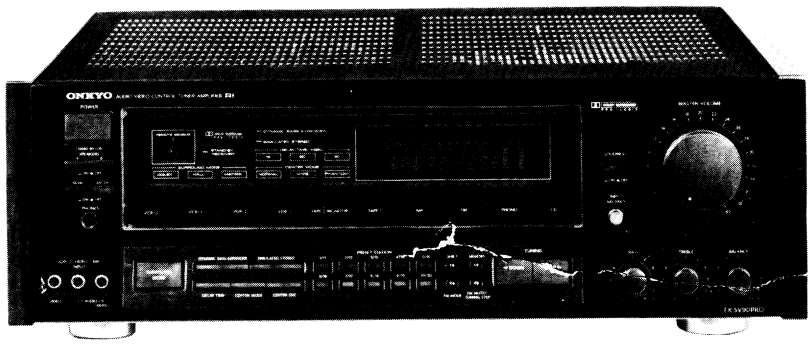
SERIAL NO. 3351

ONKYO SERVICE MANUAL

AUDIO VIDEO CONTROL TUNER AMPLIFIER

MODEL TX-SV90PRO



BHUD, BHUDN	120V AC, 60Hz
BHUQ	240V AC, 50Hz
BHUW	120/220V AC, 50/60Hz

SAFETY-RELATED COMPONENT WARNING!!
COMPONENTS INDENTIFIED BY MARK ⚠ 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.

TABLE ●F CONTENTS

ONKYO®
AUDIO COMPONENTS

-SV90 PRO

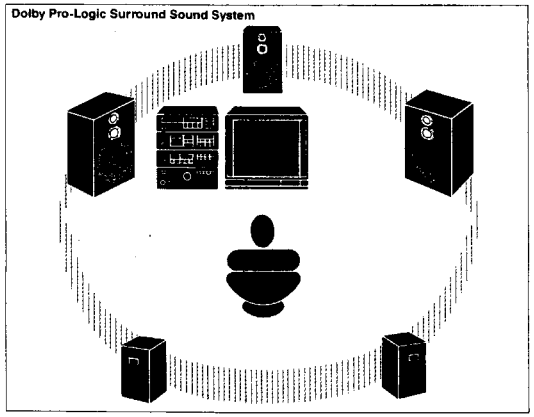
ass A/V tuner amplifier
ı an abundance of
ıw-distortion power
Dolby* Pro-Logic
d Sound System for
ed realism and
ent.

r for Top Performance

)0 PRO is built around Onkyo's
w-distortion amplifier circuitry to
the sound quality offered by
ıy music sources. Luscious,
surround sound performance is
a total of five high quality
ctions for driving the front (left
ear and center speakers. In a
al two-channel stereo configura-
-SV90 PRO pumps out a big
channel, both channels driven
s from 20 Hz to 20,000 Hz with
an 0.04% total harmonic distor-
ı five-channel surround sound
ıe front channel amps are each
) W (0.04% THD), the rear chan-
t 30 W (0.08% THD) and the
ınel amp at 30 W (0.08% THD).

Dolby Pro-Logic Surround Sound System*

Dolby Pro-Logic Surround Sound employs circuitry based on that found in the professional Dolby surround decoders used in movie theaters. This "active decoder" configuration is more sophisticated than the "passive decoder" circuitry found in conventional receivers. Dolby Pro-Logic Surround's biggest feature is its "directional emphasis circuit." It adds a new, independently controlled "center channel" to the existing stereo L/R front channels and monaural L/R rear channel. The result is the same sonic composition you hear in a theater. Rather than just a combination of left and right channel information, the center channel benefits from logic steering circuitry that increases separation from around 3 dB to between 26 and 40 dB. This results in pinpoint directionality, image stability and enhanced overall sound quality. For example, the voices of on-screen characters always seem to come directly from the TV and never from a side speaker, even if you are sitting far to one side of the TV screen. A built-in noise sequencer generates test tones, making it easy to set the optimum channel balance. Simply listen to the test tone as it sequences automatically between the left, center, right and rear channels and set the channel levels so that they match. It's that easy to bring a theater ambience into your home.

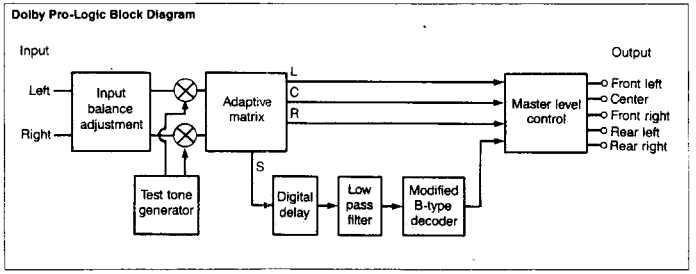


Adjustable Digital Time Delay

The TX-SV90 PRO includes adjustable digital time delay for the rear speaker channels to let you acoustically tailor the perceived room size to match the characteristics of the program material. This feature works with both the Dolby Pro-Logic and Hall surround modes and can be adjusted either manually or via the remote control. Delay can be set to 15, 20 or 30 milliseconds. The longer the delay, the larger the apparent acoustical size of the listening room.

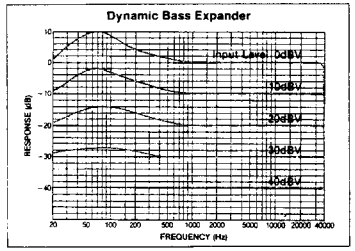
Discrete Pre-Out and Main-In Terminals

If you own a separate preamp or power amp, you'll appreciate the TX-SV90 PRO's pre-out and main-in terminals. The pre-out terminals for the front, rear and center channels allow you to route these signals directly to a separate power amp, bypassing the power amp blocks completely. You can also connect the TX-SV90 PRO to a separate preamp using the main-in facilities for the front left and front right channels only.



*Dynamic Bass Expander**

This exclusive Onkyo feature helps you get the most out of any sound source, especially your VCR or videodisc player. It expands low frequency response depending on the input signal level. The effect is totally new because the rate of expansion changes constantly, unlike conventional bass boost circuits. Deep bass impact and definition increase without altering the upper midbass and midrange. You can defeat the circuit when desired.



98-Function Programmable Universal Remote Control Included

With the RC-AV90M you can control all the components in your A/V system. This not only includes infrared remote compatible Onkyo components, but virtually any component or appliance made by any manufacturer that accepts infrared codes. All RI commands for RI system remote compatible Onkyo components are preprogrammed. They can also be replaced with other control codes. And a total of 98 separate control codes can be programmed. So you'll have complete command over your A/V system no matter how many separate components there are.

***There may be some cases of incompatibility due to nonstandard systems used by some manufacturers.**

Features at a Glance

Amplifier Section

- 110 Watts Per Channel (
  Front: 100 Watts Per Cha
  Per Channel, Center: 30
  Surround Sound)
- Discrete Output Stages F
  Channels and Center Ch
- Dolby* Pro-Logic Surrou
- Adjustable Digital Time D
  30 Milliseconds
- Three Surround Sound F
  Pro-Logic and Hall Surro
  Digital Time Delay, and M
- Dynamic Bass Expande
  Bass Impact and Extens
- Simulated Stereo for Wid
  TV Soundtracks
- Front Panel VDP-2/Camc
- Videodisc Copying Capa
- VCR-2 Mono/Stereo Sele
- Pre-Out Terminals for Re
  Channels; Pre-Out and M
  Front Channels
- Left + Right Out Termina
  Woofer
- Tape-1 to Tape-2 Copyin
- Motor-Driven Five-Gang
  Control, Discrete Center
  Controls
- Separate A, B, Rear and
  System Selectors
- Heavy-Duty Four-Way Sp
  Front Outputs
- Audio Muting (– 20dB) (
  Remote Control)
- Loudness Control
- Headphone Jack

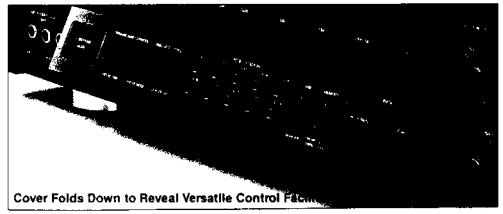
Tuner Section

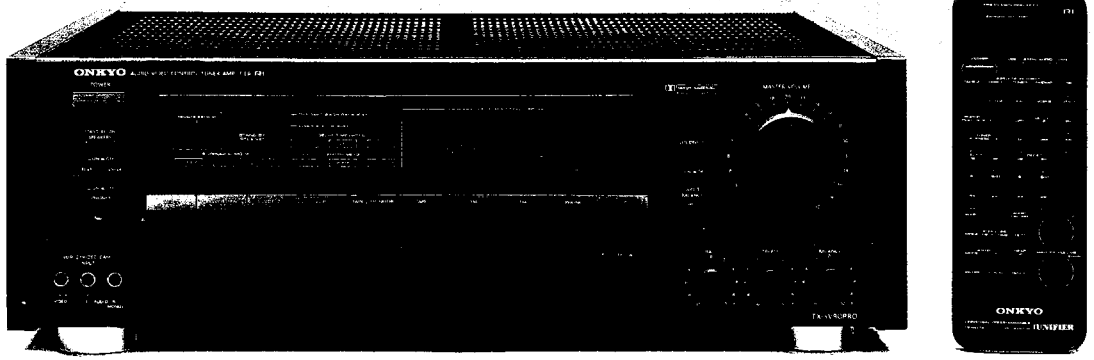
- Random Preset Tuning w
- Battery Free Backup to M
  Contents
- Automatic Tuning Mode
- Fluorescent Station Indic
- Cable FM Compatibility
  Steps

General

- Inputs for Four Video So
  Video Compatible) and F
- Handsome Solid Alumin
  Flip Down Auxiliary Cont
- Woodgrain Side Panels

*Patent per





O (BH) *Available in black only.*

AV DOLBY SURROUND PRO · LOGIC RI

SPECIFICATIONS

AMPLIFIER SECTION

Power Output: Stereo mode
110 watts per channel min. RMS. at 8 ohms, both channels driven, from 20Hz to 20,000Hz, with no more than 0.04% total harmonic distortion.
Surround mode
100 watts per channel min. RMS. at 8 ohms both channels driven, from 20Hz to 20,000Hz, with no more than 0.04% total harmonic distortion. (FRONT)
30 watts per channel min. RMS. at 8 ohms 1,000Hz with no more than 0.08% total harmonic distortion. (REAR/CENTER Matrix surround mode)

Total Harmonic Distortion:	0.04% at rated power (FRONT)
[illegible] Distortion:	0.04% at rated power (FRONT)
[illegible]ing Factor:	70 at 8 ohms (FRONT)
[illegible] and Impedance:	Phono: 2.5mV/50 kohms
	CD/Tape Play: 150mV/50 kohms
	Tape Rec: 150mV/2.2 kohms (Phono)
	Main input (FRONT): 1V, 50 kohms
	Pre out (FRONT): 1V, 2.2 kohms
	Pre out (REAR/CENTER): 1V, 2.2 kohms
	mono out (SUB WOOFER): 1V, 2.2 kohms
Phono Overload:	120mV RMS. at 1,000 Hz, 0.5 % THD.
Frequency Response:	20 to 30,000 Hz, +/−1 dB
	VDP IN → DOLBY SURROUND REAR PRE OUT : 30 to 7 kHz, +0 dB, −3 dB
RIAA Deviation:	20 to 20,000 Hz, +/−0.8 dB
Tone Control:	BASS: +/−10 dB at 100 Hz
	TREBLE: +/−10 dB at 10,000 Hz
Signal to Noise Ratio:	PHONO MM: 77 dB (IHF A, 5mV input)
	CD/TAPE: 93 dB (IHF A)
Muting:	−20dB

VIDEO SECTION

signal sensitivity and Impedance
VDP/VCR normal input, output: 1 V_{p-p}, 75 ohms
S-VIDEO input, output: Y signal 1 V_{p-p}, 75 ohms
C signal 0.28 V_{p-p}, 75 ohms

TUNER SECTION

FM:

Tuning Range:	87.50 − 108.00 MHz (50/25 kHz steps)
Usable Sensitivity:	Mono: 11.2 dBf, 1.0 µV (75 ohms)
	Stereo: 17.2 dBf, 2.0 µV (75 ohms)
50dB Quieting Sensitivity:	Mono: 17.2 dBf, 2.0 µV (75 ohms)
	Stereo: 37.2 dBf, 20 µV (75 ohms)
Capture Ratio:	1.5 dB
Image Rejection Ratio:	40 dB
IF Rejection Ratio:	90 dB
Signal-to-Noise Ratio:	Mono: 76 dB
	Stereo: 70 dB
Alternate Channel Attenuation:	65 dB
AM Suppression Ratio:	50 dB
Harmonic Distortion:	Mono: 0.1%
	Stereo: 0.2%
Frequency Response:	30 − 15,000 Hz ±1.0 dB
Stereo Separation:	45 dB at 1kHz
	30 dB at 100 − 10,000Hz
Muting Level:	17.2 dBf

AM:

Tuning Range:	530 − 1710 kHz (10 kHz steps) and /or 531 to 1,602 kHz (9kHz steps) (worldwide model) 522 to 1611 kHz (9 kHz steps) (Australian model)
Usable Sensitivity:	30 µV
Image Rejection Ratio:	40 dB
IF Rejection Ratio:	40 dB
Signal-to-Noise Ratio:	40 dB
Harmonic Distortion:	0.7%

GENERAL

Power Supply:	
USA model:	AC120V, 60Hz
Australian model:	AC240V, 50Hz
Worldwide model:	120 and 220V Switchable, 50/60Hz
Dimensions (W x H x D):	465 x 158 x 432 mm
	18-5/16" x 6-1/4" x 17"
Weight:	14.8kg., 32.3 lbs.

