PIONEER

Service Manual

CIRCUIT DESCRIPTIONS
REPAIR & ADJUSTMENTS

ORDER NO.
ARP1184-A

STEREO CONTROL AMPLIFIER

C-90(BK)

MODEL C-90 (BK) COMES IN FIVE VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Power requirement	Export destination
KU	AC120V only	U.S.A.
HE	AC220V, 240V (switchable)	European continent
HEZ	AC220V, 240V (switchable)	West Germany
HB	AC220V, 240V (switchable)	United Kingdom
S/G	AC110V, 120V, 220V, 240V (switchable)	U.S. Military

- **This service manual is applicable to the HEZ type.**
- **As to the HE and HB types, please refer to the additional service manual (ARP1212).**
- **As to the KU and S/G types, please refer to C-90 (BK)/KU and S/G service manual (APR1205).**

CONTENTS

1. SPECIFICATIONS 2
2. FRONT PANEL FACILITIES 3
3. PARTS LOCATIONS 5
4. EXPLODED VIEWS AND PARTS LIST 7
5. PACKING 12
6. P.C. BOARDS CONNECTION DIAGRAM 13
7. SCHEMATIC DIAGRAM 17
8. BLOCK DIAGRAM 22
9. CIRCUIT DESCRIPTION 24
10. IC DESCRIPTION 25
11. ELECTRICAL PARTS LIST 27

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
TEL: (213) 420-5700
PIONEER ELECTRONIC (EUROPE) N.V. Keetberglaan 1, 2740 Beveren, Belgium TEL: 03/775-28-08
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia
TEL: (03) 580-9911

YG © JUNE 1986 Printed in Japan

1. SPECIFICATIONS

Amplifier section

Rated power
20 Hz—20 kHz, 0.01% ..... 8 V
Harmonic distortion
20 Hz—20 kHz, 1 V 0.002%
Cross modulation distortion (50 Hz: 7 kHz = 4 : 1)
1 V 0.002%
Input terminals (sensitivity/impedance)
PHONO MM ..... 2.5 mV/50 kΩ
PHONO MC ..... 250 μV/40 Ω
125 μV/3 Ω
TUNER, CD, TAPE PLAY, ADAPTOR ..... 150 mV/50 kΩ
Output terminals (output level/output impedance)
TAPE REC ..... 150 mV/1 kΩ
PRE OUT ..... 1 V/600 Ω
Frequency response
PHONO MM 20 Hz—20 kHz ..... ±0.2 dB
TUNER, CD, AUX, 20 Hz—20 kHz ..... +0 dB
−0.2 dB
Tone control
BASS ..... ±9 dB, 100 Hz
TREBLE ..... ±9 dB, 10 kHz
Filter
LOW (SUBSONIC) ..... 7 Hz, 6 dB/oct
HIGH ..... 10 kHz, 6 dB/oct
MUTING ..... −20 dB
SN ratio (short-circuit, A network)
PHONO MM ..... 96 dB
PHONO MC ..... 86 dB
TUNER, CD, TAPE PLAY, ADAPTOR ..... 109 dB

Power section, etc.

Power requirements ..... AC 220 V~, 50/60 Hz
Power consumption ..... 26 W
AC outlets
Linked to power switch (x2) ..... 250 W
Unlinked to power switch (x1) ..... 250 W
External dimensions ..... 457 (W) x 405 (D) x 125 (H)
Weight ..... 9.0 kg

Accessories

Operating Instructions 1
Pin-plug cord 1

The specifications and appearance noted above may change without notice due to improvements.

Precautions for installation

To ensure optimum sound quality, observe the following precautions.

- This unit is heavy. Be sure to install it on a firm base which can support its weight. Also, to prevent the flow of cooling air from being blocked off, do not place the unit on soft material such as a carpet or cushion, or install it in a confined space. When installing the unit in a rack, provide adequate space around it to allow heat to dissipate.
- To prevent the control amplifier from picking up noise due to leakage flux from the power amplifier when the control amplifier and power amplifier are installed adjacent to each other, install the control amplifier on the right of the power amplifier. Also, if you install the control amplifier above or below the power amplifier, place a partition between them to separate them by at least 10 cm from each other.
- Install the unit on a level surface so that the feet of the unit are all touching the installation surface.

2. FRONT PANEL FACILITIES

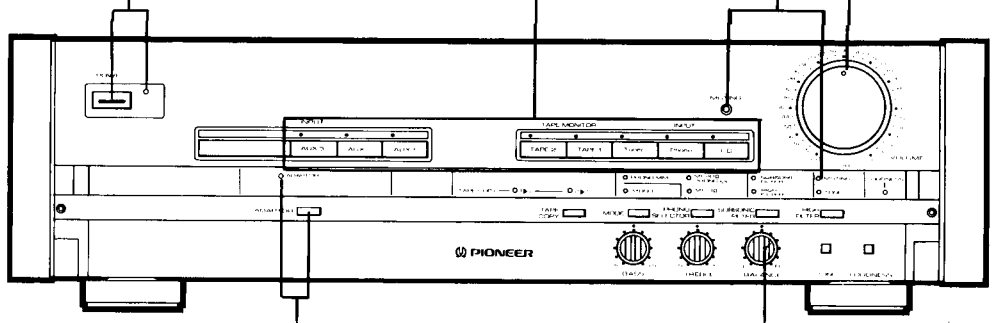
FRONT PANEL

POWER switch/indicator
Press this switch to turn this unit's power ON/OFF.
When you switch the unit ON, the muting function will be activated, and the indicator will flash. Once the flashing indication changes to a steady indication, the unit will operate normally.

VOLUME control
Use to adjust the sound volume. At the [∞] position, sound will not be heard, while at the [0] position, sound volume will be at its maximum.

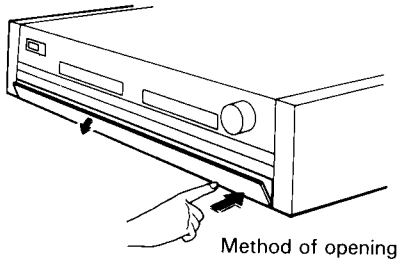
MUTING switch/indicator
Use to temporarily −20 dB audio signals. When this switch is pressed so that the indicator lights, the muting circuit operates to reduce the level of all audio signals by 20 dB. When set to the OFF position, the volume is returned to its previous level.

INPUT SELECTOR switch/indicator
Use to select playback audio components (indicator lights).
[CD]— Compact disc player.
[Phono]— Stereo turntable.
[Tuner]— Tuner for listening to FM/AM broadcasts.
[TAPE 1]— The tape deck connected to the rear panel Tape 1 terminals.
[TAPE 2]— The tape deck connected to the rear panel Tape 2 terminals.
[AUX 1]— The audio component connected to the rear panel AUX 1 terminals.
[AUX 2]— The audio component connected to the rear panel AUX 2 terminals.
[AUX 3]— The audio component connected to the rear panel AUX 3 terminals.



ADAPTOR switch/indicator
Normally, set this switch OFF.
Set to ON when using a surround processor or graphic equalizer connected to the rear panel adaptor terminals AUDIO IN/OUT.

BALANCE control
Normally, leave in the center position; use it to adjust the right-left sound volume when it seems to be unevenly balanced. When the sound is too loud on the right side, turn the control in the LEFT direction; when too loud on the left side, turn the control in the RIGHT direction.



Method of opening cover

TAPE COPY switch/indicator

Use this switch when you are using two tape decks and copying one tape to another tape.

[1 ► 2]— When copying a tape in the tape deck connected to the TAPE 1 PLAY terminals to the tape deck connected to the TAPE 2 REC terminals.

[2 ► 1]— When copying a tape in the tape deck connected to the TAPE 2 PLAY terminals to the tape deck connected to the TAPE 1 REC terminals.

HIGH FILTER switch/indicator

When this switch is pressed to the ON position, the indicator lights and a high-cut filter (cutoff frequency 10 kHz) is activated.

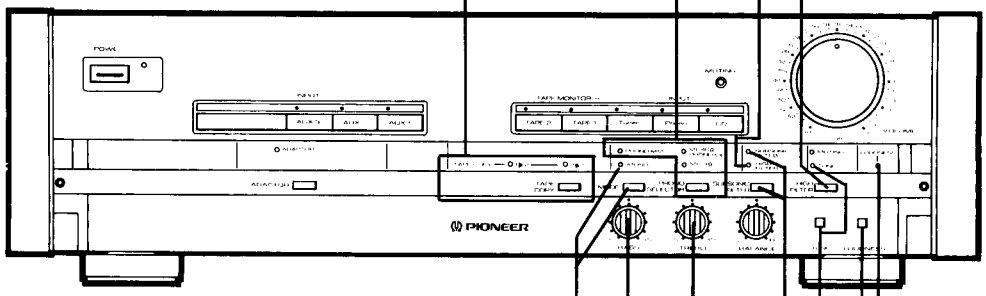
PHONO SELECTOR switch/indicator

Set in accordance with the type of cartridge used on your turntable (the corresponding indicator will light).

[MM]—Set here when using a moving magnet cartridge, or a high-output (1mV or more) moving coil (MC) cartridge.

[MC 40 Ω]—Set here when using a moving coil cartridge with impedance of 40 Ω.

[MC 3 Ω]—Set here when using a MC cartridge with impedance of 3 Ω.



MODE switch/indicator

Use to select the stereo or monaural audio playback mode. Normally, this switch is not used.

When the monaural playback mode is selected, press this switch; the MODE MONO indicator will light.

SUBSONIC FILTER switch/indicator

When this switch is pressed to the ON position, the indicator lights and a subsonic filter (cutoff frequency 7 Hz) is activated. Use to remove low-frequency noise due to warped records, etc.

TONE switch/indicator

[ON]— The TONE indicator lights, and audio inputs from all components are played back after passing through the tone control circuits. In this condition, the tone controls (BASS, TREBLE) can be used to adjust sound quality.

[OFF]— The TONE indicator goes out, and signals are played back without passing through the tone control circuits.

Tone controls

These controls can be used only when the TONE indicator is lighted.

[BASS]— Use to adjust low-frequency sounds. The center indicates the standard (flat) position. When the control is rotated to the right, low-frequency sounds are augmented; when rotated to the left, low-frequency sounds are attenuated.

[TREBLE]— Use to adjust high-frequency sounds. The center indicates the standard (flat) position. When the control is rotated to the right, high-frequency sounds are augmented; when rotated to the left, high-frequency sounds are attenuated.

LOUDNESS switch/indicator

Use this switch when you wish to listen at low volume. Normally, leave it OFF.

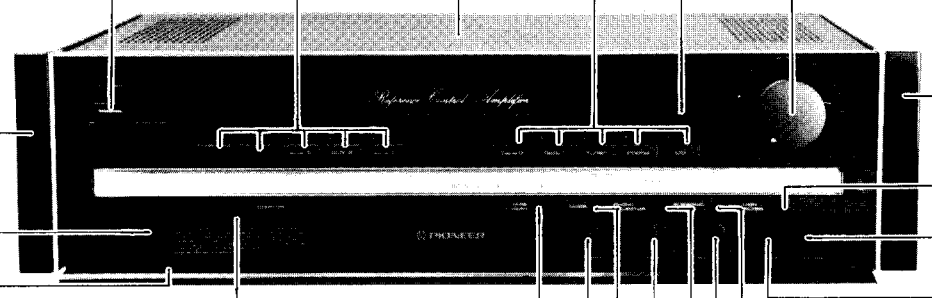
When you turn this switch ON (indicator lights), the bass and treble will be accentuated, providing dynamic reproduction even at low volume.

3. PARTS LOCATION

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by " ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Front Panel View with Front Panel Removed



