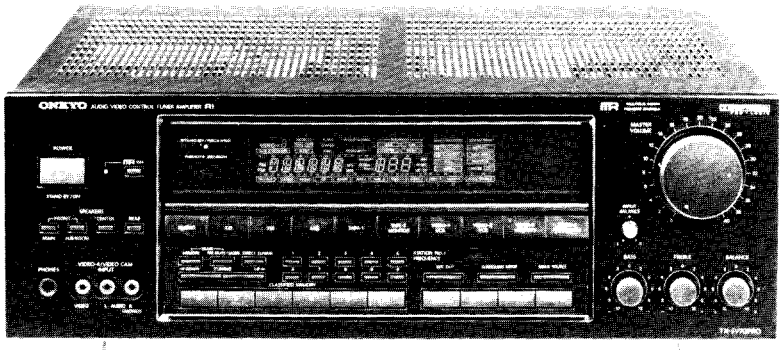
REF. NO. 3379

ONKYO® SERVICE MANUAL

AUDIO VIDEO CONTROL TUNER AMPLIFIER MODEL TX-SV70PRO



SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED 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 PARTSWHOSE 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.

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ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

AMPLIFIER SECTION

Power Output:	Stereo mode 90 watts per channel min. RMS. at 8 ohms, both channels driven, from 20Hz to 20.000Hz, with no more than 0.06% total harmonic distortion. Surround mode 85 watts per channel min. RMS. at 8 ohms both channels driven, form 20Hz to 20.000Hz, with no more than 0.06% total harmonic distortion. (FRONT/CENTER Matrix surround mode) 30 watts per channel min. RMS. at 8 ohms 1,000Hz with no more than 0.08% total harmonic distortion. (REAR Matrix surround mode)
Total Harmonic Distortion:	0.06% at rated power (FRONT)
IM distortion:	0.06% at rated power (FRONT)
Damping Factor:	70 at 8 ohms (FRONT)
Sensitivity and Impedance:	Phono: 2.5mV/50 kohms CD/Tape Play: 150mV/50 kohms Tape Rec: 150mV/2.2 kohms (Phono) 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, 0.06% THD.
Frequency Response:	20 to 30,000 Hz, +/−1 dB VIDEO IN → DOLBY PRO LOGIC → 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: 80 dB (IHF A, 5mV input) CD/TAPE: 100 dB (IHF A)
Muting:	−∞

TUNER SECTION

FM:

Tuning Range:	87.50 – 108.00 MHz (50 kHz steps)
Usable Sensitivity:	Mono: 11.2 dBf, 2.0μV Stereo: 17.2 dBf, 4.0μV
50dB Quieting Sensitivity:	Mono: 17.2 dBf, 4.0μV Stereo: 37.2 dBf, 40 μV
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:	55 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)
Usable Sensitivity:	30 μV
Image Rejection Ration:	40 dB
IF Rejection Ration:	40 dB
Signal-to-Noise Ratio:	40 dB
Harmonic Distortion:	0.7%

GENERAL

Power Supply:	AC120V, 60Hz
Dimensions (W×H×D):	435×157×432 mm 17-1/8″×6-3/16″×17″
Weight:	14.0kg., 30.9 lbs.

REMOTE CONTROL TRANSMITTER RC-AV70M

Transmitter:	Infrared
Signal Range:	Approx. 5 meters (16ft. 4″)
Power Supply:	Two "AA" batteries (1.5V×2)

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.

Circuit No.	Part No.	Description
F901	252053	8A (ST-6), Primary
F903, F904	252051	6A (ST-6), Secondary

2. Change of AM band selector

A AM BAND step selector switch is not provided.

Band step	D716 (1SS133)
10kHz → 9kHz	Additional
9kHz → 10kHz	Eliminated

The diode D716 is on the display PC board. (Refer to the page 23)

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.

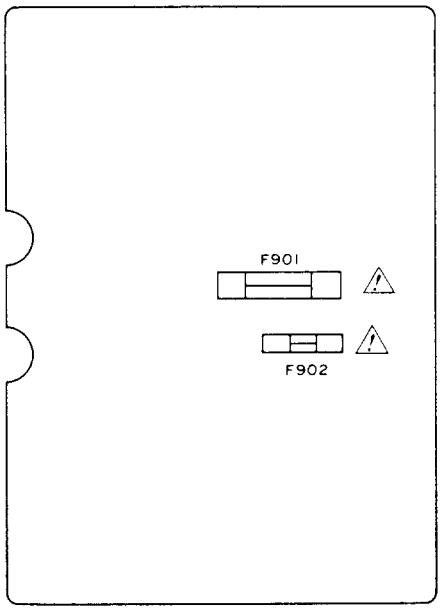
4. Safety-check out

(Only U.S.A. model)

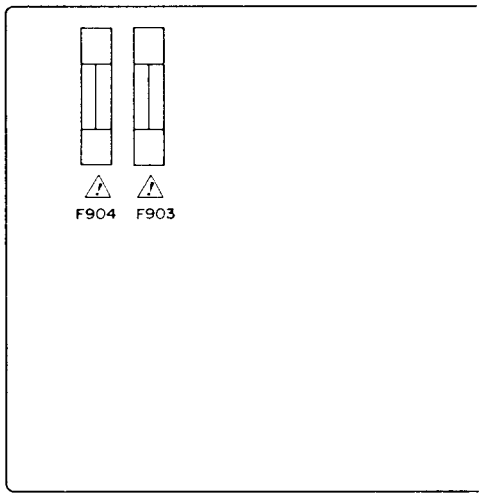
After correcting the original service problem perform the following safety check before releasing the set to the customer.

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.

