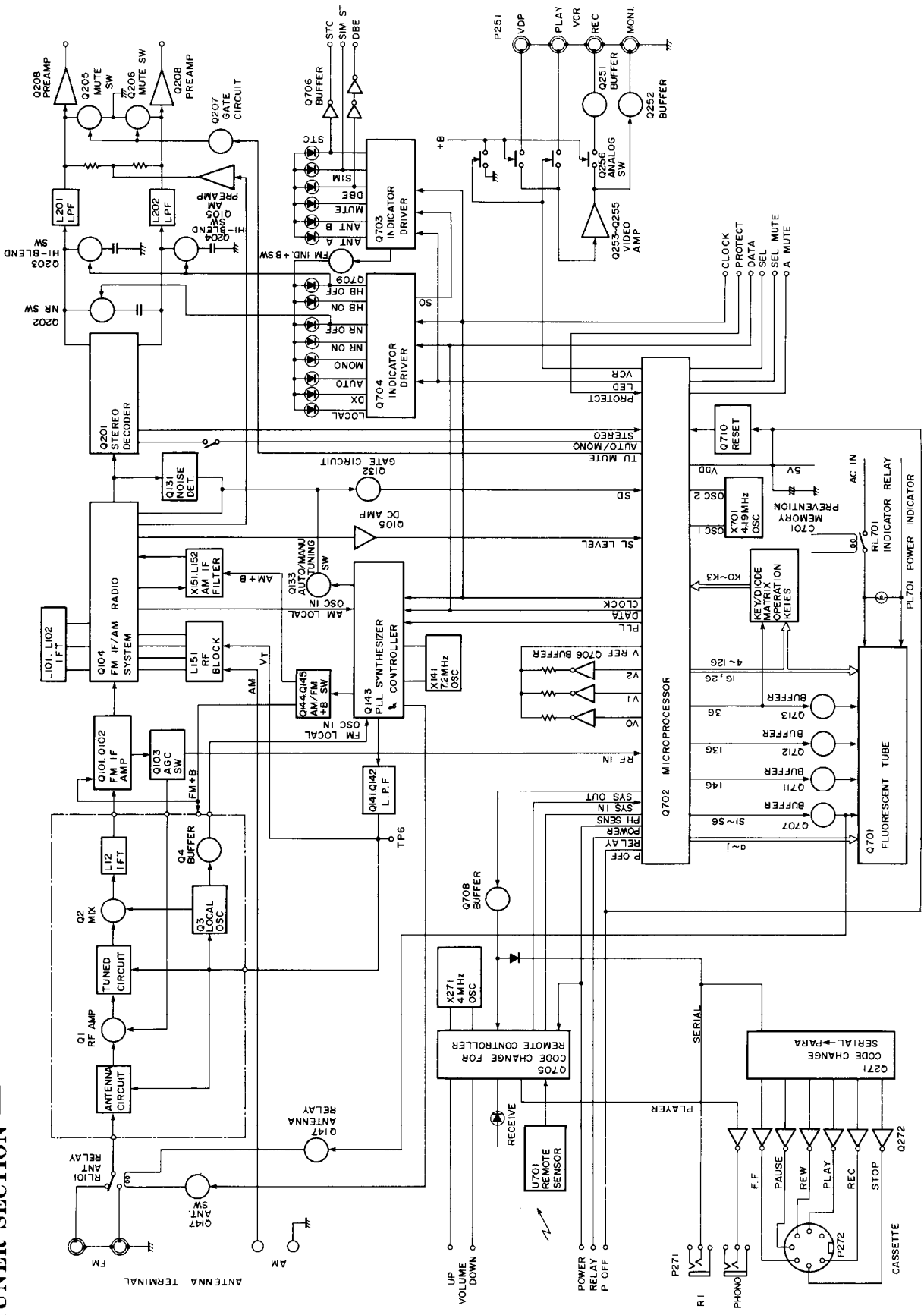
REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
1	27110455B	Front bracket ass'y	57	28191491A	Clear plate	U2	1A124553-1A	NASW-3453-1A, Operation switch pc board ass'y <W>
2	28140923	t3 x 60 x 45, Cushion	58	27170254B	Bottom board	U3	1A123554-1	NASW-3454-1, Stand-by switch pc board ass'y
3	28140927	t2 x 30 x 10, Cushion	59	27175153	Leg	U4	1A124555-1	NASW-3455-1, AM band step selector pc board ass'y <W>
4	27160235	Radiator	61	834430088	3TTS + 8B(BC), Tapping screw	U5	1A123556-1	NAAF-3456-1, Volume pc board ass'y
5	27130435	Bracket, transistor	62	833430080	3TTP + 8P(BC), Tapping screw	U6	1A123557-1	NASW-3457-1, Mode switch pc board ass'y
6	27141301	Bracket, HR	63	834430108	3TTS + 10B(BC), Tapping screw	U7	1A123558-1	NAAF-3458-1, Tone control circuit board ass'y
7	27141302	Bracket HL	66	28185340	Side panel L	U8	1A123559-1	NADIS-3459-1, Volume indicator pc board ass'y
8	27141321	Bracket, power transformer	67	28185342	Side panel R	U9	1A123560-1	NARF-3460-1, FM/AM tuner pc board ass'y <D>
9	27141322	Bracket R	68	836440303	4STV + 30CQ(BC), Tapping screw	U10	1A123567-1	NASW-3467-1, De-emphasis switch pc board ass'y <W>
10	27141300	Bracket S	69	870086	W4 x 12(BC), Special washer	U11	1A123561-1	NAPS-3461-1, Power supply circuit pc board ass'y <D>
11	27115240A	Side bracket R	71	28323558	Knob VOLUME	U12	1A123562-1	NAAF-3462-1, Pre. and power amplifier pc board ass'y
12	27130564A	Bracket, power transformer	72	28323559	Knob TONE	U13	1A123563-1	NASW-3463-1, Speaker switch pc board ass'y
13	27130565A	Bracket F	73	2832341A	Knob POWER	U14	1A123564-1	NAETC-3464-1, Power supply transistor pc board ass'y
14	27141306	Bracket K	74	28323314	Knob SPEAKER A	U15	1A123565-1	NAETC-3465-1, Power supply transistor pc board ass'y
15	27273111	Joint, power	75	28323316	Knob SPEAKER B			
16	28133211	Back plate	76	28323560	Knob PUSH			
17	28130251	Back plate	81	27141033	Connection plug (pre out- main in)			
18	27190686	Holder, dial plate	F901	252052	7A(ST-6), Primary fuse			
19	27121193	Back panel <D>	F902	252077	4A-SE-EAK, Primary fuse <W>			
20	28140020	t2 x 10 x 40, Cushion	P305	25060044	Terminal GND			
21	27300750	Strainrelief	P901	243123,	AS-CU-6 #18, Power supply cord			
22	27141200A	Bracket, pc board		253136,				
23	27190062	KGLS-125, Holder		253140 or				
24	880009	Rivert		253146				
25	27190693	KGLS-6R, Holder	P902	25050293	NSCT-6P120, AC outlet			
26	838430068	3TTB + 6B(BC), Tapping screw	Q525, Q526	2201653,	2SC3856-O,			
27	834430088	3TTS + 8B(BC), Tapping screw	Q529, Q530	2201654 or	2SC3856-Y or			
28	833430080	3TTP + 8P(BC), Tapping screw	Q527, Q528	2201655	2SC3856-P, Power transistor			
29	831130088	3TTW + 8B, Tapping screw	Q531, Q532	2201663,	2SA1492-O			
30	834430108	3TTS + 10B(BC), Tapping screw	S301b	2201665	2SA1492-Y or			
31	834230108	3TTS + 10B(Ni), Tapping screw	S903	25065112	2SA1492-P, Power transistor			
32	830440089	4TTC + 8C(BC), Tapping screw		26065123	Wire for remote switch			
33	27270212	Spacer	T901	2300379	NSS-1258P, Voltage selector switch <W>			
34	82143006	3P + 6FN(BC), Pan head screw		2300380	NPT-1016D, Power transformer <D>			
35	833426060	2.6TTP + 6P(BC), Tapping screw for U2	U1	1A123552-1	NPT-1016DG, Power transformer <W>			
36	82143006	3P + 6FN(BC), Pan head screw (Voltage selector switch) <W>	U2	1A123553-1	NADIS-3452-1, Display circuit pc board ass'y			
37	27270212	2.6P + 4F(BC), Pan head screw (Band/De-emphasis switch) <W>			NASW-3453-1, Operation switch pc board ass'y <D>			
38	82143006	Top cover						
39	28140020	t4 x 10 x 40, Cushion						
40	1A123121	Front panel ass'y						
41	82143006	3P + 6FN(BC), Pan head screw (Voltage selector switch) <W>						
42	82142604	2.6P + 4F(BC), Pan head screw (Band/De-emphasis switch) <W>						
43	28184419A	Top cover						
44	28140020	t4 x 10 x 40, Cushion						
45	1A123121	Front panel ass'y						

NOTE: <D>: Only 120V model  
<W>: Only Worldwide model

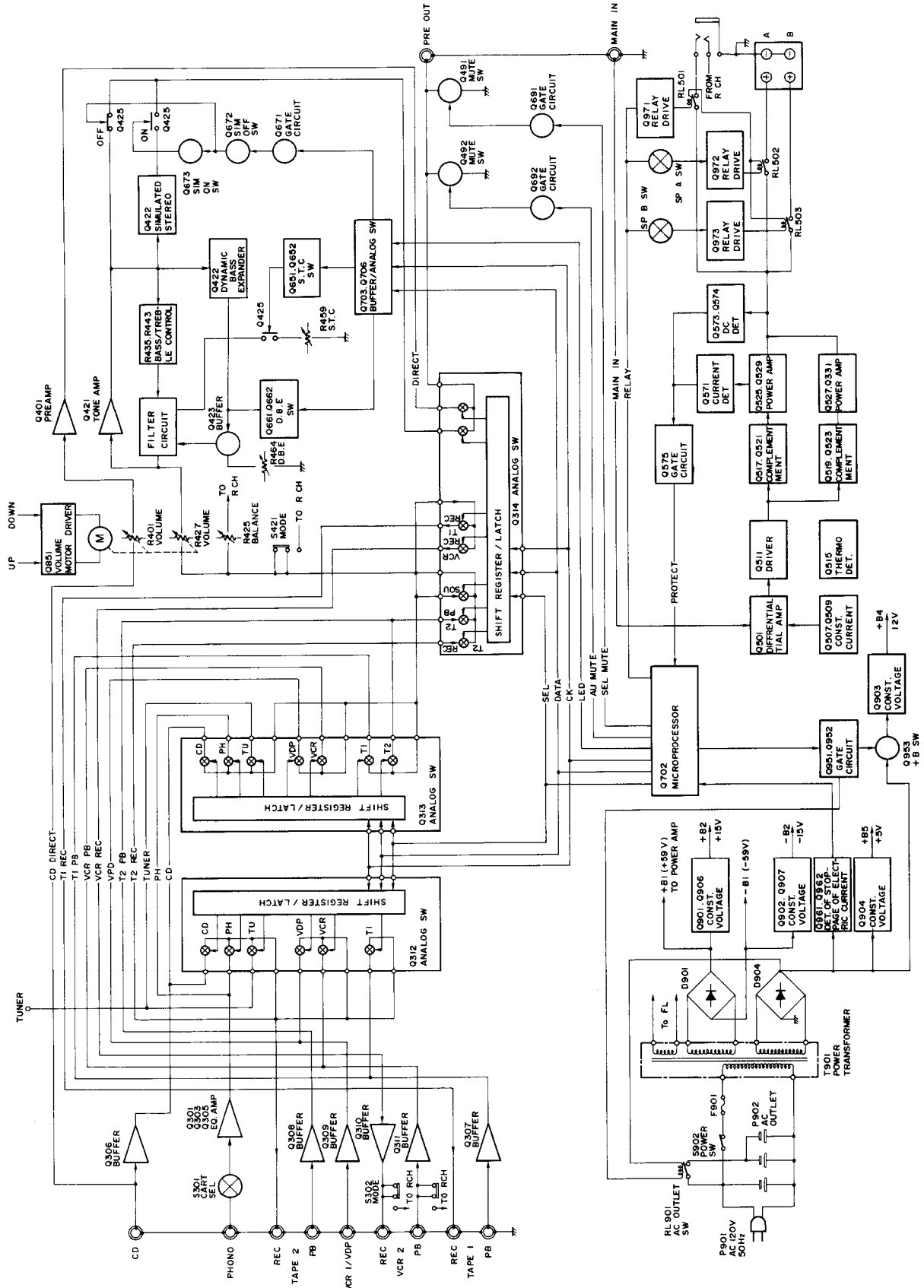
NOTE: THE COMPONENTS IDENTIFIED BY MARK  $\Delta$  ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBERS SPECIFIED.