REMOTE CONTROL TRANSMITTER RC-AV90M

Transmitter:	Infrared
Signal Range:	Approx. 5 meters (16ft. 4")
Power Supply:	Four "AAA" batteries (1.5V x 4)
Dimensions (W x H x D):	70 x 30 x 19
	2-3/4" x 1-3/16" x 7-1/2"
Weight:	200 grams 7.1 oz. (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	252053	8A (ST-6), Primary
F903, F904	252053	8A (ST-6), Secondary

Q (240V) model

Circuit No.	Part No.	Description
F902	252077	4A-SE-EAK, Primary
F903, F904	252079	6.3A-SE-EAK, Secondary

W (Worldwide) model

Circuit No.	Part No.	Description
F901	252053	8A (ST-6), Primary
F902	252077	4A-SE-EAK, Primary
F903, F904	252079	6.3A-SE-EAK, Secondary

2. Change of AM band selector

With the exception of the worldwide model, a AM BAND step selector switch is not provided.

Band step	D714
10kHz → 9kHz	Additional
9kHz → 10kHz	Eliminated

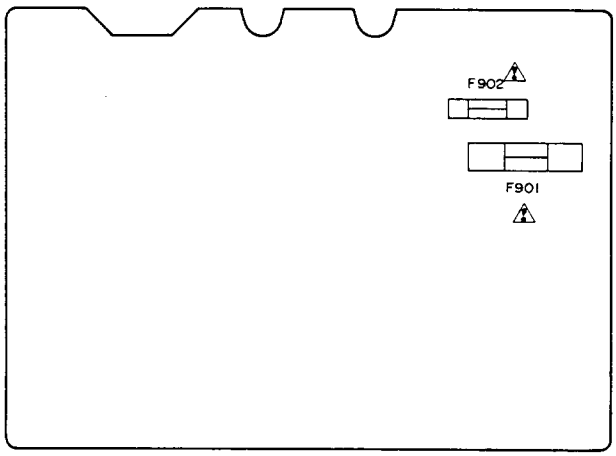
– Worldwide model –

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

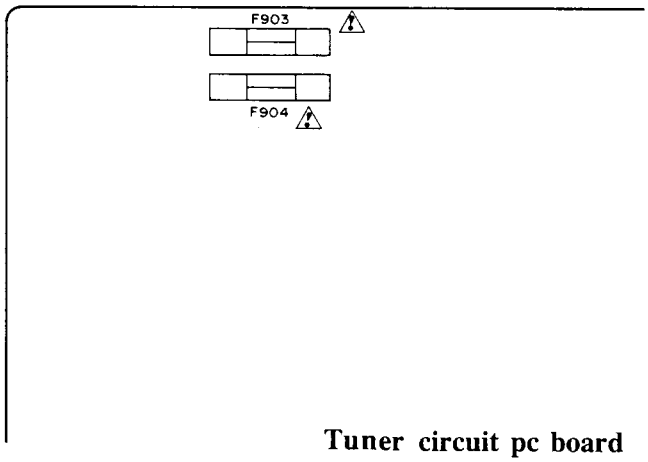
	Band step
U.S.A.	10kHz
Other region	9kHz

3. 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.



Power supply circuit pc board



Tuner 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.

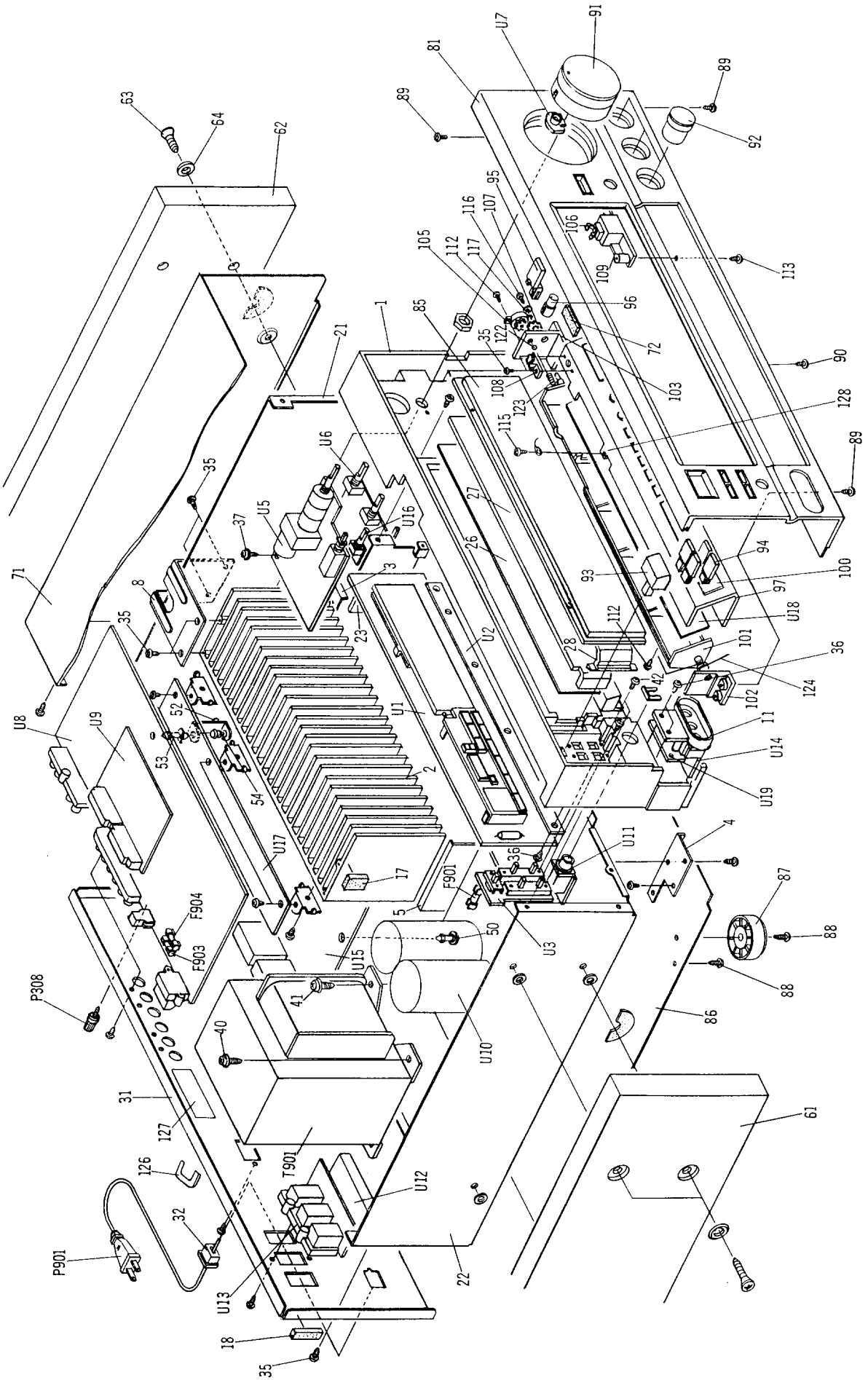
Connect the insulating-resistance tester between the plug of power supply cord and terminal GND on the back panel. Specifications: 3.3 Mohm ±10% at 500V.

5. 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 screw-driver 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.

EXPLODED VIEW



PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
1	27110531A	Front bracket ass'y
2	27160246	Radiator
3	27141301	Bracket HR
4	27141302	Bracket HL
5	27141359	Bracket H
8	27141322	Bracket R
10	27141360	Bracket B
11	27190736	Holder, Pin
17	28140927	2×30×10, Cushion
18	28140933	3×7×55, Cushion
21	27115240B	Side bracket R
22	27130564C	Bracket PT
23	27130591	Bracket F
26	28133234	Back plate
27	28130258	Dial plate
28	27190686	Holder, Dial plate
31	27121307-1	Back panel <D>
	27121307-3	Back panel <W>
	27121307-4	Back panel <Q>
32	27300750	⚠ Bushing(Strainrelief)
35	834430088	3TTS+8B(BC), Self-tapping screw
36	833430080	3TTP+8P(BC), Self-tapping screw
37	831130088	3TTW+8B, Self-tapping screw
38	834430108	3TTS+10B(BC), Self-tapping screw
39	834230108	3TTS+10B(Ni), Self-tapping screw
40	830440089	4TTC+8C(BC), Self-tapping screw
41	838440089	4TTB+8C(BC), Self-tapping screw
42	82143006	3P+6FN(BC), Pan head screw
43	834430128	3TTS+12B(BC), Self-tapping screw Front main amp. transistor
44	801433	3SMS8W.SW+14B(BC), Sems self-tapping screw, Center/rear main amp. transistor
45	82142604	2.6P+4F(BC), Pan head screw <W>
50	27190693	KGLS-6R, Holder
52	27141200A	Bracket PC
53	27190062	KGLS-12S, Holder
54	880009	NRP-345, Rivet
61	28185340A	Side panel L
62	28185342A	Side panel R
63	836440303	4STV+30CQ(BC), Self-tapping screw
64	870086	W4×12(BC), Special washer
71	28184448	Top cover
72	28140835	0.5×10×135, Cushion
81	1A198121-	Front panel ass'y
85	28191537	Clear plate
86	27170254C	Bottom board
87	27175153-1	Leg
88	834430088	3TTS+8B(BC), Self-tapping screw
89	833430080	3TTP+8P(BC), Self-tapping screw
90	834430108	3TTS+10B(BC), Self-tapping screw
91	28323558	Knob VOLUME
92	28323310	Knob TONE
93	28323241-1A	Knob POWER
94	28323839A	Knob SPEAKER
95	28323646	Knob MIC
96	28323671	Knob VOLUME
97	27211148	Panel, lid

REF.NO.	PART NO.	DESCRIPTION
100	28323841	Knob ass'y, LID
101	27190734	Holder DOOR
102	27301265A	Bearing L
103	27301266A	Bearing R
105	28400363	Damper
106	28400534	Holder, catch
107	27301083	Gear, door
108	27190735	Holder, lock
109	27190737	Holder PU
112	833420108	2TTP+10B(BC), Self-tapping screw
113	833430080	3TTP+8P(BC), Self-tapping screw
114	831430100	3TTW+10P(BC), Self-tapping screw
115	834430088	3TTS+8B(BC), Self-tapping screw
116	833426060	2.6TTP+6P(BC), Self-tapping screw
117	87642607	W2.6×7F(BC), Flat washer
122	270555	Steelball
123	27180452	Spring
124	27180453A	Spring
126	27141033	Bracket, plug, Pre., /Main
127	29360626-1	⚠ Label, fuse rating <D>
128	206112100	Clamp
129	260215	Binder L (Right side of radiator)
	260208	Binder
F901	252053	⚠ 8A(ST-6), Fuse <D/W>
F902	252077	⚠ 4A-SE-EAK, Fuse <Q/W>
F903, F904	252053	⚠ 8A(ST-6), Fuse <D>
	252079	⚠ 6.3A-SE-EAK, Fuse <Q/W>
P308	25060044	Terminal GND
P901	253123, 253136, 253140 or 253146	⚠ AS-UC6 #18, Power supply cord <D>
	253092-1A	⚠ AS-CEE-2, Power supply cord <W>
	253118	⚠ AS-SAA, Power supply cord <Q>
P902, P903	25050337	⚠ NSCT-2P164, AC outlet <W>
	25050346	⚠ NSCT-2P173, AC outlet <Q>
Q521, Q522	2201803, 2201804 or 2201806	☆2SC3857-O, ☆2SC3857-Y or ☆2SC3857-P, Transistor, Front power amplifier
Q523, Q524	2201793, 2201794 or 2201796	☆2SA1493-O, ☆2SA1493-Y or ☆2SA1493-P, Transistor, Front power amplifier
Q575, Q576 Q593	2202063, 2202064 or 2202066	☆2SC4511-O, ☆2SC4511-Y or ☆2SC4511-P, Transistor, Center/rear power amplifier
Q577, Q578 Q594	2202053, 2202054 or 2202056	☆2SA1725-O, ☆2SA1725-Y or ☆2SA1725-P, Transistor, Center/rear power amplifier
S902	25065287	⚠ NSS-22113P, Voltage selector switch <W>
T901	2300489	⚠ NPT-1048D, Power transformer <D>
	2300491	⚠ NPT-1048DG, Power transformer <W>
	2300492	⚠ NPT-1048Q, Power transformer <Q>