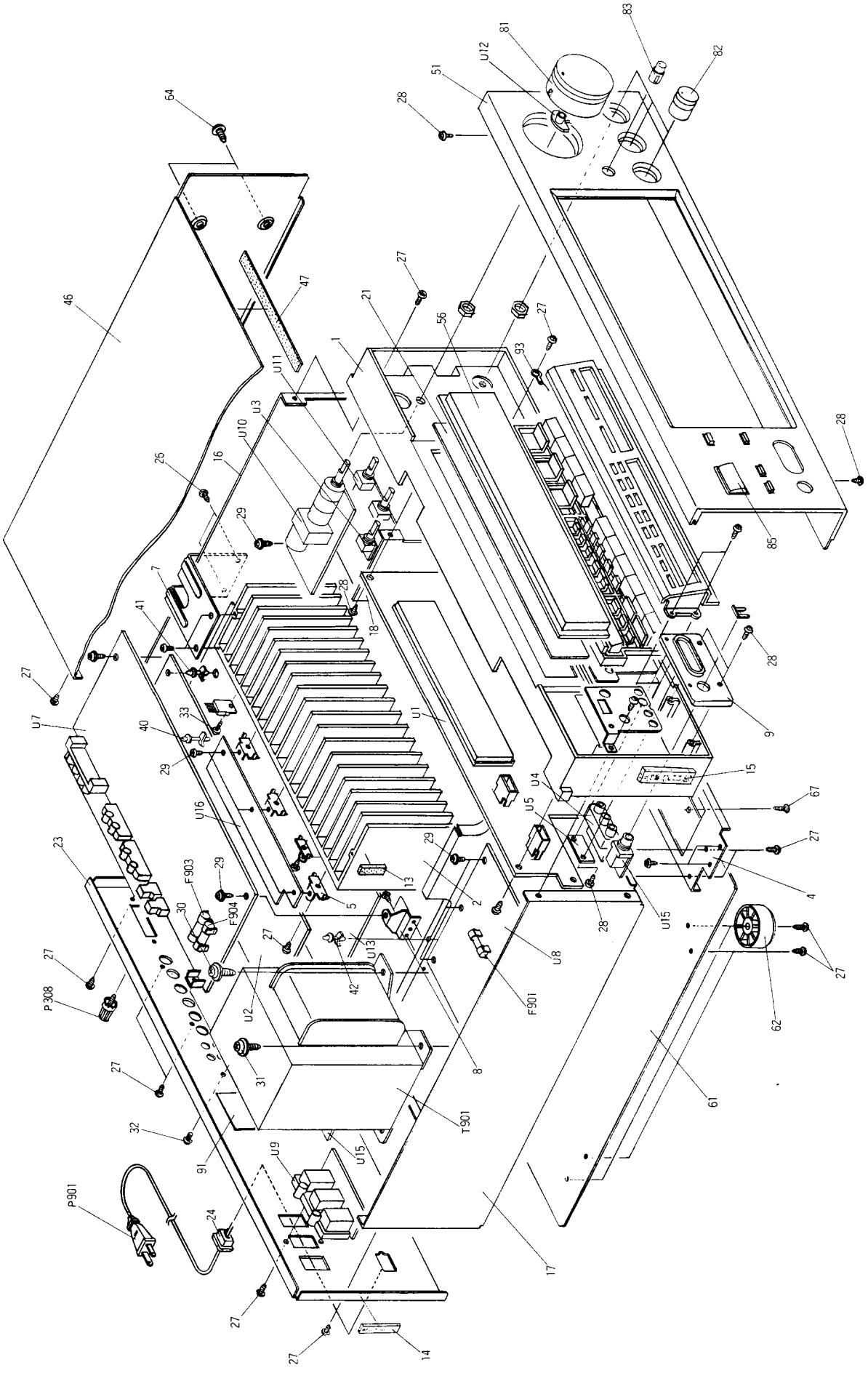


Power supply circuit pc board



Tuner circuit pc board

CHASSIS-EXPLODED VIEW



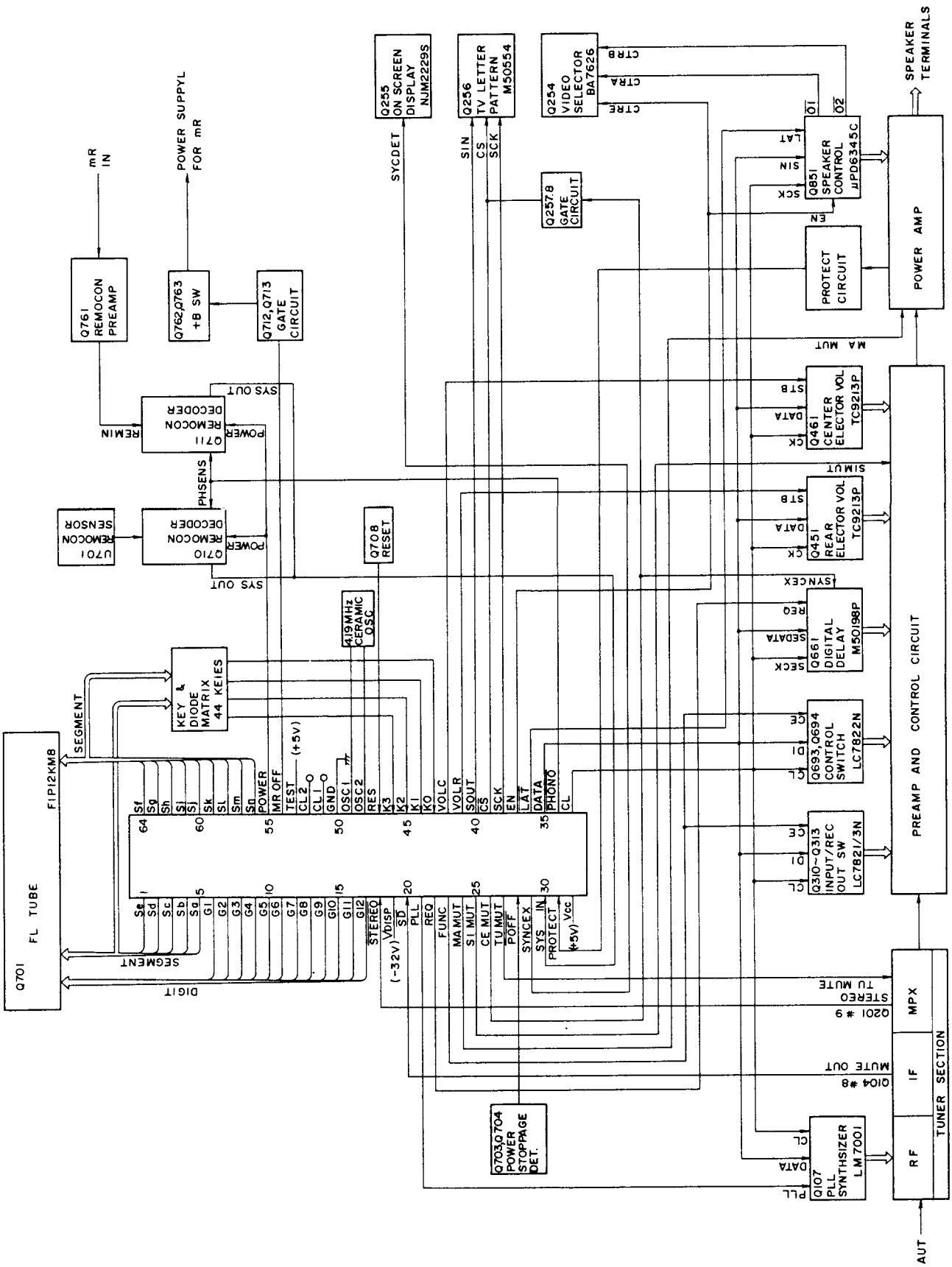
CHASSIS-EXPLODED VIEW – PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
1	27110585A	Front bracket
2	27160261	Radiator
4	27130628	Bracket H
5	27141359	Bracket H
7	27141322	Bracket R
8	27141360	Bracket B
9	27190782	Holder PIN
13	28140927	t2×30×10, Cushion
14	28140933	t3× 7×55, Cushion
15	28141086	Cushion
16	27115240-1	Side bracket
17	27130564D	Bracket PT
18	27130621	Bracket F
21	28133248	Back plate
23	27121377A	Back panel
24	27300750	⚠ Bushing
27	834430088	3TTS+8B (BC), Self-tapping screw
28	833430080	3TTP+8P (BC), Self-tapping screw
29	831130088	3TTW+8B, Self-tapping screw
30	830440089	4TTC+8C (BC), Self-tapping screw
31	838440109	4TTB+ 10C (BC), Self-tapping screw
32	82143006	3P+6FN (BC), Pan head screw
33	801433	3SMS8W·SW+14B (BC), Sems self-tapping screw
40	27190369	KGLS-22S, Holder
41	27190783	KGLS-11S, Holder
42	27190693	KGLS-6R, Holder
46	28184463A	Top cover
47	28140835	t0.5×10×135, Cushion
51	1A233121	Front panel ass'y
56	28191576	Clear plate
61	27170254C	Bottom board
62	27175153-1	Leg
64	838440089	4TTB+8C (BC), Self-tapping screw
67	834430108	3TTS+10B (BC), Self-tapping screw
81	28323558	Knob VOLUME
82	28323310A	Knob TONE
83	28323671A	Knob VOLUME
85	28324072	Knob POWER
91	29360626-1	Label FUSE
92	260215	Binder
93	2061112060	Terminal ass'y

REF.NO.	PART NO.	DESCRIPTION
F901	252053	⚠ 8A (ST-6), Primary fuse
F903, F904	252051	⚠ 6A (ST-6), Secondary fuse
P308	25060044	Terminal GND
P901	253123, 253136, 253140, 253146 or 253161	⚠ AS-UC6#18, Power supply cord
T901	2300589	⚠ NPT-1080D, Power transformer
U1	1A233565-1	NADIS-3965-1, Display circuit pc board ass'y
U2	1A233566-1	NAAF-3966-1, Surround circuit pc board ass'y
U3	1A233567-1	NAETC-3967-1, Input balance volume pc board ass'y
U4	1A233568-1	NAETC-3968-1, Video terminal pc board ass'y
U5	1A233569-1	NAETC-3969-1, Pc board for video pc board hold
U7	1A233570-1	NARF-3970-1, Tuner circuit pc board ass'y
U8	1A233571-1	NAPS-3971-1, Power supply circuit pc board ass'y
U9	1A233572-1	NAETC-3972-1, AC outlet terminal pc board ass'y
U10	1A233573-1	NAAF-3973-1, Master volume pc board ass'y
U11	1A233574-1	NAAF-3974-1, Tone control pc board ass'y
U12	1A233575-1	NADIS-3975-1, Volume indicator pc board ass'y
U13	1A233576-1	NAAF-3976-1, Pre., and main amplifier pc board ass'y
U14	1A233577-1	NAETC-3977-1, Speaker terminal pc board ass'y
U15	1A233578-1	NAETC-3978-1, Headphone terminal pc board ass'y
U16	1A233579-1	NAAF-3979-1, Rear amplifier pc board ass'y

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

MICROPROCESSOR DESCRIPTIONS



Q702
HD404729A86 (Microprocessor)
Terminal Description

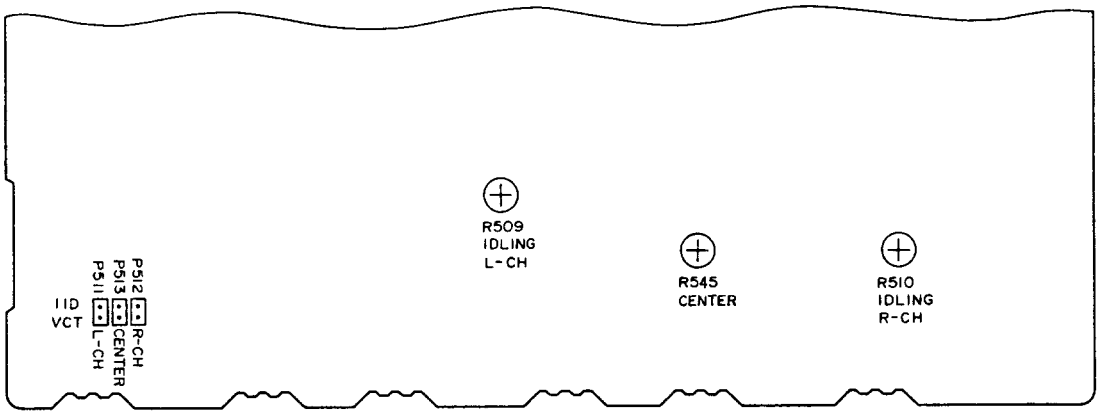
Pin no.	Symbol	Description
1	Se	Segment output terminals.Active H.
2	Sd	
3	Sc	
4	Sb	
5	Sa	
6	G1	Digit and Key scan output terminals.Active H.
7	G2	
8	G3	
9	G4	
10	G5	
11	G6	
12	G7	
13	G8	
14	G9	
15	G10	
16	G11	
17	G12	
18	$\overline{\text{STEREO}}$	Stereo broadcast discrimination input terminal.Active L. Contorl to the indicator STEREO.
19	Vdisp	Power supply terminal for pull-down resistor.
20	$\overline{\text{SD}}$	Broadcast discrimination input terminal.Active L.
21	PLL	Connect to the terminal CE of PLL IC (LM7001). Active H.
22	REQ	Connect to the terminal REQ of delay IC(M50198P).Active H.
23	FUNC	Connect to the terminal CE of analog switches.(LC7821N, LC7822N and LC7823N) Active H.
24	MAMUT	Audio main muting output terminal.Active H.
25	SIMUT	Audio simulative muting output terminal.Active H.
26	CEMUT	Muting output terminal for the chip select terminal of the control ICs(Data extended IC,PLL IC,and Delay IC).Active H.
27	TUMUT	Tuner muting output terminal.Active H.
28	$\overline{\text{POFF}}$	Stoppage detection input terminal.Active L.
29	SYNCEX	External/Internal changeover input terminal of syncronizing signal of on screen display.
30	SYS IN	System code input terminal.Active H.
31	PROTECT	Protection circuit discremination input terminal.H when the protection circuit operates.
32	Vcc	Power supply terminal.