Bonnet case
ANE1007

Function knob assembly C
AAD1015

Knob (POWER)
AAD1012

Side board (L)
AMS1001

Front panel
ANB1005

Door Panel
AAN1010

Knob (ADAPTOR)
AAY-157

Knob (TAPE COPY)
AAY-157

Knob (BASS)
AAB1001

Knob (MODE)
AAY-157

Fuction knob assembly A
AAD1014

Knob (MUTE)
AAD1016

Knob (Volume)
AAF1012

Side board (R)
AMS1002

Knob (HIGH FILTER)
AAY-157

Knob (LOUDNESS)
AAD1017

Knob (TONE)
AAD1017

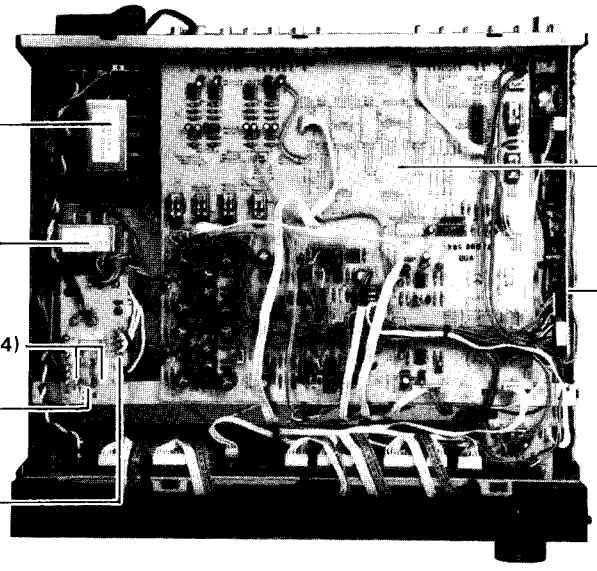
Knob (SUBSONIC FILTER)
AAY-157

Knob (BALANCE)
AAB1001

Knob (PHONO SELECTOR)
AAY-157

Knob (TREBLE)
AAB1001

Top View with Bonnet Case Removed



⚠ ★ Power transformer
(220V/240V: T3)
ATT1008

⚠ ★ Power transformer
(220V/240V: T1, T2)
ATT1007

⚠ ★★ Fuse (T500mA, FU1, FU4)
AEK-401

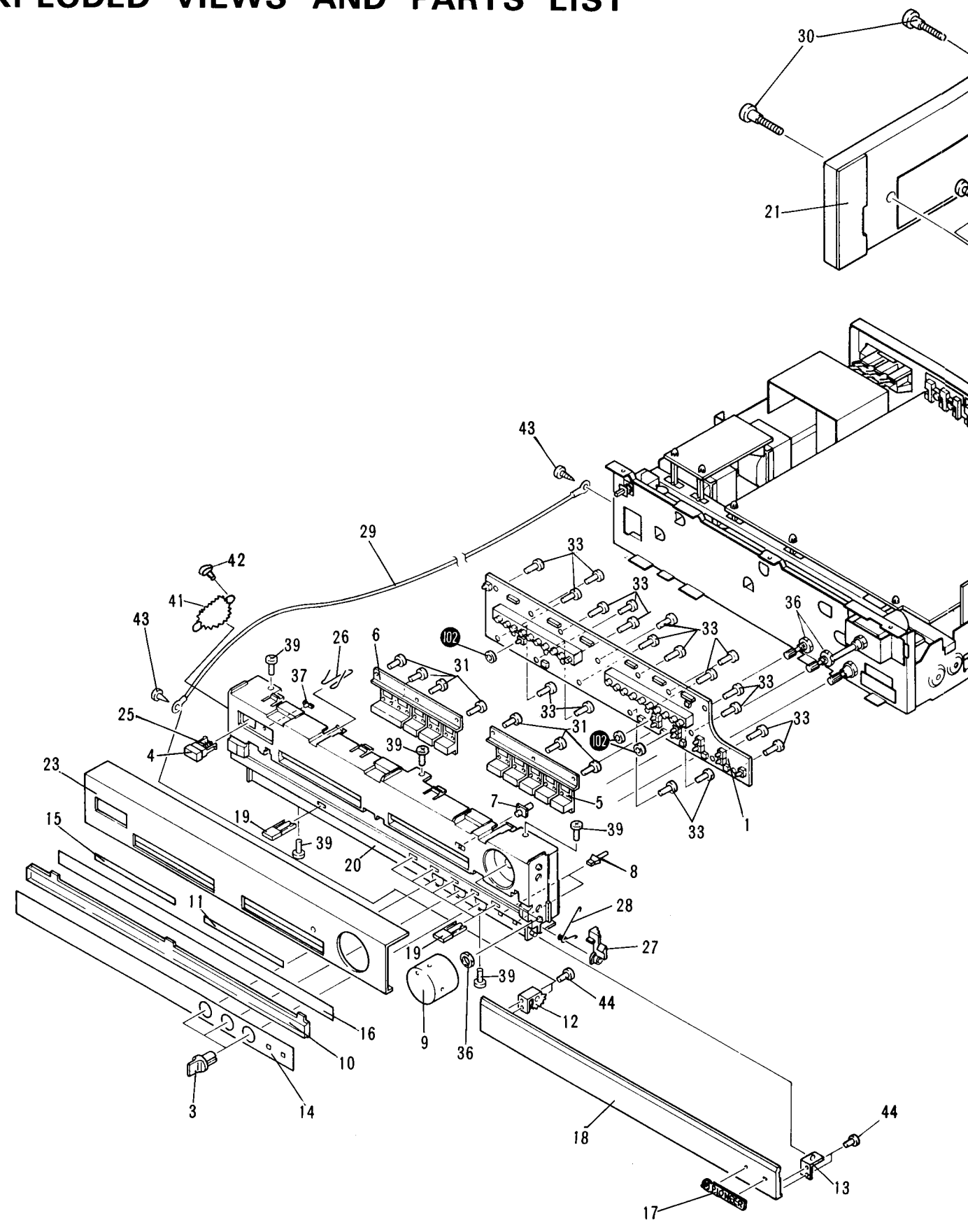
⚠ ★★ Fuse (T1A, FU3)
AEK-402

Fuse assembly

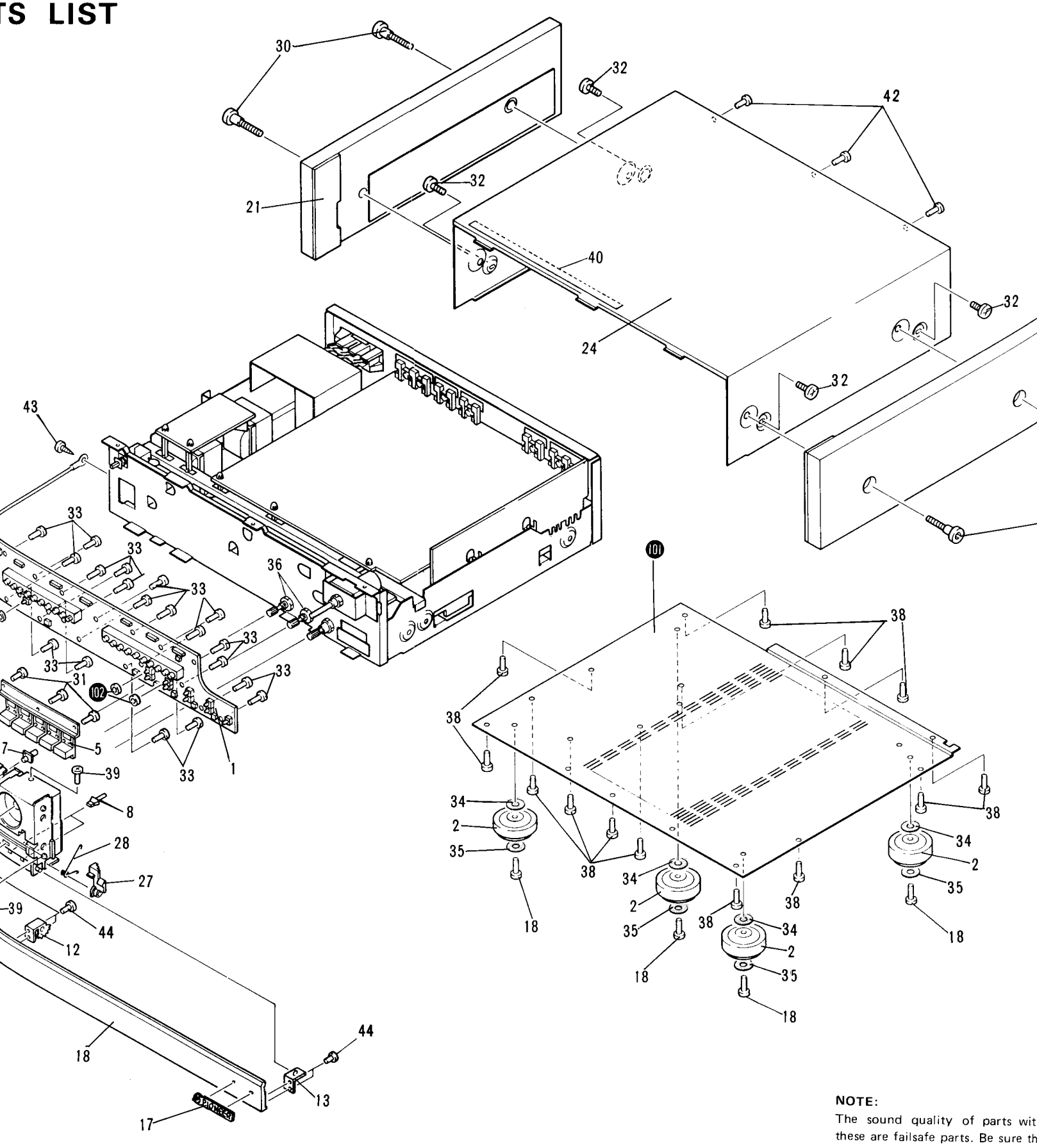
AF Assembly
AWZ1044

Equalizer assembly
AWF1002

4. EXPLODED VIEWS AND PARTS LIST

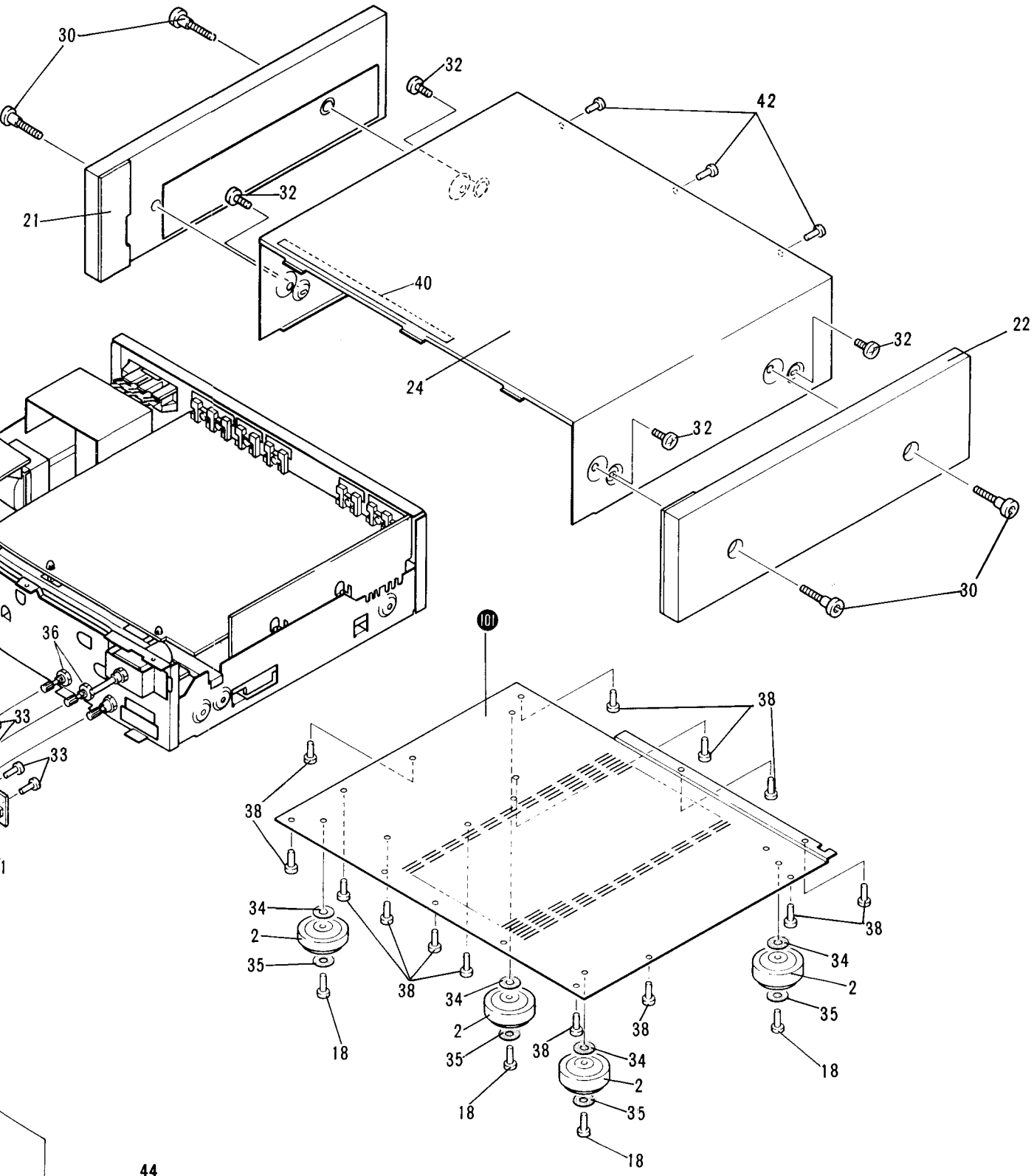


TS LIST



NOTE:

The sound quality of parts wit
these are failsafe parts. Be sure th
positions prescribed.



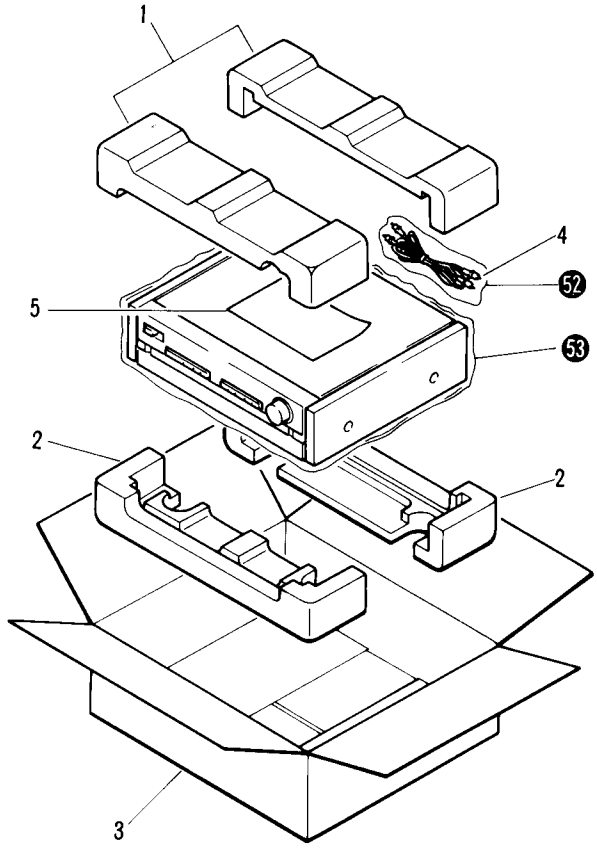
NOTE:
The sound quality of parts with the [redacted] mark denotes that these are failsafe parts. Be sure that the designated parts are in the positions prescribed.

n	Mark	No.	Part No.	Description
bly		101		. . . . .
ply assembly		102		VR A Assembly
sembly		103		VR C Assembly
		104		SW B Assembly
0.01/400V)		105		Fuse assembly
nsformer (T1, T2)				
0V)		106		Terminal (EARTH)
nsformer		107		Transformer frame
/240V)		108		Right frame
		109		Rear panel
t (AC OUTLET)		110		Panel stay
OWER, S1)				
4, T500mA)		111		P.C.B. Holder
		112		Transformer frame
, FU2, FU3, T1A)		113		Volume holder
ef		114		Center frame
cord		115		P.C.B. Holder-C
. .				
		116		Shield cover
		117		Damper plate A
assembly		118		Damper plate B
		119		P.C.B. Holder-B
		120		Cushion rubber
. .		121		Cushion rubber
		122		Capacitor cover
		123		P.C.B. Support
. .		124		P.C.B. Support
		125		Pin grommet
		126		Cushion
		127		Lavel
		128		Terminal
e				