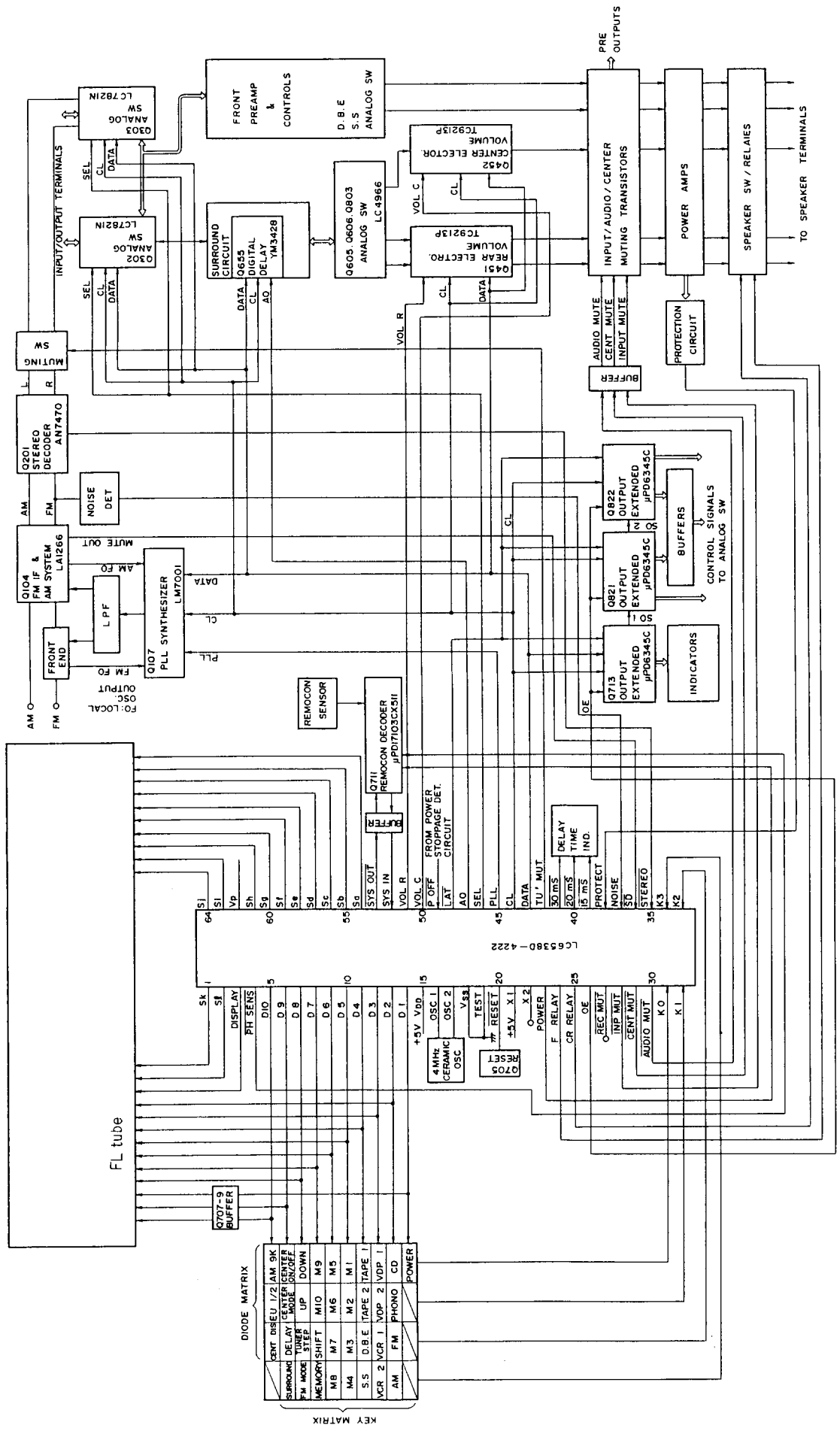
REF.NO.	PART NO.	DESCRIPTION
U1	1A198502-1	NADG-3702-1, Digital circuit pc board ass'y <D>
	1A198502-1A	NADG-3702-1A, Digital circuit pc board ass'y <Q>
	1A198502-1B	NADG-3702-1B, Digital circuit pc board ass'y <W>
U2	1A198503-1	NASW-3703-1, Source selector switch pc board ass'y
U3	1A198504-1	NASW-3704-1, Speaker/Power switch pc board ass'y
U4	1A198505-1	NASW-3705-1, Band step switch pc board ass'y <W>
U5	1A198506-1	NAAF-3706-1, Master volume pc board ass'y
U6	1A198507-1	NAAF-3707-1, Tone control circuit pc board ass'y
U7	1A198508-1	NADIS-3708-1, Volume indicator pc board ass'y
U8	1A198509-1	NARF-3709-1, Tuner circuit pc board ass'y <D>
	1A198509-1A	NARF-3709-1A, Tuner circuit pc board ass'y <Q>
	1A198509-1B	NARF-3709-1B, Tuner circuit pc board ass'y <W>
U9	1A198510-1	NAETC-3710-1, Video terminal pc board ass'y
U10	1A198511-1	⚠ NAPS-3711-1, Power supply circuit pc board ass'y <D>
	1A198511-1B	⚠ NAPS-3711-1B, Power supply circuit pc board ass'y <W>
	1A198511-1C	⚠ NAPS-3711-1C, Power supply circuit pc board ass'y <Q>
U11	1A198512-1	NAETC-3712-1, Headphone terminal pc board ass'y
U12	1A198513-1	NAETC-3713-1, Speaker relay pc board ass'y
U13	1A198514-1	NAETC-3714-1, AC outlet terminal pc board ass'y <D>
U14	1A198515-1	NAETC-3715-1, VDP circuit pc board ass'y
U15	1A198516-1	NAAF-3716-1, Pre., /Main amplifier pc board ass'y
U16	1A198517-1	NAETC-3717-1, Input balance volume pc board ass'y
U17	1A198518-1	NAAF-3718-1, Rear and center amplifier pc board ass'y
U18	1A198519-1	NASW-3719-1, Station switch pc board ass'y
U19	1A198558-1	NAETC-3758-1, Pc board for holder

NOTE: <D>: Only 120V Model
<Q>: Only 240V Model
<W>: Only Worldwide Model

CAUTION: Replacement for transistor of mark☆, if necessary, must be made from the same beta group (HFE) as the original type.

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

MICROPROCESSOR DESCRIPTIONS



Terminal Descriptions

Pin No.	Function	Description
1 2	Sk Sl	Segment output terminals. Active "H".
3	DISPLAY	Display control output terminal. "H" during the display is lighted on.
4	$\overline{\text{PH SENS}}$	Phono control output terminal. "L" when PHONO.
5 – 14	D10 – D1	Digit and key scan output terminals. Active "H".
15	V_{DD}	Power supply terminal. (+5V).
16 17	OSC1 OSC2	Main system clock terminal. Connect to the 4.0MHz ceramic oscillator.
18	V_{SS}	Ground terminal.
19	TEST	Test terminal. Connect to V_{SS}.
20	$\overline{\text{RESET}}$	Reset terminal. Active "L".
21 22	X1 X2	Sub-clock terminal. Not used.
23	POWER	Power source control output terminal.
24 •	FRELAY	Front speaker relay control output terminal.
25 •	CRRELAY	Center and rear speaker relaies control output terminal.
26	OE	Output enable output terminal. Active "H".
27	$\overline{\text{REC MUTE}}$	Muting output terminal of recording output. Nou used.
28	$\overline{\text{INP MUTE}}$	Muting output terminal of input selector.
29	$\overline{\text{CENT MUTE}}$	Muting output terminal of center (pre.) output.
30	$\overline{\text{AUDIO MUTE}}$	Audio muting output terminal.
31 – 34	K0 – K3	Key matrix terminals.
35	$\overline{\text{STEREO}}$	Stereo broadcast detection input terminal. Stereo at the low level.
36	$\overline{\text{SD}}$	Station detection input terminal. Active "L".
37	NOISE	Noise detection input terminal. Active "L".
38	PROTECT	Protection circuit detection input terminal. This terminal becomes the low level when the protection circuit is operated. Control to the FRELAY and CRRELAY output terminals.
39 40 41	$\overline{\text{15ms}}$ $\overline{\text{20ms}}$ $\overline{\text{30ms}}$	Dealy time indication output terminals.
42	TU MUT	Muting output terminal of tuner.
43	DATA	Data output terminal. Connect to the terminal DATA of PLL IC LM7001, terminal DI of analog switches LC7821N, terminal DIN of surround IC YM3428, terminal DATA of electro volume TC9213P, and terminal SIN of extended IC μPD6345C.
44	CL	Clock output terminal. Connect to the terminal CL of PLL IC, terminal CL of analog switches, terminal SCI of surround IC, terminal CK of electro volume, and terminal SIN of extended IC.
45	PLL	Connect to the terminal CE of PLL IC.
46	SEL	Connect to the terminal CE of analog switches.
47	AO	Connect to the terminal AO of surround IC.
48	$\overline{\text{LAT}}$	Connect to the terminal LAT of extended IC.
49	POFF	Stoppage detection input terminal. Active "L".
50	VOLC	Connect to the terminal STB of electro volume for the center volume.
51	VOLR	Connect to the terminal STB of electro volume for the rear volume.
52	SYS IN	System code input terminal.
53	$\overline{\text{SYS OUT}}$	System code output terminal.
54 – 61	Sa-Sh	Segment output terminals.
62	VP	Power supply terminal for pull-down resistor.
63 64	Si Sj	Segment output terminals.

Key and Diode Matrix

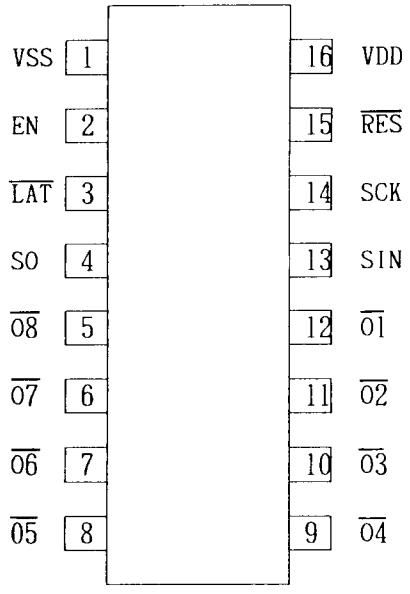
		#34	#33	#32	#31	
		K3	K2	K1	K0	
#14	D1				POWER	
#13	D2	AM	FM	PHONO	CD	
#12	D3	VCR2	VCR1	VDP2	VDP1	
#11	D4	SIMULATED	DBE	TAPE2	TAPE1	
#10	D5	M4	M3	M2	M1	
#9	D6	M8	M7	M6	M5	
#8	D7	MEMORY	SHIFT	M10	M9	
#7	D8	FM MODE	TUNING STEP	UP	DOWN	
#6	D9	SURROUND	DELAY	CENTER MODE	CNTER ON/OFF	
#5	D10		CENTER DIS	EU1/2	AM9K	Diode matrix

CENTER MODE ..... Pressing this button changes the center mode cyclically from NORMAL to WIDE to PHANTOM.
DELAY TIME ..... Pressing this button changes the delay time cyclically from 15 to 20 to 30m sec.
SURROUND MODE ..... Pressing this button changes the surround mode cyclically from BYPASS to DOLBY to HALL to MATRIX.