Pin No.	Symbol	Description
33	CL	Clock pulse output terminal.Connect to the terminal CL of PLL IC, the terminal CE of analog switches,the terminal SECK of delay IC, the terminal CK of the electro volume,and the teminal SCK of data extended IC.
34	$\overline{\text{PHONO}}$	Phono contorl output terminal.L when the selector switch is PHONO.
35	DATA	Data output terminal.Connect to the terminal DATA of PLL IC,the terminal DI of analog switches,the terminal SEDATA of delay IC ,the terminal DATA of electro volume,and the terminal SIN of data extended IC.
36	$\overline{\text{LAT}}$	Connect to the terminal LAT of the data extended IC.
37	EN	Connect to the terminal EN of the data extended IC.
38	SCK	Connect to the terminal SCK of the on screen display IC.
39	$\overline{\text{CS}}$	Connect to the terminal CS of the on screen display IC.
40	SOUT	Connect to the terminal SIN of the on scren display IC.
41	VOLR	Connect to the terminal STB of the electro volume IC for rear and simul.
42	VOLC	Connect to the terminal STB of the electro volume IC for center.
43	K0	Key matrix input termianls.Active H.
44	K1	
45	K2	
46	K3	
47	RES	Reset input terminal.Active H.
48	OSC2	Main system clock input terminal. Connect to the ceramic oscillator of 4.19MHz.
49	OSC1	
50	GND	Ground terminal.
51	CL1	Sub clock input terminal.Not used.
52	CL2	
53	$\overline{\text{TEST}}$	Test terminal.
54	$\overline{\text{MR OFF}}$	Multi-room remote control ON/OFF control output terminal.Active L.
55	POWER	Power control output terminal.H when the power turns on.
56	Sn	Segment output terminals.Active H.
57	Sm	
58	Sl	
59	Sk	
60	Sj	
61	Si	
62	Sh	
63	Sg	
64	Sf	

ADJUSTMENT PROCEDURES

• Preparation

1. Input
   FM mono: 1kHz, 75kHz devi., 60dB/μV
   FM stereo: 1kHz, 75kHz devi., 60dB/μV
   Pilot signal 19kHz 7.5kHz devi.
   AM: 400Hz 30% mod.
2. Outputs
   Connect the non-inductive type resistors of 8ohms to the main speaker, subroom speaker, center speaker, and rear speaker terminals unless otherwise noted.
3. Standard Knob Position
   TAPE MONITOR 1/2 ..... OFF
   VOLUME ..... Maximum
   BASS/TREBLE/BALANCE/INPUT
   BALANCE ..... Center
   MUTING/LOUDNESS ..... Off
   REC SELECTOR ..... SOURCE
   INPUT SELECTOR ..... CD
   SPEAKERS ..... ON
   S.T.C. ..... OFF



PRE., AND MAIN PC BOARD

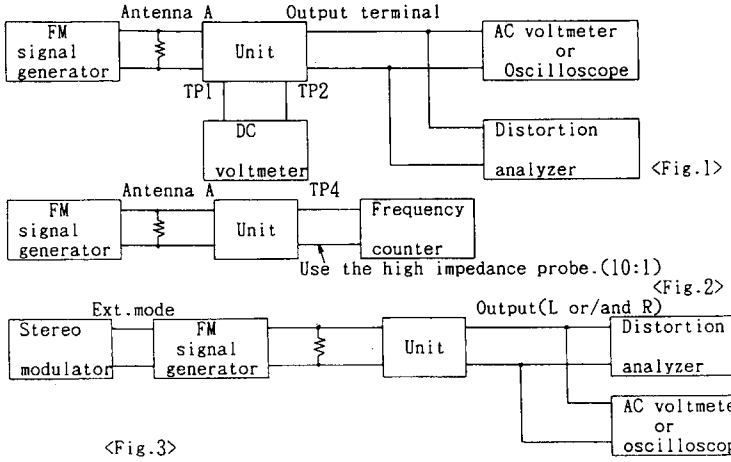
Amplifier section

Idling Current Adjustment

Connect the DC voltmeter to the terminals IID and VCT on the pre.,and main amplifier pc board. Adjust the semi-fixed resistors R509,R510,and R545 so that the indication of voltmeter is 5$\pm$0.5mV.

ection

tem	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/MODE switch: ON/STEREO Repeat the steps 1 and 3 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	
tion		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	

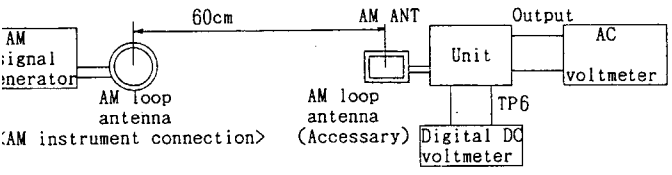


<Fig.3>

ection

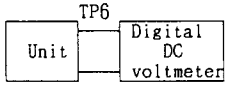
	AM SG output	Tuning frequency	Output indicator	Adjustment point	Adjust for
		530kHz	Digital DC voltmeter	OSC coil on RF block	1.5±0.1V
	600kHz 400Hz, 30% mod. 60dB/m	600kHz	AC voltmeter	ANT coil on RF block	Maximum
	990kHz 400Hz, 30% mod. 60dB/m	990kHz	AC voltmeter	L152	Maximum

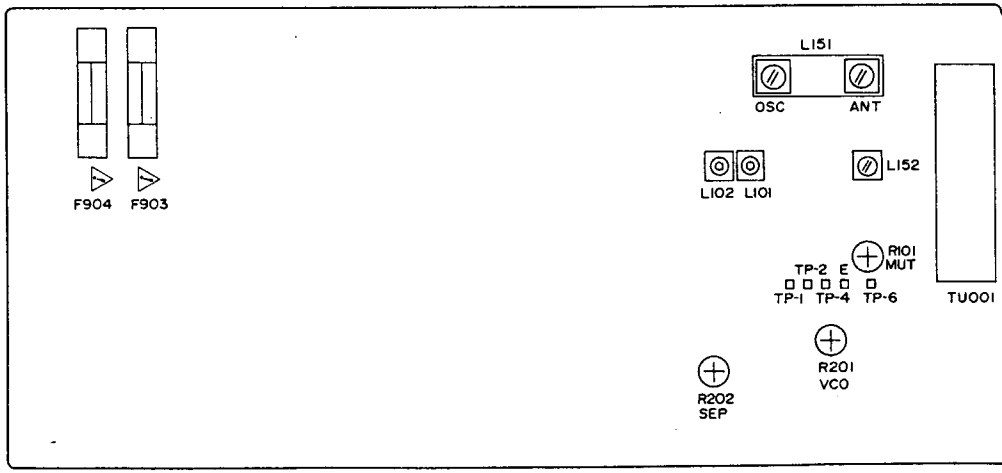
Reference Specifications
FM tuned voltage: 87.5MHz – 108.00MHz
1.6±0.4V – 7.9±0.4V
AM tuned voltage: 530kHz 1.3±0.5V
1710kHz 7.2±0.5V
Auto stop level: AM: Less than 62dB/m
FM: Less than 17dB/μ



<AM instrument connection>

Confirmation of tuned voltage





Tuner circuit pc bo

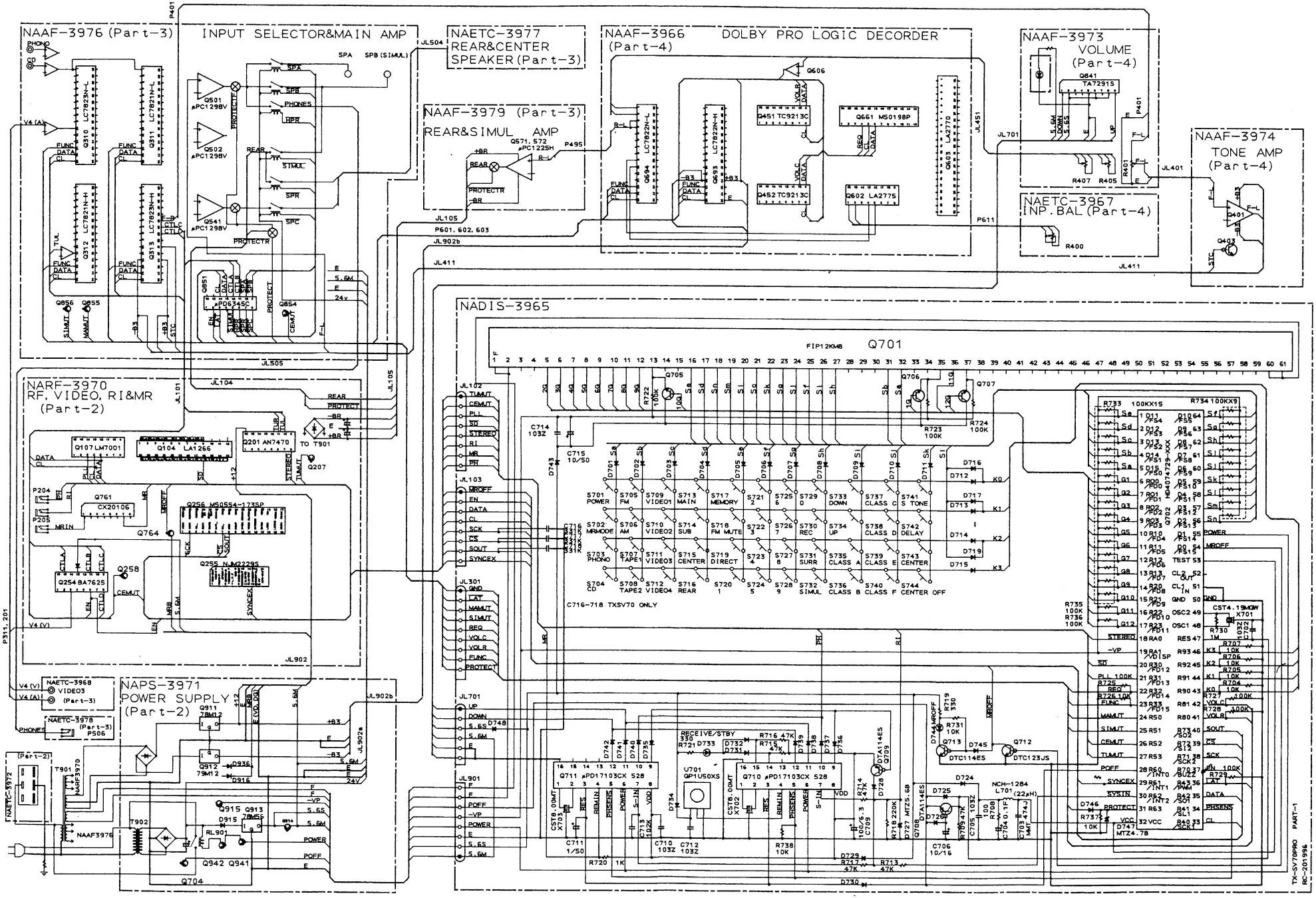
DISPLAY CIRCUIT PC BOARD (NADIS-3965-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Remocon sensor	
U701	24130003	GP1U50XS
	ICs	
Q702	22240378	HD404729A86
Q710, Q711	22240376	μPD17103CX-528
	FL tube	
Q701	212088	FIP12KM8
	Transistors	
Q705-Q707	2213284	2SC1740S-R
Q708, Q709	2213510	DTA114ES
Q712	2213640	DTC123JS
Q713	2213290	DTC114ES
	Diodes	
D701-D715	223163	1SS133
D719, D748	223163	1SS133
D724-D726	223163	1SS133
D727	224450562	MTZ5.6B, Zener
D728-D732	223163	1SS133
D734-D743	223163	1SS133
D745, D746	223163	1SS133
D747	224450472	MTZ4.7B, Zener