# BLOCK DIAGRAM

## TUNER SECTION

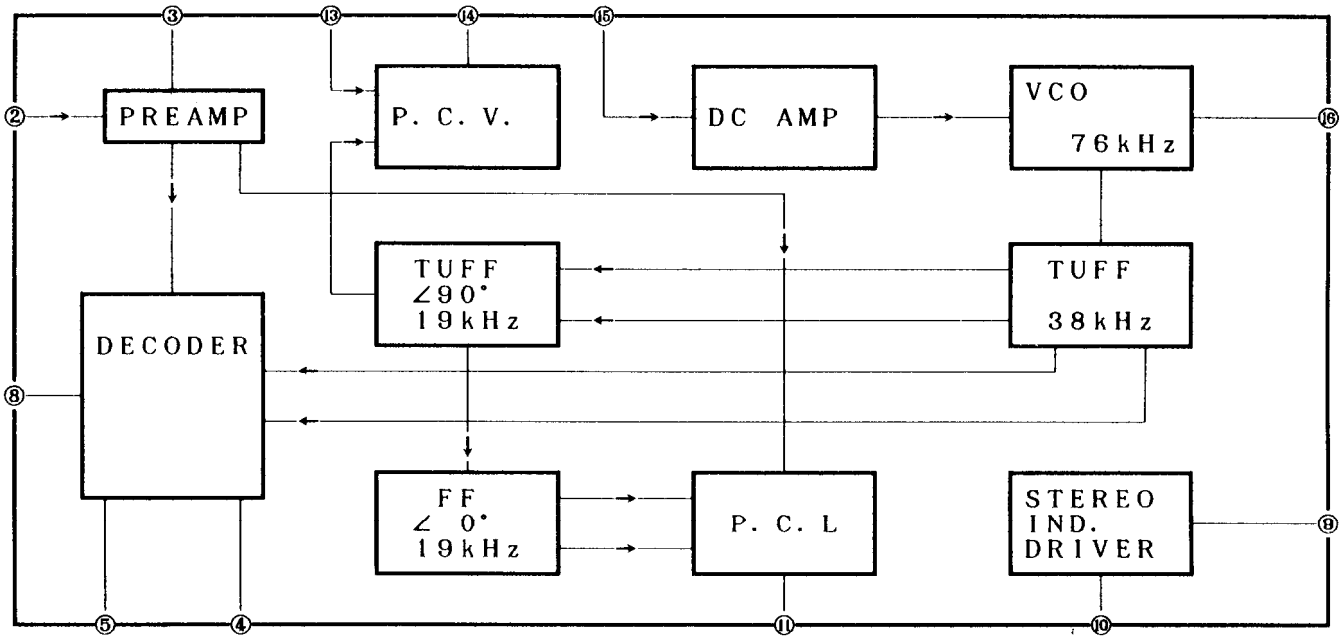


AMPLIFIER SECTION



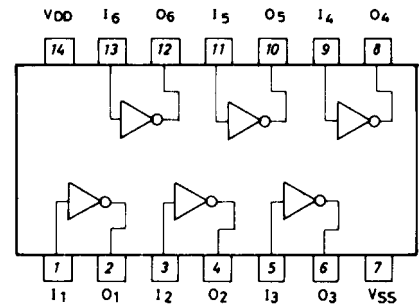
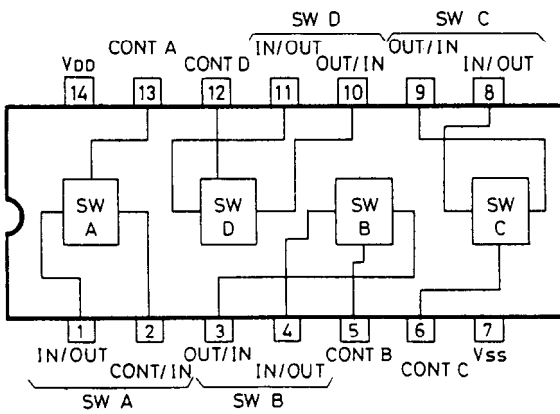
# IC BLOCK DIAGRAM AND DESCRIPTIONS

## HA12016 (FM STEREO DECODER)

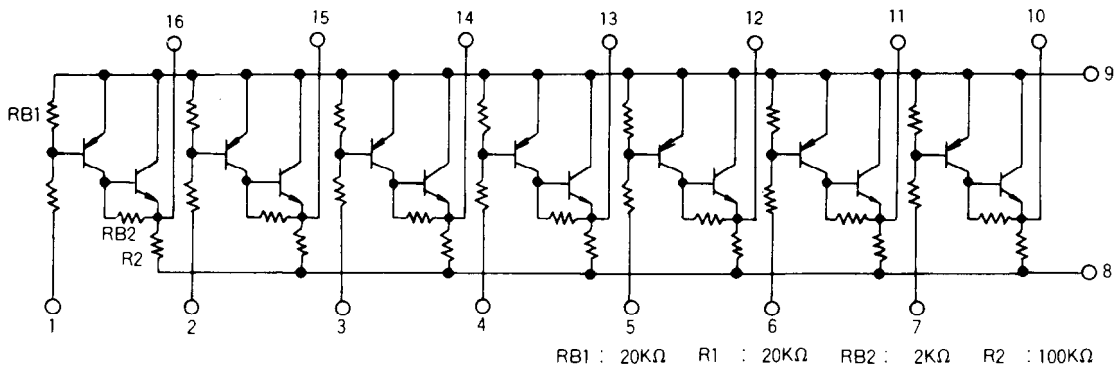


**LC4966 (ANALOG SWITCH)**

**4069UB (HEX INVERTER)**

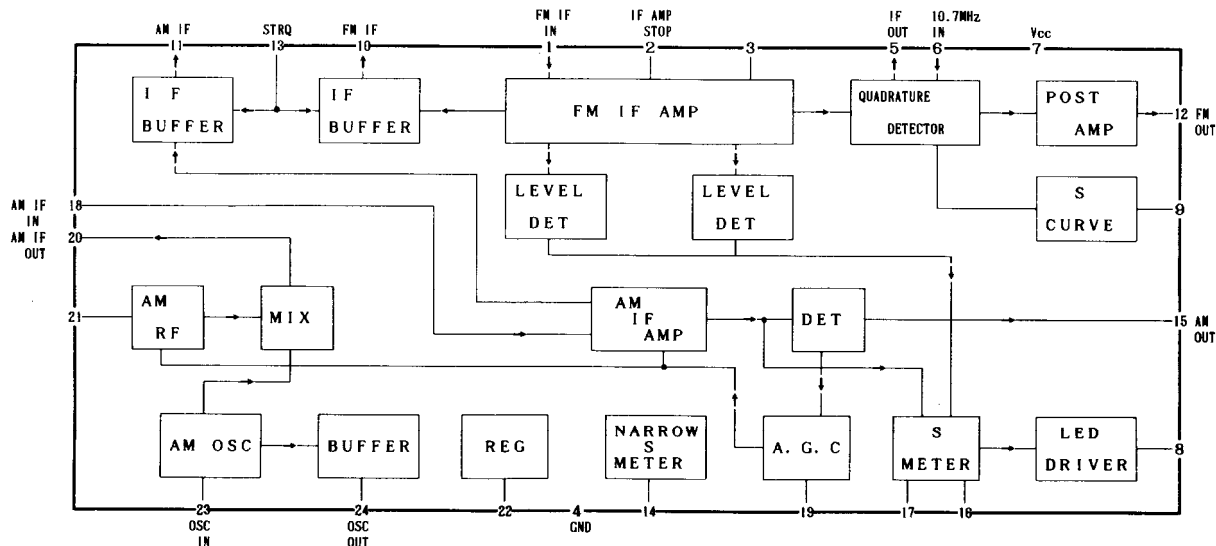


**$\mu$ PA81C (INVERTER/BUFFER)**

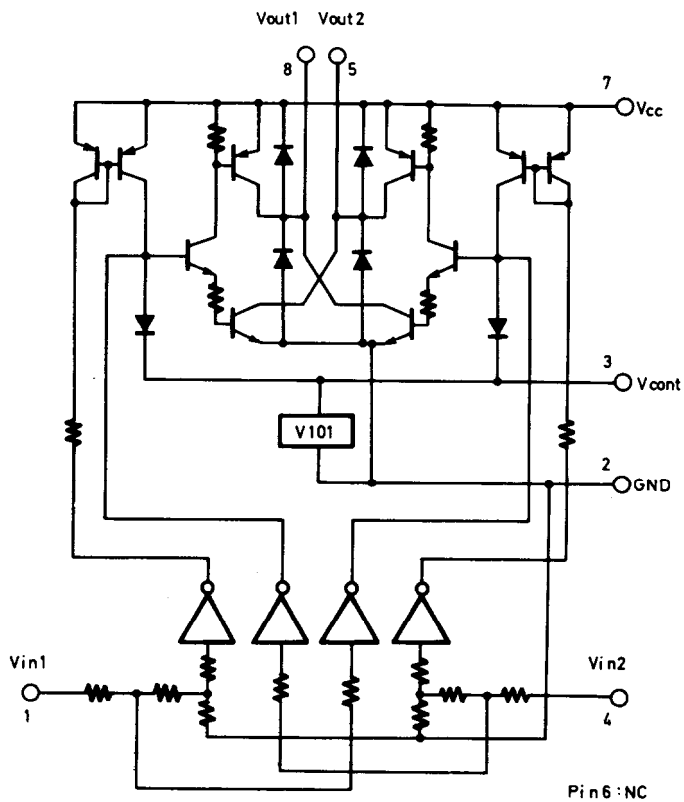




LA1266A (FM IF AND AM RADIO SYSTEM)



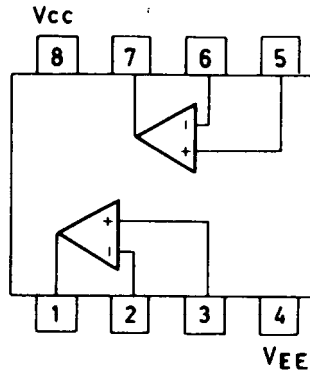
LB1630 (MOTOR DRIVER)



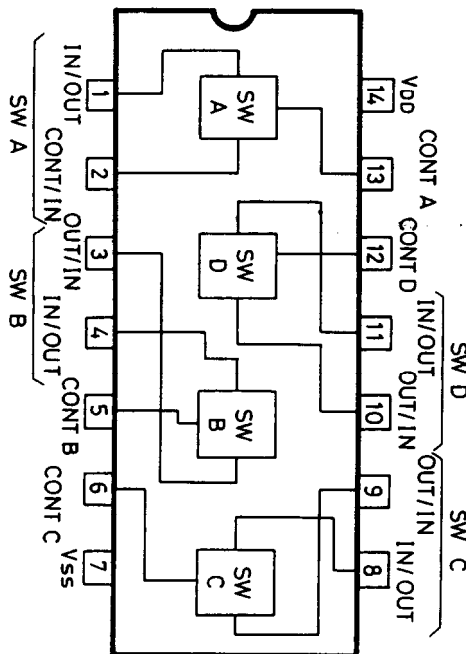
TRUTH TABLE

IN 1	IN 2	OUT 1	OUT 2	MOTOR
H	L	H	L	Normal
L	H	L	H	Reverse
H	H	OFF	OFF	Wait
L	L	OFF	OFF	Wait

NJM4565DD/NJM4558DX/  
μPC4570C (OP. AMP)



4066B (ANALOG SWITCH)



## LC6538D-3838 (MICROPROCESSOR)

Pin No.	Symbol	Description
1	D14	These are the digit and key scan signal output terminals. "H" when active. Refer to the key and diode matrix.
2	D13	
3	D12	
4	D11	
5	D10	
6	D9	
7	D8	
8	D7	
9	D6	
10	D5	
11	D4	
12	D3	
13	D2	
14	D1	
15	VDD	Power supply terminal. (+5V)
16	OSC1	Connect to the 4.19MHz ceramic oscillator.
17	OSC2	
18	VSS	Ground terminal.
19	TEST	Test terminal. Connect to the ground.
20	RES	This is the input terminal for reset when the power switch turns on. "L" when active.
21	X1	Sub clock terminal. Not used. Terminal X1 Connects to the ground.
22	X2	
23	POWER	This is the output terminal for power source. It is "H" for power on. This signal controls to the power supply circuit and the relay for AC outlet.
24	RELAY	This is the output terminal for control of the speaker and headphone relaiies. "H" when active.
25	VDP	These are the output terminals for control of video signal.
26	VCR	
27	PHONO	This is the output terminal for control of record player. "L" when the source selector is PHONO
28	MUTING	This is the output terminal for muting control. "H" when active.
29	SEL MUTE	This is the muting output terminal when the selector key is operated. "H" when active.
30	TUNER MUTE	This is the output terminal for muting control of tuner section. "H" when active.
31	K0	These are the input terminals for key return signal source and diode matrix. "H" when active.
32	K1	
33	K2	
34	K3	
35	S IN	This is the signal strength input terminal.
36	SD	Auto stop signal input terminal. Auto tuning stops when this terminal becomes to the high level
37	STEREO	This is the input terminal for detection of the stereo broadcast. "L" when active.
38	RF IN	This is the input terminal for RF level.
39	LED	This is the output terminal for indicator LED driver. Connect to terminal LAT of $\mu$ PD6345C.
40	VREF	This is the input terminal for comparator reference voltage.
41	AUTO/MONO	This is the AUTO/MONO switching output terminal. "L" when AUTO.
42	PLL	Connect to the terminal CE of PLL IC (LM7001).
43	DATA	This is the serial data output terminal. Connect to the terminal DATA of PLL IC, and terminal DI of LED driver ( $\mu$ PD6345C), and terminal DI of analog switches (LC7821/LC7822).
44	CL	This is the serial clock output terminal. Connect to the terminal CI of PLL IC, and terminal SCK of LED driver, and terminal CL of analog switches.
45	SEL	Connect to the terminal SEL of analog switches.
46	VO	These are the output terminals for comparator reference voltage. Refer to the signal level indicator circuit.
47	V1	
48	V2	
49	P OFF	This is the input terminal for detection of the stoppage of electric current. "L" when the stoppage of electric current.
50	PROTECT	This is the detection terminal for protection circuit. The speaker and headphone relaiies turn off when this terminal become to the high level.
51	SYSTEM OUT	This is the output terminal for system code. "L" when active.
52	SYSTEM IN	This is the input terminal for system code. "H" when active.

Pin No.	Symbol	Description
53	DISPLAY	This is the display output terminal. This signal controls to the static indication section of fluorescent tube. "L" when active.
54 55 56 57 58 59 60 61	Sa Sb Sc Sd Se Sf Sg Sh	These are the segment signal output terminals. "H" when active.
62	VP	Pull-down resistor connection terminal of FIP controller/driver.
63 64	Si Sj	These are the segment signal output terminals. "H" when active.

