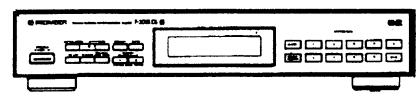
Service Manual

PIONEER®
The Art of Entertainment



ORDER NO.
ARP2868

The chapter 1 of this Service Manual will not be reprinted. On your additional orders, we may supply only the chapter 2. For the chapter 1, please make copies and attach to the chapter 2 at your side if necessary.

FM/AM DIGITAL-SYNTHESIZER TUNER

F-303RDS
F-303RDS-G

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model		Power Requirement	Remarks
	F-303RDS	F-303RDS-G		
HEXK	○	○	AC 220V - 230V	AC 240V, *
HBXK	○	Not used	AC 240V,	AC 220V - 230V, *
HEWZIXK	○	Not used	AC 220V - 230V	AC 240V, *
HZIXK	Not used	○	AC 220V - 230V	AC 240V, *

* : Alter the wiring of the Power-supply block at the primary winding of Power-transformer referring to the "Line Voltage Selection" described in Service Manual.

CONTENTS

CHAPTER 1

1.1 CONNECTIONS 1-2
1.2 PANEL FACILITIES 1-3
1.3 SPECIFICATIONS 1-5
1.4 BLOCK DIAGRAM 1-6
1.5 FL INFORMATION 1-7
1.6 PCB PARTS LIST 1-8
1.7 ADJUSTMENTS 1-10
1.8 PARTS LIST FOR EXPLODED AND PACKING 1-12

CHAPTER 2

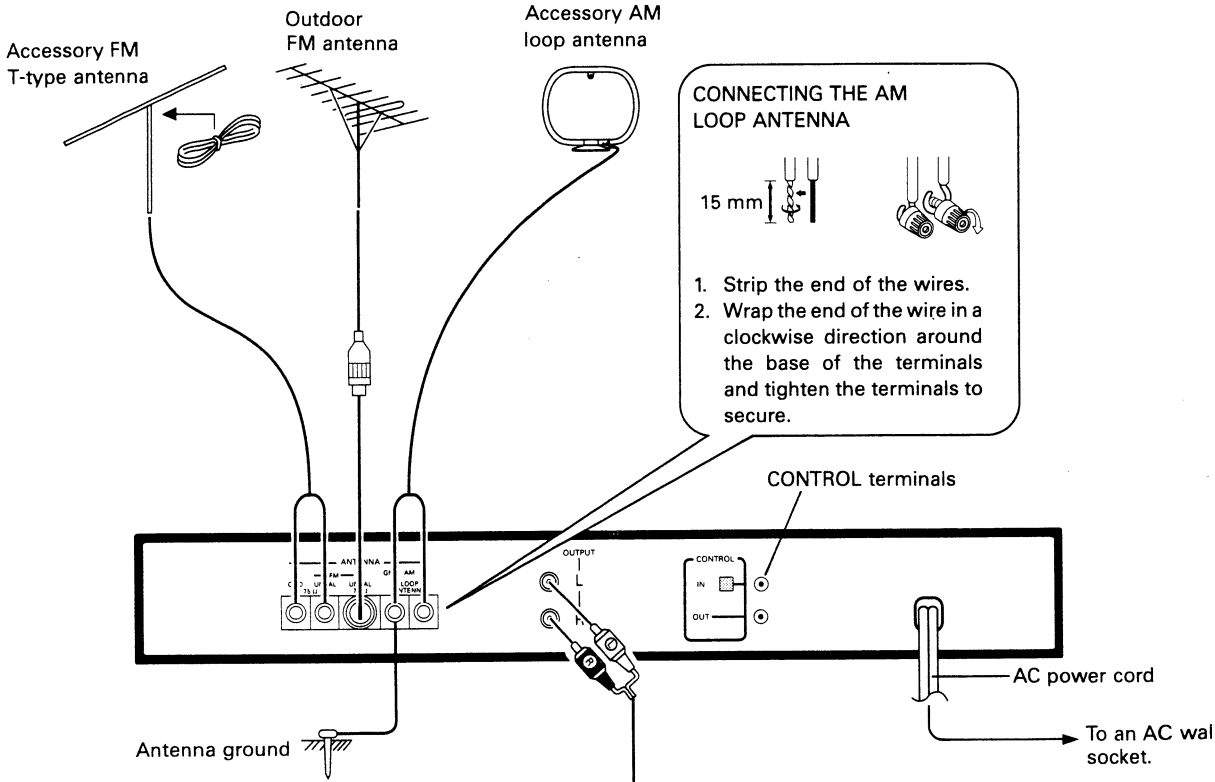
2.1 EXPLODED VIEWS AND PACKING 2-3
2.2 SCHEMATIC AND PCB CONNECTION DIAGRAMS 2-5