AM band wide setting

AM9K	EU1/2	Frequecny Range	Channel Space	Reference Frequency	IF Frequency
0		530 ~ 1710kHz	10kHz	10kHz	450kHz
1	0	522 ~ 1611kHz	9kHz	9kHz	450kHz
1	1	531 ~ 1602kHz	9kHz	9kHz	450kHz

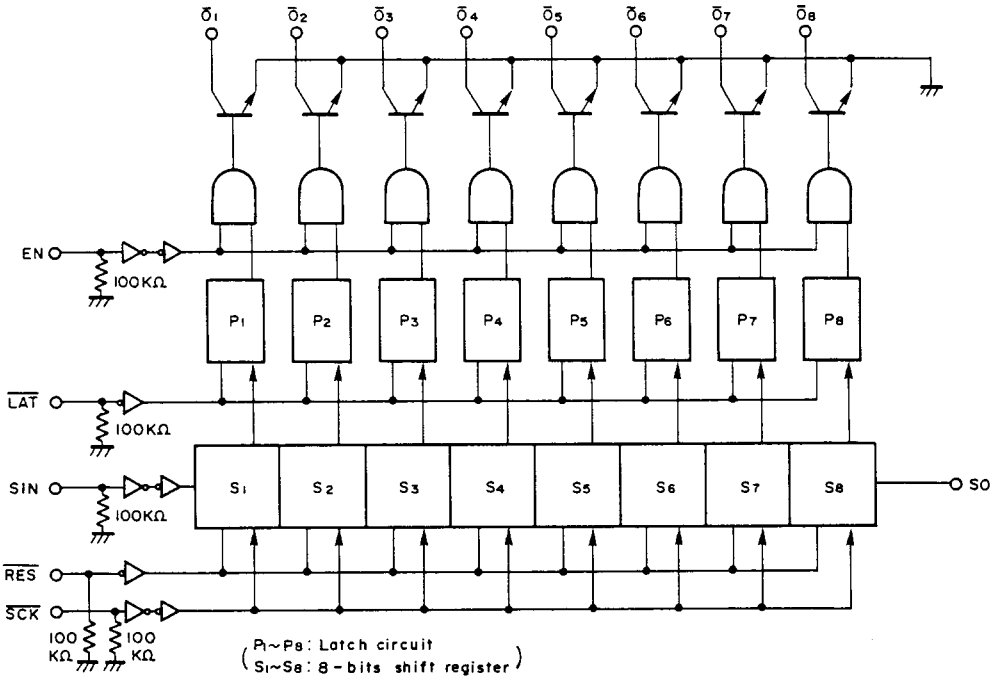
μPD6345C (Output Data Extended IC)



Pin No.	Symbol	Description
1	V_{SS}	Ground terminal.
2	EN	Chip enable terminal. Connect to the terminal CE of the Microprocessor LC6538D-4222.
3	$\overline{LAT}$	Latch terminal. Connect to the terminal LAT of the microprocessor.
4	SO	Serial data output terminal.
5 – 12	$\overline{O8} - \overline{O1}$	Data output terminals.
13	SIN	Serial data input terminal.
14	SCK	Serial clock input terminal. Connect to the terminal CLOCk of microprocessor.
15	$\overline{RESET}$	Reset input terminal. "L" when active.
16	V_{DD}	Power supply terminal. (+5V).

OUTPUT DATA DESCRIPTIONS

OUTPUT	Function	08	07	06	05	04	03	02	01
Q713	Indicator output	DOLBY	HALL	MATRIX	NORMAL	WIDE	PHANTOM	DBE	SIMULATED
Q821	Selector output	DOLBY	HALL	MATRIX		DBE	SIMULATED	VC2	VC1
Q822		DOLBY TEST	DOLBY TEST A	DOLBY TEST B	DOLBY TEST C	DOLBY TEST D	NORMAL	WIDE	CENTER



Video Selector Output (Q821 #11, #12)

Selector	VC2	VC1
VDP1	L	L
VDP2	H	L
VCR1	L	H
VCR2	H	H

Dolby Test Control Output

MODE	DOLBY TEST	DOLBY TEST A	DOLBY TEST B	DOLBY TEST C	DOLBY TEST D
L	L	H	L	H	H
C	L	L	L	H	L
R	L	H	H	H	L
S	L	L	L	L	H

Dolby test output terminals are the high level when except Dolby test mode.

ADJUSTMENT PROCEDURES

• Preparation

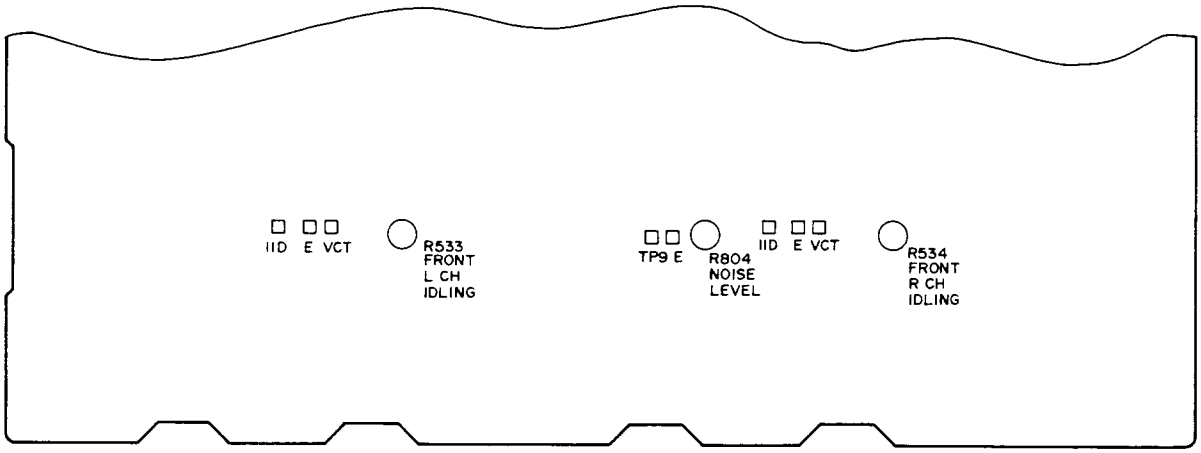
1. Input
   FM mono: 1kHz, 75kHz devi., 60dB/μV
   FM stereo: 1kHz, L+R 67.5kHz devi.,
   Pilot signal 19kHz 7.5kHz devi.
   AM: 400Hz 30% mod.
2. Outputs
   Connect the non-inductive type resistors of 8ohms to the front speaker, center speaker, and rear speaker terminals unless otherwise noted.
3. Standard Knob Position
   TAPE MONITOR ..... SOURCE
   VOLUME ..... Maximum
   BASS/TREBLE/BALANCE/INPUT
   BALANCE ..... Center
   MUTING/LOUDNESS ..... Off
   VCR 2 ..... STEREO
   FRONT SPEAKER ..... A
   CENTER/REAR SPEAKERS ..... ON
   SURROUND MODE ..... Bypass
   SIMULATED STEREO ..... Off
   DYNAMIC BASS EXPANDER ..... Off

Amplifier Section

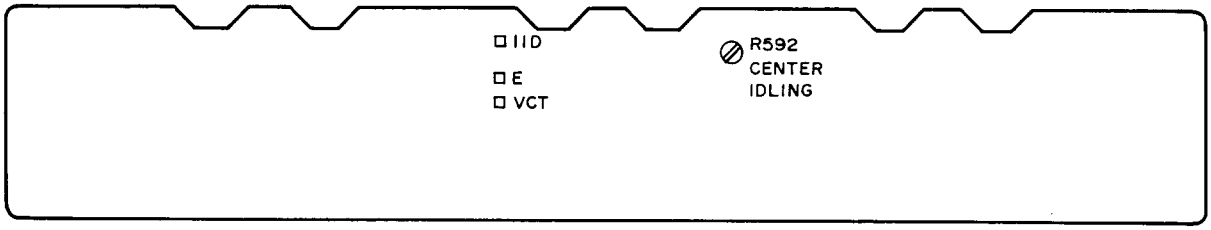
1. Idling Current Adjustment (Front)
Connect the DC voltmeter to the terminals IID and VCT on the pre./main amplifier pc boared. Adjust the semi-fixed resistors R533 and R534 so that the indication of voltmeter is 7.5±1.5mV.
Note: Open load, Adjust after switching on for 5 minutes.

2. Idling Current Adjustment (Center)
Connect the DC voltmeter to the terminals IID and VCT on the rear and center amplifier pc board. Adjust the semi-fixed resistor R592 so that the indication of voltmeter is 7.5±1.5mV.
Note: Open load, Adjust after switching on for 5 minutes.

3. Dolby Noise Level Adjustment
Connect the AC voltmeter to the terminals TP9 and TPE. Press the button TEST of remote control transmitter. Adjust R804 so that the indication of voltmeter is 60mV. (30~120mV).



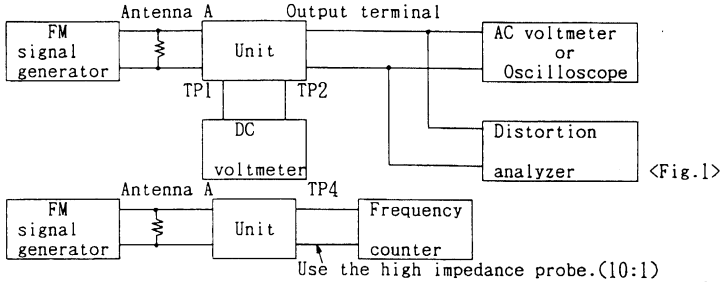
Pre./main amplifer pc board



Rear and center amplifier pc board

ection

Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Tuning frequency	Output indicator	Adjustment point	Adjust for	Remarks
	1	Fig. 1	99.1MHz 1kHz, 75kHz devi. 65dBf (60dB)		99.1MHz	DC voltmeter	L101	0±20mV	FM MUTE/TUNING STEP switch: OFF/FINE Repeat the steps 1 and 2 until no further adjustment is necessary.
	2					AC voltmeter	IFT on the front end	Maximum	
	3					Distortion analyzer	L102	Minimum	
		Fig. 2	99.1MHz 1kHz, 75kHz devi. 65dBf (60dB)		99.1MHz	Frequency counter	R201	19kHz±10Hz	MODE switch: STEREO
rtion		Fig. 3	99.1MHz, Ext mod., 65dBf (60dB)	Channel L or R 1kHz	99.1MHz	Distortion analyzer	IFT on the front end	Minimum	Don't turn more than ±180°
ation	1	Fig. 3	99.1MHz Ext. modulation 65dBf (60dB)	Channel L 1kHz	99.1MHz	Channel R AC voltmeter	R202	Minimum	Maximum and same separation.
	2			Channel R 1kHz		Channel L AC voltmeter		Minimum	
g		Fig. 3	99.1MHz 17.2dBf (12dB)		99.1MHz	TUNING indicator	R101	Light on	FM MUTE/TUNING STEP switch: ON



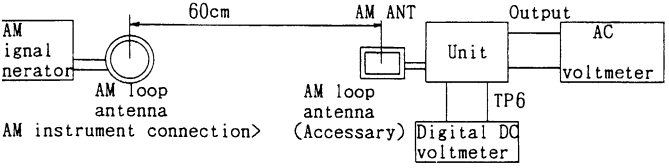
<Fig.3>

ection

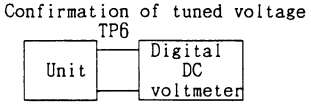
AM SG output	Tuning frequency	Output indicator	Adjustment point	Adjust for
	530kHz ⟨522kHz⟩ (531kHz)	Digital DC voltmeter	OSC coil on RF block	1.5±0.1V
600kHz (603kHz) 400Hz, 30% mod. 60dB/m	600kHz (603kHz)	AC voltmeter	ANT coil on RF block	Maximum
990kHz 400Hz, 30% mod. 60dB/m	990kHz	AC voltmeter	L152	Maximum