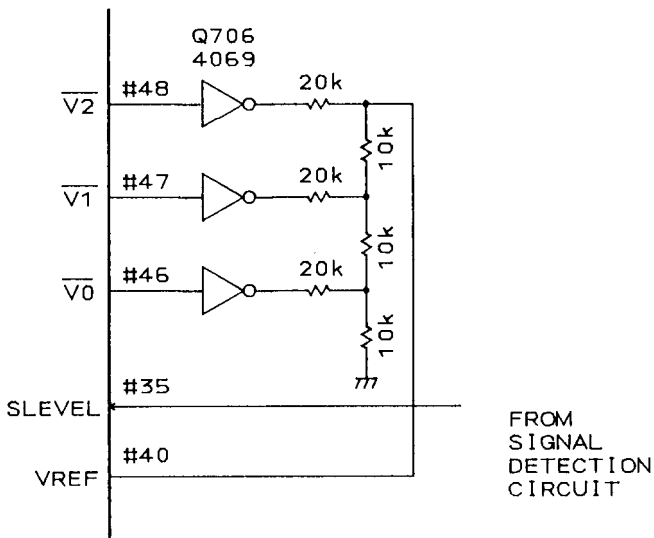
**KEY AND DIODE MATRIX**

	K3 (#34)	K2 (#33)	K1 (#32)	K0 (#31)	
D1 (#14)	M4	M3	M2	M1	
D2 (#13)	M8	M7	M6	M5	
D3 (#12)	MEMORY	SHIFT	M10	M9	
D4 (#11)	TU LEVEL	FM MUTE	UP	DOWN	
D5 (#10)	CD DIRECT	POWER	APR	ANT	
D6 (#9)	AM	FM	PHONO	CD	
D7 (#8)	TAPE 2	TAPE 1	VCR	VDP	
D8 (#7)	SIM STEREO	STC	DBE	REC SEL	
D9 (#6)				AUTO/MONO	ALTERNATE KEY
D10 (#5)	SYS DIS(1)	TI DIS(0)	AM9K(0/1)	MODE	DIODE MATRIX

**AM9K (AM band step setting diode matrix)**

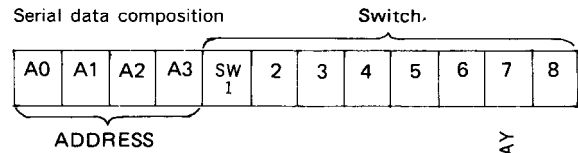
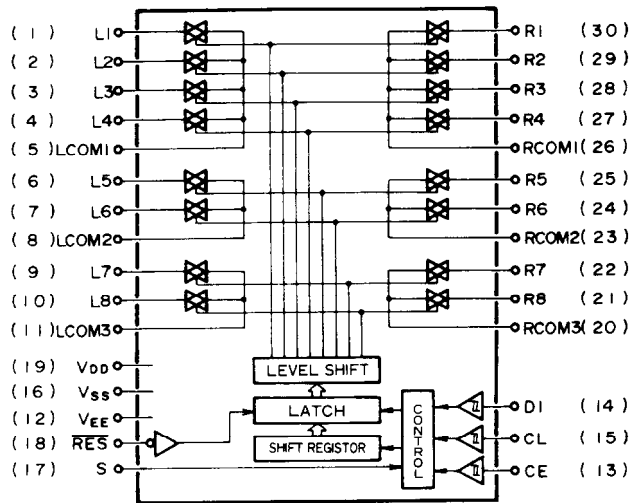
D763	Frequency range	Channel space	Refernce frequency	IF frequency
0	530~1620kHz	10kHz	10kHz	450kHz
1	522~1611kHz	9kHz	9kHz	450kHz

**SIGNAL LEVEL INDICATOR CIRCUIT**



Output terminals			Signal strength indicator
V2	V1	V0	
H	H	H	Light off
H	H	L	Light off
H	L	H	1st on
H	L	L	2nd on
L	H	H	3th on
L	H	L	4th on
L	L	H	5th on
L	L	L	5th on

**LC7821 (Analog switch)**



Serial data composition	ADDRESS	SW 1	2	3	4	5	6	7	8
(Q312)	0 1 0 1	CD	—	PHONE	TUNER	VDP	VCR PLAY	TAPE-1 PLAY	—
(Q313)	1 1 0 1	CD	—	PHONE	TUNER	VDP	VCR	TAPE-1	TAPE-2

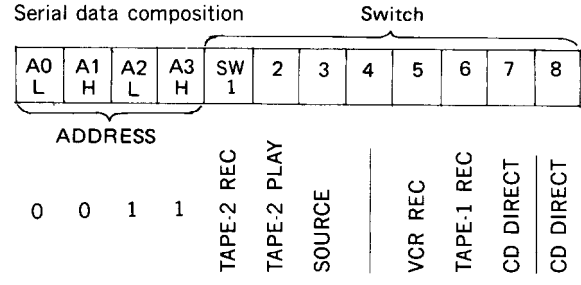
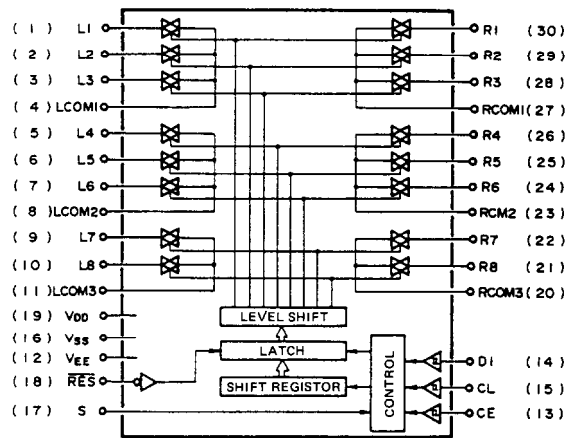
**(Q312)**

Pin No.	Terminal	Description	Pin No.	Terminal	Description
1	CD	Input/output terminals of audio signal of right channel. Control to the inside analog switch at the serial data.	16	V <sub>SS</sub>	Ground terminal.
2	—		17	S	Selector terminal.
3	PHONO		18	RES	Reset terminal. When power is turned ON, the condition of the analog switch is not determined, but when this terminal is "L", all analog switches are OFF.
4	TUNER				
5	L COM 1		19	V <sub>DD</sub>	Power supply terminal. (+15V)
6	VDP				
7	VCR PLAY		Input/output terminals of audio signal of left channel. Control to the inside analog switch at the serial data.	20	R COM 3
8	L COM 2				
9	TAPE 1 PLAY				
10	—				
11	L COM 3				
12	V <sub>EE</sub>	Negative power supply terminal. (-15V)			
13	CE	Chip enable terminal. Connect to SEL terminal of LC6538D-3838.			
14	DI	Serial data input terminal. Connect to DATA terminal of LC6538D-3838.			
15	CL	Serial clock input terminal. Connect to CLOCK terminal of LC6538D-3838.			
21	—	Input/output terminals of audio signal of left channel. Control to the inside analog switch at the serial data.			
22	TAPE 1 PLAY				
23	R COM 2				
24	VCR PLAY				
25	VDP				
26	R COM 1				
27	TUNER				
28	PHONO				
29	—	Input/output terminals of audio signal of right channel. Control to the inside analog switch at the serial data.	29	—	
30	CD				

**(Q313)**

Pin No.	Terminal	Description	Pin No.	Terminal	Description
1	CD	Input/output terminals of audio signal of left channel. Control to the inside analog switch at the serial data.	16	V <sub>SS</sub>	Ground terminal.
2	—		17	S	Selector terminal.
3	PHONO		18	RES	Reset terminal. When power is turned ON, the condition of the analog switch is not determined, but when this terminal is "L", all analog switches are OFF.
4	TUNER				
5	L COM 1		19	V <sub>DD</sub>	Power supply terminal. (+15V)
6	VDP				
7	VCR		Input/output terminals of audio signal of right channel. Control to the inside analog switch at the serial data.	20	R COM 3
8	L COM 2				
9	TAPE 1				
10	TAPE 2				
11	L COM 3				
12	V <sub>EE</sub>	Negative power supply terminal. (-15V)			
13	CE	Chip enable terminal. Connect to SEL terminal of LC6538D-3838.			
14	DI	Serial data input terminal. Connect to DATA terminal of LC6538-3838.			
15	CL	Serial clock input terminal. Connect to CLOCK terminal of LC6538-3838.			
21	—	Input/output terminals of audio signal of right channel. Control to the inside analog switch at the serial data.			
22	TAPE-2				
23	R COM 2				
24	VCR				
25	VDP				
26	R COM 1				
27	TUNER				
28	PHONO				
29	—	Input/output terminals of audio signal of right channel. Control to the inside analog switch at the serial data.	29	—	
30	CD				

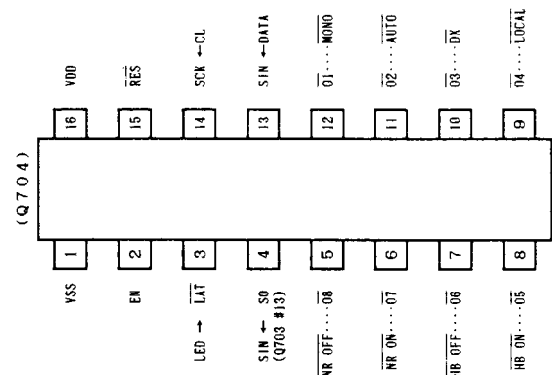
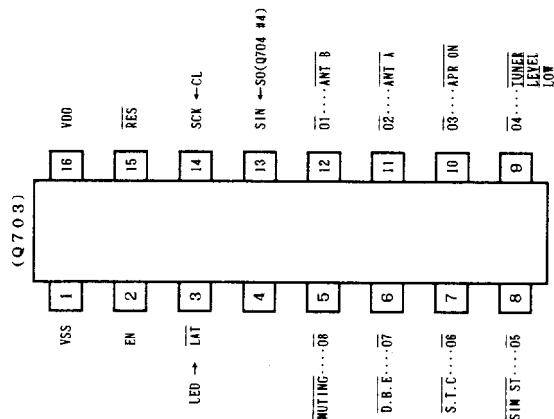
### LC7822 (ANALOG SWITCH)

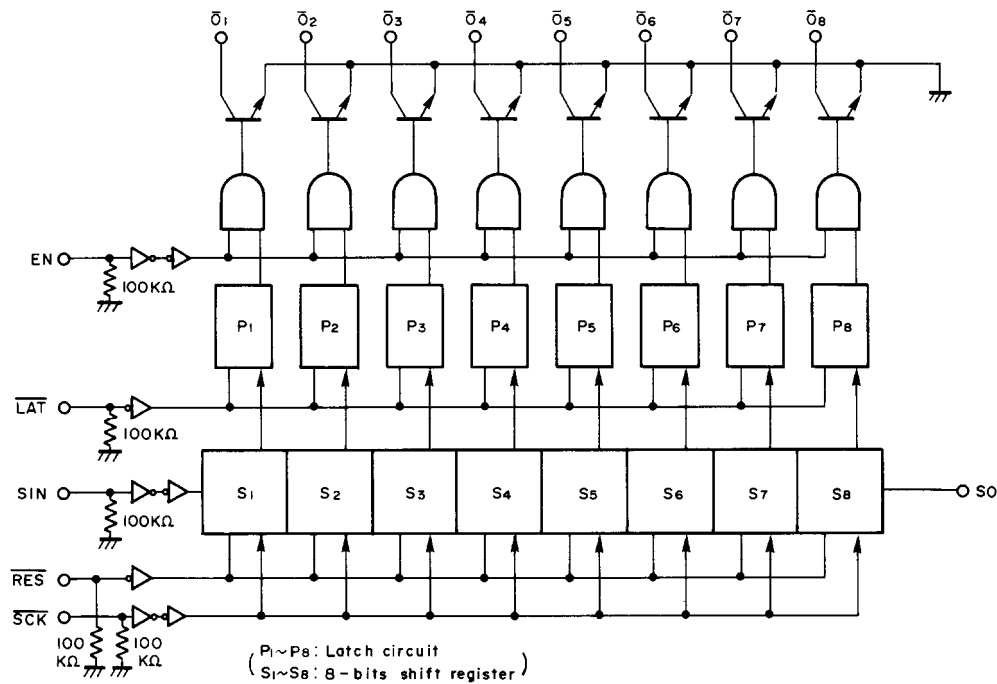


### (Q314)

Pin No.	Terminal	Description	Pin No.	Terminal	Description
1	TAPE 2 REC	Input/output terminals of audio signal of right channel. Control to the inside analog switch at the serial data.	16	V <sub>SS</sub>	Ground terminal.
2	TAPE 2 PB		17	S	Selector terminal.
3	SOURCE		18	RES	Reset terminal. When power is turned ON, the condition of the analog switch is not determined, but when this terminal is "L", all analog switches are OFF.
4	L COM 1		19	V <sub>DD</sub>	Power supply terminal. (+5V)
5	—		20	R COM 3	Input/output terminals of audio signal of left channel. Control to the inside analog switch at the serial data.
6	VCR REC		21	CD DIRECT	
7	TAPE 1 REC		22	CD DIRECT	
8	L COM 2		23	R COM 2	
9	CD DIRECT		24	TAPE 1 REC	
10	CD DIRECT		25	VCR REC	
11	L COM 3		26	—	
12	V <sub>EE</sub>	27	R COM 1		
13	CE	28	SOURCE		
14	DI	29	TAPE 2 PB		
15	CL	30	TAPE 2 REC		

### μPD6345C (INDICATOR LED DRIVER)





(Q704)