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.
PIONEER ELECTRONICS OF CANADA, INC. 300 Allstate Parkway Markham, Ontario L3R 0P2 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

O-FFN JULY 1994 Printed in Japan

CHAPTER 1

1.1 CONNECTIONS



Antenna ground

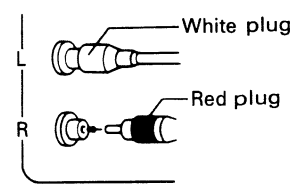
Although grounding is not always necessary for reception, it is recommended for protection against damage from lightning if an outdoor FM antenna is used. It is also recommended for reducing noise and hum.

CAUTION:

Never make the ground connection to a gas pipe as sparks can cause the gas to ignite.

Pin plug connecting cord

- Connect the white plug to the white terminal (L) and the red plug to the red terminal (R).
- Make sure that the connections are secure.



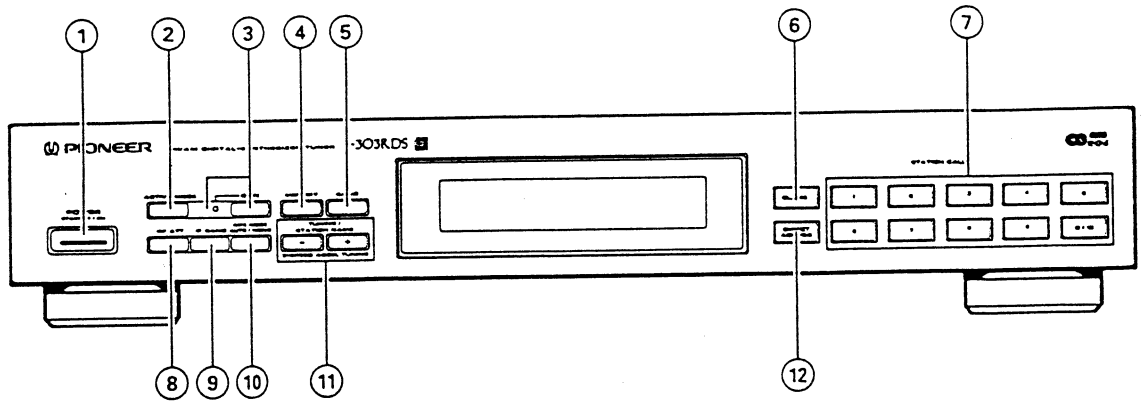
CONTROL Terminals

When using together with a Pioneer component bearing the SR mark, connect the CONTROL IN terminal on the rear panel of the tuner to the CONTROL OUT terminal on the component using the supplied control cord. This will enable the tuner to be controlled from a distance with the remote control unit supplied with the component.

When this feature is not used, connection is not necessary.

- For instructions regarding connection and operation, please refer to the operating instruction manual of your stereo component.

1.2 PANEL FACILITIES



① POWER (STANDBY/ON) switch

This is the switch for electric power.

ON ..... When set to ON position, power is supplied and the unit becomes operational.

STANDBY .... When set to STANDBY position, the main power flow is cut and the unit is no longer fully operational. A minute flow of power feeds the unit to maintain operation readiness.

NOTE:

- *The memory will be backed up so long as the power cord is not unplugged.*
- *If the power cord is unplugged, the memory will be retained for several days.*
- *When not using the unit for a long period, disconnect the power cord.*

② ACTIVE MODE button

Each time you press this button, the mode changes as follows:

FM:

RT mode ..... Displays PS → RT → PTY in sequence (skipped when there is no PTY data). "RT" lights.

↓

PS mode ..... Displays PS. "PS" lights.