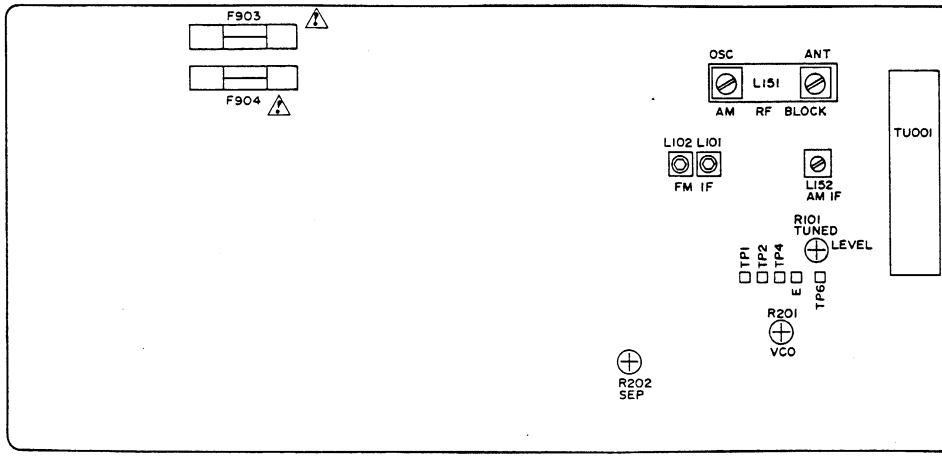
⟨ ⟩: Australian model ( ): 9kHz step model

Reference Specifications
FM tuned voltage: 87.5MHz – 108.00MHz
2.0±0.4V – 7.7±0.4V
AM tuned voltage: 530kHz 1.5±0.5V
1710kHz 7.2±0.5V
(10kHz step model)
522kHz 1.5±0.5V
1611kHz 7.2±0.5V
(9kHz step model)
Auto stop level: AM: Less than 62dB/m
FM: Less than 17dBμ



AM instrument connection>





Tuner circuit pc bo

IINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

PRINTED CIRCUIT BOARD PARTS LIST

TUNER CIRCUIT PC BOARD(NARF-3709-1/1A/1B)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Front End	
TU001	240084	TFFG2U122A
	ICs	
Q104	22240039	LA1266
Q107	22240090	LM7001
Q201	22240242	AN7470
Q251	22240284	LA7951
Q902	222780125NEC	78M12HF
Q903, Q904	222780055NEC	78M05HF
Q906	222780125NEC	78M12HF
Q907	222790125	79M12HF
	Transistors	
Q101	2211723	2SC1923-O
Q102	2210746	2SC945A-P
Q103, Q106	2211183 or	2SC1740-R or
Q131	2211255	2SC1815-GR
Q105	2212294	2SK108-D, FET
Q108, Q109	2213090	DTA114YS
Q202	2213090	DTA114YS
Q203, Q204	2212794	2SD1468-R
Q252, Q253	2211183 or	2SC1740-R or
	2211255	2SC1815-GR
Q254	221282	DTC144E-S <D>
Q901	2211455	2SA1015-GR
Q909-Q912	2213640	DTC123JS
	Diodes	
D101, D102	223132	1K60, Germanium
D103	223163	1SS133
D131, D132	223163	1SS133
D133	224450512	MTZ5.1B, Zener
D201, D202	223163	1SS133
D902-D908	22380032	1SR139-100
D909	224452704	MTZ27D, Zener
D910	223163	1SS133
D911, D913	22380032	1SR139-100
D912	224450472	MTZ4.7B, Zener
D914	223163	1SS133
D915	22380022	RBV402
D916-D923	223163	1SS133
	Transformers	
L101	233401	NFIF-4072
L102	233402	NFIF-4073
L152	232139	NMIF-4062
	Coils	
L103	233400K033	NCH-2228
L131	231081	NCH-2129
L151	232148	NMRF-7050
L201, L202	233294	NMC-5040
L581-L583	231001	S-1.3B
	Ceramic Filters	
X101, X102	3010137	SFE10.7MMK
X103	3010006	SFE10.7MA8
X151	3010123	SFZ450JL
X152	3010076	BFU450C
	Crystal osc	
X104	3010141	XTL-7.2M

TUNER CIRCUIT PC BOARD

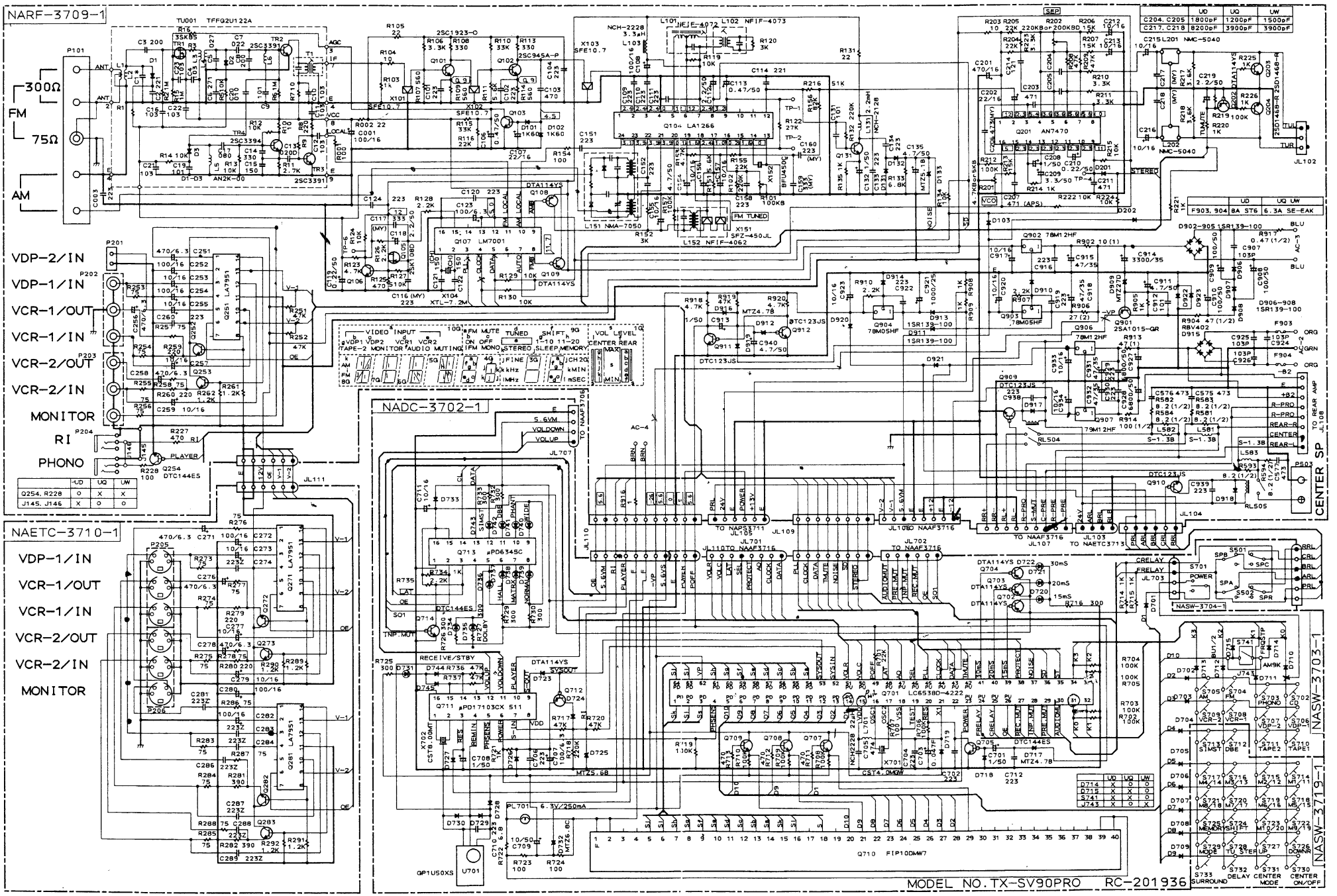
CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C001	354741019	100 μF, 16V, Elect.
C106	354784799	0.47μF, 50V, Elect.
C107	354742209	22μF, 16V, Elect.
C108	354741019	100 μF, 16V, Elect.
C112	354780229	2.2 μF, 50V, Elect.
C113	354784799	0.47μF, 50V, Elect.
C116	371122234	0.022 μF, 5%, 50V, Mylar
C117	371123334	0.033 μF, 5%, 50V, Mylar
C118	354780229	2.2 μF, 50V, Elect.
C119	354782299	0.22μF, 50V, Elect.
C123	354741019	100 μF, 16V, Elect.
C132	354780109	1 μF, 50V, Elect.
C135, C154	354780479	4.7 μF, 50V, Elect.
C155-C157	354741009	10μF, 16V, Elect.
C159	371123334	0.033 μF, 5%, 50V, Mylar
C160	371122234	0.022 μF, 5%, 50V, Mylar
C201	354744719	470 μF, 16V, Elect.
C202	354742209	22μF, 16V, Elect.
C204, C205	371121824	1800pF, 5%, 50V, Mylar <D>
	371121224	1200pF, 5%, 50V, Mylar <Q/W>
C206	371124734	0.047 μF, 5%, 50V, Mylar
C207	370134714	470pF, 5%, 100V, APS
C208	354780109	1 μF, 50V, Elect.
C209	354780339	3.3 μF, 50V, Elect.
C210	354782299	0.22μF, 50V, Elect.
C212, C213	354741009	10μF, 16V, Elect.
C215, C216	354741009	10μF, 16V, Elect.
C217, C218	371128224	8200pF, 5%, 50V, Mylar <D>
	371123924	3900pF, 5%, 50V, Mylar <Q/W>
C219	354780229	2.2 μF, 50V, Elect.
C251	354724719	470 μF, 6.3V, Elect.
C252, C254	354741019	100 μF, 16V, Elect.
C253, C255	354741009	10μF, 16V, Elect.
C256, C258	354724719	470 μF, 6.3V, Elect.
C257, C259	354741009	10μF, 16V, Elect.
C575-C577	371124734	0.047 μF, 5%, 50V, My
C908-C910	354781019	100 μF, 50V, Elect.
C911	354780479	4.7 μF, 50V, Elect.
C913	354780109	1 μF, 50V, Elect.
C914	354763329 or	3300μF, 35V, Elect.
	3500103	
C915, C918	354764709	47μF, 35V, Elect.
C917, C920	354741009	10μF, 16V, Elect.
C921	354751029	1000μF, 25V, Elect.
C923	354741009	10μF, 16V, Elect.
C927, C928	3504207	6800μF, 50V, Elect.
C931, C932	354764709	47μF, 35V, Elect.
C933, C934	354741009	10μF, 16V, Elect.
C940	354780479	4.7 μF, 50V, Elect.
	Resistors	
R101	5210221 or	N06HR100KBD, Sem
	5210070	
R201	5210216 or	N06HR5KBD or
	5210062	N06HR4.7KBD, Semi
R202	5210072 or	N06HR220KBD or
	5210222	N06HR200KBD, Sem
R581-R584	442520824	8.2ohm, 1/2W, Metal
R593, R594	442520824	8.2ohm, 1/2W, Metal
R902	441621004	10ohm, 1W, Metal oxi
R904	442524704	47ohm, 1/2W, Metal o
R906	441722704	27ohm, 2W, Metal oxi
R913	441624704	47ohm, 1W, Metal oxi
R914	442521014	100ohm, 1/2W, Metal
R917	442520104	1ohm, 1/2W, Metal o
	Relaies	
RL504	25065339	NRL-2P5ADC-24V-0
RL505	25065379	NRL-1P5A-DC-24V-
	Terminals	
P101	25060145	NTM-5PDMN073, A
P503	25060143	NTM-2PDML071, Ce
		Speaker
	Sockets	
JL102	25050267	NSCT-3P95
JL104, JL105	25050270	NSCT-6P98
JL106, JL108	25050272	NSCT-8P100
JL109		
JL107	25050273	NSCT-9P101
JL110	25050275	NSCT-11P103
	Plug	
P201	25055132	NPLG-2P116
	Jacks	
P202, P203	25045205	NPJ-3PDYE085, VID
		IN/OUT
P204	25045172	HSJ1003-01-020, RI
	Radiators	
Q902a	27160209	RAD67
Q906a	27160211	RAD68
	Fuses	
F903, F904	252053	⚠8A(ST-6) <D>
	252079	⚠6.3A-SE-EAK <Q/W
	Label	
	29360622	T6.3A/250A <Q/W>
	Holders	
F903a, F904a	250113	⚠SN5051, Fuse <D>
	25050065	⚠YSH403T, Fuse<Q/