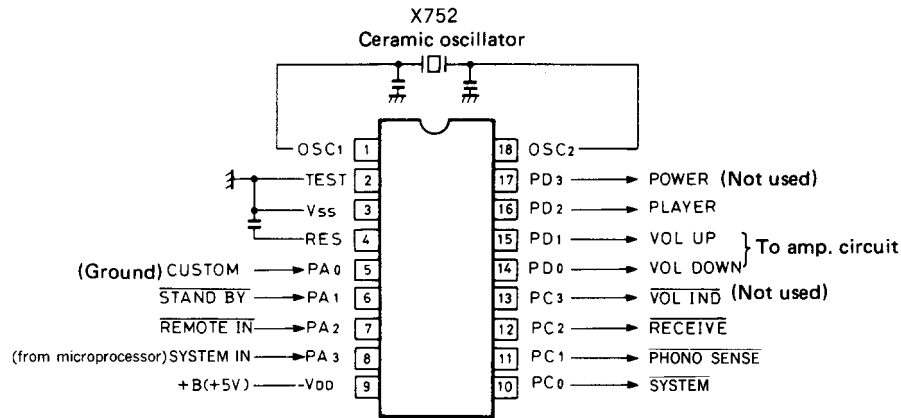
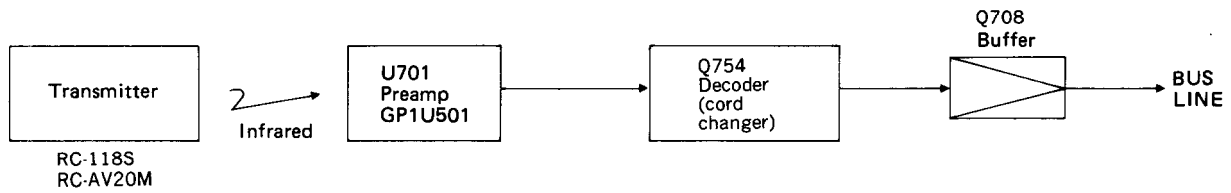
(Q703)

Pin No.	Symbol	Descriptions	Pin No.	Symbol	Descriptions
1	VSS	Ground terminal.	1	VSS	Ground terminal.
2	EN	Enable terminal. Connect to 5V.	2	EN	Enable terminal. Connect to 5V.
3	$\overline{\text{LAT}}$	Latch terminal. Connect to the terminal LED of LC6538D-3838.	3	$\overline{\text{LAT}}$	Latch terminal. Connect to the terminal LED of LC6538D-3838.
4	S0	Serial data output terminal. Connect to terminal SIN of $\mu\text{PD6345C}$ (Q703)	4	S0	Serial data output terminal.
5~12	$\overline{08} \sim \overline{01}$	Data output terminals. Connect to the indicator L. E. Ds.	5~12	$\overline{08} \sim \overline{01}$	Data output terminals. Connect to the indicator L. E. Ds.
13	SIN	Serial data input terminal. Connect to the terminal DATA of LC6538D-3838.	13	SIN	Serial data input terminal. Connect to the terminal S0 of $\mu\text{PD6345C}$ (Q704).
14	SCK	Serial clock input terminal. Connect to the terminal CL of LC6538D-3838.	14	SCK	Serial clock input terminal. Connect to the terminal CL of LC6538D-3838.
15	$\overline{\text{RES}}$	Reset input terminal. "L" when active.	15	$\overline{\text{RES}}$	Reset input terminal. "L" when active.
16	VDD	Power supply terminal. (+5V)	16	VDD	Power supply terminal. (+5V)

Recording Selector Button and Display.

This button selects the source of audio signal output to REC OUTPUT of TAPE-1 and VCR-2. Each time it is pressed, the selection changes in the sequence of **SOURCE**, **CD**, **PHONO**, **TUNER**, **VCR-1/VDP**, **VCR-2**, **TAPE-1**, **TAPE-2** → **SOURCE**, and the selected position is displayed within the red frame. Set this button to **SOURCE** when REC OUT audio signals will not be used.

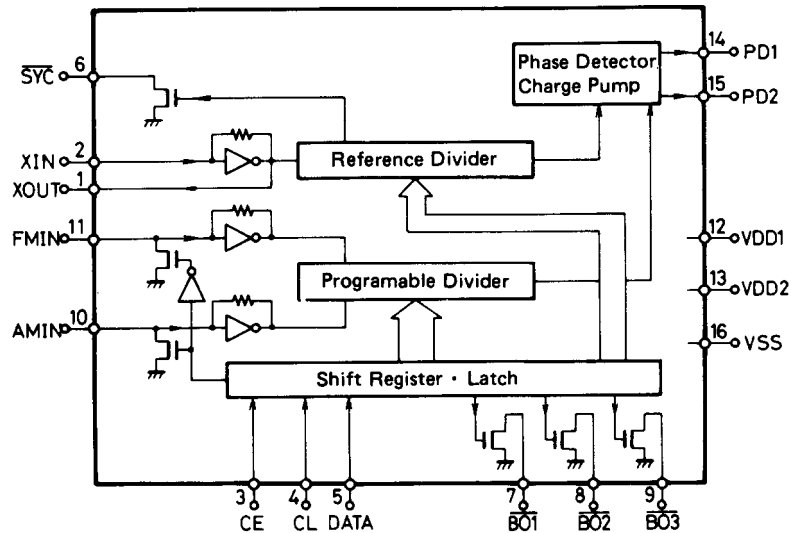
LC6527C-3802 (CODE CHANGER)



Connection diagram

Terminal No.	Symbol	Terminal	Description
1 18	OSC1 OSC2	OSC	Connect to the 4MHz ceramic oscillator.
2	TEST	TEST	Test terminal. Connect to the ground.
3	V <sub>SS</sub>	GND	Ground terminal.
4	$\overline{RES}$	$\overline{RES}$	Reset terminal.
5	PA0	CUSTOM	The custom code for decode is selected at this terminal. For this model, the level is low.
6	PA1	STANDBY	Terminal for STANDBY detection. During low input, only the POWER code is decoded.
7	PA2	REMOTE IN	Signal input terminal from remote control preamp. Active low.
8	PA3	SYSTEM IN	System code input terminal. Active high.
9	V <sub>DD</sub>	+B(5V)	Power supply terminal.
10	PC0	SYSTEM OUT	Output at this terminal are the custom code remote control code input to REMOTE IN, the system code that has been converted corresponding to the decoded data code.
11	PC1	PH SENS	Phono detection input terminal. Active low.
12	PC2	RECEIVE	This is the display output for remote control reception. Output is low when decoded code is being received.
13	PC3	VOLIND	During output of VOLUME UP/DOWN, a pulse ( $\sqrt{T} \square T$ ; T=250ms) is output.
14	PD0	VOL DOWN	When the volume DOWN code is input, a high pulse of 120ms is output.
15	PD1	VOL UP	When the volume UP code is input, a high pulse of 120ms is output.
16	PD2	PLAYER	Player control output terminal.
17	PD3	POWER	The power code input inverts the L/H. Level is high for power being tuned ON.

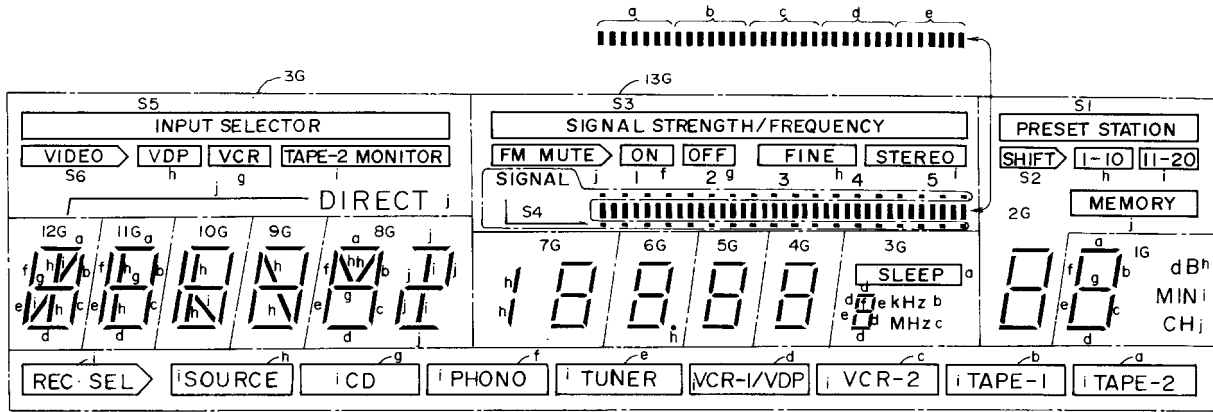
## LM7001 (PLL SYNTHESIZER AND CONTROLLER)



Pin No.	Terminal	Description
1	XOUT	Connect to the 7.2 MHz crystal oscillator.
2	XIN	
3	CE	Chip enable terminal. Connect to the PLL terminal of LC6538D-3838.
4	CL	Serial clock input terminal. Connect to the CL terminal of LC6538D-3838.
5	DATA	Serial data input terminal. Connect to the DATA terminal of LC6538D-3838.
6	$\overline{\text{SYN}}$	Not used.
7	$\overline{\text{BO1}}$	Antenna selector output terminal. Antenna B.
8	$\overline{\text{BO2}}$	FM auto tuning output terminal. "L" when FM. Auto tuning at low level at high level.
9	$\overline{\text{BO3}}$	AM band control signal output terminal. AM band at low level.
10	AMIN	AM local oscillator input terminal.
11	FMIN	FM local oscillator terminal.
12	VDD1	Power supply terminal for back-up.
13	VDD2	Power supply terminal.
14	PD1	Charge pump output of the phase detector which constitutes the PLL. High level is output when the divided local oscillator frequency is high than the reference frequency. In the opposite case, low level is output. Floating occurs when the frequencies matched. The output is applied to the variable capacitor diode in the local oscillator through the low pass filters.
15	PD2	
16	VSS	Ground terminal.



FIP15AMW26 (FLUORESCENT INDICATOR TUBE)



Terminal No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Electrode	F	NP	S1	S2	S3	S4	S5	S6	j	i	NP	h	NP	g	f	NP	e

(Left)

Terminal No.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Electrode	d	c	b	a	NP	NP	NP	14G	NP	13G	12G	11G	10G	9G	8G	7G	6G

Terminal No.	35	36	37	38	39	40	41	42	43
Electrode	5G	4G	3G	2G	1G	NP	NP	NP	F

F: Filament  
 G: Grid  
 NP: No pin  
 a~j/1G~14G: Anode

(Right)

Segment	Digit	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1
Sa	TAPE-2	1th □	a	a	a	a	a	a	a	a	a	a	SLEEP	a	a
Sb	TAPE-1	2nd □	b	b	b	b	b	b	b	b	b	b	kHz	b	b
Sc	VCR	3rd □	c	c	c	c	c	c	c	c	c	c	MHz	c	c
Sd	VDP	4th □	d	d	d	d	d	d	d	d	d	d	┌ └	d	d
Se	TUNER	5th □	e	e	e	e	e	e	e	e	e	e	┌ └	e	e
Sf	PHONO	ON	f	f	f	f	f	f	f	f	f	f	—	f	f
Sg	CD	OFF	g	g	g	g	g	g	g	g	g	g	VCR	g	g
Sh	SOURCE	FINE	┌ └	┌ └	┌ └	┌ └	┌ └	┌ └	┌ └	┌ └	┌ └	┌ └	VDP	I-10(A)	dB
Si	REC SEL	STEREO	┌ └										TAPE-2	I1-20(B)	MIN
Sj		FM MUTE											DIRECT	MEMORY	CH

# ADJUSTMENT PROCEDURES

## Preparation

### • Input

FM mono: 1kHz, 75kHz devi., 60dB/μV  
 FM stereo: 1kHz, L+R 67.5kHz devi.: Pilot signal 19kHz  
 7.5kHz devi.  
 AM: 400Hz, 30% mod.,

### • Output

Connect the non-inductive type resistor of 8 ohms to the speaker terminal A of left and right channels unless otherwise noted.

### • Standard knob position

TAPE MONITOR . . . . .	SOURCE
VOLUME . . . . .	Maximum
BASS/TREBLE/BALANCE . . . . .	Center
MODE . . . . .	STEREO
SPEAKER . . . . .	A
SIMULATED STEREO . . . . .	OFF
DYNAMIC BASS EXPANDER . . . . .	OFF
SELECTIVE TONE CONTROL . . . . .	OFF
MUTING/LOUDNESS . . . . .	OFF
CARTRIDGE SELECTOR . . . . .	MM
REC SELECTOR . . . . .	SOURCE

## Amplifier section

### 1. Idling current adjustment

Connect the DC voltmeter to the terminals IID and VCT on the power amplifier pc board.

Adjust the semi-fixed resistors R531 and R532 so that the indication of voltmeter is  $15 \pm 2\text{mV}$ .

Notes: VOLUME . . . . . Maximum, Open load,  
 Adjust after switching on for 15 minutes.

*.21 MAX.*



### 2. Check of operation of protection circuit.

#### 1) Check of operation of protection relay.

- (1) Confirm that the relay turns ON approximately 5 seconds after the power switch is turned ON.
- (2) The relay should turn OFF approximately 0.5 seconds after the power switch is turned OFF.

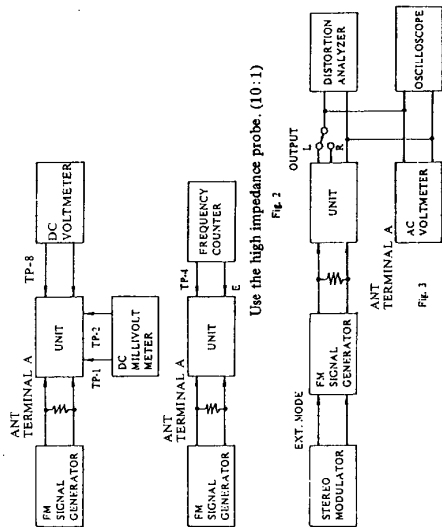
#### 2) Check of DC detection

- (1) Turn the power on with no load.
- (2) After the speaker relay turns ON, apply DC1~1.5V to the CD input terminals. Confirm that the relay turns OFF.
- (3) Confirm that operation is the same as (2) above when an input of DC-1~-1.5V is applied.

Note) Under no circumstances connect a load or short the speaker terminals when performing the above test.