↓

Station name input mode ..... "CHARACTER" lights. Station names of up to four characters can be input for a total of 40 preset channels.

↓

PTY mode ..... Displays PTY. "PTY" lights.

↓

PTY search mode .... "SEARCH" lights. — (down)/+ (up) buttons can be used to select the program type. Press the ACTIVE MODE button again, and it searches for programs in your specified type.

↓

Frequency display mode ..... Displays tuned-in frequency.

↓

CT mode ..... Displays time data if available; otherwise displays frequency. "CT" lights.

↓ (returns to RT mode)

NOTE:

The station name input mode and PTY search mode are skipped when the EON function is used for interrupt waiting.

AM:

Station name display mode

↓

Station name input mode ..... "CHARACTER" lights. Station names of up to four characters can be input for a total of 40 preset channels.

↓

Frequency display mode ..... Displays tuned-in frequency.

↓ (returns to Station name display mode)

③ EON button/indicator

If receiving a station broadcasting EON information, the radio can automatically keep track of broadcast information from other network stations.

If you specify traffic information (TA) or program type (PTY) beforehand, the frequency will change automatically when the specified broadcast begins.

The display's EON indicator lights when receiving EON information. When a specified TA or PTY broadcast is received, this indicator and EON in the display section flash.

④ MEMORY button

Use to preset stations.

This is also used for FM or AM broadcast manual station name character selection. When you want automatic tuning to programs of a particular musical type when using EON PTY, press this button while the desired type is displayed, and interrupt waiting begins.

⑤ BAND selector button

Each time you press this button, the band changes as follows:

FM → AM →

⑥ CLASS button

Use to switch between preset memory classes 1 to 4. In each class, 10 stations can be memorized using the STATION CALL buttons, enabling a total of 40 stations to be memorized.

⑦ STATION CALL buttons

Use these buttons to preset stations and to receive the already preset stations.
These are also used when performing direct access tuning.

⑧ RF ATT button

Set this button to on when receiving strong FM signals (nearby stations) to reduce sound distortion (RF ATT indicator lights).
Normally, this button should be set to off.
This button does not affect AM reception.

NOTE:
This button's status is preset for each station in station memory.

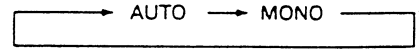
⑨ IF BAND button

Each time this button is pressed, the bandwidth of the IF circuit switches between "normal" and "narrow" for the FM band.
Set to NARROW in case of interference from other stations.
The NARROW indicator lights up. When not lit, normal filter bandwidth is selected.
This button does not affect AM reception.

NOTE:
This button's status is preset for each station in station memory.

⑩ MPX (multiplex) MODE AUTO/MONO button

Mode changes as follows each time this button is pressed.



"AUTO" is not displayed.
This button does not affect AM reception.

AUTO:
Normally leave in this mode for reception. When a stereo FM broadcast is received, it will be automatically reproduced in stereo sound and the STEREO indicator lights up.

NOTE:
When the signal level is too weak for reception, sound output is automatically muted.

MONO:
MONO indicator lights up.
To receive stereo broadcasts in monaural.
If there is too much noise during stereo reception of a weak signal, you can reduce the level of noise by switching to MONO.

NOTE:
This button's status is preset for each station in station memory.

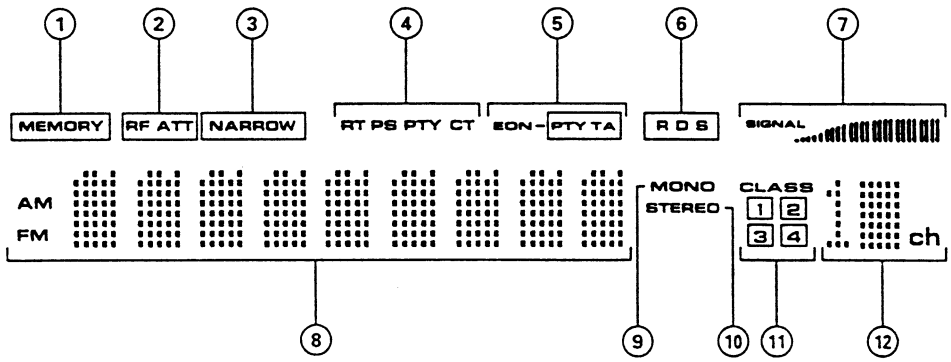
⑪ TUNING/STATION NAME − (down)/+ (up) buttons

Use for tuning. Press these buttons to change the frequency display (3-Speed Accel Tuning).
In the Manual Name input mode, PTY search mode and when selecting program types on EON PTY, these are used to select characters and program type.