CIRCUIT NO.	PART NO.	DESCRIPTION
	L.E.Ds	
D733, D744	225141	SEL2213C
	Ceramic oscs	
X701	3010163	CST4.19MGW
X702, X703	3010154	CST8.00MT
	Coil	
L701	233409K220	NCH-1284
	Capacitors	
C703	375524744	0.47μF, 5%, 50V, Plastic (MMT)
C704	3000057	0.1F, 5.5V, Super
C706	353741009	10μF, 16V, Elect.
C709	353721019	100μF, 6.3V, Elect.
C711, C715	353780109	1μF, 50V, Elect.
	Resistors	
R733	49163104415	100k×15, 1/10W, Network
R734	49163104409	100k×9, 1/10W, Network
	Switches	
S701-S744	25035548	NPS-111-S510
	Holders	
Q701a	27190784	FL tube
D733a	27190549	Stand-by
D744a	27190517A	MR Off

SCHEMATIC DIAGRAM

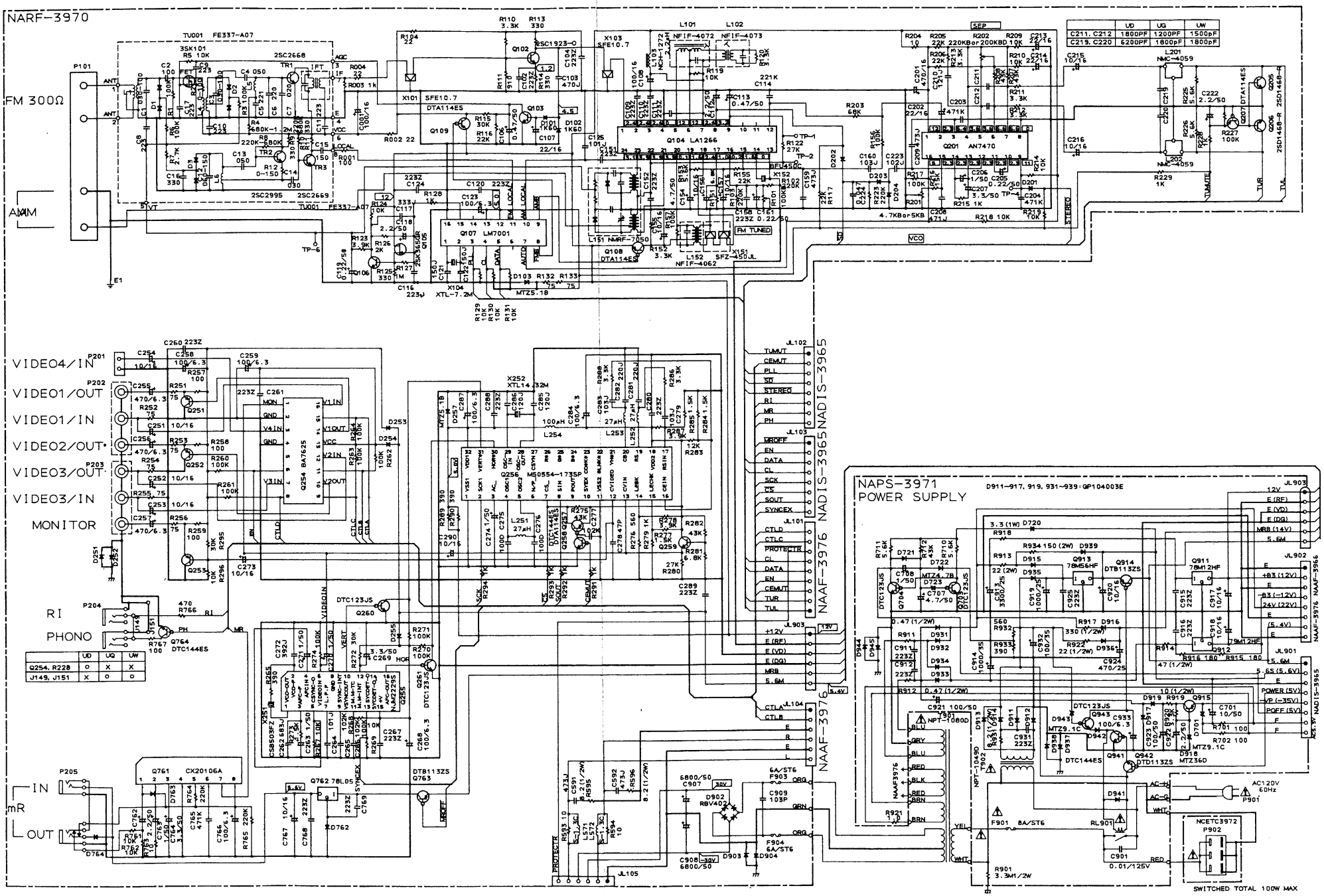
MICROPROCESSOR CONNECTION DIAGRAM



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

HEMATIC DIAGRAM

ER CIRCUIT AND POWER SUPPLY SECTION



TUNER CIRCUIT PC BOARD (NARF-3970-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Front End	
TU001	240088	FE337-A07
	ICs	
Q104	22240039	LA1266
Q107	22240090	LM7001
Q201	22240242	AN7470
Q254	22240373	BA7625
Q255	22240374	NJM2229S
Q256	22240299	M50554-173SP
Q761	22240345	CX20106A
Q762	222780053	78L05
	Transistors	
Q102	2211723	2SC1923-O
Q103, Q106	2211183 or	2SC1740-R or
Q259	2211255	2SC1815-GR
Q105	2212445	2SK365-GR, FET
Q108, Q109	2213510	DTA114ES
Q205, Q206	2212794	2SD1468-R
Q207	2213510	DTA114ES
Q251-Q253	2213074 or	2SA933-R or
	2211455	2SA1015-GR
Q257	2213510	DTA114ES
Q258	221282	DTC144ES
Q260, Q261	2213640	DTC123JS
Q763	2213830	DTB113ZS
Q764	221282	DTC144ES
	Diodes	
D101, D102	223132	1K60, Germanium
D103	224450512	MTZ5.1B, Zener
D201-D204	223163	1SS133
D251-D255	223163	1SS133
D257	224450512	MTZ5.1B, Zener
D762-D764	223163	1SS133
D902	22380022	RBV402
D903, D904	223163	1SS133
	Transformers	
L101	233401	NFIF-4072
L102	233402	NFIF-4073
L152	232139	NMIF-4062
	Coils	
L103	233409M022	NCH-1272
L151	232148	NMRF-7050
L201, L202	233355A	NMC-4059
L251-L253	233409K270	NCH-1285
L254	233409K101	NCH-1292
L571, L572	231176	S-1.3C
	Ceramic Filters	
X101, X103	3010071	SFE10.7MA5
X151	3010123	SFZ450JL
X152	3010076	BFU450C
	Oscillator elements	
X104	3010141	XTL-7.2M, X'tal
X251	3010168	CSB503F2, Ceramic
X252	3010167	XTL-14.32M, X'tal
	Capacitors	
C001, C108	354741019	100μF, 16V, Elect.
C106	354784799	0.47μF, 50V, Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION
C107	354742209	22μF, 16V, Elect.
C112	354780229	2.2μF, 50V, Elect.
C113	354784799	0.47μF, 50V, Elect.
C116	374722234	0.022μF, 5%, 50V, TF
C117	374723334	0.033μF, 5%, 50V, TF
C118	354780229	2.2μF, 50V, Elect.
C119, C161	354782299	0.22μF, 50V, Elect.
C123	354721019	100μF, 6.3V, Elect.
C154	354780479	4.7μF, 50V, Elect.
C155-C157	354741009	10μF, 16V, Elect.
C159	374724734	0.047μF, 5%, 50V, TF
C160	374721034	0.01μF, 5%, 50V, TF
C201	354744719	470μF, 16V, Elect.
C202	354742209	22μF, 16V, Elect.
C205	354782299	0.22μF, 50V, Elect.
C206	354780109	1μF, 50V, Elect.
C207	354780339	3.3μF, 50V, Elect.
C208	370134714	470pF, 5%, 100V, APS
C209	374724734	0.047μF, 5%, 50V, TF
C211, C212	374721824	1800pF, 5%, 50V, TF
C213, C214	354742209	22μF, 16V, Elect.
C215, C216	354741009	10μF, 16V, Elect.
C219, C220	374726224	6200pF, 5%, 50V, TF
C222	354780229	2.2μF, 50V, Elect.
C223	374721024	1000pF, 5%, 50V, TF
C224	374724734	0.047μF, 5%, 50V, TF
C251-C254	354741009	10μF, 16V, Elect.
C255-C257	354724719	470μF, 6.3V, Elect.
C258, C259	354721019	100μF, 6.3V, Elect.
C262	374726834	0.068μF, 5%, 50V, TF
C263	354780109	1μF, 50V, Elect.
C268	354721019	100μF, 6.3V, Elect.
C269	354780339	3.3μF, 50V, Elect.
C270, C271	354780109	1μF, 50V, Elect.
C272	374723924	3900pF, 5%, 50V, TF
C273	354741009	10μF, 16V, Elect.
C274	354780109	1μF, 50V, Elect.
C279, C283	374721034	0.01, 5%, 50V, TF
C284, C287	354721019	100μF, 6.3V, Elect.
C290	354741009	10μF, 16V, Elect.
C591, C592	374724734	0.047μF, 5%, 50V, TF
C762	354780229	2.2μF, 50V, Elect.
C763	354780109	1μF, 50V, Elect.
C764	354780339	3.3μF, 50V, Elect.
C766	354721019	100μF, 6.3V, Elect.
C767	354741009	10μF, 16V, Elect.
C907, C908	3504207	6800μF, 50V, Elect.
	Resistors	
R101	5210221 or 5210070	N06HR100KBD, Semi-fixed
R201	5210216 or 5210062	N06HR5KBD or N06HR4.7KBD, Semi-fixed
R202	5210072 or 5210222	N06HR220KBC or N06HR200KBD, Semi-fixed
R595, R596	442520824	8.2ohm, 1/2W, Metal oxide film
	Terminal	
P101	25060085	NTM-4PDMN29, Antenna
	Sockets	
P201	2009990021A	NSAS-4P0045
JL101	25050273	NSCT-9P101
JL102, JL103	25050272	NSCT-8P100
JL104, JL105	25050270	NSCT-6P98
JL903	25050270	NSCT-6P98