FM section

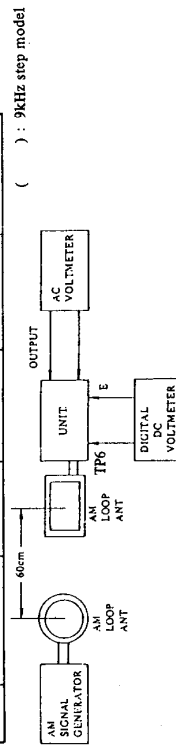
Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Turning dial setting	Output indicator	Adjustment	Adjust for	Remarks
FM IF	1		99.1MHz 1kHz, 75kHz devi. 65dBf (60dB)	-	99.1MHz	DC millivolt meter	L101	0V ± 20mV	Muting switch: OFF Repeat the steps 1 and 3 until no further adjustment is necessary
	2	Fig. 1				DC voltmeter	IF on the front end	Maximum	
	3					Distortion analyzer	L102	Minimum	
VCO		Fig. 2	99.1MHz 1kHz, 75kHz devi. 65dBf (60dB)	-	99.1MHz	Frequency counter	R201	76kHz ± 40Hz	
Stereo Distortion		Fig. 3	99.1MHz 65dBf (60dB) Ext. modulation	L or Rch. 1kHz	99.1MHz	Distortion analyzer	IF on the front end	Minimum	Don't turn more than ± 180°.
Stereo Separation	1	Fig. 3	99.1MHz 65dBf (60dB) Ext. modulation	Lch. 1kHz	99.1MHz	Rch. AC voltmeter	R202	Minimum	Maximum and same separation
	2			Rch. 1kHz		Lch. AC voltmeter		Minimum	
Muting level	1	Fig. 3	99.1MHz 19.2dBf (14dB) Ext. modulation	-	99.1MHz	Auto indicator	R101	Light on	
	2		99.1MHz 18.2dBf (13dB) Ext. modulation	-				Light off	
Signal indicator level		Fig. 3	99.1MHz 45.2dBf (40dB) 1kHz, 75kHz devi.	-	99.1MHz	5th Signal indicator	R102	Light on	



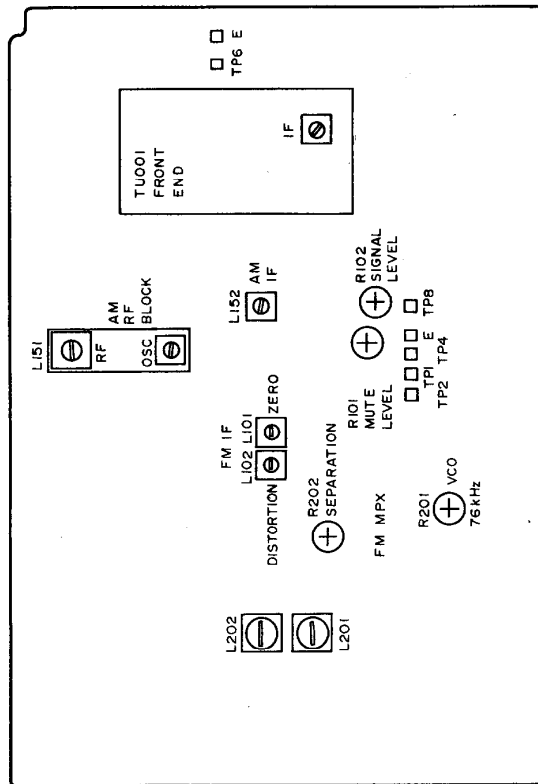
Use the high impedance probe. (10:1)

AM section

Step	AM SG output	Tuned frequency	Output indicator	Adjustment point	Adjust for
1		530kHz (531kHz)	Digital DC voltmeter	OSC on RF block	1.3V ± 0.1V
2	600kHz(603kHz) 400Hz 30% mod. 60dB/m	600kHz (603kHz)	AC voltmeter	RF on RF block	Maximum
3	1000kHz (999kHz) 400Hz 30% mod. 60dB/m	1000kHz (999kHz)	AC voltmeter	L152	Maximum



Reference specifications  
 FM Tuned voltage 87.5MHz 1.5±0.5V  
 108.0MHz 8.0±0.5V  
 Signal meter voltage (TP-8)  
 98MHz 60dBμ more than 4V  
 Auto stop level AM: Less than 62dB/m  
 FM: 14±3dBμ  
 HI-blend switching level 33±5dBμ  
 NR switching level 17±5dBμ  
 DX/LOCAL switching level 60±8dBμ  
 AM Tuned voltage 530kHz 1.3±0.5V  
 1620kHz 8.0±0.5V (TP-6)



## PRINTED CIRCUIT BOARD-PARTS LIST

## FM/AM TUNER PC BOARD (NARF-3460-1/1A)

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Front end</b>					
TU001	240080	FE306-A27	C116	354741009	10 $\mu$ F, 16V, Elect.
<b>ICs</b>					
Q104	22240214	LA1266A	C118	354784799	0.47 $\mu$ F, 50V, Elect.
Q105	222502 or 22240050	NJM4558DX or $\mu$ PC4570C	C119	354780479	4.7 $\mu$ F, 50V, Elect.
Q143	22240090	LM7001	C120	354741009	10 $\mu$ F, 16V, Elect.
Q201	222593	HA12016	C121	354780339	3.3 $\mu$ F, 50V, Elect.
Q208	222502 or 22240050	NJM4558DX or $\mu$ PC4570C	C123	371123334	0.033 $\mu$ F $\pm$ 5%, 50V, Mylar
Q256	222840661	4066B	C124	371124734	0.047 $\mu$ F $\pm$ 5%, 50V, Mylar
Q271	22240145	LC6527C-3547	C127, C132	354784799	0.47 $\mu$ F, 50V, Elect.
Q272	222807	$\mu$ PA81C	C135	354780479	4.7 $\mu$ F, 50V, Elect.
<b>Transistors</b>					
Q101	2211723	2SC1923-O	C141	354782299	0.22 $\mu$ F, 50V, Elect.
Q102	2210746	2SC945A-P	C142	354780229	2.2 $\mu$ F, 50V, Elect.
Q103, Q131	2211255	2SC1815-GR	C143	371123334	0.033 $\mu$ F $\pm$ 5%, 50V, Mylar
Q132, Q133	2211255 or	2SC1815-GR or	C144	371121034	0.01 $\mu$ F $\pm$ 5%, 50V, Mylar
Q147	2210746	2SC945A-P	C146	354721019	100 $\mu$ F, 6.3V, Elect.
Q141	2211255	2SC1815-GR	C201	354741009	10 $\mu$ F, 16V, Elect.
Q142	2212294	2SK108-D	C202	354744719	470 $\mu$ F, 16V, Elect.
Q144	2211705,	2SD655-E,	C203, C204	354721019	100 $\mu$ F, 6.3V, Elect.
Q205, Q206	2211706 or 2212794	2SD655-F or 2SD1468-R	C205, C206	371121824 371121024	1800pF $\pm$ 5%, 50V, Mylar <D> 1000pF $\pm$ 5%, 50V, Mylar <W>
Q145, Q146	2212600	DTA124ES	C207, C208	370138214	820pF $\pm$ 5%, 100V, APS <W>
Q202-Q204	2211945	2SK246-GR	C211	371124734	0.047 $\mu$ F $\pm$ 5%, 50V, Mylar
Q207	2211455	2SA1015-GR	C212	370131024	1000pF $\pm$ 5%, 100V, APS
Q251-Q254	2211255	2SC1815-GR	C213, C215	354780339	3.3 $\mu$ F, 50V, Elect.
Q255	2211455	2SA1015-GR	C214, C216	354780109	1 $\mu$ F, 50V, Elect.
<b>Diodes</b>					
D101, D102	223132	1K60	C217	354741019	100 $\mu$ F, 16V, Elect.
D103	223163	1SS133	C218	371121034	0.01 $\mu$ F $\pm$ 5%, 50V, Mylar
D131-D135	223163	1SS133	C219, C220	371128224	8200pF $\pm$ 5%, 50V, Mylar
D141	223163	1SS133	C221, C222	354780229	2.2 $\mu$ F, 50V, Elect.
D202, D203	223163	1SS133	C223, C224	371123924	3900pF $\pm$ 5%, 50V, Mylar
D271, D272	223163	1SS133	C225	354780229	2.2 $\mu$ F, 50V, Elect.
<b>Transformers</b>					
L101	233396	NFIF-4070	C227-C230	354741009	10 $\mu$ F, 16V, Elect.
L102	233397	NFIF-4071	C251, C252	354741009	10 $\mu$ F, 16V, Elect.
L152	232139	NMIF-4062	C253, C254	354724719	470 $\mu$ F, 6.3V, Elect.
<b>Coils</b>					
L103	233400K003	NCH-2228	C257	354741009	10 $\mu$ F, 16V, Elect.
L131	231081	NCH-2129	C271	354721019	100 $\mu$ F, 6.3V, Elect.
L201, L202	233294	NCM 5040	C272	354780109	1 $\mu$ F, 50V, Elect.
<b>RF block</b>					
L151	232148	NMRF-7050	<b>Resistors</b>		
<b>Ceramic filters</b>					
X101, X102	3010137	SFE10.7MMK	R006, R007	431523355	3.3Mohm, 1/2W, Solid
X103	3010006	SFE10.7MA8	R101	5210068	N06HR47KBD, Semi-fixed, FM mute level
X151	3010123	SFZ450JL	R102	5210072	N06HR220KBD, Semi-fixed, FM signal level
X152	3010076	BFU450C	R201	5210061	N06HR 3.3KBD, Semi-fixed, VCO
<b>OSC element</b>					
X141	3010141	XTL7.2M, X'tal	R202	5210070	N06HR100KBD, Semi-fixed, Separator
X271	3010099	CSA4.00MG, Ceramic	<b>Terminals</b>		
<b>Capacitors</b>					
C001	354741009	10 $\mu$ F, 16V, Elect.	P101	25060127	NTM-2PDSF060, Antenna FM
C105	354742209	22 $\mu$ F, 16V, Elect.	P102	25060128	NTM-2PDMN061, Antenna AM
C106, C113	354784799	0.47 $\mu$ F, 50V, Elect.	P251	25045216	NPJ-4PDBL94, Output VIDEO
C112	354741019	100 $\mu$ F, 16V, Elect.	P271	25045172	HSJ1003-01-020, Phono RI
C115	354780229	2.2 $\mu$ F, 50V, Elect.	P272	25050294	NSCT-8P-121, Tape DIN
<b>Relay</b>					
RL101 25065356 NRL-1P0. 1A-DC12-050					
<b>Sockets</b>					
25050268 NSCT-4P-96					
25050270 NSCT-6P-98					
25050273 NSCT-9P-101					
25050274 NSCT-10P-102					
<b>Bracket</b>					
27141059 Ground					

NOTE: <D>: Only 120V model  
<W>: Only Worldwide model

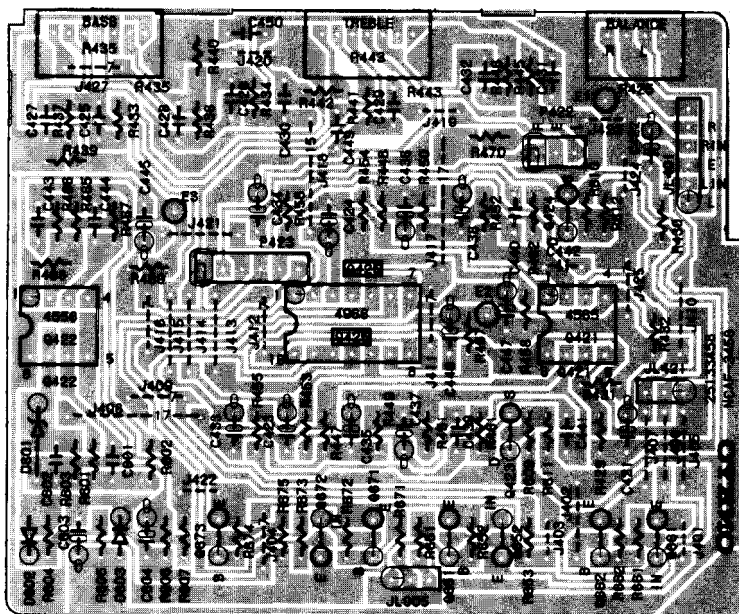
# PRINTED CIRCUIT BOARD-PARTS LIST

## PRE. AND POWER AMPLIFIER PC BOARD (NAAF-3462-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Transistors</b>	
Q301-Q304	2211782 or 2211783	2SA991-F or 2SA991-E
Q491-Q494	2212285 or 2212286	2SC2878-A or 2SC2878-B
Q501, Q502	2211371 or 2211372	2SC2259-O-001 or 2SC2259-O-002
Q503-Q506	2211455	2SA1015-GR
Q507, Q508	2211732 or 2211733	2SC1845-F or 2SC1845-E
Q509, Q510	2211255	2SC1815-GR
Q511, Q512	2211353 or 2211354	2SA949-O or 2SA949-Y
Q513, Q514	2211633 or 2211634	2SC2229-O or 2SC2229-Y
Q515, Q516	2211255	2SC1815-GR
Q517, Q518	2211633 or 2211634	2SC2229-O or 2SC2229-Y
Q519, Q520	2211353 or 2211354	2SA949-O or 2SA949-Y
Q521, Q522	2201643 or 2201644	2SC3298-O or 2SC3298-Y
Q523, Q524	2201633 or 2201634	2SA1306-O or 2SA1306-Y
Q525, Q526	2201653,	2SC3856-O, #
Q529, Q530	2201654 or 2201655	2SC3856-Y or 2SC3856-P
Q527, Q528	2201663,	2SA1492-O, #
Q531, Q532	2201664 or 2201665	2SA1492-Y or 2SA1492-P
NOTE: Replacement for transistor of mark #, if necessary, must be made from the same beta group (HFE) as the original type.		
	Ex. 2SC3856-O	2SA1492-O
		Same beta group
Q571, Q572	2211633 or 2211634	2SC2229-O or 2SC2229-Y
Q573, Q574	2211732 or 2211733	2SC1845-F or 2SC1845-E
Q575	2211792 or 2211793	2SA992-F or 2SA992-E
Q691, Q692	2212600	DTA124ES
Q905	2201934, 2201935 or 2201936	2SB1186-D, 2SB1186-E or 2SB1186-F
Q906, Q907	2211945	2SK246-GR
Q951, Q952	2211255 or 2210746	2SC1815-GR or 2SC945A-P
Q953	2211643 or 2211644	2SA965-O or 2SA965-Y
Q954	2211792 or 2211793	2SA992-F or 2SA992-E
Q961, Q962	2211255 or 2210746	2SC1815-GR or 2SC945A-P
Q971-Q973	2211255	2SC1815-GR
	<b>ICs</b>	
Q305-Q311	222502	NJM4558DX
Q312, Q313	22240079	LC7821
Q314	22240081	LC7822
Q401	22240191	NJM4565DD