⑫ DIRECT ACCESS button

When this button is pressed, the STATION CALL buttons function as ten-key number buttons for direct input of the desired reception frequency. Press again to cancel this mode.

OPERATING DISPLAY



① MEMORY indicator

② RF ATT indicator

Stays lit while RF ATT button is on.

③ NARROW indicator

Stays lit while IF BAND button is set to NARROW.
When not lit, stays NORMAL.

④ RT, PS, PTY, CT indicator

One of these lights to indicate the selected display mode (selected by the ACTIVE MODE button).
Time is displayed when the CT data is received. It changes to frequency display mode if not lit.

⑤ EON — PTY TA indicator

When a station broadcasting EON information is received, EON— [ ] lights. After specifying TA or PTY, interrupt waiting begins and the TA or PTY indicator flashes.

⑥ RDS indicator
Lights when an RDS broadcast is received.

⑦ SIGNAL indicator

⑧ Frequency, character, clock time indicator
CT (Clock Time) data, band, RDS data and frequency data are displayed.

⑨ MONO indicator
Stays lit while MPX MODE AUTO/MONO button is set to MONO.

⑩ STEREO indicator
Lights up when a stereo broadcast is received (the indicator does not light when the MPX MODE AUTO/MONO button is set to MONO).

⑪ CLASS [1], [2], [3], [4] indicator
Shows the class selected by the CLASS button.
The current CLASS is displayed.

⑫ Station indicator
When STATION CALL buttons are pressed, it will show the corresponding channel number.

1.3 SPECIFICATIONS

FM Tuner Section

Frequency Range	87.5 MHz to 108 MHz
Usable Sensitivity	
NORMAL	Mono: 12.7 dBf, IHF (1.2 µV/75 Ω)
50 dB Quieting Sensitivity	
NORMAL	Mono: 18.0 dBf, IHF (2.2 µV/75 Ω)
	Stereo: 38.3 dBf, IHF (22.6 µV/75 Ω)
Sensitivity (DIN)	
NORMAL	Mono: 0.9 µV/75 Ω
	Stereo: 32 µV/75 Ω
Signal-to-Noise Ratio	Mono: 80 dB (at 80 dBf)
	Stereo: 75 dB (at 80 dBf)
Signal-to-Noise Ratio (DIN)	Mono: 66 dB
	Stereo: 60 dB
Distortion (at 80 dBf)	
NARROW	Mono: 0.15 % (1 kHz)
	Stereo: 0.2 % (1 kHz)
Alternate Channel Selectivity	
NORMAL	70 dB (400 kHz)
NARROW	70 dB (300 kHz)
Stereo Separation	45 dB (1 kHz)
Frequency Response	±1 dB (30 Hz to 15 kHz)
Image Response Ratio	80 dB
IF Response Ratio	90 dB
Subcarrier Product Ratio	70 dB
Antenna Input	75 Ω unbalanced

AM Tuner Section

Frequency Range	531 kHz to 1,602 kHz (Step 9 kHz)
Sensitivity (IHF, Loop antenna)	350 µV/m
Selectivity	40 dB
Signal-to-Noise Ratio	55 dB
Antenna	Loop Antenna

Audio Section

Output (Level/Impedance)	
FM (100 % MOD)	650 mV/1.1 kΩ
AM (30 % MOD)	150 mV/1.1 kΩ