CIRCUIT NO.	PART NO.	DESCRIPTION
	Jacks	
P202, P203	25045299	NPJ-3PDYE158
P204	25045172	HSJ-1003-01-020, RI
P205	25045293	HSJ-1003-01-012, MR
	Fuses	
F903, F904	252051	⚠ 6A (ST-6), Secondary
	Holders	
F903a, F904a	250113	⚠ SN5051, Fuse

POWER SUPPLY CIRCUIT PC BOARD (NAPS-3971-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q911	222780122NEC	78M12
Q912	222790125	79M12
Q913	222780565JRC	78M56
	Transistors	
Q703, Q704	2213640	DTC123JS
Q914	2213830	DTB113ZS
Q915	2213074 or 2211455	2SA933-R or 2SA1015-GR
Q941	221282	DTC144ES
Q942	2213650	DTD113ZS
Q943	2213640	DTC123JS
	Diodes	
D701	224450913	MTZ9.1C, Zener
D720-D722	223163	ISS133
D723	224450472	MTZ4.7B, Zener
D911-D917	22380035 or 22380032	GP104003E or 1SR139-100
D918	224453604	MTZ36D, Zener
D919, D939	22380035 or	GP104003E or
D931-D936	22380032	1SR139-100
D937, D938	223163	1SS133
D941, D942	223163	1SS133
D943	224450913	MTZ9.1C
D944, D945	223163	1SS133
	Power transformer	
T902	2300493	⚠ NPT-1049D
	Capacitors	
C701	354781009	10μF, 50V, Elect.
C707	354780479	4.7μF, 50V, Elect.
C708	354780109	1μF, 50V, Elect.
C901	3500065A	⚠ DE7150FZ103PAC400V/125V, IS
C913	354753329	3300μF, 25V, Elect.
C914	354761029	1000μF, 35V, Elect.
C917, C918	354741009	10μF, 16V, Elect.
C919	354751029	1000μF, 25V, Elect.
C920	354741009	10μF, 16V, Elect.
C921, C923	354781019	100μF, 50V, Elect.
C922	354780229	2.2μF, 50V, Elect.
C924	354754719	470μF, 25V, Elect.
C932	354781019	100μF, 50V, Elect.
C933	354721019	100μF, 6.3V, Elect.
	Resistors	
R901	431523355	⚠ 3.3Mohm, 1/2W, Solid
R911, R912	442524794	0.47ohm, 1/2W, Metal oxide film
R913	441722204	22ohm, 2W, Metal oxide film
R914	442524704	47ohm, 1/2W, Metal oxide film
R917	442523314	330 ohm, 1/2W, Metal oxide film
R918	441620334	3.3 ohm, 1W, Metal oxide film

CIRCUIT NO.	PART NO.	DESCRIPTION
R919	442521004	10ohm, 1/2W, Metal oxide film
R922	442522204	22ohm, 1/2W, Metal oxide film
R931	442520824	8.2 ohm, 1/2W, Metal oxide film
R934	441721514	150ohm, 2W, Metal oxide film
	Relay	
RL901	25065248	⚠ NRL-1P15A-DC12-29
	Sockets	
JL901, JL902	25050272	NSCT-8P100
P903	2009990078	NSAS-4P0115
	Fuse	
F901	252053	⚠ 8A (ST-6), Primary
	Fuseholders	
F901a	250113	⚠ SN5051, Fuse
	Radiator	
	27160209	RAD-67

CIRCUIT NO.	PART NO.	DESCRIPTION
	Labels	
F901b	29360842	8A/125V, Rating
F901c	29360626-1	Fuse

AC OUTLET TERMINAL PC BOARD (NAETC-3972-1)

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

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

PRINTED CIRCUIT BOARD PARTS LIST

PRE./MAIN AMPLIFIER PC BOARD (NAAF-3976-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q301	22240191	NJM4565D-D
Q302-Q309	22240247 or	BA15218N or
	22240293	NJM4558L-D
Q310, Q313	22240339	LC7823N
Q311, Q312	22240280	LC7821N
Q501, Q502	22240311	μPC1298V
Q541	22240311	μPC1298V
Q851	22240211	μPD6345C
	Transistors	
Q491-Q493	2213631 or	RN1241-A or
	2213632	RN1241-B
Q503, Q504	2211183 or	2SC1740-R or
Q542	2211255	2SC1815-GR
Q505, Q506	2201653,	☆2SC3856-O,
Q543	2201654 or	☆2SC3856-Y or
	2201655	☆2SC3856-P
Q507, Q508	2201663,	☆2SA1492-O,
Q544	2201664 or	☆2SA1492-Y or
	2201665	☆2SA1492-P

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

2SC3856-O 2SA1492-O

Same beta group

Q531-Q534	2211732 or	2SC1845-F or
Q556	2211733	2SC1845-E
Q561	2211792 or	2SA992-F or
	2211793	2SA992-E
Q801-Q805	2213631 or	RN1241-A or
	2213632	RN1241-B
Q852,Q855,Q856	2213510	DTA114ES
Q853	2213710	DTA123JS
Q854	221282	DTC114ES
	Diodes	
D501-D506	223163	1SS133
D851, D852	223163	1SS133
D901	22380038	RBV602
	Coils	
L501, L502	231176	S-1.3C
L541	231176	S-1.3C
	Capacitors	
C303, C304	391980227	2.2μF, 50V, Elect.
C307, C308	391921017	100μF, 6.3V, Elect.
C309, C310	374726224	6200pF, 5%, 50V, TF
C311, C312	374721824	1800pF, 5%, 50V, TF
C313, C314	391941007	10μF, 16V, Elect.
C317-C320	391941007	10μF, 16V, Elect.
C323-C326	391941007	10μF, 16V, Elect.
C331-C334	391941007	10μF, 16V, Elect.
C339-C342	391941007	10μF, 16V, Elect.
C347-C350	391941007	10μF, 16V, Elect.
C355-C358	391941007	10μF, 16V, Elect.
C361-C364	391941007	10μF, 16V, Elect.
C367-C370	391941007	10μF, 16V, Elect.
C371, C372	354744709	47μF, 16V, Elect.
C501, C502	391941007	10μF, 16V, Elect.
C503, C504	373303314	330pF, 5%, 125V, PP
C505, C506	354742219	220μF, 16V, Elect.
C511, C512	374726834	0.068μF, 5%, 50V, TF
C513, C514	374724734	0.047μF, 5%, 50V, TF
C517-C520	354700109	1μF, 160V, Elect.
C533	391921017	100μF, 6.3V, Elect.
C541	391941007	10μF, 16V, Elect.
C542	373303314	330pF, 5%, 125V, PP
C543	354742219	220μF, 16V, Elect.
C546	374726834	0.068μF, 5%, 50V, TF
C547	374724734	0.047μF, 5%, 50V, TF
C549, C550	354700109	1μF, 160V, Elect.
C562	354700109	1μF, 160V, Elect.
C851	391921017	100μF, 6.3V, Elect.
C855, C856	391941007	10μF, 16V, Elect.
C905, C906	3504240	12000μF, 63V, Elect.
	Resistors	
R509, R510	5210118 or	N06HR 5KBC or
R545	5210062	N06HR 4.7KBD, Semi-fixed
R515-R516	442520824	8.2ohm, 1/2 W, Metal oxide film
R517, R518	441620824	8.2ohm, 1W, Metal oxide film
R519, R520	4500031	0.22ohm, 5W, Metal plate
R521, R522	442520824	8.2ohm, 1/2W, Metal oxide film
R523, R524	441620474	4.7ohm, 1W, Metal oxide film
R525-R528	442524794	0.47ohm, 1/2W, Metal oxide film
R529, R530	441623914	390ohm, 1W, Metal oxide film
R548	442520824	8.2ohm, 1/2W, Metal oxide film
R549	441620824	8.2ohm, 1W, Metal oxide film
R550	4500031	0.22ohm, 5W, Metal plate
R551	442520824	8.2ohm, 1/2W, Metal oxide film
R552	441620474	4.7ohm, 1W, Metal oxide film
R553, R554	442524794	0.47ohm, 1/2W, Metal oxide film
	Relaies	
RL501, RL502	25065339	NRL-2P5A-DC24-046
RL503	25065379	NRL-1P5A-DC24-058
RL504, RL505	25065339	NRL-2P5A-DC24-046
RL506	25065396	NRL-2P1.25A-DC24-067
	Terminals	
P301-P303	25045300	NPJ-6PDBL-159
P304	25045301	NPJ-8PDBL-160
P305	25045298	NPJ-2PDBL-157
P501	25060125	NTM-8PDMN058
	Plugs	
P511-P513	25055493	NPLG-2P468
P601-P603	25055492	NPLG-9P467
	Sockets	
P311	2000783	NSAS-6P739
P401	2000931	NSAS-6P884
JL301	25050273	NSCT-9P101
JL411	25050270	NSCT-6P98
	Shild plate	
	27150309	
	Radiators	
	27160262	
	Clamps	
	27301186	
	Cord ass'y	
P491	2065525300	