CIRCUIT NO.	PART NO.	DESCRIPTION
Q903	222780122NEC	78M12
Q904	222780052NEC	78M05
	<b>Diodes</b>	
D301-D324	223163	1SS133
D491-D494	223163	1SS133
D501-D506	223163	1SS133
D507, D508	4000120	KB265
D902, D903	224151602 or 224651602	05AZ16Y or HZ16EB2
D904	223862 or 223890	WL01 or W01RL
D905	223880 or 223896	GP101N4003 or 1N4003F
D906	223163	1SS133
D907	224153301 or 224653301	05Z33X or HZ33EB1
D952, D953	223163	1SS133
D961	224151001 or 224651001	05AZ10X or HZ10EB1
D971-D973	223163	1SS133
	<b>Capacitors</b>	
C301, C302	354741009	10 $\mu$ F, 16V, Elect.
C307, C308	371128224	8200pF $\pm$ 5%, 50V, Mylar
C309, C310	371123034	0.03 $\mu$ F $\pm$ 5%, 50V, Mylar
C313, C314	371121134	0.011 $\mu$ F $\pm$ 5%, 50V, Mylar
C315, C316	354721029	1000 $\mu$ F, 6.3V, Elect.
C317, C318	354741009	10 $\mu$ F, 16V, Elect.
C319, C320	354742219	220 $\mu$ F, 16V, Elect.
C321-C336	354741009	10 $\mu$ F, 16V, Elect.
C337-C340	354780229	2.2 $\mu$ F, 50V, Elect.
C341-C348	354741009	10 $\mu$ F, 16V, Elect.
C399	354741009	10 $\mu$ F, 16V, Elect.
C401, C402	354780229	2.2 $\mu$ F, 50V, Elect.
C405, C406	354721019	100 $\mu$ F, 6.3V, Elect.
C407, C408	354741009	10 $\mu$ F, 16V, Elect.
C501, C502	354781009	10 $\mu$ F, 50V, Elect.
C507, C508	354722219	220 $\mu$ F, 6.3V, Elect.
C513, C514	354780229	2.2 $\mu$ F, 50V, Elect.
C525-C528	371124734	0.047 $\mu$ F $\pm$ 5%, 50V, Mylar
C573	354722219	220 $\mu$ F, 6.3V, Elect.
C574	354790479	4.7 $\mu$ F, 100V, Elect.
C591, C592	354790479	4.7 $\mu$ F, 100V, Elect.
C691, C692	354741009	10 $\mu$ F, 16V, Elect.
C916, C917	354744709	47 $\mu$ F, 16V, Elect.
C918, C919	354744719	470 $\mu$ F, 16V, Elect.
C920	335251039	0.01 $\mu$ F, 500V, Ceramic
C923	354761019	100 $\mu$ F, 35V, Elect.
C924	354763329	3300 $\mu$ F, 35V, Elect.
C925	354761019	100 $\mu$ F, 35V, Elect.
C927, C930	354741009	10 $\mu$ F, 16V, Elect.
	<b>Resistors</b>	
R525, R526	442522704	27ohm, 1/2W, Metal oxide film
R529, R530	442529104	91ohm, 1/2W, Metal oxide film
R531, R532	5210062	N06HR4, 7KBD, Semi-fixed, Idling
R537, R538	442521024	1kohm, 1/2W, Metal oxide film
R539, R540	442521014	100ohm, 1/2W, Metal oxide film
R541-R548	442520224	2.2ohm, 1/2W, Metal oxide film
R549-R552	441620104	1ohm, 1W, Metal oxide film
R553-R560	4000063 or 4500009	0.47ohm, 2W, Metal plate
R561, R562	441520474	4.7ohm, 1/2W, Metal oxide film
R563, R564	441720824	8.2ohm, 2W, Metal oxide film

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION	
R567-R570	442521014	100ohm, 1/2W, Metal oxide film	P302, P303	25045213	NPJ-6PDBL-92	
R591, R592	442520224	2.2ohm, 1/2W, Metal oxide film	P304	25045171	NPJ-4PDBL-65	
R902-R905	441621814	180ohm, 1W, Metal oxide film	P501	25060125	NTM-8PDMN058	
R910	442524794	0.47ohm, 1/2W, Metal oxide film			<b>Plugs</b>	
R913	441620474	4.7ohm, 1W, Metal oxide film	P401a, P402a	25055133	NPLG-3P117	
R914	441721804	18ohm, 2W, Metal oxide film	P422a	25055133	NPLG-3P117	
R916	442529104	91ohm, 1/2W, Metal oxide film			<b>Sockets</b>	
					2000931	NSAS-6P884
L501, L502	231134	S-0.8E	JL421	25050267	NSCT-3P95	
			JL702	25050273	NSCT-9P101	
S301	25065358	NSS-42136, Cartridge selector	JL703	25050268	NSCT-4P96	
S302	25065286	NSS-22112, Mode VCR	JL901	25050270	NSCT-6P98	
					<b>Shield plate</b>	
RL501	25065342	NRL-2P1. 25A-DC24-048, Headphone			27150267	
RL502, RL503	25065360	NRL-2P7A-DC24V-052, Speaker			<b>Bracket</b>	
					27141059	GND
P301	25045252	NPJ-6PDBL-124			<b>Radiators</b>	
					27160146	RAD-52

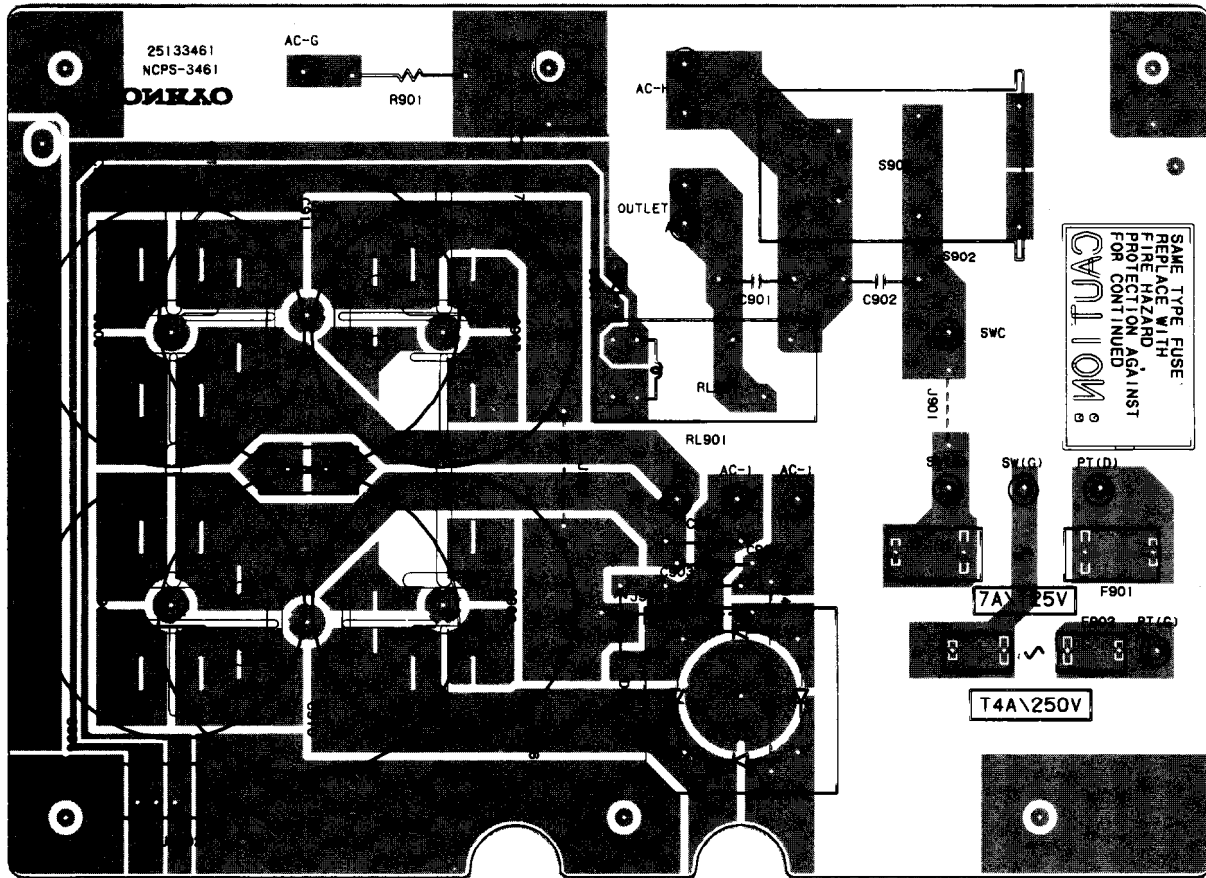


## TONE CONTROL CIRCUIT PC BOARD

### TONE CONTROL CIRCUIT PC BOARD (NAAF-3458-1)

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
		<b>ICs</b>	C429, C430	371124724	4700pF ± 5%, 50V, Mylar
Q421	22240191	NJM4565DD	C431, C432	371123934	0.039μF ± 5%, 50V, Mylar
Q422	222502	NJM4558DX	C433, C434	354780229	2.2μF, 50V, Elect.
Q425	22240025	LC4966	C435-C438	354781099	0.1μF, 50V, Elect.
		<b>Transistors</b>	C439-C442	371121024	1000pF ± 5%, 50V, Mylar
Q423, Q424	2211945	2SK246-GR	C443	371121124	1100pF ± 5%, 50V, Mylar
Q651, Q662	2211255 or	2SC1815-GR or	C444	371121234	0.01μF ± 5%, 50V, Mylar
Q671, Q673	2210746	2SC945A-P	C445	354741009	10μF, 16V, Elect.
Q652, Q661	2212600	DTA124ES	C446, C447	354744709	47μF, 16V, Elect.
Q672			C603	354781099	0.1μF, 50V, Elect.
		<b>Diodes</b>	C604	354780229	2.2μF, 50V, Elect.
D601	224150623,	05AZ6. 2Z,			<b>Resistors</b>
	224650623 or	HZ6. 2EB3 or	R425	5104225	N11RGLC250KWT22Z, Variable, Balance
	224450623	MTZ6. 2C	R435, R436	5104216	N14RLC50KC22Z, Variable, Bass
D602, D603	223163	1S5133	R443, R444	5104216	N14RLC50KC22Z, Variable, Treble
		<b>Capacitors</b>			<b>Sockets</b>
C421, C422	354780229	2.2μF, 50V, Elect.	P422	2000931	NSAS-6P884
C423, C424	354741009	10μF, 16V, Elect.	P423	2000933	NSAS-12P885
C425, C426	371123334	0.033μF ± 5%, 50V, Mylar			
C427, C428	352983396	0.33μF, 50V, Non-polar elect.			

## PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE



POWER SUPPLY CIRCUIT PC BOARD

## PRINTED CIRCUIT BOARD-PARTS LIST

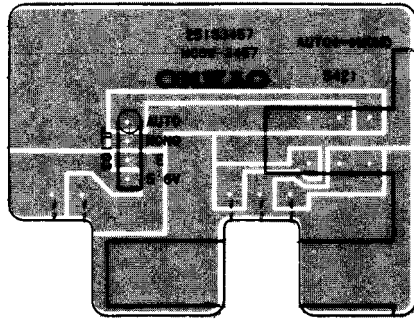
## POWER SUPPLY CIRCUIT (NAPS-3461-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Diodes</b>	
D901	223898	RB602
D951	223163	1SS133
	<b>Capacitors</b>	
C901, C902	3500065A	△ DE7150FZ103PAC400V/125V, Capacitor IS
C903-C905	335251039	0.01 $\mu$ F, 500V, Ceramic
C906-C909	3504228	12000 $\mu$ F, 71V, Elect.
	<b>Resistor</b>	
R901	431523355	△ 3.3Mohm, 1/2W, Solid <D>
	<b>Relay</b>	
RL901	25065357	NRL-1P5A-DC24V-051 <D>
	25065341	NRL-1P15A-DC24V-047 <W>
	<b>Switch</b>	
S902	25035603	△ NPS-121-L564P
	<b>Fuseholders</b>	
F901a	250113	△ SN5051
F902a	25050065	△ YSH403T <W>
	<b>Fuses</b>	
F901	252052	△ 7A (ST-6)
F902	252077	△ 4A-SE-EAK <W>

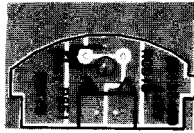
CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Socket</b>	
JL902	25050267	NSCT-3P95
	<b>Bracket</b>	
	27141059	GND
	<b>Radiator</b>	
	27160196	RAD-64
	<b>Busses</b>	
	27300826A	Two pieces
	27300827A	

NOTE: <D>: Only 120V model  
<W>: Only Worldwide model

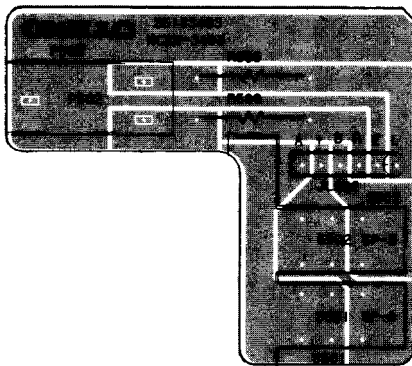
NOTE: THE COMPONENTS IDENTIFIED BY MARK △ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBERS SPECIFIED.