Miscellaneous

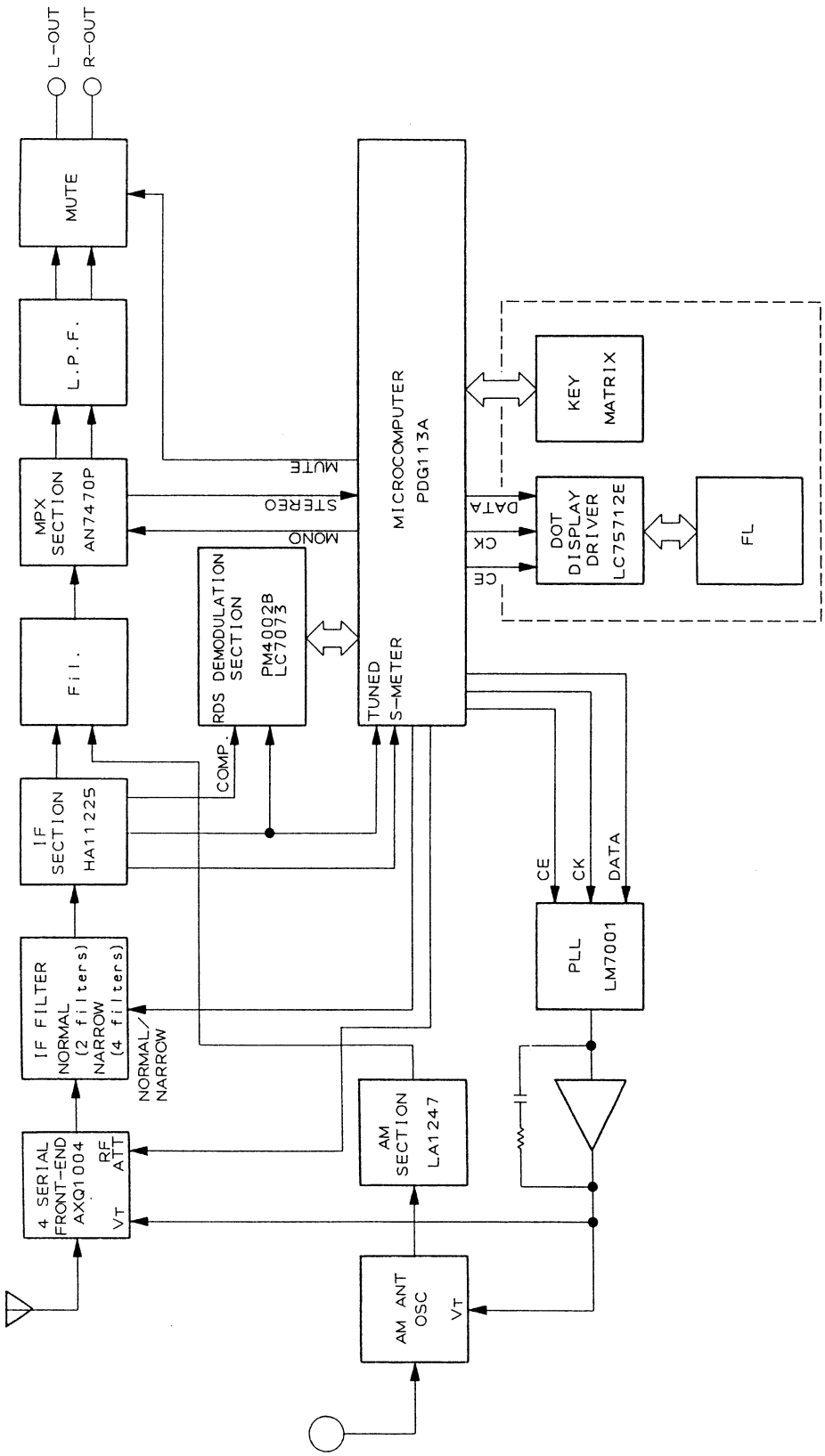
Power Requirements	AC 240 Volts ~, 50/60 Hz
Power Consumption	15 W
Dimensions	420 (W) x 75.5 (H) x 284 (D) mm
Weight (without package)	2.8 kg

Furnished Parts

FM T-type Antenna	1
AM Loop Antenna	1
Connecting Cord with Pin Plugs	1
Control Cord	1
Operating Instructions	1

NOTE:
Specifications and design are subject to possible modifications without notice, due to improvements.