HEADPHONE TERMINAL PC BOARD (NAETC-3978-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
P504	25045256	YKB21-5010, Headphone terminal

VIDEO TERMINAL PC BOARD (NAETC-3968-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
D381-D384	223163	1SS133, Diodes
P307	25045321	NPJ-3PDBL178, Terminal
P201a	25055132	NPLG-2P116, Plug
P311a	25055133	NPLG-3P117, Plug
P999	2061712100	Cord ass'y

REAR AMPLIFIER PC BOARD (NAAF-3979-1)

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

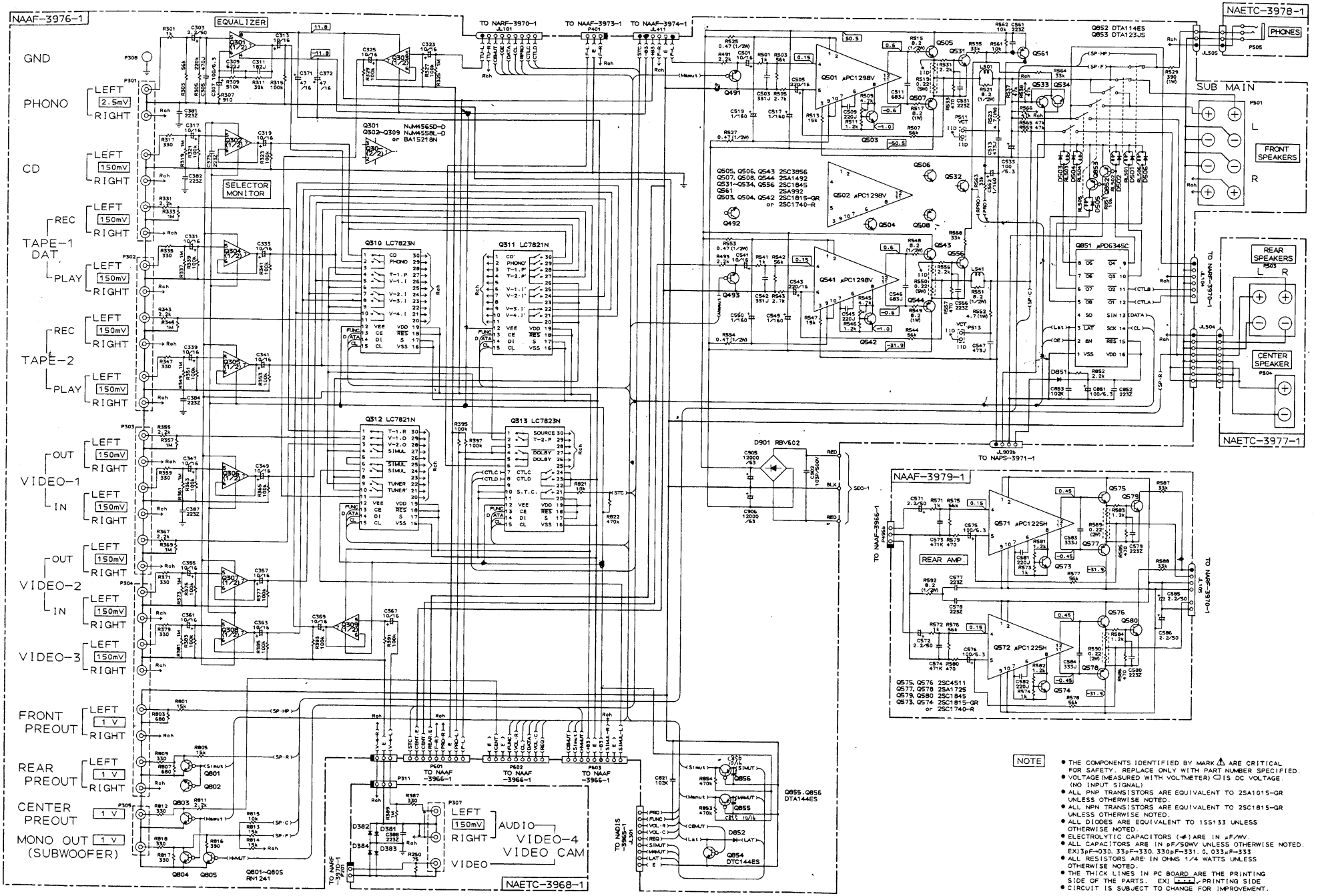
CIRCUIT NO.	PART NO.	DESCRIPTION
	Ex. 2SC4511-O 2SA1725-O	
	Same beta group	
Q579, Q580	2211732 or	2SC1845-F or
	2211733	2SC1845-E
	Capacitors	
C571, C572	391980227	2.2μF, 50V, Elect.
C575, C576	354741019	100μF, 16V, Elect.
C583, C584	374723334	0.033μF, 5%, 50V, TF
C585, C586	391980227	2.2μF, 50V, Elect.
	Resistors	
R589, R590	4500027	0.22ohm, 2W, Metal plate
R592	442520824	8.2ohm, 1/2W, Metal oxide film
	Socket	
P495	2000562	NSAS-6P518

SPEAKER TERMINAL PC BOARD (NAETC-3977-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
P502	25060143	NTM-2PDML071, Terminal Center Speaker
P503	25060144	NTM-4PDML072, Terminal Rear Speaker

CHEMATIC DIAGRAM

IPLIFIER SECTION



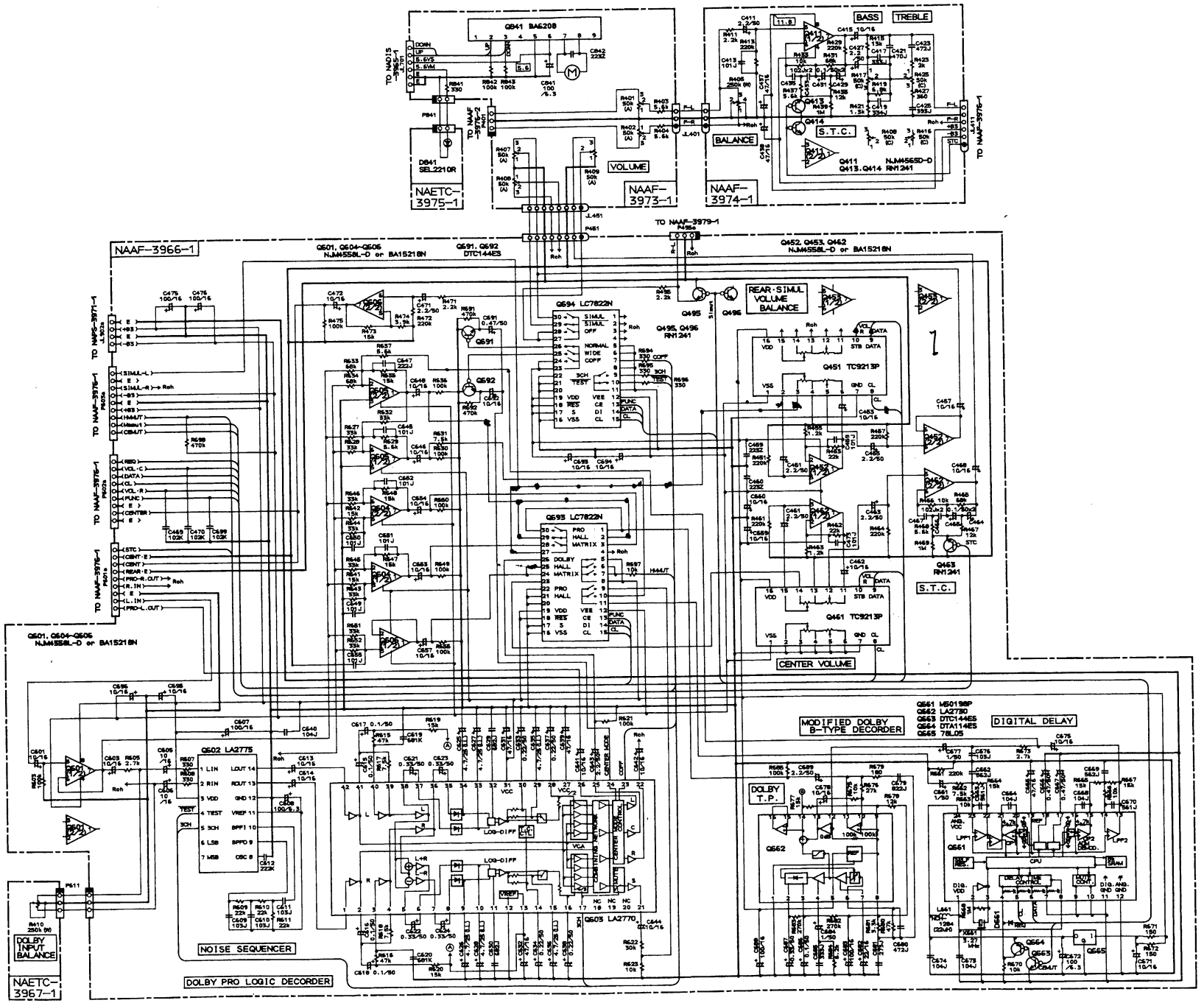
NOTE

- THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- VOLTAGE (MEASURED WITH VOLTMETER) ☐ IS DC VOLTAGE (NO INPUT SIGNAL)
- ALL PNP TRANSISTORS ARE EQUIVALENT TO 2SA1015-GR UNLESS OTHERWISE NOTED.
- ALL NPN TRANSISTORS ARE EQUIVALENT TO 2SC1815-GR UNLESS OTHERWISE NOTED.
- ALL DIODES ARE EQUIVALENT TO 1SS133 UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (◀) ARE IN μF/WV.
- ALL CAPACITORS ARE IN pF/50WV UNLESS OTHERWISE NOTED. EX) 3pF→030, 33pF→330, 330pF→331, 0.033μF→333
- ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED.
- THE THICK LINES IN PC BOARD ARE THE PRINTING SIDE OF THE PARTS. EX) ▬▬ PRINTING SIDE
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