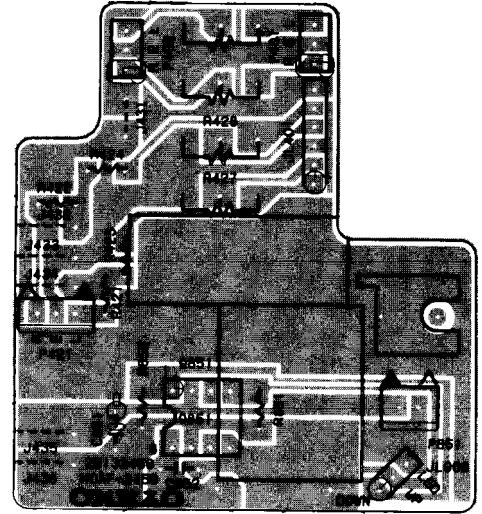
**MODE SWITCH PC BOARD**



**VOLUME INDICATOR PC BOARD**



**SPEAKER SWITCH PC BOARD**



**VOLUME PC BOARD**



**POWER SUPPLY TRANSISTOR PC BOARDS**

**MODE SWITCH PC BOARD (NASW-3457-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
S421, S301a	25035599	NPS-100-122-L561, Mode/Cartridge selector switch

**VOLUME INDICATOR PC BOARD (NADIS-3459-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
D851	225241 or	SEL2210R-C or
	225242	SEL2210R-D, LED
	27190545	Holder

**SPEAKER SWITCH PC BOARD (NASW-3463-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
R565, R566	441623914	390ohm, 1W, Metal oxide film
S501, S502	25035517	NPS-222-L479, Speaker switch
P502	25045187	HLJ-0541-01-010, Headphone terminal

**VOLUME PC BOARD (NAAF-3456-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
Q851	222963	LB1630, IC
C851	354721019	100 $\mu$ F, 6.3V, Elect. capacitor
R401, R402	5144008	N16RGL50KA30F, Variable resistor
R427, R428		

CIRCUIT NO.	PART NO.	DESCRIPTION
P401	2000931	NSAS-6P884, Socket
P402	2000624	NSAS-6P580, Socket
P851	2000635A	NSAS-4P591, Socket
P421a	25055133	NPLG-3P117, Plug
	27141059	Bracket GND

**POWER SUPPLY TRANSISTOR PC BOARD (NAETC-3464-1)**

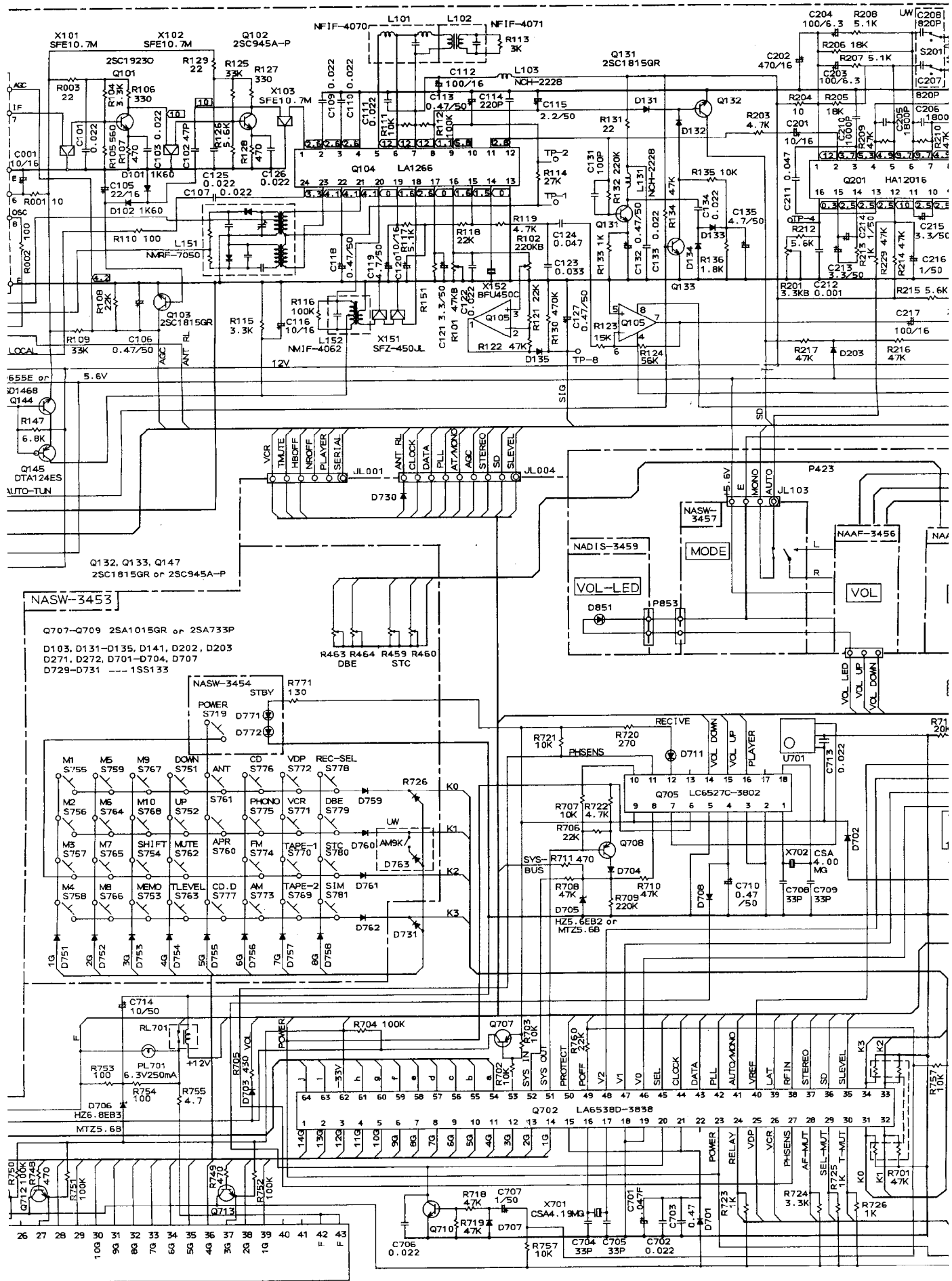
CIRCUIT NO.	PART NO.	DESCRIPTION
Q901	2201944,	2SD1763-D,
	2201945 or	2SD1763-E or
	2201946	2SD1763-F, Transistor

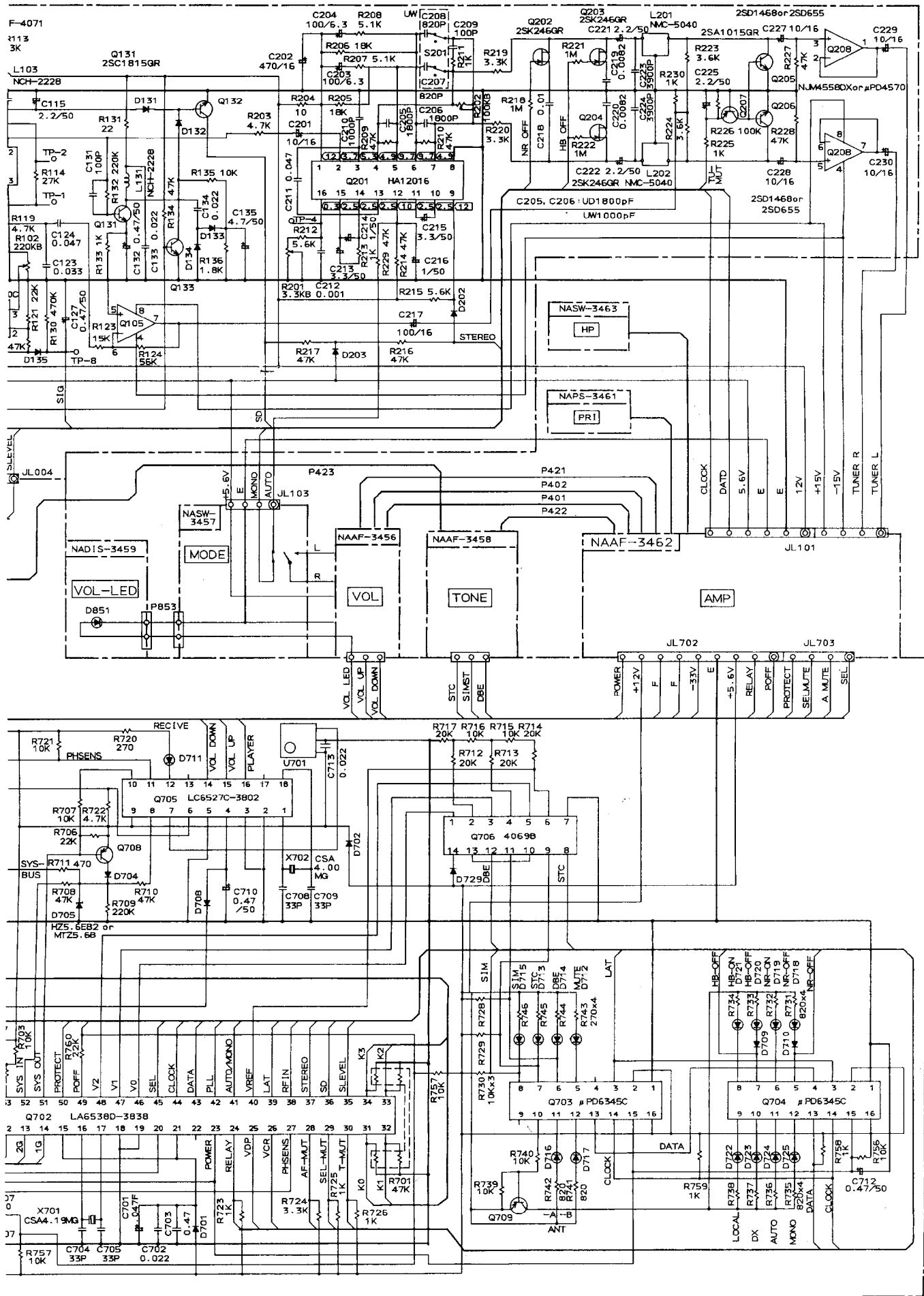
**POWER SUPPLY TRANSISTOR PC BOARD (NAETC-3465-1)**

CIRCUIT NO.	PART NO.	DESCRIPTION
Q902	2201934,	2SB1186-D,
	2201935 or	2SB1186-E or
	2201936	2SB1186-F, Transistor