5. PACKING

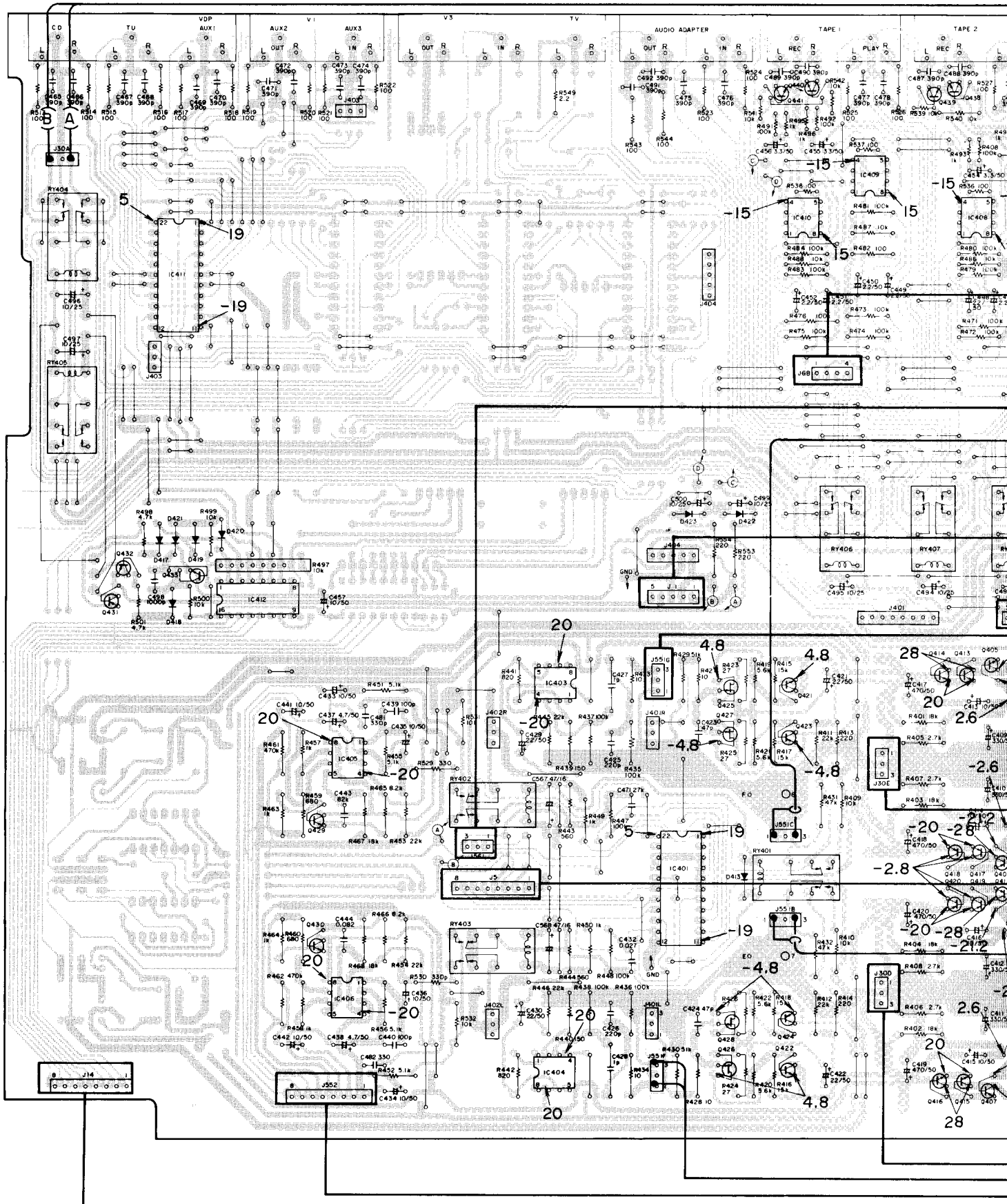
Parts List of Packing

Mark	No.	Part No.	Description
	1	AHA1003	Top pad
	2	AHA1004	Bottom pad
	3	ADE1012	Packing case
	4	ADE-081	Connection cord with plug
	5	ARC1003	Operating instruction
	51		. . . . .
	52		Vinyl bag
	53		Seat