A B C D E F G

HEMATIC DIAGRAM

TROL SECTION



ONKYO CORPORATI

SURROUND CIRCUIT PC BOARD (NAAF-3966-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q451, Q461	22240266	TC9213P
Q452, Q453	22240247 or	BA15218N or
Q462, Q601	22240293	NJM4558L-D
Q602	22240371	LA2775
Q603	22240279	LA2770
Q604-Q606	22240247 or	BA15218N or
	22240293	NJM4558L-D
Q661	22240370	M50198P
Q662	22240139	LA2730
Q665	222780053	78L05
Q693, Q694	22240270	LC7822N
	Transistors	
Q463, Q495	2213631 or	RN1241-A or
Q496	2213632	RN1241-B
Q663	221282	DTC144ES
Q664	2213510	DTA114ES
Q691, Q692	221282	DTC144ES
	Diode	
D661	223163	1SS133
	Coil	
L661	233409K220	NCH-1284
	Ceramic osc	
X661	3010169	CST3.27MGW002

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C451, C452	391980227	2.2μF, 50V, Elect.
C453, C454	391941007	10μF, 16V, Elect.
C455, C456	391980227	2.2μF, 50V, Elect.
C457, C458	391941007	10μF, 16V, Elect.
C461, C463	391980227	2.2μF, 50V, Elect.
C462	391941007	10μF, 16V, Elect.
C464, C465	354781099	0.1μF, 50V, Elect.
C466, C467	374721024	1000pF, 5%, 50V, TF
C468, C472	391941007	10μF, 16V, Elect.
C471	391980227	2.2μF, 50V, Elect.
C475, C476	354741019	100μF, 16V, Elect.
C601-C606	391941007	10μF, 16V, Elect.
C607	354741019	100μF, 16V, Elect.
C608	354721019	100μF, 6.3V, Elect.
C609-C611	374721034	0.01μF, 5%, 50V, TF
C613, C614	391941007	10μF, 16V, Elect.
C615-C618	354781099	0.1μF, 50V, Elect.
C621-C624	354783399	0.33μF, 50V, Elect.
C625-C628	392850477	4.7μF, 25V, LL
C629, C630	374726824	6800pF, 5%, 50V, TF
C631, C632	354744709	47μF, 16V, Elect.
C633, C634	354782299	0.22μF, 50V, Elect.
C635, C636	392850477	4.7μF, 25V, LL
C637, C638	354782299	0.22μF, 50V, Elect.
C639	354744709	47μF, 16V, Elect.
C640	374721044	0.1μF, 5%, 50V, TF
C641, C642	391941007	10μF, 16V, Elect.
C643	391980227	2.2μF, 50V, Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION
C644, C646	391941007	10μF, 16V, Elect.
C647	374722224	2200pF, 5%, 50V, TF
C648	391941007	10μF, 16V, Elect.
C653, C654	391941007	10μF, 16V, Elect.
C657	391941007	10μF, 16V, Elect.
C659, C660	391941007	10μF, 16V, Elect.
C661	354780109	1μF, 50V, Elect.
C662	374725624	5600pF, 5%, 50V, TF
C664, C668	374721044	0.1μF, 5%, 50V, TF
C665	354744709	47μF, 16V, Elect.
C666, C667	354784799	0.47μF, 50V, Elect.
C669	374725624	5600pF, 5%, 50V, TF
C671	391941007	10μF, 16V, Elect.
C672	391921017	100μF, 6.3V, Elect.
C673, C674	374721044	0.1μF, 5%, 50V, TF
C675	391941007	10μF, 16V, Elect.
C676	374721034	0.01μF, 5%, 50V, TF
C677	354780109	1μF, 50V, Elect.
C678	391941007	10μF, 16V, Elect.
C679	374728224	8200pF, 5%, 50V, TF
C680	374724724	4700pF, 5%, 50V, TF
C681	374722734	0.027μF, 5%, 50V, TF
C682	354742209	22μF, 16V, Elect.
C683	354741019	100μF, 16V, Elect.
C684	354780109	1μF, 50V, Elect.
C685	374723334	0.033μF, 5%, 50V, TF
C686	354781099	0.1μF, 50V, Elect.
C687	354783399	0.33μF, 50V, Elect.
C688	354741019	100μF, 16V, Elect.
C689	391980227	2.2μF, 50V, Elect.
C691	354784799	0.47μF, 50V, Elect.
C692-C696	391941007	10μF, 16V, Elect.
	Plug	
P495a	25055133	NPLG-3P117
	Sockets	
P601a-P603a	25050442	NSCT-9P266
P611	2000799	NSAS-6P755
	Shield wire	
P451	2050031	NCS-8P3E40

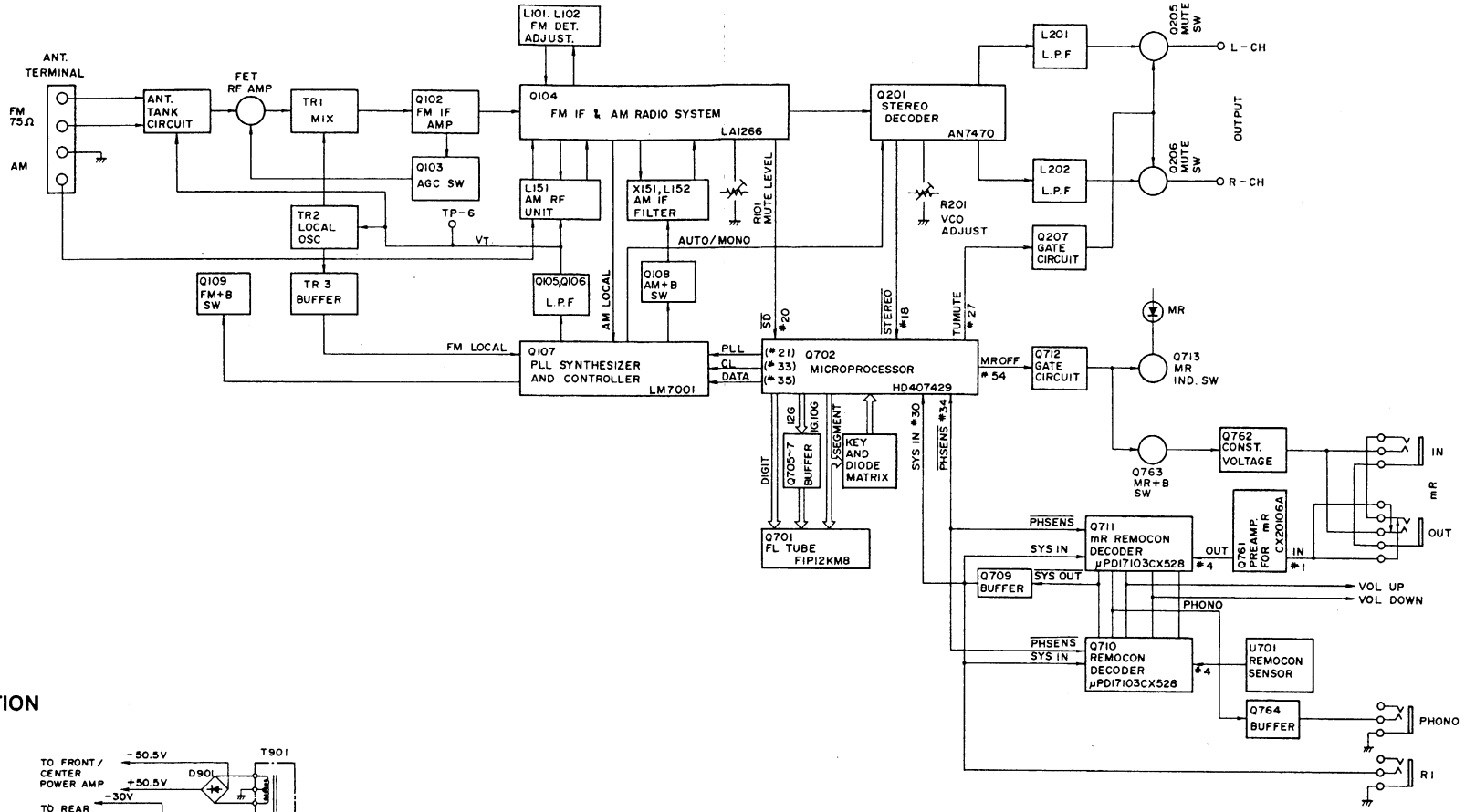
MASTER VOLUME PC BOARD (NAAF-3973-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q841	22240372	BA6208
	Capacitor	
C841	354721019	100μF, 6.3V, Elect.
	Resistor	
R401, R402	5140002	N16RGL50KA30F, Variable,
R407-R409		Master Volume

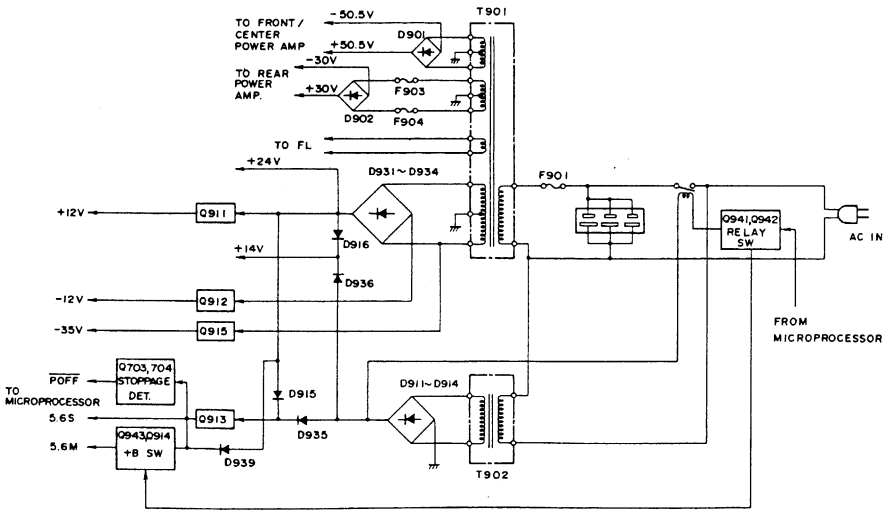
(Continued on the page 47.)