NOTE: <D>: Only 120V Model
<Q>: Only 240V Model
<W>: Only Worldwide Model

HEMATIC DIAGRAM

A | B | C | D | E | F | G

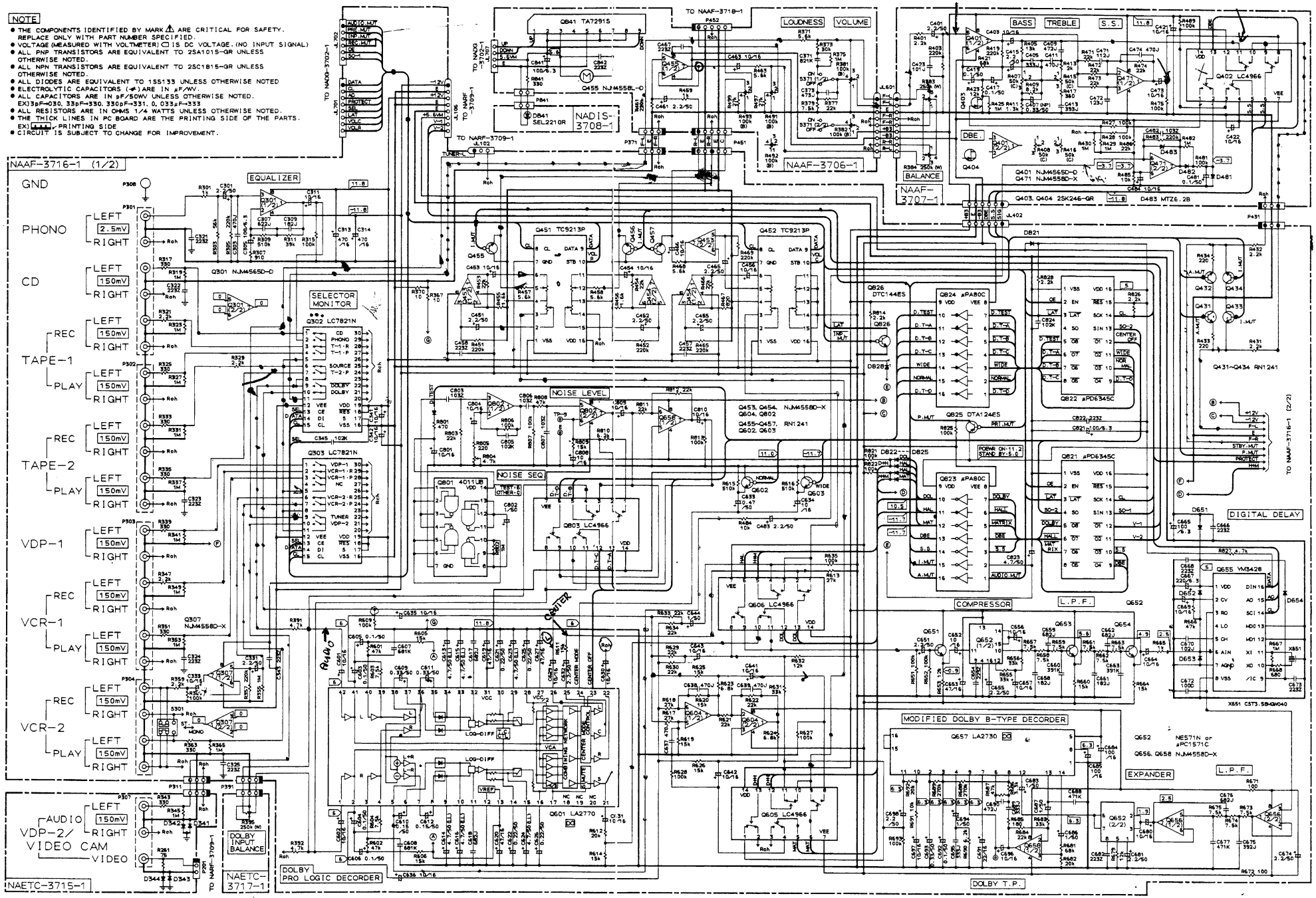
- TUNER SECTION –



CHEMATIC DIAGRAM

A | B | C | D | E | F | G

– PRE./CONTROL AMPLIFIER SECTION –



PRINTED CIRCUIT BOARD PARTS LIST

PRE., /MAIN AMPLIFIER PC BOARD(NAAF-3716-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q301	22240191	NJM4565D-D
Q302, Q303	22240280	LC7821N
Q307	222502	NJM4558D-X
Q451, Q452	22240266	TC9213P
Q453, Q454	222502	NJM4558D-X
Q601	22240279	LA2770
Q604	222502	NJM4558D-X
Q605, Q606	22240025	LC4966
Q652	22240115 or	NE571N or
	22240131	μPC1571C
Q655	22240281	YM3428
Q656, Q658	222502	NJM4558D-X
Q657	22240139	LA2730
Q801	222840112TOS	4011UB
Q802, Q861	222502	NJM4558D-X
Q803	22240025	LC4966
Q821, Q822	22240211	μPD6345C
Q823, Q824	222801	μPA80C
	Transistors	
Q431-Q434	2213631 or	RN1241-A or
	2213632	RN1241-B
Q456-Q458	2213631 or	RN1241-A or
	2213632	RN1241-B
Q501, Q502	2211371 or	2SC2259-O-001 or
	2211372	2SC2259-O-002
Q503-Q506	2213074 or	2SA933-R or
	2211455	2SA1015-GR
Q507-Q510	2211732 or	2SC1845-F or
	2211733	2SC1845-E
Q511, Q512	2211353 or	2SA949-O or
	2211354	2SA949-Y
Q513, Q514	2211633 or	2SC2229-O or
	2211634	2SC2229-Y
Q515, Q516	2211183 or	2SC1740-R or
	2211255	2SC1815-GR
Q517, Q518	2202034 or	2SD1763A-D or
	2202035	2SD1763A-E
Q519, Q520	2202024 or	2SB1186A-D or
	2202025	2SB1186A-E
Q521, Q522	2201803,	☆2SC3857-O,
	2201804 or	☆2SC3857-Y or
	2201806	☆2SC3857-P
Q523, Q524	2201793,	☆2SA1493-O,
	2201794 or	☆2SA1493-Y or
	2201796	☆2SA1493-P

CAUTION: Replacement for transistor of mark ☆, if necessary, must be made from the same beta group (HFE) as the original type.

2SC3857-O　　2SA1493-O

Same beta group

Q551, Q552	2211633 or	2SC2229-O or
	2211634	2SC2229-Y
Q553, Q554	2211732 or	2SC1845-F or
	2211733	2SC1845-E
Q555	2211792 or	2SA992-F or
	2211793	2SA992-E
Q602, Q603	2213631 or	RN1241-A or
	2213632	RN1241-B
Q651, Q653	2211183 or	2SC1740-R or
Q654	2211255	2SC1815-GR

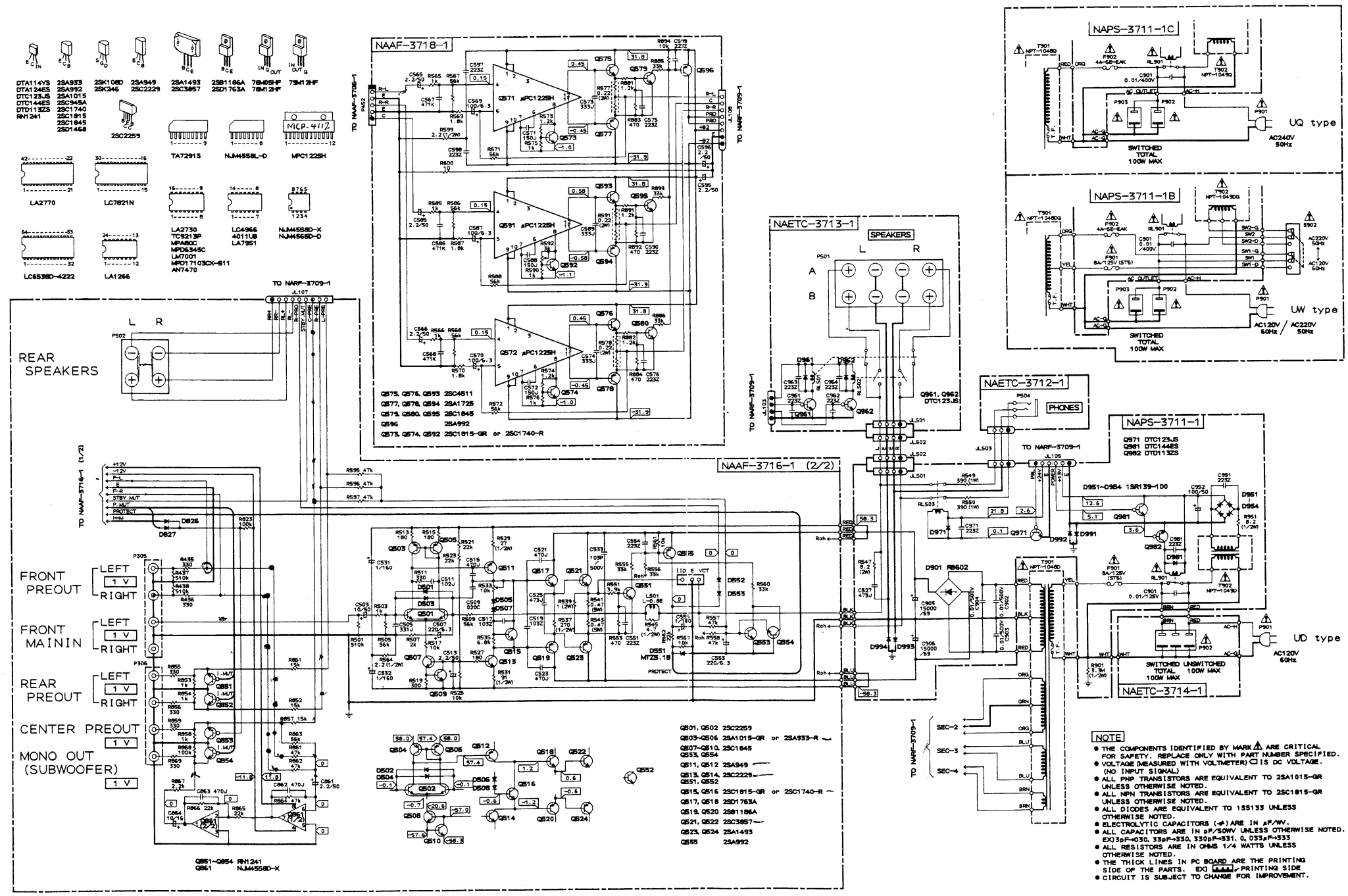
CIRCUIT NO.	PART NO.	DESCRIPTION
Q825	2212600	DTA124ES
Q826	221282	DTC144ES
Q851-Q854	2213631 or	RN1241-A or
	2213632	RN1241-B
	Diodes	
D501-D508	223163	1SS133
D551	224450512	MTZ5.1B, Zener
D552, D553	223163	1SS133
D651-D654	223163	1SS133
D801	223163	1SS133
D821-D825	223163	1SS133
D826	223150,	US1040,
	223145 or	1S2076TD or
	223124	1S2473
D827, D828	223163	1SS133
	Coils	
L501, L502	231134	S-0.8E
	Ceramic osc	
X651	3010155	CST3.58MGW040
	Capacitors	
C301, C302	354780229	2.2 μF, 50V, Elect.
C305, C306	354721019	100 μF, 6.3V, Elect.
C307, C308	371126224	6200pF, 5%, 50V, Mylar
C309, C310	371121824	1800pF, 5%, 50V, Mylar
C311, C312	354741009	10μF, 16V, Elect.
C313, C314	354744719	470 μF, 16V, Elect.
C331, C332	354780229	2.2 μF, 50V, Elect.
C333, C334	354741009	10μF, 16V, Elect.
C341, C342	354741009	10μF, 16V, Elect.
C451, C452	354780229	2.2 μF, 50V, Elect.
C453, C454	354741009	10μF, 16V, Elect.
C455	354780229	2.2 μF, 50V, Elect.
C456, C466	354741009	10μF, 16V, Elect.
C465, C483	354780229	2.2 μF, 50V, Elect.
C503, C504	391741009	10μF, 16V, Elect. <HWQ>
C507, C508	354742219	220 μF, 16V, Elect.
C513, C514	354780229	2.2 μF, 50V, Elect.
C525, C526	371124734	0.047 μF, 5%, 50V, Mylar
C531, C532	354700109	1 μF, 160V, Elect.
C533, C534	335251039	0.01μF, 500V, Ceramic
C553	354722219	220 μF, 6.3V, Elect.
C555	354700109	1 μF, 160V, Elect.
C601, C602	354741009	10μF, 16V, Elect.
C603-C606	354781099	0.1 μF, 50V, Elect.
C609, C611	354783399	0.33μF, 50V, Elect.
C610, C612	354781599	0.15μF, 50V, Elect.
C613-C616	392850477	4.7 μF, 25V, Elect.(LL)
C617, C618	371126824	6800pF, 5%, 50V, Mylar
C619, C620	354744709	47μF, 16V, Elect.
C621, C622	354782299	0.22μF, 50V, Elect.
C623, C624	392850477	4.7 μF, 25V, Elect.(LL)
C625, C626	354782299	0.22μF, 50V, Elect.
C627	354744709	47μF, 16V, Elect.
C629-C631	354741009	10μF, 16V, Elect.
C632	354780229	2.2 μF, 50V, Elect.
C633	354784799	0.47μF, 50V, Elect.
C634-C636	354741009	10μF, 16V, Elect.
C641-C643	354741009	10μF, 16V, Elect.
C644	354780109	1 μF, 50V, Elect.
C651	354780229	2.2 μF, 50V, Elect.
C652	354741009	10μF, 16V, Elect.
C653	354744709	47μF, 16V, Elect.
C655	354780229	2.2 μF, 50V, Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION
C656, C657	354741009	10μF, 16V, Elect.
C658, C661	371121824	1800pF, 5%, 50V, Mylar
C659, C662	371126824	6800pF, 5%, 50V, Mylar
C664	354741009	10μF, 16V, Elect.
C665	354721019	100 μF, 6.3V, Elect.
C667	354722219	220 μF, 6.3V, Elect.
C669, C680	354741009	10μF, 16V, Elect.
C670	373301024	1000pF, 5%, 125V, Plastic (PP)
C674, C681	354780229	2.2 μF, 50V, Elect.
C675	371123924	3900pF, 5%, 50V, Mylar
C676	371126824	6800pF, 5%, 50V, Mylar
C683	354780109	1 μF, 50V, Elect.
C684, C685	354741019	100 μF, 16V, Elect.
C686, C687	354780109	1 μF, 50V, Elect.
C689	371123334	0.033 μF, 5%, 50V, Mylar
C690	371124724	4700pF, 5%, 50V, Mylar
C691	354742209	22μF, 16V, Elect.
C692	354781099	0.1 μF, 50V, Elect.
C693	354783399	0.33μF, 50V, Elect.
C694	354780109	1 μF, 50V, Elect.
C695	371123334	0.033 μF, 5%, 50V, Mylar
C696, C697	354741009	10μF, 16V, Elect.
C698	354780229	2.2 μF, 50V, Elect.
C801, C804	354741009	10μF, 16V, Elect.
C802	354780109	1 μF, 50V, Elect.
C808-C810	354741009	10μF, 16V, Elect.
C821	354721019	100 μF, 6.3V, Elect.
C823	354780479	4.7 μF, 50V, Elect.
C861	354780229	2.2 μF, 50V, Elect.
C864	354741009	10μF, 16V, Elect.
	Resistors	
R529, R530	442522704	27ohm, 1/2W, Metal oxide film
R531, R532	442529104	91ohm, 1/2W, Metal oxide film
R533, R534	5210119 or	N06HR10KBC or
	5210064	N06HR10KBD, Semi-fixed
R537, R538	442522714	270ohm, 1/2W, Metal oxide film
R539, R540	441720104	1ohm, 2W, Metal oxide film
R541-R544	4500022 or	BPR58FK 0.47 or
	4000080	MPC74-5WK 0.47, Metal plate
R545, R546	441520474	4.7ohm, 1/2W, Metal oxide film
R564	442520224	2.2ohm, 1/2W, Metal oxide film
R804	5210118 or	N06HR5KBC or
	5210062	N06HR4.7KBD, Semi-fixed
	Switch	
S301	25065286	NSS-22112, Slide, VCR-2 MODE
	Terminals	
P301	25045252	NPJ-6PDBL-124
P302, P303	25045213	NPJ-6PDBL-92
P304-P306	25045171	NPJ-4PDBL-65
P502	25060144	NTM-4PDML072
	Plugs	
P311, P431a	25055133	NPLG-3P117
P451a	25055135	NPLG-5P119
	Sockets	
P371	2000931	NSAS-6P884
P391	2009990022	NSAS-6P0046
JL402, JL702	25050270	NSCT-6P98
JL701	25050272	NSCT-8P100
	Clamps	
	27301186	MSA-1606