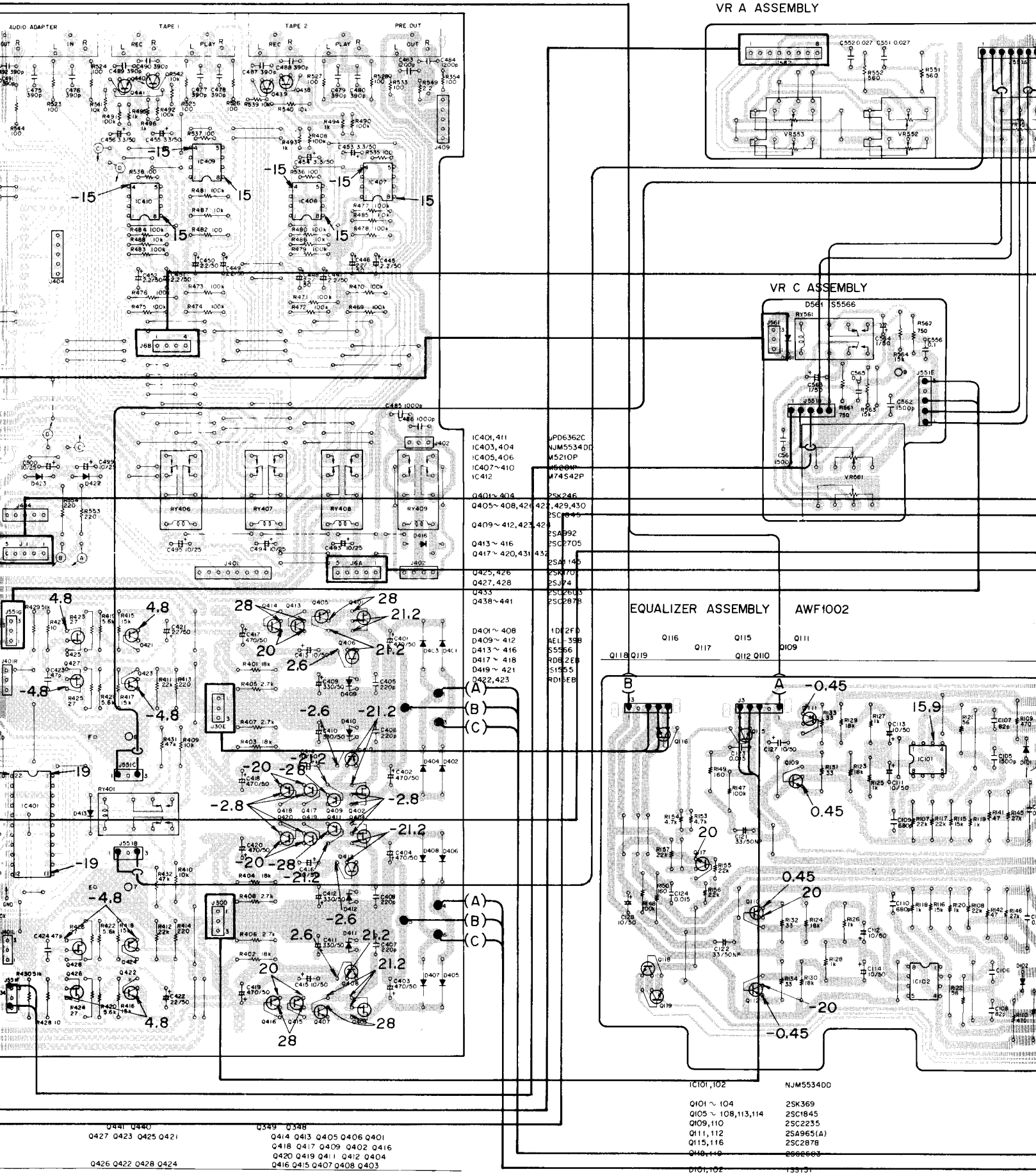


6. P.C.BOARDS CONNECTION DIAGRAM

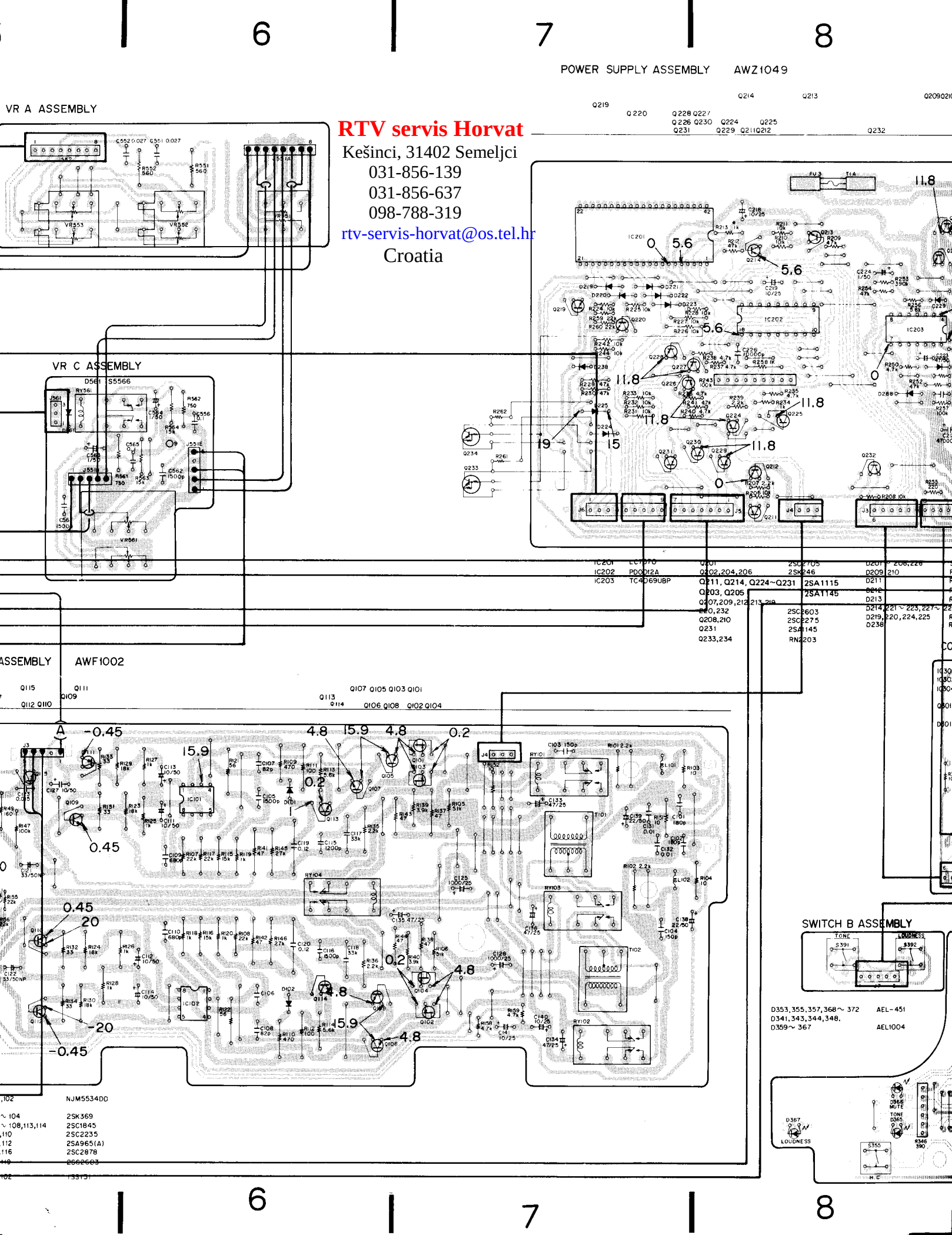
AF ASSEMBLY AWZ1044

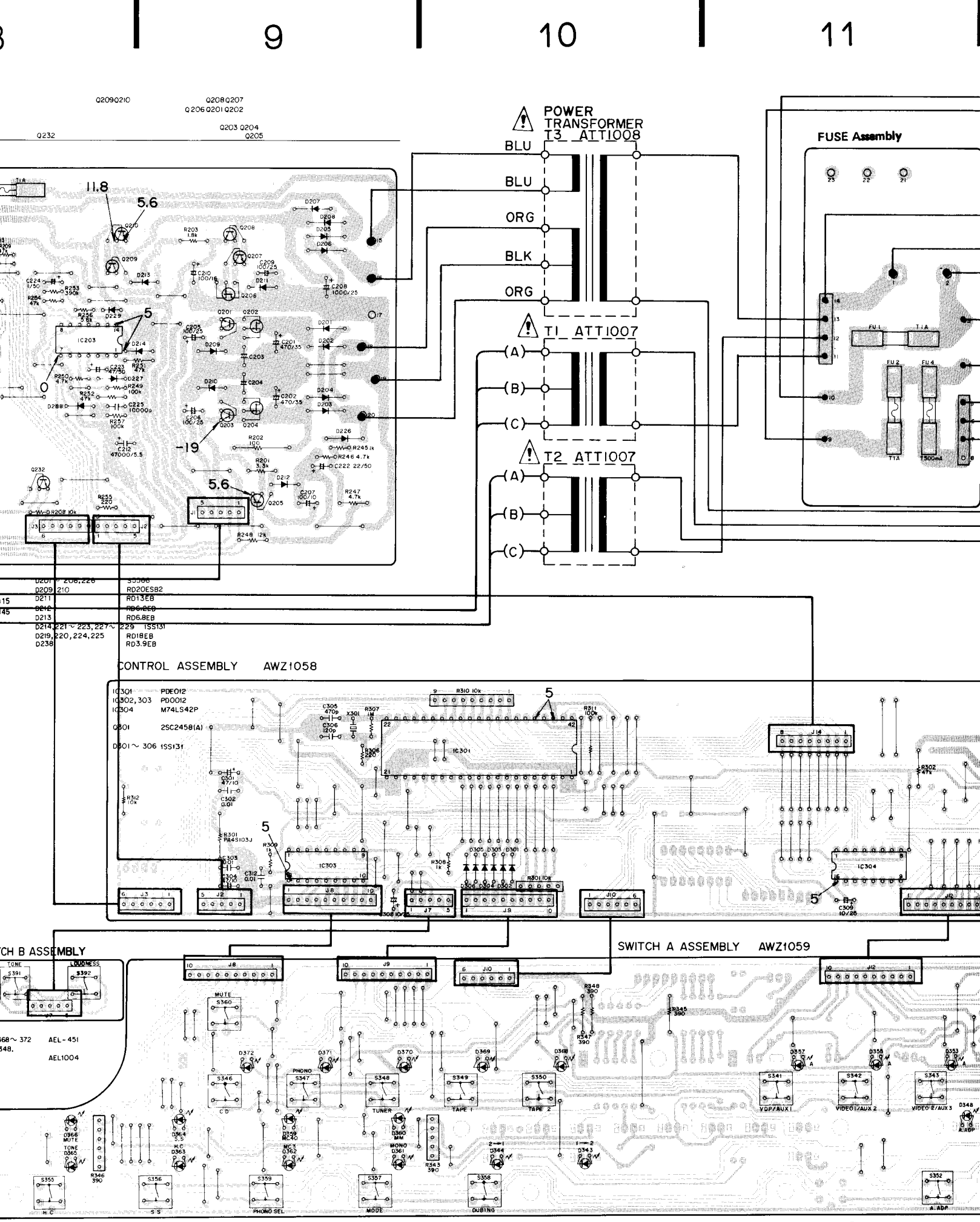


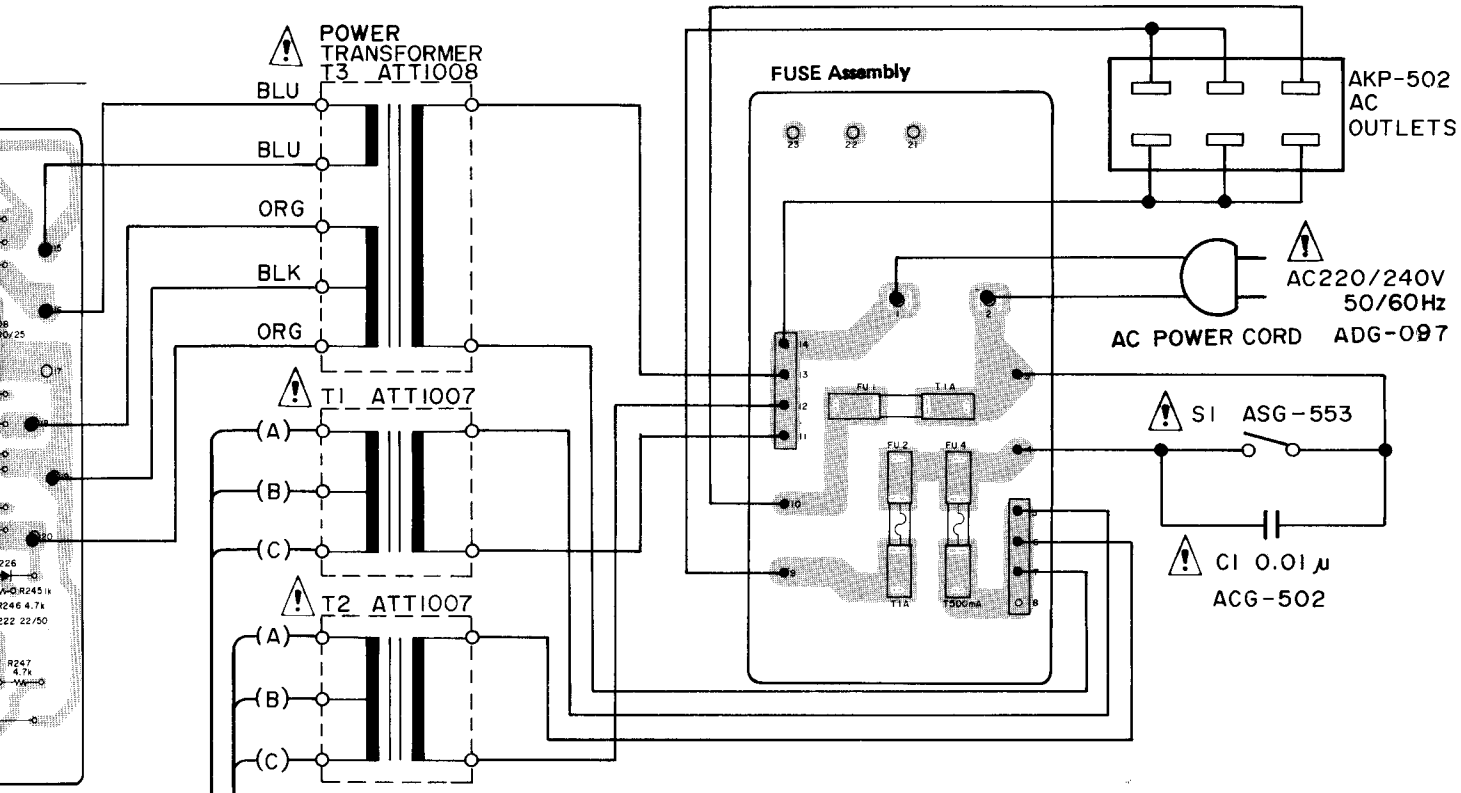
M

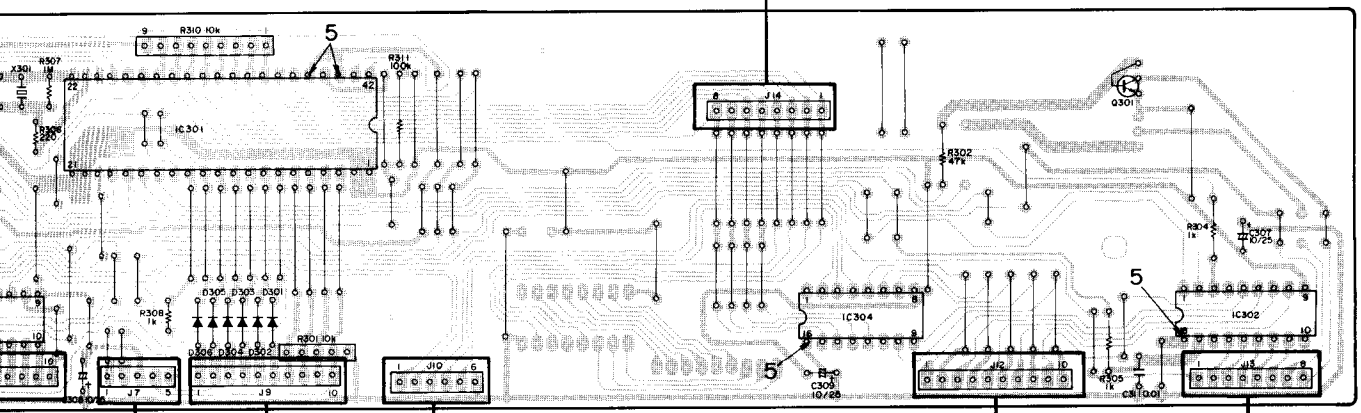

VR A ASSEMBLY
VR C ASSEMBLY
EQUALIZER ASSEMBLY AWF1002
AUDIO ADAPTER
TAPE 1
TAPE 2
PRE OUT
IC401,411 μPD6362C
IC403,404 NJM5534DD
IC405,406 M5210P
IC407~410 M5208P
IC412 M74S42P
Q401~404 2SK246
Q405~408,421,422,429,430 2SC1845
Q409~412,423,424 2SA992
Q413~416 2SC2705
Q417~420,431,432 2SA1145
Q425,426 2SK170
Q427,428 2SJ74
Q433 2SC2603
Q438~441 2SC2878
D401~408 1D12FD
D409~412 AEL-398
D413~416 S5566
D417~418 RD8.2EB
D419~421 1S1555
D422,423 RD15EB
IC101,102 NJM5534DD
Q101~104 2SK369
Q105~108,113,114 2SC1845
Q109,110 2SC2235
Q111,112 2SA965(A)
Q115,116 2SC2878
Q118,119 2SC2603
D101,102 1S1555
Q441 Q440
Q427 Q423 Q425 Q421
Q426 Q422 Q428 Q424
Q349 Q348
Q414 Q413 Q405 Q406 Q401
Q418 Q417 Q409 Q402 Q416
Q420 Q419 Q411 Q412 Q404
Q416 Q415 Q407 Q408 Q403

RTV servis Horvat
Kešinci, 31402 Semeljci
031-856-139
031-856-637
098-788-319
rtv-servis-horvat@os.tel.hr
Croatia

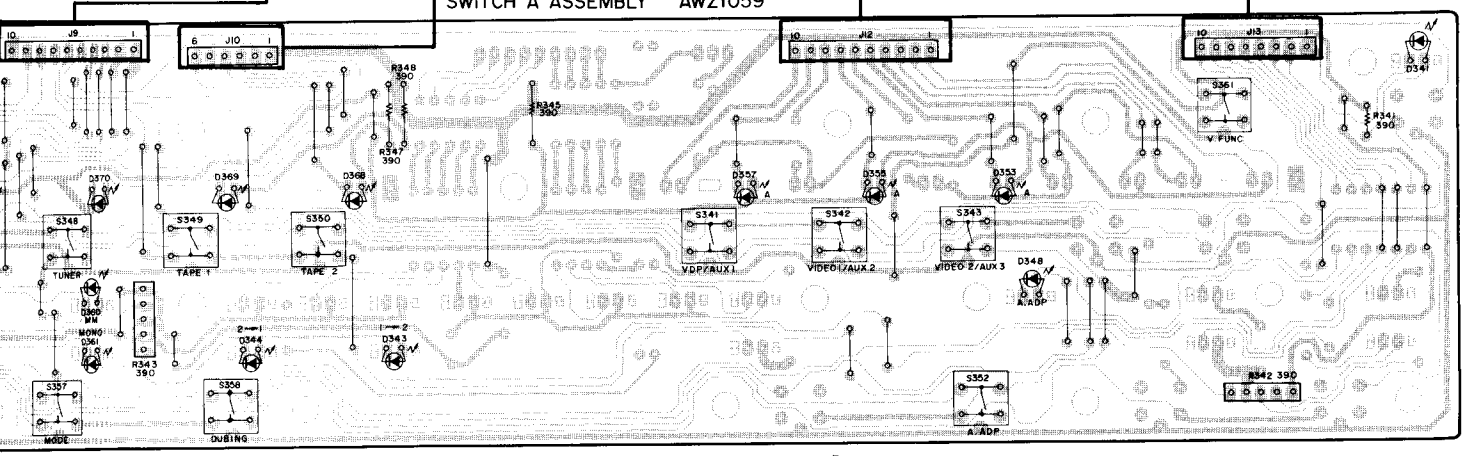



POWER TRANSFORMER T3 ATT1008
BLU
BLU
ORG
BLK
ORG
T1 ATT1007
(A)
(B)
(C)
T2 ATT1007
(A)
(B)
(C)
FUSE Assembly
CONTROL ASSEMBLY AWZ1058
SWITCH A ASSEMBLY AWZ1059
SWITCH B ASSEMBLY
AEL-451
AEL1004