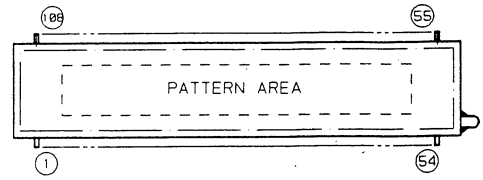
1.4 BLOCK DIAGRAM



1.5 FL INFORMATION

■ AAV1193 (V901)

PIN LOCATION



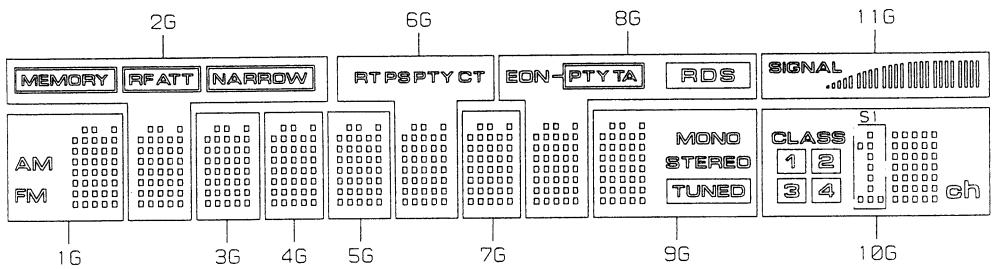
PIN CONNECTION

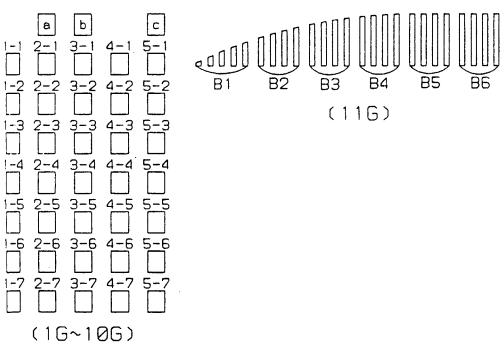
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
CONNECTION	F1	F1	NP	NP	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	F1	F2

PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
CONNECTION	F1	F1	NP	NP	G	G	G	G	G	G	G	C	C	C	C	C	C	C	C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	G	G	C	1	2	3	4	5	6	7	8	9	10	G	G

NOTE
1) F1,F2 --- Filament
2) NP ------ No pin
3) NX ------ No extend pin
4) DL ------ Datum Line
5) NC ------ No connection
6) 1G~11G --- Grid
7) IC ------ Internal connection
8) Pin50 and pin73 are connected inside.

GRID ASSIGNMENT





ANODE CONNECTION

	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G
P 1	-	-	-	-	-	CT	-	RDS	-	ch	B6
P 2	-	NARROW	-	-	-	PTY	-	TA	TUNED	S1	B5
P 3	FM	RFATT	-	-	-	PS	-	PTY	STEREO	4	B4
P 4	AM	MEMORY	-	-	-	RT	-	EON-	MONO	3	B3
P 5	c	c	c	c	c	c	c	c	c	2	B2
P 6	b	b	b	b	b	b	b	b	b	1	B1
P 7	a	a	a	a	a	a	a	a	a	CLASS	SIGNAL
P 8	5-7	5-7	5-7	5-7	5-7	5-7	5-7	5-7	5-7	5-7	-
P 9	4-7	4-7	4-7	4-7	4-7	4-7	4-7	4-7	4-7	4-7	-
P10	3-7	3-7	3-7	3-7	3-7	3-7	3-7	3-7	3-7	3-7	-
P11	2-7	2-7	2-7	2-7	2-7	2-7	2-7	2-7	2-7	2-7	-
P12	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7	-
P13	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	-
P14	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	-
P15	3-6	3-6	3-6	3-6	3-6	3-6	3-6	3-6	3-6	3-6	-
P16	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	-
P17	1-6	1-6	1-6	1-6	1-6	1-6	1-6	1-6	1-6	1-6	-
P18	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	-
P19	2-5	2-5	2-5	2-5	2-5	2-5	2-5	2-5	2-5	2-5	-
P20	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	-
P21	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	-
P22	5-5	5-5	5-5	5-5	5-5	5-5	5-5	5-5	5-5	5-5	-
P23	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	-
P24	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	-
P25	4-4	4-4	4-4	4-4	4-4	4-4	4-4	4-4	4-4	4-4	-
P26	5-4	5-4	5-4	5-4	5-4	5-4	5-4	5-4	5-4	5-4	-
P27	1-1	1-1	1-1	1-1	1-1	1-1	1-1	1-1	1-1	1-1	-
P28	2-1	2-1	2-1	2-1	2-1	2-1	2-1	2-1	2-1	2-1	-
P29	3-1	3-1	3-1	3-1	3-1	3-1	3-1	3-1	3-1	3-1	-
P30	4-1	4-1	4-1	4-1	4-1	4-1	4-1	4-1	4-1	4-1	-
P31	5-1	5-1	5-1	5-1	5-1	5-1	5-1	5-1	5-1	5-1	-
P32	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	-
P33	2-2	2-2	2-2	2-2	2-2	2-2	2-2	2-2	2-2	2-2	-
P34	3-2	3-2	3-2	3-2	3-2	3-2	3-2	3-2	3-2	3-2	-
P35	4-2	4-2	4-2	4-2	4-2	4-2	4-2	4-2	4-2	4-2	-
P36	5-2	5-2	5-2	5-2	5-2	5-2	5-2	5-2	5-2	5-2	-
P37	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	-
P38	2-3	2-3	2-3	2-3	2-3	2-3	2-3	2-3	2-3	2-3	-
P39	3-3	3-3	3-3	3-3	3-3	3-3	3-3	3-3	3-3	3-3	-
P40	4-3	4-3	4-3	4-3	4-3	4-3	4-3	4-3	4-3	4-3	-
P41	5-3	5-3	5-3	5-3	5-3	5-3	5-3	5-3	5-3	5-3	-
P42	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	-