IEMATIC DIAGRAM

A | B | C | D | E | F | G

MAIN AMPLIFIER SECTION –



PRINTED CIRCUIT BOARD PARTS LIST

VIDEO TERMINAL PC BOARD(NAETC-3710-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q271, Q281	22240284	LA7951
	Transistors	
Q272, Q273	2211183 or	2SC1740-R or
Q282, Q283	2211255	2SC1815-GR
	Capacitors	
C271, C276	354724719	470 μF, 6.3V, Elect.
C272	354741019	100 μF, 16V, Elect.
C273, C277	354741009	10μF, 16V, Elect.
C278	354724719	470 μF, 6.3V, Elect.
C280, C282	354741019	100 μF, 16V, Elect.
C279	354741009	10μF, 16V, Elect.
	Sockets	
P205	25050395	NSCT-12P222
P206	25050394	NSCT-12P221

POWER SUPPLY CIRCUIT PC BOARD(NAPS-3711-1/1B/1C)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q971	2213640	DTC123JS
Q981	221282	DTC144ES
Q982	2213650	DTD113ZS
	Diodes	
D901	223898	RB602
D951-D954	22380032	1SR139-100
D971, D981	223163	1SS133
D991-D994	223163	1SS133
	Power transformer	
T902	2300493	⚠ NPT-1049D <D>
	2300495	⚠ NPT-1049DG <W>
	2300496	⚠ NPT-1049Q <Q>
	Capacitors	
C527, C528	371124734	0.047 μF, 5%, 50V, Mylar
C901	3500065A	⚠ DE7150FZ103PAC400V/125V, IS
C902-C904	335251039	0.01μF, 500V, Ceramic
C905, C906	3504222	15, 000μF, 69V, Elect.
C952	354781019	100 μF, 50V, Elect.
	Resistors	
R547, R548	441720824	8.2ohm, 2W, Metal oxide film
R549, R550	441623914	390ohm, 1W, Metal oxide film
R901	431523355	⚠ 3.3Mohm, 1/2W, Solid <D>
R951	442520824	8.2ohm, 1/2W, Metal oxide film
	Relaies	
RL503	25065342	NRL-2P1.25A-DC24-048
RL901	25065248	⚠ NRL-1P15A-DC12-29
	Socket	
P904	2009990020	NSAS-6P0044 <D>
	Fuses	
F901	252053	⚠ 8A(ST-6) <D/W>
F902	252077	⚠ 4A-SE-EAK <Q/W>
	Fuseholders	
F901a	250113	⚠ SN5051 <D/W>
F902a	25050065	⚠ YSH403T <Q/W>

HEADPHONE TERMINAL PC BOARD(NAETC-3712-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
P504	25045256	YKB26-5010, Headphone terminal

SPEAKER RELAY PC BOARD (NAETC-3713-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q961, Q962	2213640	DTC123JS
	Diodes	
D961, D962	223163	1SS133
	Relaies	
RL501, RL502	25065339	NRL-2P5A-DC24-046

CIRCUIT NO.	PART NO.	DESCRIPTION
	Terminal	
P501	25060125	NTM-8PDMN058, Front Speaker

AC OUTLET TERMINAL PC BOARD(NAETC-3714-1) (Only 120V Model)

CIRCUIT NO.	PART NO.	DESCRIPTION
P902	25050388	NSCT-6P215, AC outlet

VDP CIRCUIT PC BOARD(NAETC-3715-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
D341-D344	223163	1SS133, Diodes
P307	25045266	NPJ-3PDBL133, VDP terminal
P201	2009990021A	NSAS-4P0045, Socket
P311	2000785	NSAS-6P741, Socket

INPUT BALANCE VOLUME PC BOARD(NAETC-3717-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
R395	5104258	N11RGLC250KWT15Z, Variable resistor

SPEAKER/POWER SWITCH PC BOARD(NASW-3704-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
S501, S502	25035617	NPS-222-L579, Push switches
S701	25035618	⚠ NPS-122-S580, Power switch

BAND STEP SWITCH PC BOARD(NASW-3705-1) (Only Worldwide Model)

CIRCUIT NO.	PART NO.	DESCRIPTION
S741	25065267	NSS-22109, Slide switch

MASTER VOLUME PC BOARD(NAAF-3706-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q455	22240293	NJM4558L-D
Q841	22240239	TA7291S
	Capacitors	
C373, C374	371124734	0.047 μF, 5%, 50V, Mylar
C461, C462	354780229	2.2 μF, 50V, Elect.
C463, C464	354741009	10μF, 16V, Elect.
C841	354721019	100 μF, 6.3V, Elect.
	Resistor	
R381, R382 R491-R493	5140001	N16RGL100KBT30F, Variable, Master Volume
	Switch	
S371	25035428	NPS-122-L392, LOUDNESS
	Plugs	
P371a	25055133	NPLG-3P117
P452a	25055135	NPLG-5P119
	Sockets	
P451	2009990023	NSAS-10P0047
P841	2000635A	NSAS-4P591

VOLUME INDICATOR PC BOARD(NADIS-3708-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
D841	225241 or	SEL2210R-C or
	225242	SEL2210R-D, L.E.D
	27190545	Holder, LED

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

NOTE: <D>: Only 120V Model
<Q>:Only 240V Model
<W>:Only Worldwide Model

PRINTED CIRCUIT BOARD PARTS LIST

DIGITAL CIRCUIT PC BOARD(NADG-3702-1/1A/1B)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Remocon sensor	
U701	24130003	GP1U50XS
	ICs	
Q701	22240282	LC6538D-4222
Q711	22240283	μPD17103CX-511
Q713	22240211	μPD6345C
	FL tube	
Q710	212079	FIP10DMW7
	Transistors	
Q702-Q704	2213090	DTA114YS
Q705	221282	DTC144ES
Q707-Q709	2211183 or	2SC1740-R or
	2211255	2SC1815-GR
Q712	2213090	DTA114YS
Q714	221282	DTC144ES
	Lamp	
PL701	210064B	PL6.3V250mA
	Diodes	
D701-D713	223163	1SS133
D714	223163	1SS133 <Q>
D714, D715	223163	1SS133 <W>
D717	224450472	MTZ4.7B, Zener
D718, D719	223163	1SS133
D723, D724	223163	1SS133
D725	224450562	MTZ5.6B, Zener
D726-D730	223163	1SS133
D732	224450683	MTZ6.8C, Zener
D733	223163	1SS133
D744, D745	223163	1SS133
	L.E.Ds	
D720-D722	225137CG,	SEL2413E-CG,
D736-D743	225137DG or	SEL2413E-DG or
	225137DY	SEL2413E-DY
D731	225141	SEL2213C
D734, D735	225141	SEL2213C
	Ceramic oscs	
X701	3010150	CST4.00MGW
X702	3010154	CST8.00MT
	Coil	
L701	233400K220	NCH-2228
	Capacitors	
C701	353780109	1 μF, 50V, Elect.
C703	3000051 or	0.047F, 5.5V
	3020027	Super
C705	375524744	0.47μF, 5%, 50V, Plastic(MMT)
C707	353721019	100 μF, 6.3V, Elect.
C708	353780109	1 μF, 50V, Elect.
C709	353781009	10μF, 50V, Elect.
C711	353741009	10μF, 16V, Elect.
	Plug	
P701a	25055375	NPLG-11P358
	Holder	
	27190732	L.E.D
	Spacer	
	27270302	

SOURCE SELECTOR SWITCH PC BOARD(NASW-3703-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
S702-S711	25035548	NPS-111-S510, Push switches