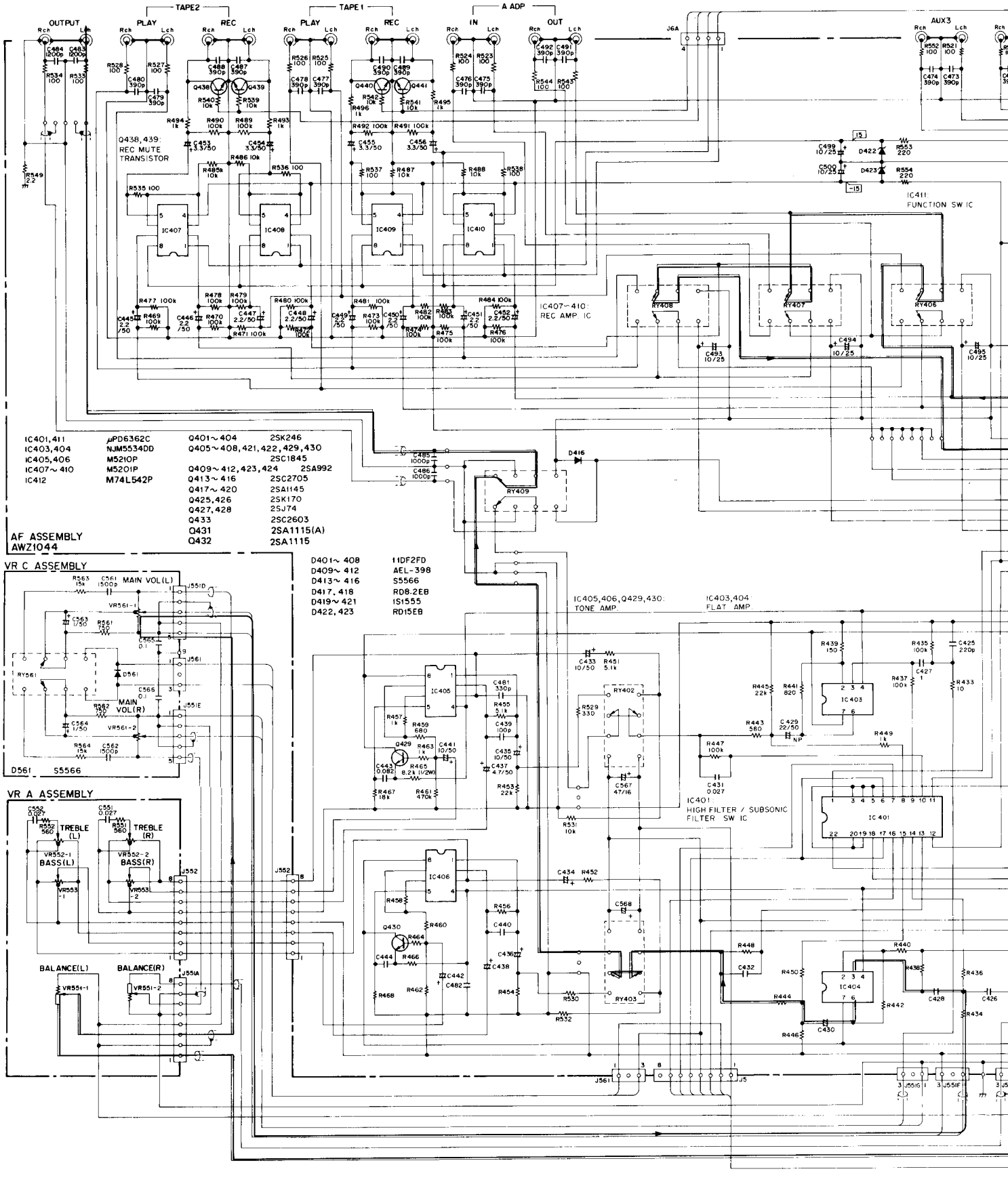


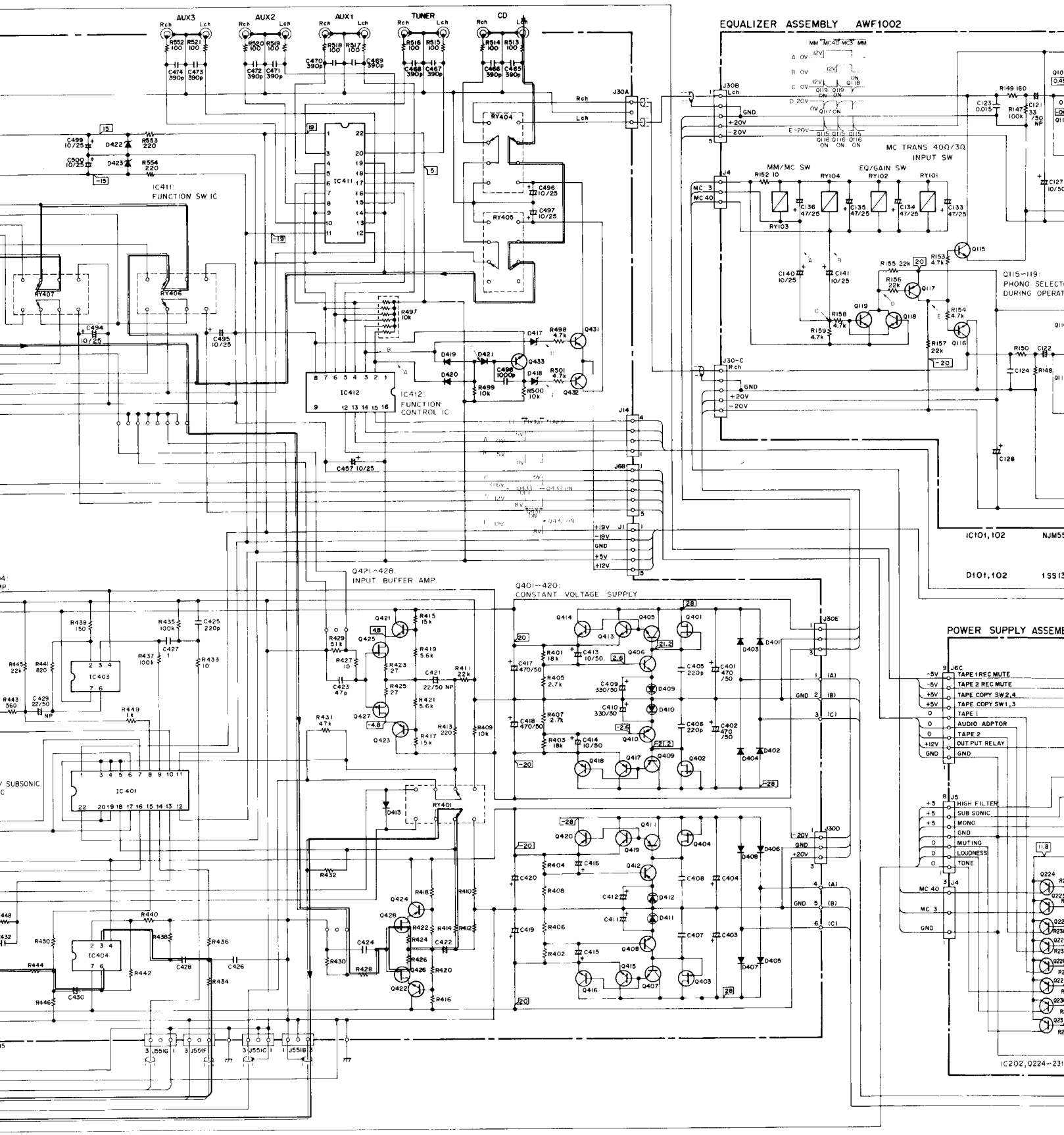


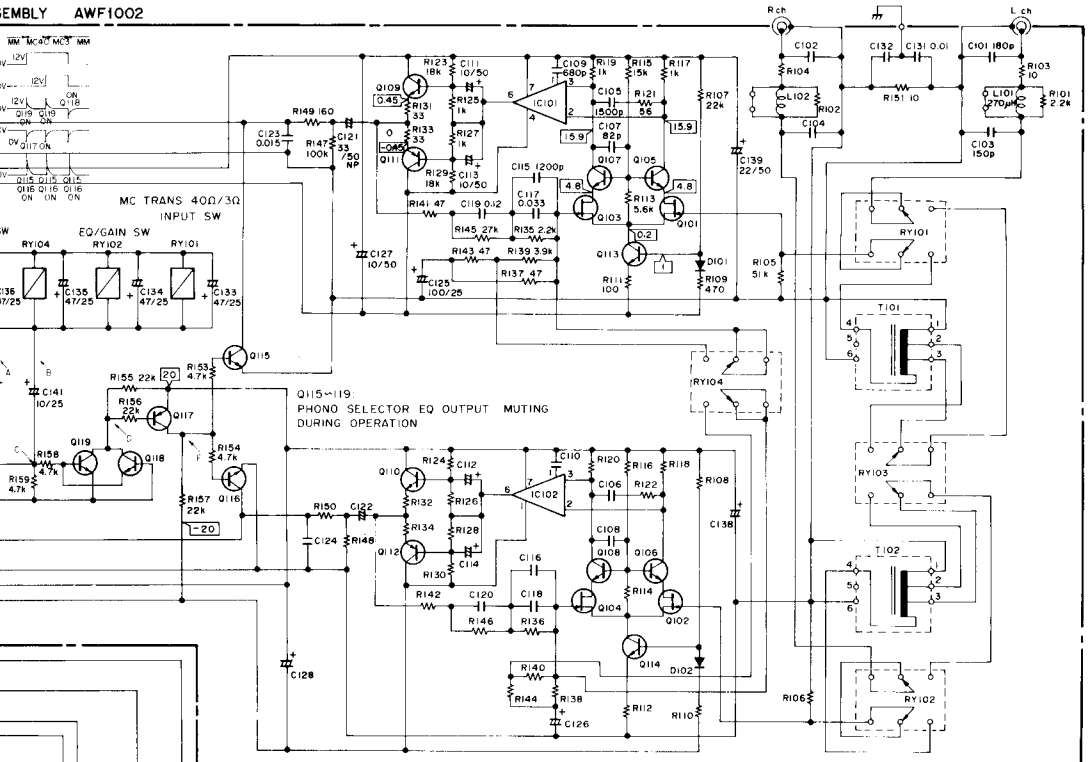
SWITCH A ASSEMBLY AWZ1059



7. SCHEMATIC DIAGRAM




EQUALIZER ASSEMBLY AWF1002
AUX3
AUX2
AUX1
TUNER
CD
Rch
Lch
IC411: FUNCTION SW IC
IC412: FUNCTION CONTROL IC
MM/MC SW
EQ/GAIN SW
MC TRANS 40Ω/3Ω INPUT SW
Q115~119: PHONO SELECT DURING OPERAT
Q421~428: INPUT BUFFER AMP
Q401~420: CONSTANT VOLTAGE SUPPLY
POWER SUPPLY ASSEME
IC101,102 NJM55
D101,102 1SS1
IC202,Q224~231
TAPE 1REC MUTE
TAPE 2 REC MUTE
TAPE COPY SW2,4
TAPE COPY SW1,3
TAPE 1
AUDIO ADPTOR
TAPE 2
OUT PUT RELAY
HIGH FILTER
SUB SONIC
MONO
MUTING
LOUDNESS
TONE

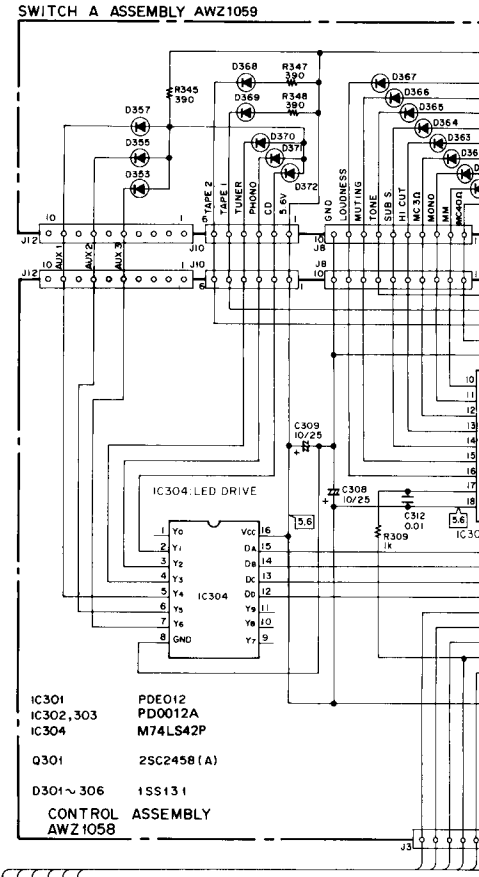


IC101,102 NJM5534DD

Q101~Q104 2SK369
Q105~Q108, 113, 114 2SC2235(A)
Q109,110 2SC2235
Q111,112 2SA965(A)
Q115,116 2SC2878
Q117 2SA1115
Q118,119 2SC2603

D101,102 1SS131

SWITCH A ASSEMBLY AWZ1059



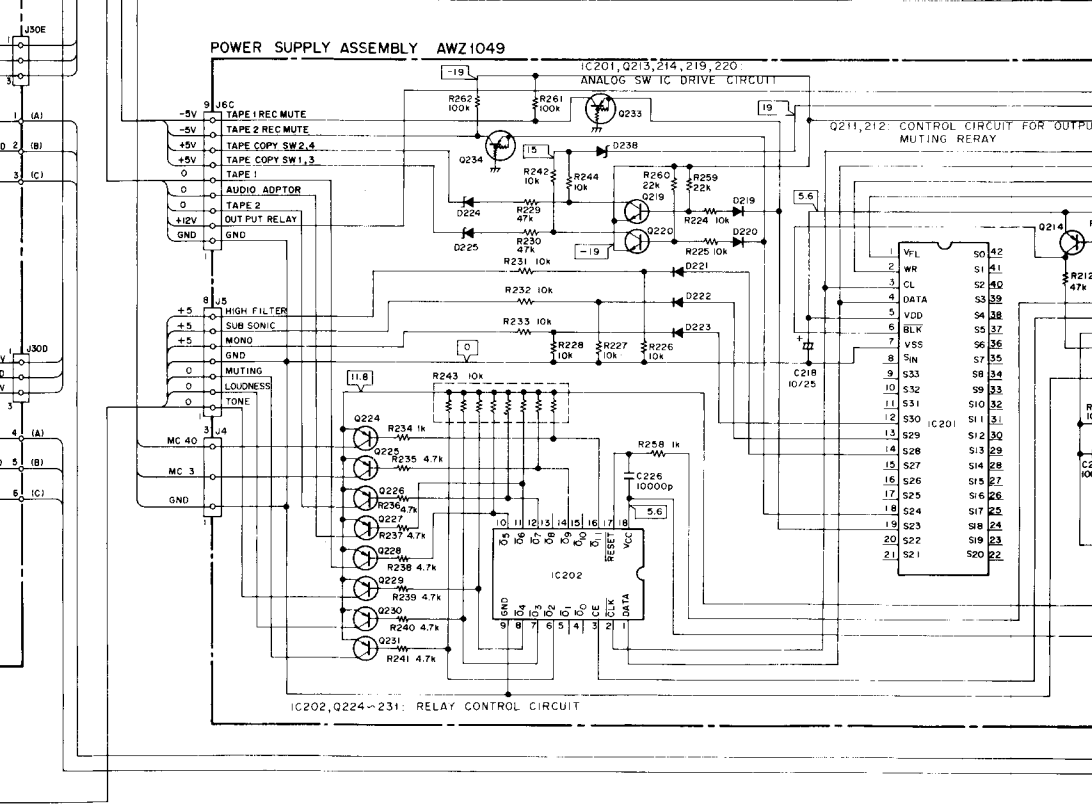
IC301 PDE012
IC302,303 PD0012A
IC304 M74LS42P

Q301 2SC2458(A)