BLOCK DIAGRAM

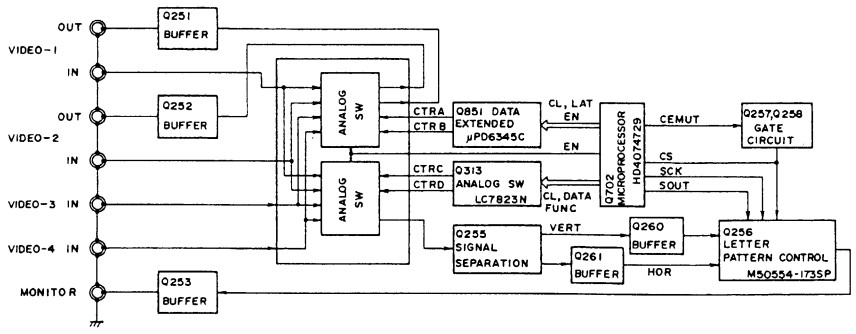
TUNER SECTION



POWER SUPPLY SECTION

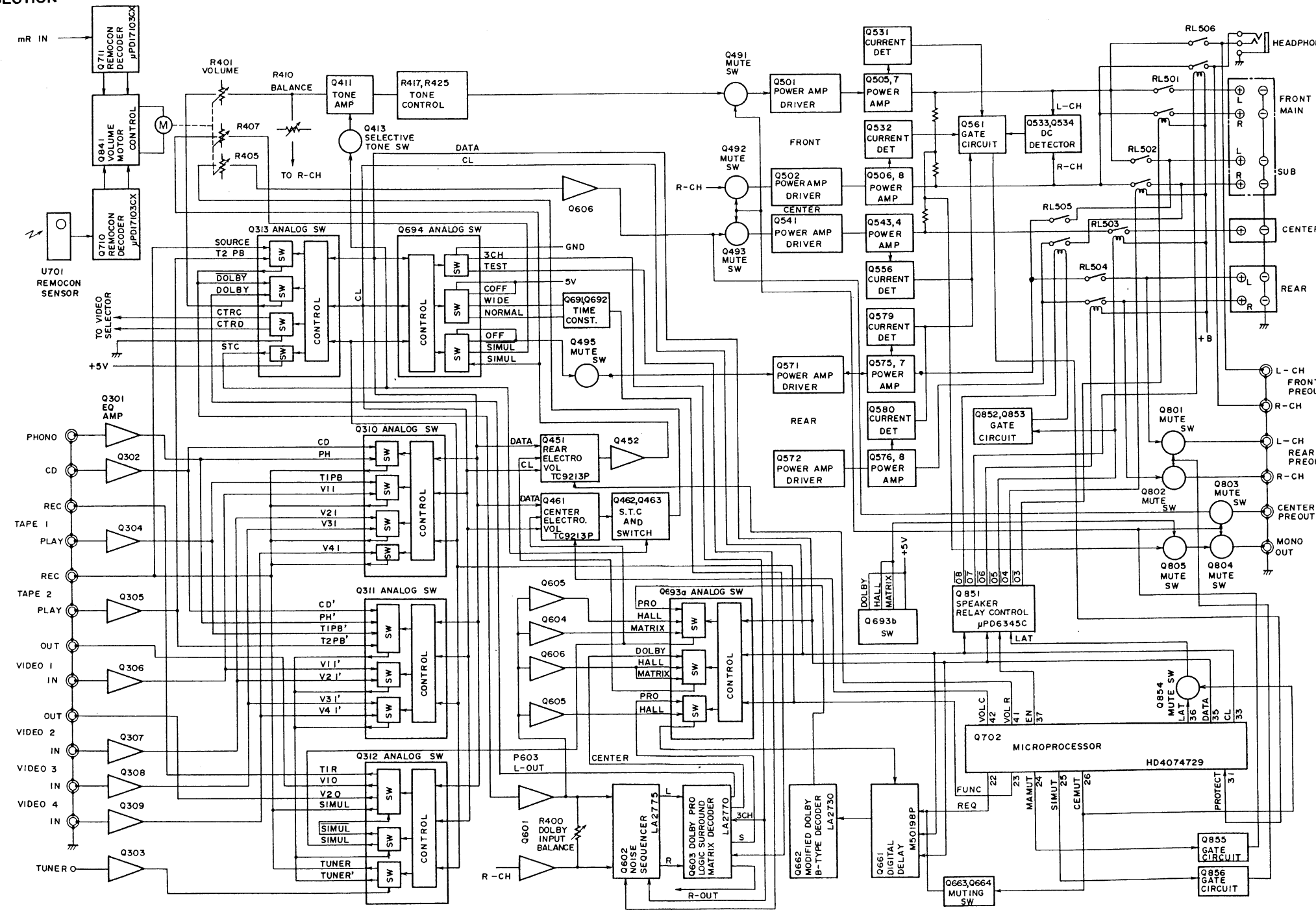


VIDEO SECTION



CK DIAGRAM

IFIER SECTION



CIRCUIT NO.	PART NO.	DESCRIPTION
	Plug	
P401a	25055133	NPLG-3P117
	Sockets	
JL451	25050272	NSCT-8P100
JL701	25050269	NSCT-5P97
P841	2000635A	NSAS-4P591

VOLUME INDICATOR PC BOARD (NADIS-3975-1)

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

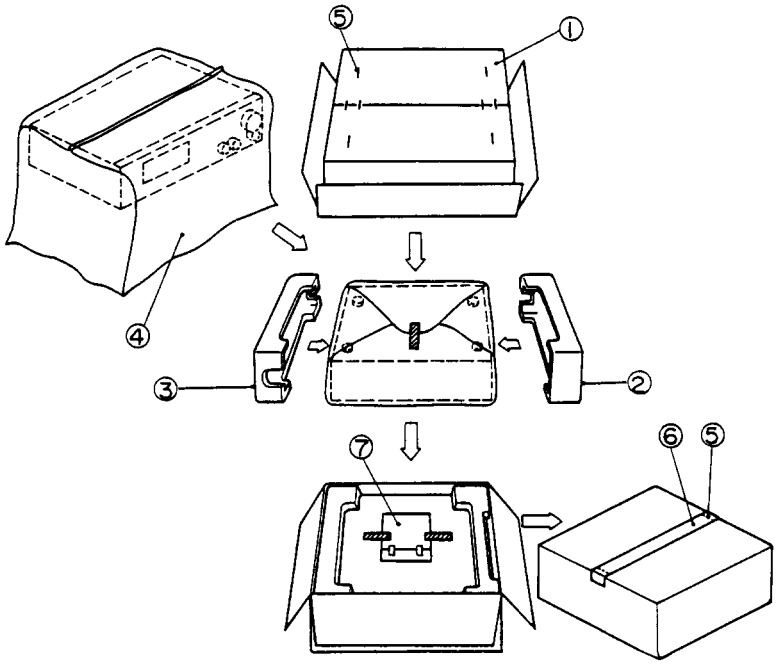
TONE CONTROL CIRCUIT PC BOARD (NAAF-3974-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q411	22240191	NJM4565D-D
	Transistors	
Q413, Q414	2213631 or	RN1241-A or
	2213632	RN1241-B
	Capacitors	
C411, C412	391980227	2.2μF, 50V, Elect.
C415, C416	391941007	10μF, 16V, Elect.
C417, C418	374723334	0.033μF, 5%, 50V, TF
C419, C420	374723344	0.33μF, 5%, 50V, TF
C423, C424	374724724	4700pF, 5%, 50V, TF
C425, C426	374723934	0.039μF, 5%, 50V, TF
C427, C428	391980227	2.2μF, 50V, Elect.
C429-C432	354781099	0.1μF, 50V, Elect.
C433-C436	374721024	1000pF, 5%, 50V, TF
C437, C438	354744709	47μF, 16V, Elect.
	Resistors	
R405	5104225	N11RGLC250KWT22Z, Variable, BALANCE
R417, R418	5104216	N14RLC50KC22Z, Variable, BASS
R425, R426	5104216	N14RLC50KC22Z, Variable, TREBLE

INPUT BALANCE VOLUME PC BOARD (NAETC-3967-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
R410	5104258	N11RGLC250KWT15Z, Variable resistor

PACKING VIEW



REF.NO.	PART NO.	DESCRIPTION
1	29052103	Master carton box
2	29091422A	Pad L
3	29091423A	Pad R
4	29100035A	1020×720, Poly-styrene bag
5	282301	Sealing hook
6	29110071-1	Damplon tape
7	Accessary bag ass'y	
	29341554A	Instruction manual
	29100097	250×350, Poly-styrene bag
	292064B	FM antenna
	232140	NMA-3057, AM loop antenna
	3010054	UM-3, Two batteries
	24140185	RC-AV70M, Remote control transmitter
	2010200	Remote control cord
	29365019	Warranty card
	29358002J	Service station list

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