TONE CONTROL CIRCUIT PC BOARD(NAAF-3707-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q401	22240191	NJM4565D-D
Q402	22240025	LC4966
Q471	222502	NJM4558D-X
	Transistors	
Q403, Q404	2211945	2SK246-GR, F.E.T.
	Diodes	
D481, D482	223163	1SS133
D483	224450623	MTZ6.2C, Zener
	Capacitors	
C401, C402	391780229	2.2 μF, 50V, Elect.(HWQ)
C403, C404	391741009	10μF, 16V, Elect.(HWQ)
C405, C406	371123334	0.033 μF, 5%, 50V, Mylar
C407, C408	352983396	0.33μF, 50V, Non-polar elect.
C409, C410	371124724	4700pF, 5%, 50V, Mylar
C413, C414	371123934	0.039 μF, 5%, 50V, Mylar
C415, C416	354780229	2.2 μF, 50V, Elect.
C417-C420	354781099	0.1 μF, 50V, Elect.
C421, C422	354741009	10μF, 16V, Elect.
C471	371121124	1100pF, 5%, 50V, Mylar
C472	371121234	0.012 μF, 5%, 50V, Mylar
C473	354741009	10μF, 16V, Elect.
C481	354781099	0.1 μF, 50V, Elect.
C484	354741009	10μF, 16V, Elect.
	Resistors	
R383, R384	5104215	N14RLC250KW22Z, Variable, BALANCE
R407, R408	5104216	N14RLC50KC22Z, Variable, BASS
R415, R416	5104216	N14RLC50KC22Z, Variable, TREBLE
	Socket	
P431	2000783	NSAS-6P739

REAR AND CENTER AMPLIFIER PC BOARD(NAAF-3718-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q571, Q572	22240108	μPC1225H
Q591		
	Transistors	
Q573, Q574	2211183 or	2SC1740-R or
Q592	2211255	2SC1815-GR
Q575, Q576	2202063,	☆2SC4511-O,
Q593	2202064 or	☆2SC4511-Y or
	2202066	☆2SC4511-P
Q577, Q578	2202053,	☆2SA1725-O,
Q594	2202054 or	☆2SA1725-Y or
	2202056	☆2SA1725-P

CAUTION: Replacement for transistor of mark ☆, if necessary must be made from the same beta group (HFE) as the original type.

Ex. 2SC4511-O 2SA1725-O

Same beta group

Q579, Q580	2211732 or	2SC1845-F or
Q595	2211733	2SC1845-E
Q596	2211792 or	2SA992-F or
	2211793	2SA992-E
	Capacitors	
C565, C566	354780229	2.2 μF, 50V, Elect.
C569, C570	354721019	100 μF, 6.3V, Elect.
C573, C574	371123334	0.033 μF, 5%, 50V, Mylar
C585	354780229	2.2 μF, 50V, Elect.
C587	354721019	100 μF, 6.3V, Elect.
C589	371123334	0.033 μF, 5%, 50V, Mylar
C595, C596	354780229	2.2 μF, 50V, Elect.
	Resistors	
R577, R578	4500027	0.22ohm, 2W, Metal plate
R591		
R592	5215061	N08HR3KBC, Semi-fixed
R599	442520224	2.2ohm, 1/2W, Metal oxide film
	Socket	
P452	2009990024	NSAS-10P0048

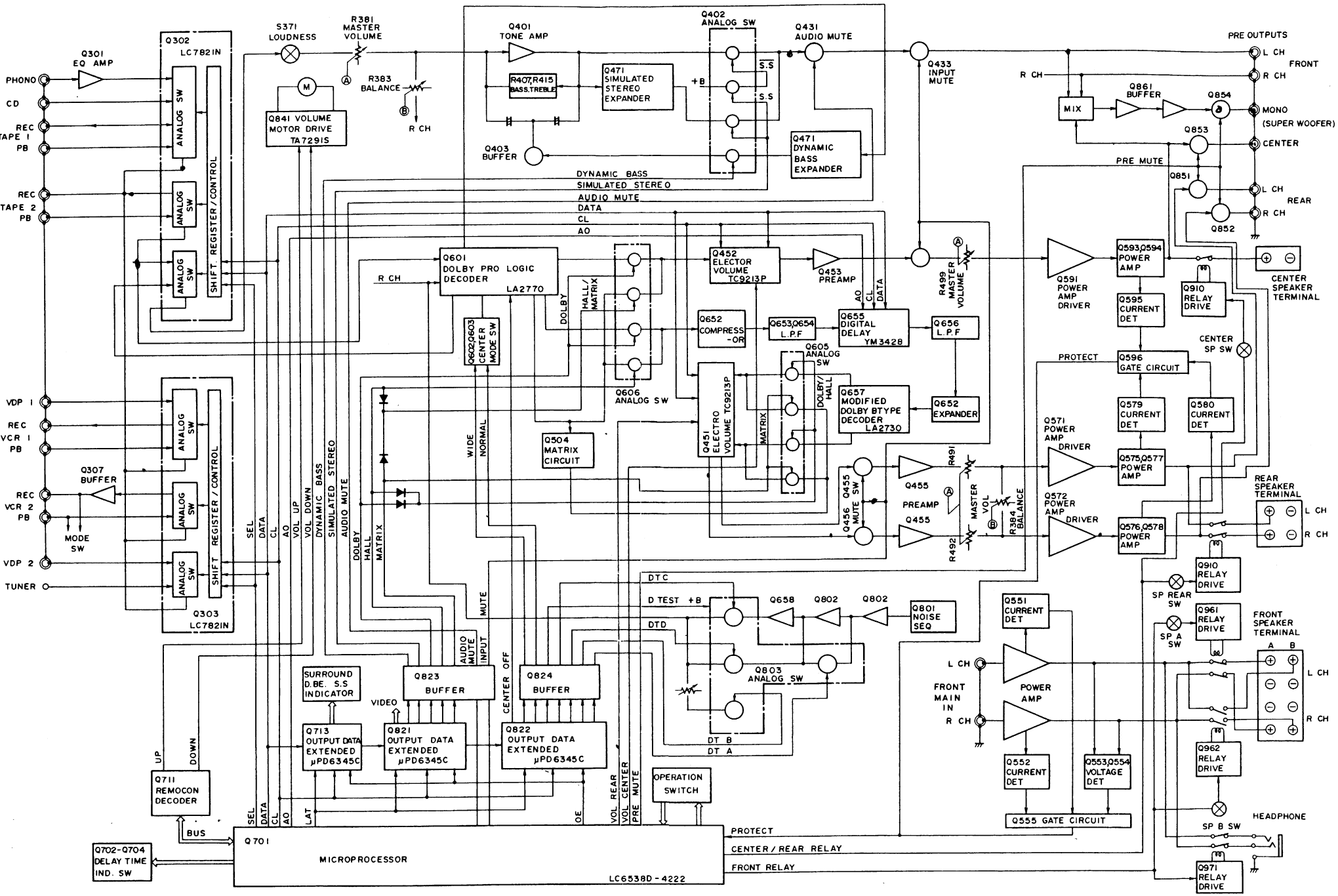
STATION SWITCH PC BOARD(NASW-3719-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
S712-S733	25035548	NPS-111-S510, Push switches
P701b	2006312223	NSAS-22P0050, Socket

NOTE: <G>: Only 240V Model
<W>: Only Worldwide Model

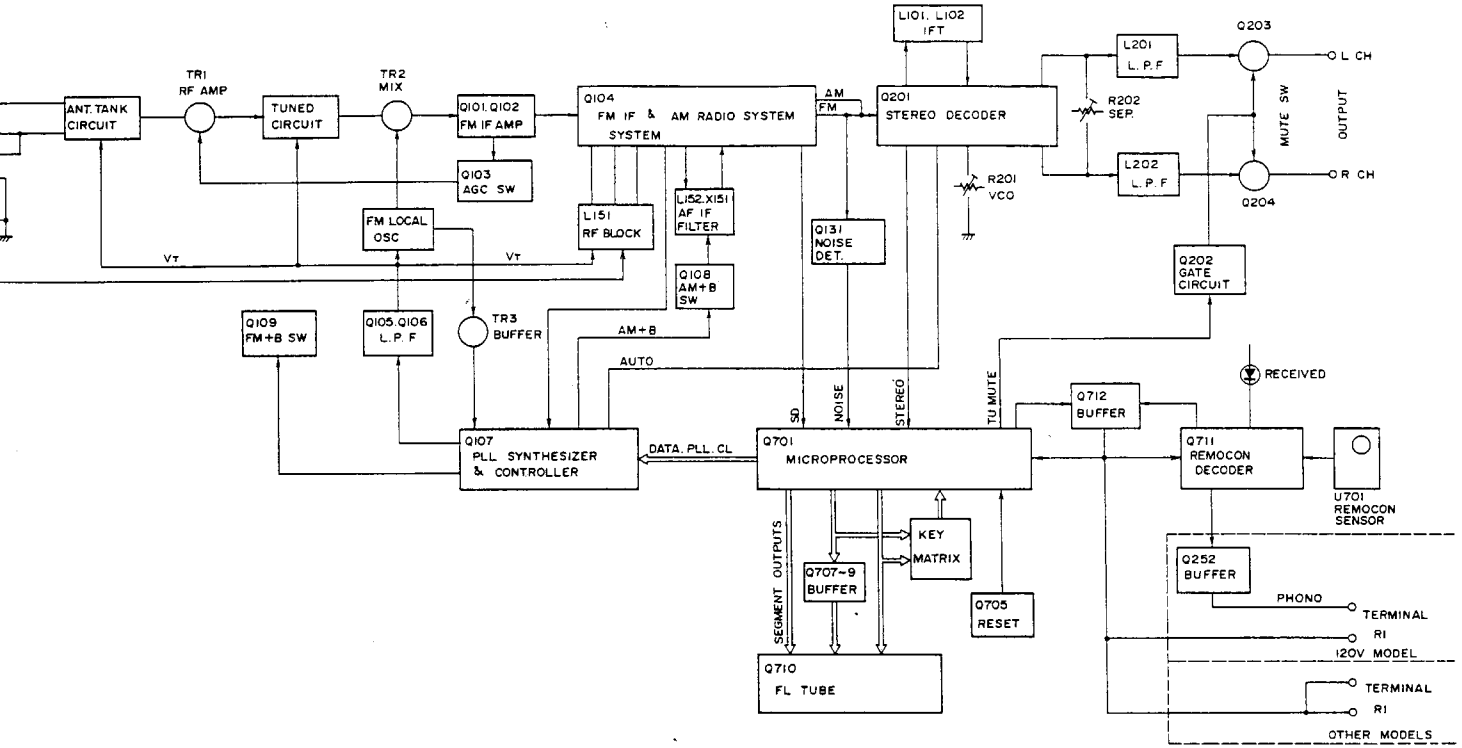
CK DIAGRAM

LIFIER/CONTROL SECTION –



K DIAGRAM

NER SECTION –



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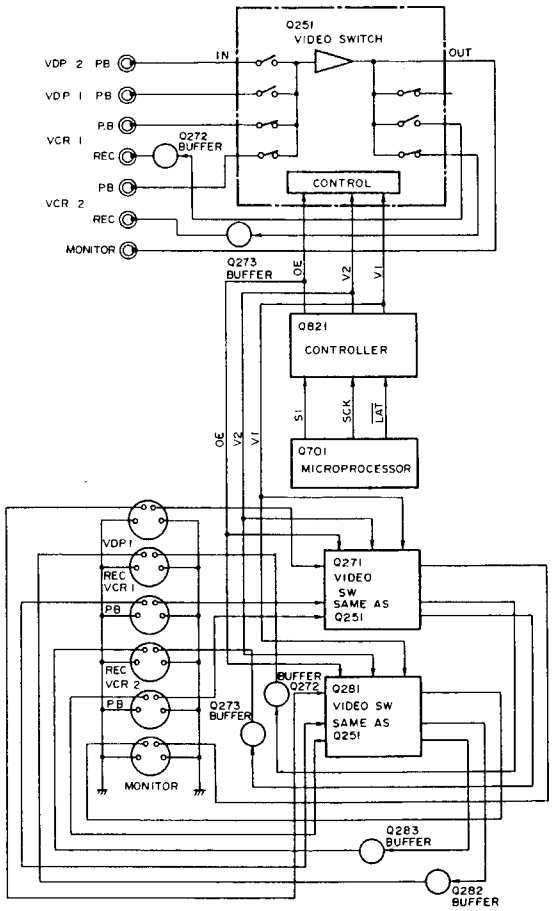

WR SUPPLY SECTION –