D301~306 1SS131

CONTROL ASSEMBLY AWZ1058

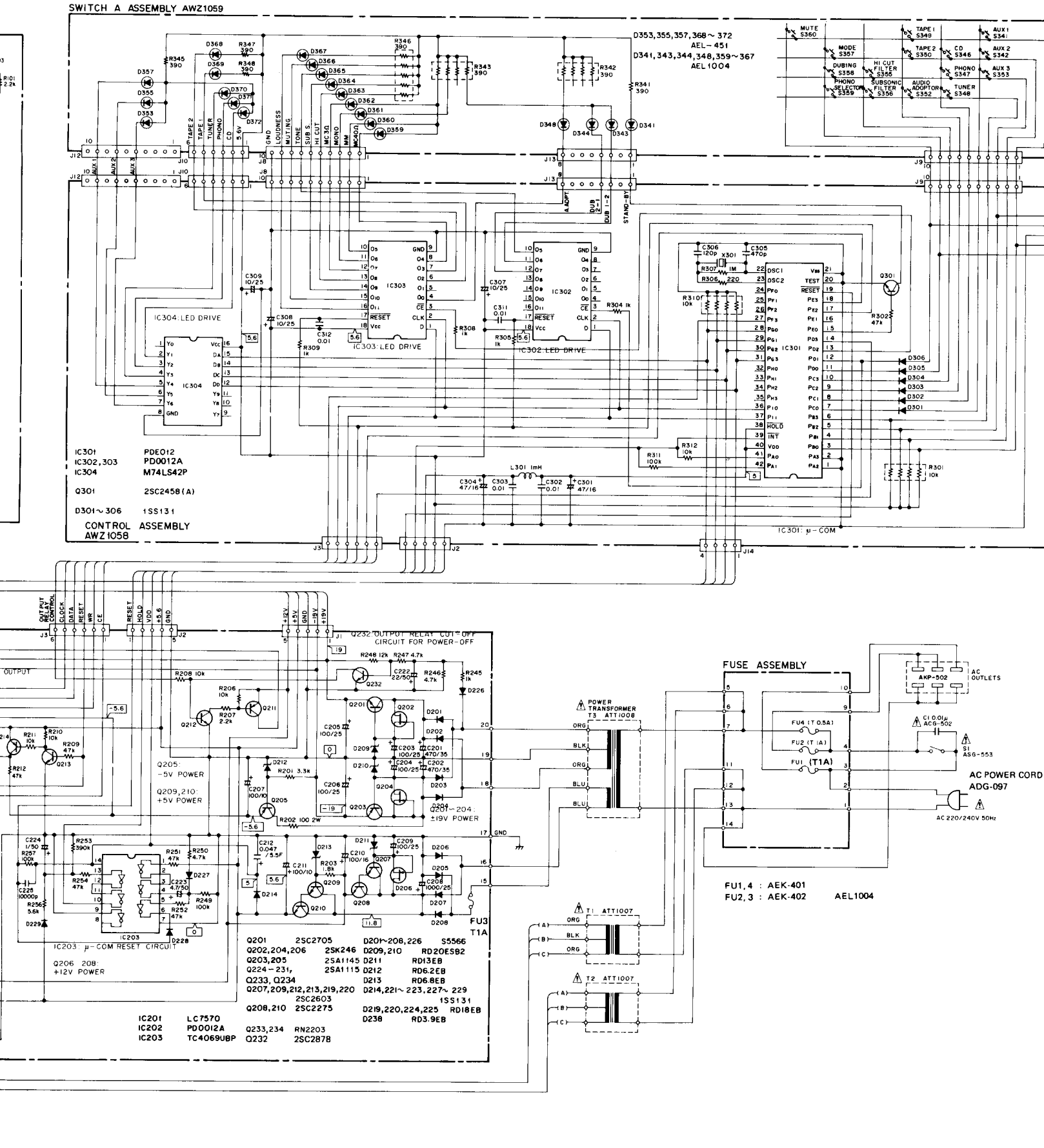
POWER SUPPLY ASSEMBLY AWZ1049



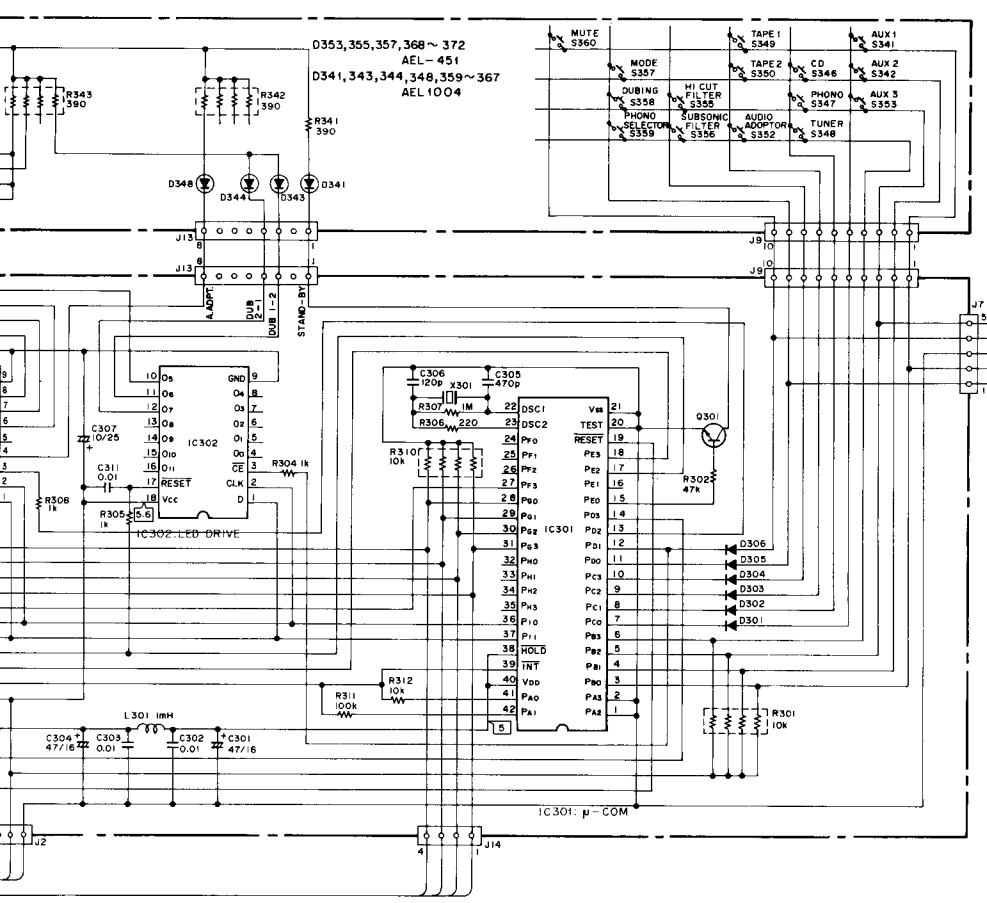
IC201 LC7570
IC202 PD0012A
IC203 TC4069UBP

Q201 2SC2705
Q202,204,206 2SK246
Q203,205 2SA1145
Q224~231, 2SA1115
Q233, Q234
Q207,209,212,213,219,220 2SC2603
Q208,210 2SC2275
Q233,234 RN2203
Q232 2SC2878

NOTE:
The ind
Other
listed in



NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



1. RESISTORS:
Indicated in Ω, ¼W, ⅛W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10% (M); ±20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT:
DC voltage (V) at no input signal
Value in ( ) is DC voltage at rated power.
mA : DC current at no input signal

4. OTHERS
: Signal route.
: Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
* marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

SWITCH & RELAY

AF ASSEMBLY		
RY401	MUTING	ON—OFF
RY402,403	TONE	ON—OFF
RY404	FUNCTION	CD—PHONO
RY405	FUNCTION	ON—OFF
RY406	TAPE 1	ON—OFF
RY407	ADAPTOR	ON—OFF
RY408	TAPE 2	ON—OFF
RY409	OUTPUT	ON—OFF
RY561	LOUDNESS	ON—OFF

EQUALIZER ASSEMBLY		
RY101		MM—MC
RY102		MM—MC
RY103		MC40—MC3
RY104		MM—MC

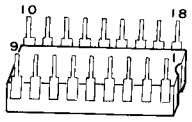
OTHERS		
S1	POWER	ON—OFF

The underlined indicates the switch position.

RTV servis Horvat
Kešinci, 31402 Semeljci
031-856-139
031-856-637
098-788-319
rtv-servis-horvat@os.tel.hr
Croatia

External Appearances of Transistor and ICs

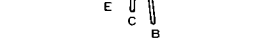
PD0012A



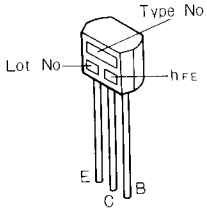
M74LS42P

2SC2458(A)

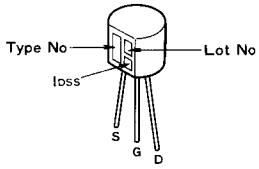
2SC2705
2SA1145
2SC2878



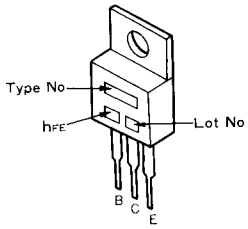
2SC2603
2SA1115



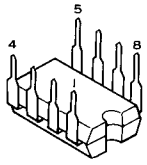
2SK246



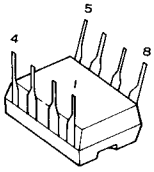
2SC2275A



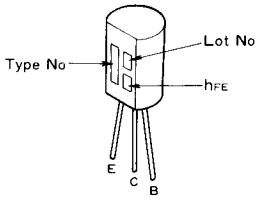
M5210P



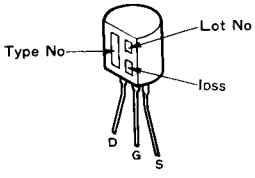
M5201P



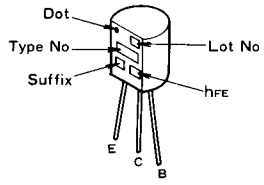
2SC1845
2SA992



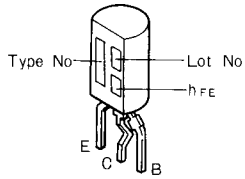
2SK170
2SJ74



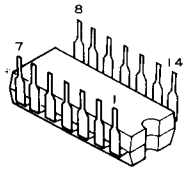
2SK369



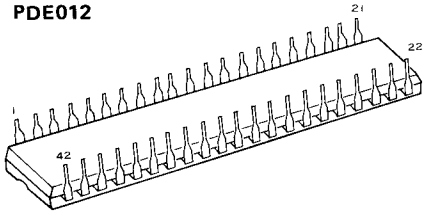
2SC2235(A)
2SA965(A)