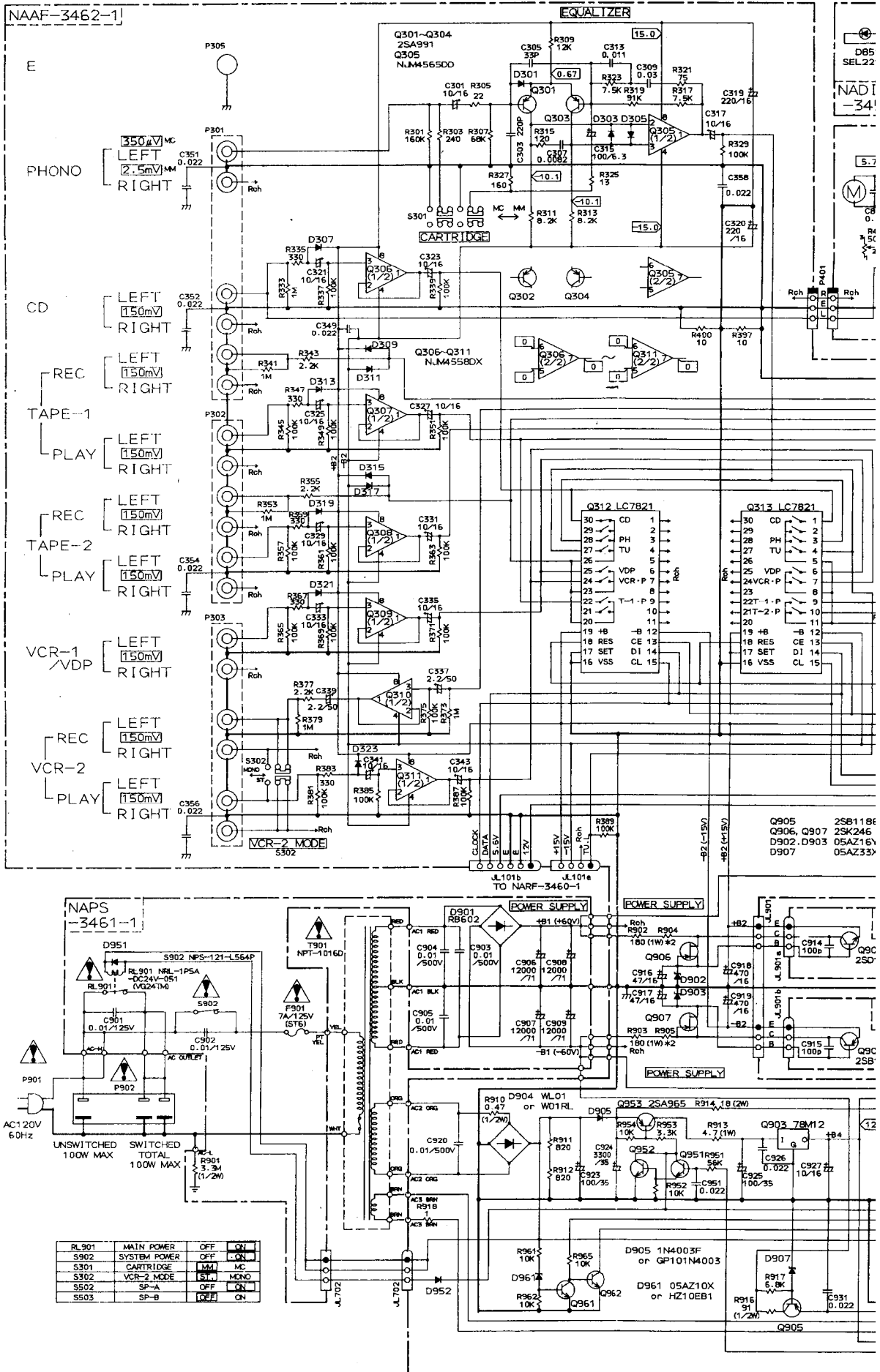


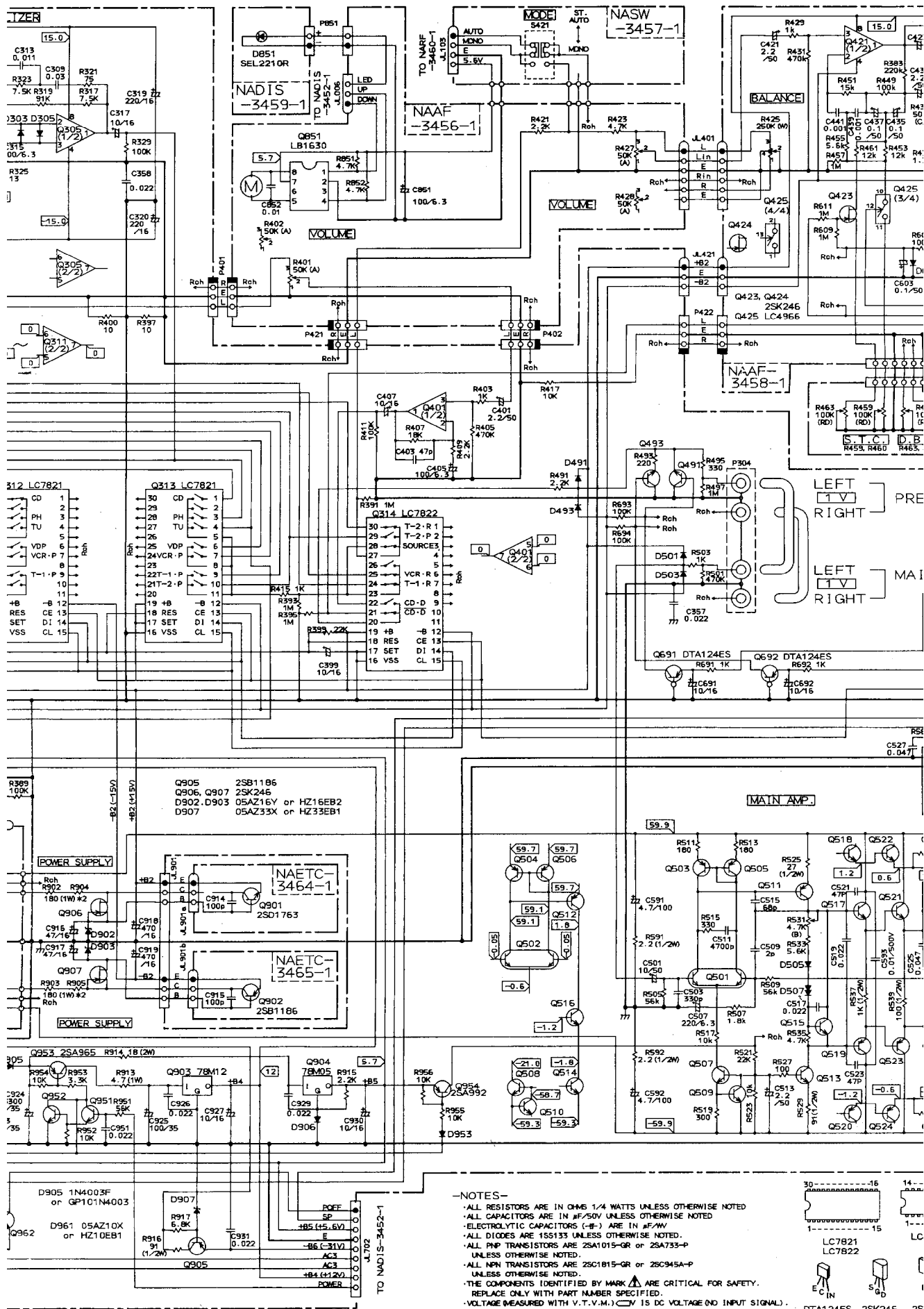




# SCHEMATIC DIAGRAM

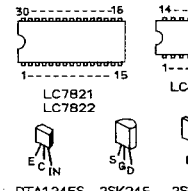
A  
B  
C  
D  
E  
F

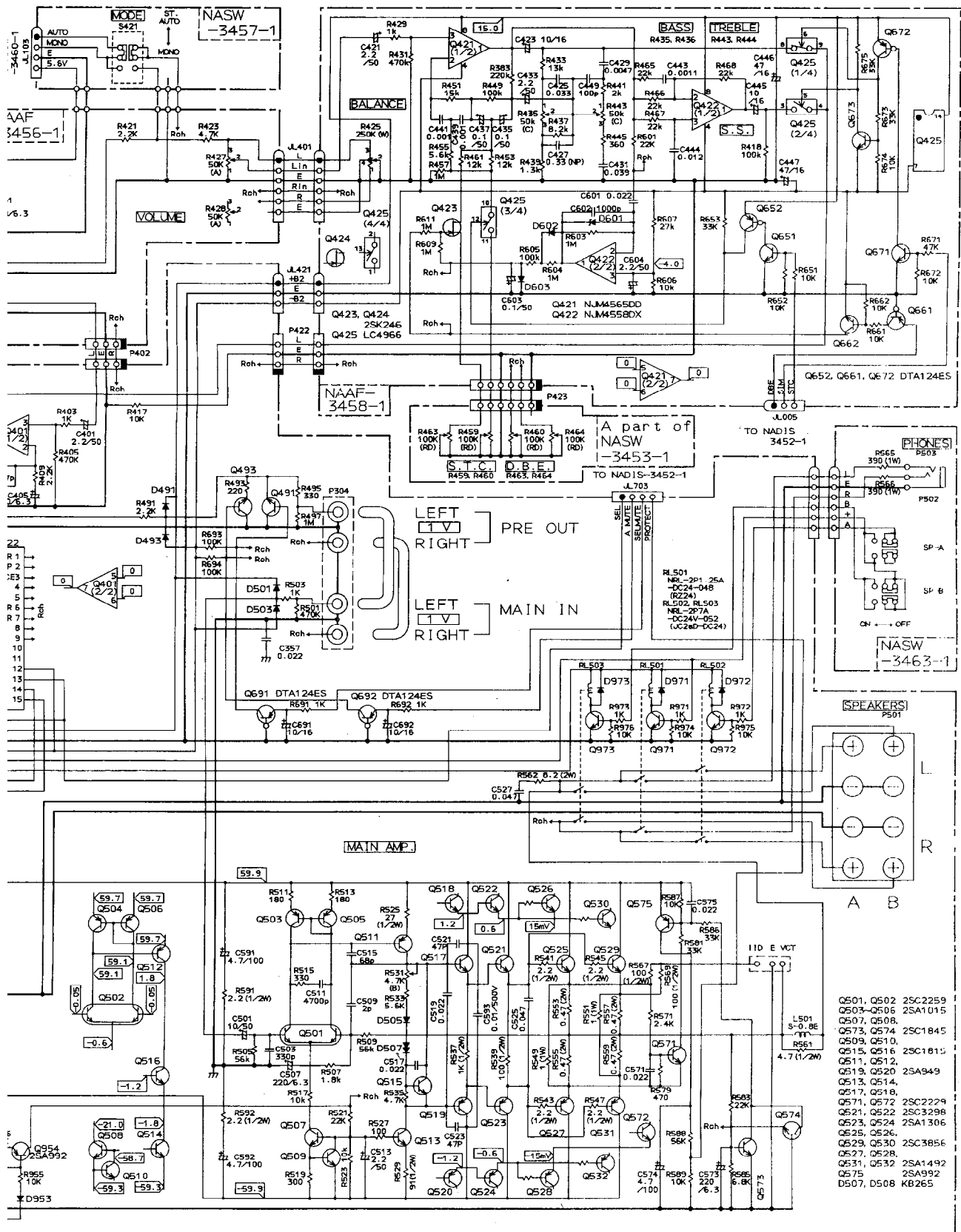




**NOTES-**

- ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED
- ALL CAPACITORS ARE IN MF/50V UNLESS OTHERWISE NOTED
- ELECTROLYTIC CAPACITORS (-E) ARE IN MF/10V
- ALL DIODES ARE 1SS133 UNLESS OTHERWISE NOTED.
- ALL PNP TRANSISTORS ARE 2SA1015-GR or 2SA733-P UNLESS OTHERWISE NOTED.
- ALL NPN TRANSISTORS ARE 2SC1815-GR or 2SC945A-P UNLESS OTHERWISE NOTED.
- THE COMPONENTS IDENTIFIED BY MARK  $\Delta$  ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- VOLTAGE MEASURED WITH V.T.V.M.  $\nabla$  IS DC VOLTAGE (NO INPUT SIGNAL).
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

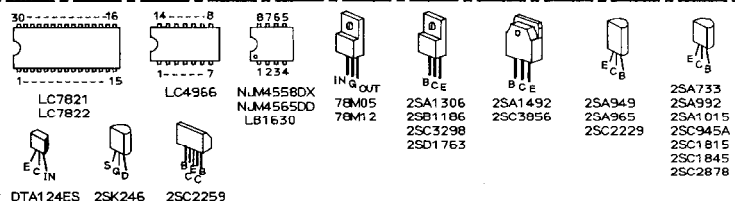




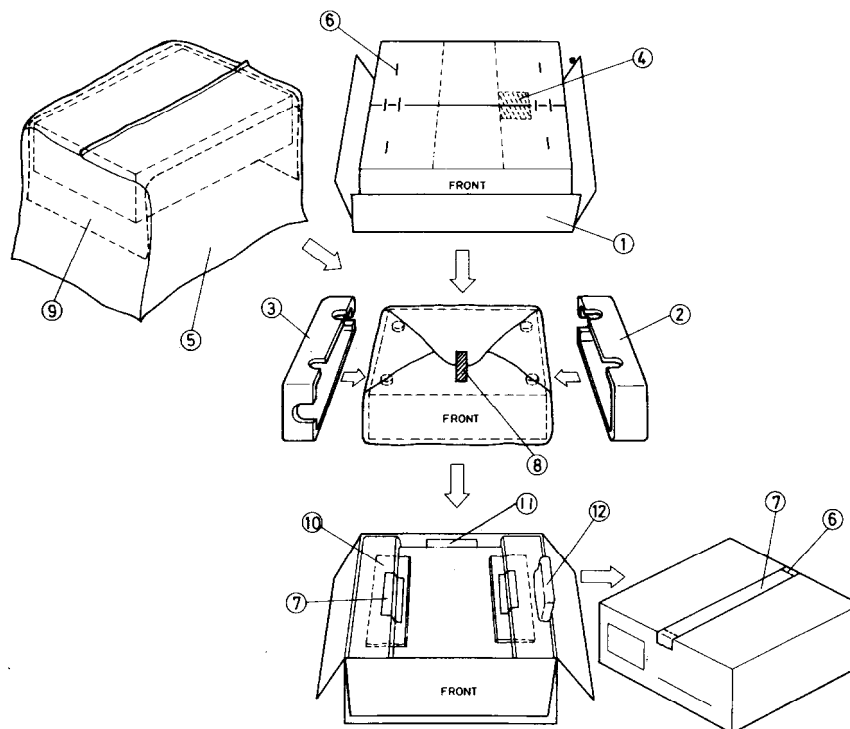
- Q501, Q502 2SC2259
- Q503-Q506 2SA1015
- Q507, Q508, Q573, Q574 2SC1845
- Q509, Q510, Q515, Q516 2SC1815
- Q511, Q512, Q519, Q520 2SA949
- Q513, Q514, Q517, Q518, Q571, Q572 2SC2274
- Q521, Q522 2SC3298
- Q523, Q524 2SA1306
- Q525, Q526, Q529, Q530 2SC3856
- Q527, Q528, Q531, Q532 2SA1492
- Q575 2SA992
- D507, D508 KB265

**-NOTES-**

- ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED
- ALL CAPACITORS ARE IN  $\mu\text{F}/50\text{V}$  UNLESS OTHERWISE NOTED
- ELECTROLYTIC CAPACITORS (E) ARE IN  $\mu\text{F}/\text{WV}$
- ALL DIODES ARE 1S5133 UNLESS OTHERWISE NOTED.
- ALL PNP TRANSISTORS ARE 2SA1015-GR or 2SA733-P UNLESS OTHERWISE NOTED.
- ALL NPN TRANSISTORS ARE 2SC1815-GR or 2SC945A-P UNLESS OTHERWISE NOTED.
- THE COMPONENTS IDENTIFIED BY MARK  $\Delta$  ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- VOLTAGE MEASURED WITH V.T.V.M. (V) IS DC VOLTAGE (NO INPUT SIGNAL).
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.



## PACKING VIEW



REF NO.	PART NO.	DESCRIPTION
1	29051816A	Master carton box (TX-890)
	29051817A	Master carton box (TX-890M/PX)
2	29091299B	Pad L
3	29091300B	Pad R
4	29091317	Pad B
5	29100035A	1020×720mm, Poly-vinyl bag
6	282301	Sealing hook
7	260012	Damplon tape
8	261504	Adhesive tape
9	29095395	880×500mm, Protection sheet
10	29095498	Sheet P
11		Accessory bag ass'y
	29341341A	Instruction manual
	29341340	Instruction manual for RC-AV20M (TX-890M/PX)
	292064B	FM antenna
	232140	NMA-3057, AM loop antenna
	2010169	Connection cord for RI
	24140021	RC-118S, Remote controller (TX-890)
	3010054	UM-3, Two batteries (TX-890)
	25060123	Two adaptors for FM antenna
	25055251	CV-CP, Conversion plug (PX)
	28330072	Three cpas for AC outlet (PX)
	29365019	Warranty card (UDN)
	29365021	Warranty card (PX)
	29358002F	Service station list
	29100097	250×350mm, Poly-vinyl bag
12	24140035	RC-AV20M, Remote controller (TX-890M/PX)

NOTE: (UDN): Only U.S.A. model  
(PX): Only PX model