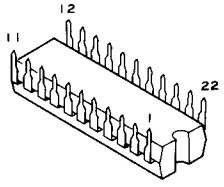
TC4069UBP



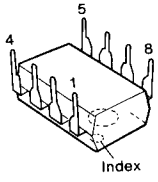
PDE012



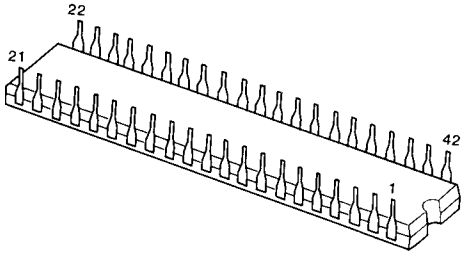
UPD6362C

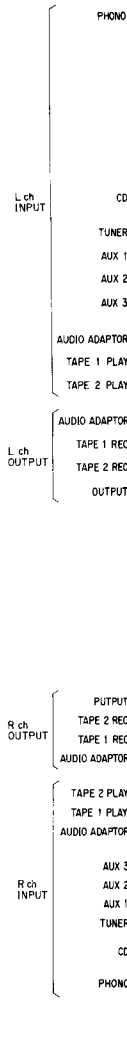


NJM5534DD

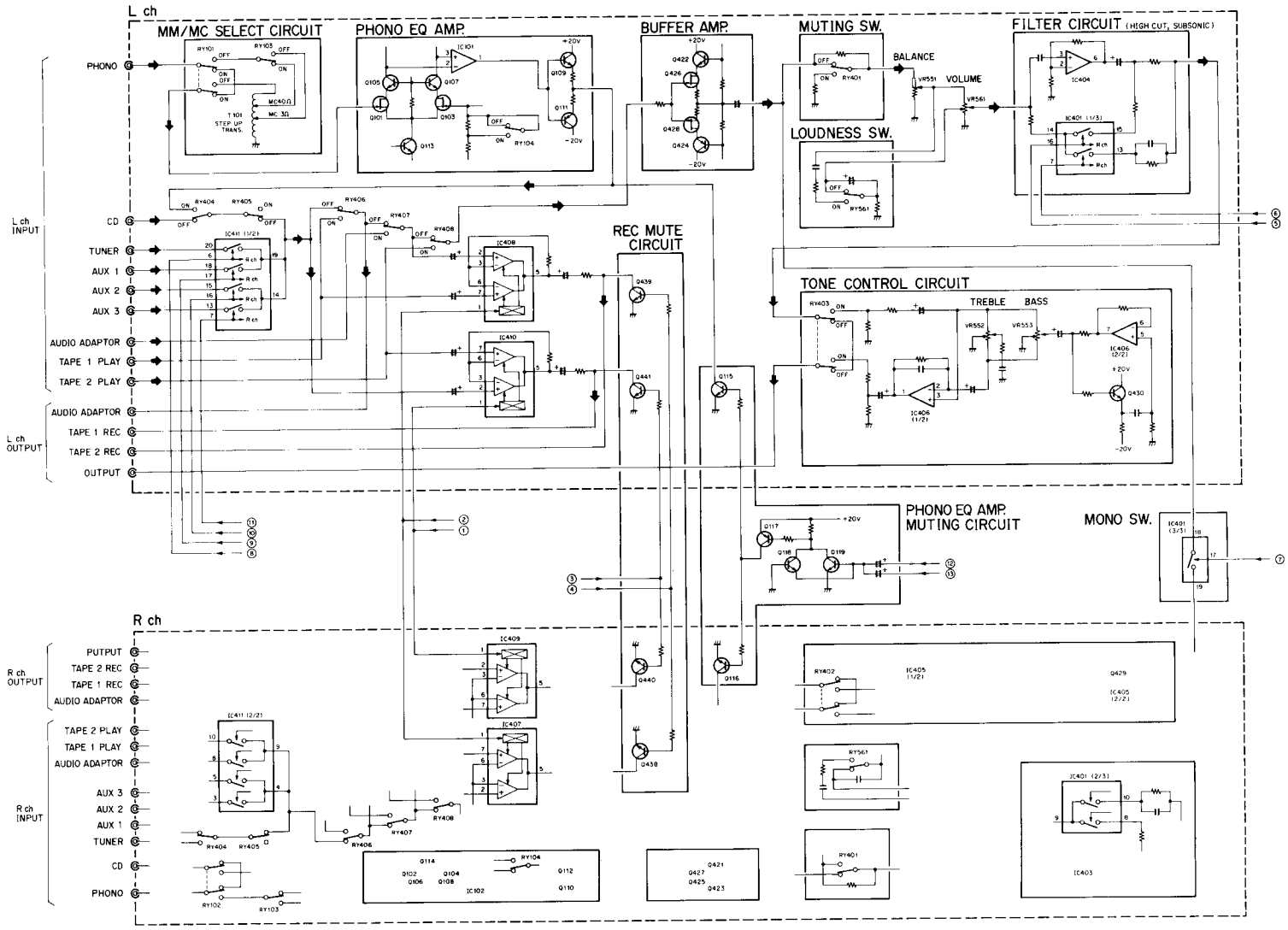


LC7570





8. BLOCK DIAGRAM



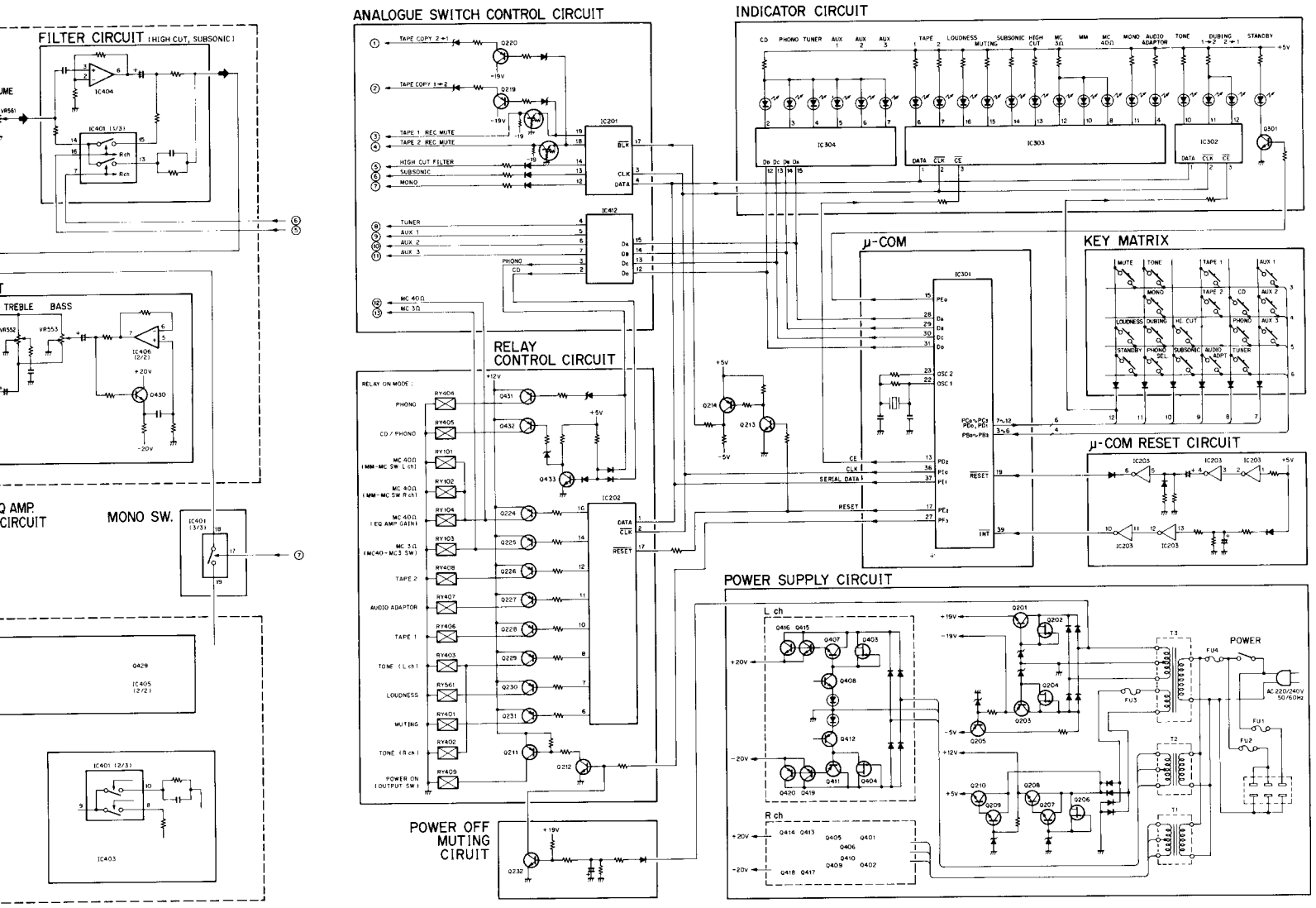
Level Diagram (Frequency

MC Tra

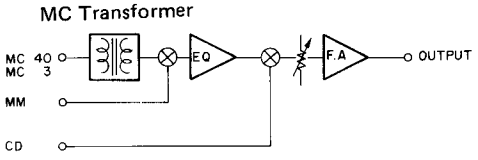
MC 40 O
MC 3

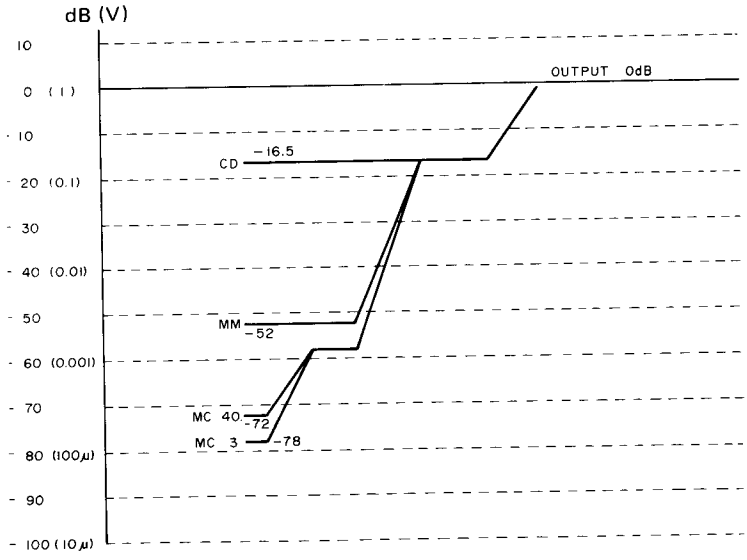
MM O

CD O



Level Diagram (Frequency: 1kHz. Voltage level display for each stage)





9. CIRCUIT DESCRIPTIONS

9.1 BLOCK DIAGRAM EXPLANATION

- A step up transformer is installed in the previous stage as the EQ amp section for MC response.
- The INPUT SELECTOR enables recording on TAPE 2 of signals routed through the AUDIO ADAPTER between TAPES 1 and 2.
- Due to aciton of the BUFFER amp which receives signals at high impedance and outputs at low impedance there is no effect transmitted to the connecting BAL VOL. MAIN VOL of the next stage.
- MUTING is fixed at -20dB (Resistance divider system).
- The FLAT amp has an input sensitivity of 150 mV and output GAIN is 16.5dB. The amp is a DC couple type DC amp (output is C couple).
- The SUBSONIC and HIGH FILTER are each set for 6dB/OCT according to the CR. f_C is 10 Hz and 10kHz respectively.
- TONE has a 100Hz, 10kHz turnover frequency. It is a positive phase amp of 0dB GAIN.
- OUTPUT MUTING switches OFF the output at the time of power ON/OFF.

9.2 EQ AMP SECTION

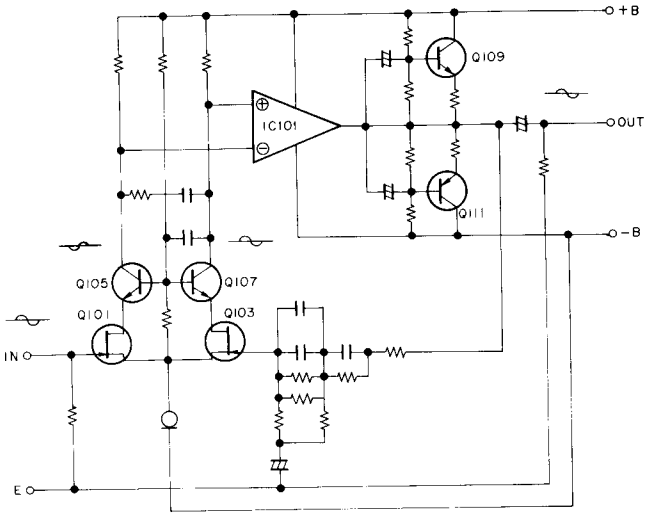


Fig. 9-1 EQ Amp Section

The EQ amp section comprises the differential FET input section, the OP amp voltage amplifier section, the SEPP output section and the feedback circuit (RIAA) of CR.

The FET differential input section receives signals directly by DC couple. Reverse output from the input section is transmitted to the reverse input of the OP amp. The non-reversible output is applied to non-reverse input, amplified and applied to the SEPP output section. The output stage contains class A circuitry to drive the low impedance feedback circuit and give low distortion output.

9.3 FLAT AMP.

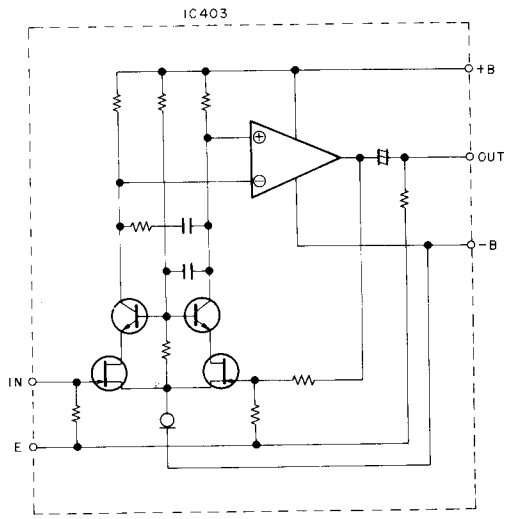


Fig. 9-2 FLAT Amp Section

This is basically the same as the EQ amp. Differences are due only to a non-SEPP output section and the resistance of the feedback circuit. The resistance of the FLAT amp feedback circuit isn't of the same low value as for the EQ amp so it has sufficient drive for the OP amp and gives low distortion. The FLAT amp is a DC construction.

9.4 TONE AMP SECTION

The TONE amp section is the same as the A-150D.

10. IC DESCRIPTION

■ μPD6362C (C MOS) Electron Switch

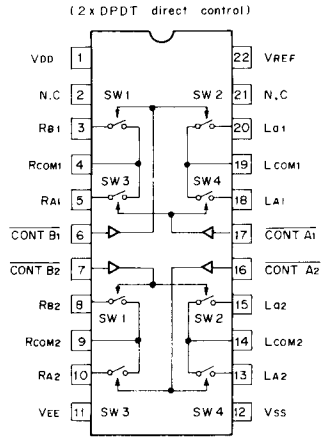


Fig.. 10-1 Micro μPD6362C Block diagram with pin distribution

μPD6362C Truth Value Chart

Control Input		SW1, SW2	SW3, SW4
$\overline{\text{CONT A}}$	H	–	OFF
	L	–	ON
$\overline{\text{CONT B}}$	H	OFF	–
	L	ON	–

(Note)

H : High level.
L : Low level.

■ NJM5534DD (Operation amp IC)

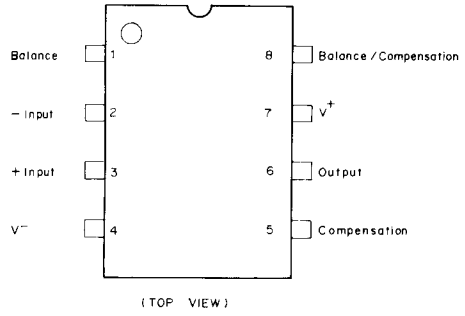
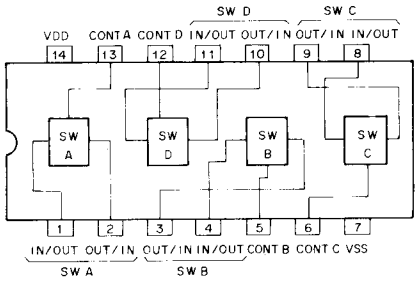


Fig. 10-2 Pin distribution chart for NJM5534DD

■ LC4966 (C MOS) Logic bilateral switch



Control input for the switch is ON with H levels.

Fig. 10-3 LC4966 Block diagram

■ LC7570 (C MOS) Display storage tube static driver

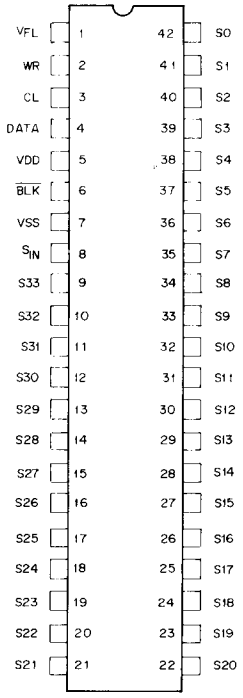


Fig. 10-4 LC7570 Pin distribution chart

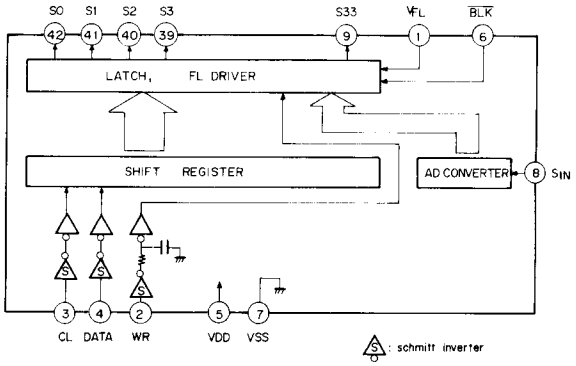


Fig. 10-5 LC7570 Block diagram

■ PD0012A
Output Expander

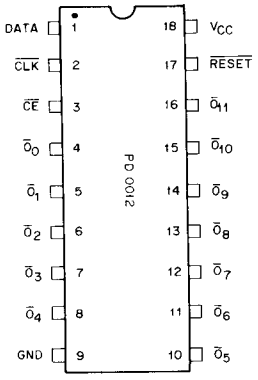


Fig. 10-6 PD0012A Pin distribution chart

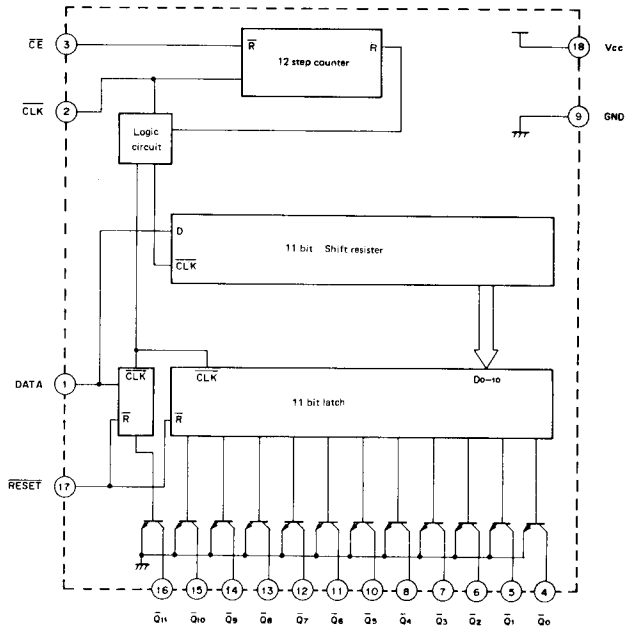


Fig. 10-7 PD0012A Block diagram

Pin names for PD0012A

No.	Code	Function	No.	Code	Function
1	DATA	Data Input	10	$\overline{O_5}$	Data Output
2	$\overline{CLK}$	Clock Input	11	$\overline{O_6}$	Data Output
3	$\overline{CE}$	Counter Reset Input	12	$\overline{O_7}$	Data Output
4	$\overline{O_0}$	Data Output	13	$\overline{O_8}$	Data Output
5	$\overline{O_1}$	Data Output	14	$\overline{O_9}$	Data Output
6	$\overline{O_2}$	Data Output	15	$\overline{O_{10}}$	Data Output
7	$\overline{O_3}$	Data Output	16	$\overline{O_{11}}$	Data Output
8	$\overline{O_4}$	Data Output	17	$\overline{RESET}$	Latch Reset Input
9	GND	Earth Terminal	18	Vcc	Power Terminal

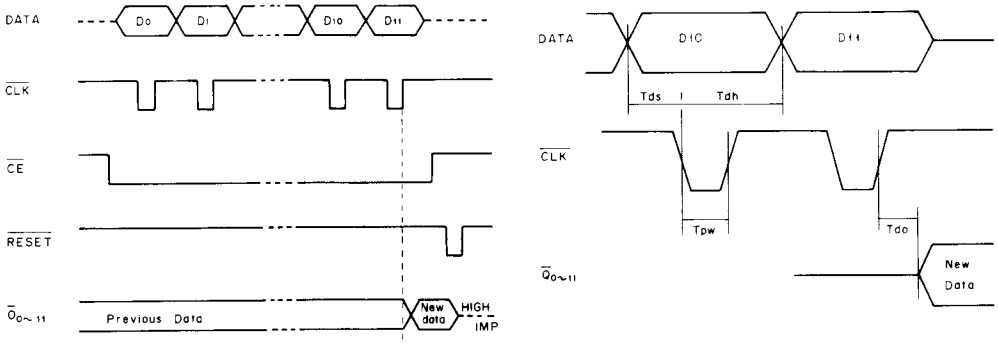


Fig. 10-8 Input data timing chart

11. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 *When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).*

560Ω	*56 × 10¹*	*561*	*RD¼PS [5][6][1] J*
47kΩ	*47 × 10³*	*473*	*RD¼PS [4][7][3] J*
0.5Ω	*0R5*		*RN2H [0][R][5] K*
1Ω	*010*		*RS1P [0][1][0] K*

  Ex. 2 *When there are 3 effective digits (such as in high precision metal film resistors).*

5.62kΩ	*562 × 10¹*	*5621*	*RN¼SR [5][6][2][1] F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by " ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Miscellaneous Parts

P.C. BOARD ASSEMBLIES

Mark	Symbol & Description	Part No.
	AF assembly	AWZ1044
	Control assembly	AWZ1058
	Switch A assembly	AWZ1059
	Power supply assembly	AWZ1049
	Equalizer assembly	AWF1002
	VR A assembly	Non supply
	VR C assembly	Non supply
	Fuse assembly	Non supply
	Switch B assembly	Non supply

OTHERS

Mark	Symbol & Description		Part No.
⚠	C1	Power capacitor (0.01μF/400V)	ACG-502
⚠ ★	T1, T2	Power transformer (220V/240V)	ATT1007
⚠ ★	T3	Power transformer (220V/240V)	ATT1008
		Plug (Terminal)	AKM-050
		AC socket 3P (AC OUTLETS)	AKP-502
⚠ ★★	S1	Push switch (POWER)	ASG-553
⚠ ★★	FU4	Fuse (T500mA)	AEK-401
⚠ ★★	FU1, FU2, FU3	Fuse (T1A)	AEK-402
⚠		AC Power cord	ADG-097

AF Assembly (AWZ1044)

SEMICONDUCTORS

Mark	Symbol & Description		Part No.
★★	IC401, IC411	E-SW IC	UPD6362C
★★	IC403, IC404		NJM5534DD
★★	IC405, IC406	OP-AMP IC	M5210P
★★	IC407–IC410	OP-AMP IC	M5201P
★★	IC412	Logic IC	M74LS42P
★★	Q401–Q404		2SK246
★★	Q405–Q408, Q421, Q422, Q429, Q430		2SC1845
★★	Q409–Q412, Q423, Q424		2SA992
★★	Q413–Q416		2SC2705
★★	Q417–Q420		2SA1145
★★	Q431, Q432		2SA1115(A)
★★	Q425, Q426		2SK170
★★	Q427, Q428		2SJ74
★★	Q433		2SC2603
★★	Q438–Q441		2SC2878
★★	Q432		2SA1115
★	D401–D408		11DF2FD
★	D409–D412	LED	AEL-398
★	D413, D416		S5566
★	D417, D418		RD8.2EB
★	D419–D421		1S1555
★	D422, D423		RD15EB

RELAIES

Mark	Symbol & Description	Part No.
★★	RY401–RY409 Relays MUTING, TONE, INPUT, CD/PHONO, TAPE1, ADAPTOR, TAPE2, OUTPUT	ASR1004

CAPACITORS

Mark	Symbol & Description	Part No.
	C401–C404, C417–C420	CEXA471M50
	C405–C408, C425, C426	CMA221J500
	C409–C412	CEXA331M50
	C413–C416, C433–C436, C441, C442	CEYA100M50
	C421, C422, C429, C430	CEYANP220M50
	C423, C424	CMA470J500
	C427, C428	ACE-217
	C431, C432	CQMXA273J100
	C437, C438	CEYA4R7M50
	C439, C440	CMA101J500
	C443, C444	CQMA823J50
	C445–C452	CEYA2R2M50
	C453–C456	CEYA3R3M50
	C457, C493–C497, C499, C500	CEAS100M25
	C465, C466	CQSXA391J160
	C467–C480, C487–C492	CKDYB391K50
	C481, C482	CKDYB331K50
	C483, C484	CQSXA122J160
	C498	CKDYB102K50
	C567, C568	CEAS470M16
	C485, C486	CQSXA102J160

RESISTORS

Note: When ordering resistors, convert the resistance value into code from, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
	R549	RD1/4PM2R2J
	R465, R466	RD1/2PM822J
	R469–R496, R498–R501, R535–R542	RD1/8PM□□□J
	R497 Resistor array	RA6S103J
	R553, R554	RS1LMF221J
	R513–R534, R544	RDR1/4PM□□□J
	Other resistors	RDR1/4PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	Terminal 4P (ADAPTOR, TAPE1, CD, TUNER)	AKB-115
	Terminal 6P (TAPE2, OUTPUT)	AKB1002
	Terminal 6P (AUX1, AUX2, AUX3)	AKB1005

Control Assembly (AWZ1058)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC301	PDE012
★★	IC302, IC303	PD0012A
★★	IC304	M74LS42P
★★	Q301	2SC2458(A)
★	D301–D306	1SS131

COIL

Mark	Symbol & Description	Part No.
	L301 (1mH)	ATH-098

CAPACITORS

Mark	Symbol & Description	Part No.
	C301, C304	CEANL470M16
	C302, C303	CKDYB103K50
	C305	CKDYB471K50
	C306	CCDCH121J50
	C307–C309	CEAS100M25
	C311, C312	CKDYF103Z50

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
	R301, R310 Resistor array	RA4S103J
	Other resistors	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
★	X301 Ceramic resonator	ASS-046

Switch A Assembly (AWZ1059)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D353, D355, D357, D368–D372 LED (AUX3, AUX2, AUX1, TAPE2, TAPE1, TUNER, PHONO, CD)	AEL-451
★	D341, D343, D344, D348, D359–D367 LED (MC, MM, MONO, HIGH CUT, FILTER, SUBSONIC FILTER, TONE, MUTE, LOUDNESS)	AEL1004

RELAYS SWITCHES

Mark	Symbol & Description	Part No.
★★	S341–S343, S346–S350, S352, S355–S360 Tact switch (INPUT, TAPE MONITOR, ADAPTOR, HIGH CUT FILTER, SUBSONIC FILTER, MODE, TAPE COPY, PHONO SEL, MUTE)	ASG-711

RESISTORS

Mark	Symbol & Description	Part No.
	R341, R345, R347, R348	RD1/8PM391J
	R342, R343 Resistor array	RA4S391J
	R346 Resistor array	RA5S391J

Switch B Assembly

SWITCHES

Mark	Symbol & Description	Part No.
★★	S391, S392 Tact switch (TONE, LOUDNESS)	ASG-711

Power Supply Assembly (AWZ1049)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC201 FL Static driver IC	LC7570
★★	IC202 Output expander IC	PD0012A
★★	IC203 Logic IC	TC4069UBP
★★	Q201	2SC2705
★★	Q202, Q204, Q206	2SK246
★★	Q211, Q214, Q224–Q231	2SA1115
★★	Q207, Q209, Q212, Q213, Q219, Q220	2SC2603
★★	Q208, Q210	2SC2275A
★★	Q203, Q205	2SA1145
★★	Q232	2SC2878
	Q233, Q234	RN2203
★	D201–D208, D226	S5566
★	D209, D210	RD20ESB2
★	D211	RD13EB
★	D212	RD6.2EB
★	D213	RD6.8EB
★	D214, D221–D223, D227–D229	1SS131
★	D219, D220, D224, D225	RD18EB
★	D238	RD3.9ESB

CAPACITORS

Mark	Symbol & Description	Part No.
	C201, C202	CEAS471M35
	C203–C206, C209	CEAS101M25
	C207, C211	CEAS101M10
	C208	CEAS102M25
	C210	CEAS101M16
	C212 (0.047F/5.5V)	ACH-902
	C218, C219	CEAS100M25
	C220, C221, C224	CEAS010M50
	C222	CEAS220M50
	C223	CEAS4R7M50
	C225, C226	CKDYF103Z50

RESISTORS

Note: When ordering resistors, convert the resistance value into code from, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
	R202	RS2LMF101J
	R243 Resistor array	RA8S103J
	Other resistors	RD1/8PM□□□J

EQUALIZER Assembly (AWF1002)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC101, IC102	NJM5534DD
★★	Q101–Q104	2SK369
★★	Q105–Q108, Q113, Q114	2SC1845
★★	Q109, Q110	2SC2235(A)
★★	Q111, Q112	2SA965(A)
★★	Q115, Q116	2SC2878
★★	Q117	2SA1115
★★	Q118, Q119	2SC2603
★	D101, D102	1SS131

COILS AND TRANSFORMERS

Mark	Symbol & Description	Part No.
	L101, L102 Inductor (270μH)	ATH-132
	T101, T102 MC Transformer	ATV1002

RELAYS

Mark	Symbol & Description	Part No.
★★	RY101–RY104 Relay (MM/MC, MC40Ω/3Ω)	ASR1004

CAPACITORS

Mark	Symbol & Description	Part No.
	C101, C102	CMA181J500
	C103, C104	CMA151J500
	C105, C106	CQSXA152J160
	C107, C108	CMA820J500
	C109, C110	CQSXA681J160
	C111–C114, C127, C128	CEYA100M50
	C115, C116	CQSXA122J160
	C117, C118 (0.03μF/100V)	ACE-094
	C119, C120 (0.12μF/100V)	ACE-095
	C121, C122	CEYANP330M50

Mark	Symbol & Description	Part No.
	C123, C124	CQMXA153J100
	C125, C126	CEXA102M25
	C131, C132	CKCYF103Z50
	C133–C136	CEAS470M25
	C138, C139	CEYA220M50
	C140, C141	CEAS100M25

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
	R135, R136–R138, R141, R142, R145, R146	RDR1/2PM□□□J
	R151, R152	RD1/4PM100J
	R153–R159	RD1/8PM□□□J
	Other resistors	RDR1/4PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	Terminal 2P (PHONO, PHONO DIRECT OUT)	AKB1001

VR A Assembly

CAPACITORS

Mark	Symbol & Description	Part No.
	C551, C552	CQMXA273J100

RESISTORS

Mark	Symbol & Description	Part No.
★	VR551 Variable resistor (BALANCE)	ACT1002
★	VR552, VR553 Variable resistor (BASS, TREBLE)	ACT1007
	R551, R552	RDR1/4PM561J

VR C Assembly

SEMICONDUCTOR

Mark	Symbol & Description	Part No.
★	D561	S5566

RELAY

Mark	Symbol & Description	Part No.
★★	RY561 Relay (LOUDNESS)	ASR1004

CAPACITORS

Mark	Symbol & Description	Part No.
	C561, C562	CQSXA152J160
	C563, C564	CEYA010M50
	C565, C566	CKCYX104M25

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
★	VR561 Variable resistor (VOLUME)	ACW1001
	R563, R564	RDR1/4PM153J
	R561, R562	RD1/4PM751J

FUSE Assembly

No replaceable parts available for Fuse assembly.

RTV servis Horvat
Kešinci, 31402 Semeljci
031-856-139
031-856-637
098-788-319
rtv-servis-horvat@os.tel.hr
Croatia