1.6 PCB PARTS LIST

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *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.*
- *Parts marked by " ◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *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* ·····	*RD1/8PM 5 6 1 J*
47kΩ	→ *47×10³* →	*473* ·····	*RD1/4PS 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* ·····	*RN1/4PC 5 6 2 1 F*

Mark	No.	Description	Parts No.	Mark

LIST OF ASSEMBLIES

TUNER ASSEMBLY(HEXK TYPE)		AWE1289
├— TUNER ASSEMBLY		AWZ5319
└— POWER ASSEMBLY		AWZ5320
TUNER ASSEMBLY(HBXK TYPE)		AWE1290
├— TUNER ASSEMBLY		AWZ5319
└— POWER ASSEMBLY		AWZ5321
TUNER ASSEMBLY(HEWZIXK AND HZIXK TYPES)		AWE1288
├— TUNER ASSEMBLY		AWZ5317
└— POWER ASSEMBLY		AWZ5318
DISPLAY ASSEMBLY		AWP1054

TUNER ASSEMBLY

SEMICONDUCTORS

IC501		AN7470P
IC201		HA11225
IC301		LA1247
IC702		LC7073
IC401		LM7001J
IC502		NJM4558LD
IC602		NJM7812AS
IC801		PDG113A
IC701		PM4002B
IC101,IC102		TA7060AP
Q101,Q603		2SA1529
Q555,Q701		2SA933S
Q605		2SB560
Q102,Q109,Q251,Q501,Q556		2SC1740S
Q702,Q704,Q851		2SC1740S
Q402		2SC1740SLN
Q106-Q108,Q703		2SC2668
Q551-Q554		2SC3327
Q608		2SD880
Q401,Q502		2SK246
Q301		DTA124ES
Q103,Q105,Q606		DTA143ES
Q104,Q607		DTC124ES
Q604,Q801		DTC143ES
D201-D203,D301,D302		1SS252
D501,D502,D701,D801,D802		1SS252
D851		1SS252
D102-D105		1SS85
D101		1SV156
D609		MTZJ27B
D803		MTZJ4.7
D610		MTZJ5.1A
D611		MTZJ6.2C

COILS AND FILTERS

T101		ATE-063
T201		ATE1008
T202		ATE1009
F103,F104		ATF-107
F101		ATF-119
F102		ATF1024
F301		ATF1042
F501,F502		ATF1143
F251		ATF1152
L101-L103,L401,L801		LAU2R2K
L553	(HEWZIXK AND HZIXK TYPES)	LAU010K
L151		LAU470K
L551,L552	(HEWZIXK AND HZIXK TYPES)	LAU2R2K

CAPACITORS

C804		ACH1246
C703,C704		CCDCH220J50
C151,C403,C404		CCPUCH150J50
C315,C405-C407		CCPUSL470J50
C412		CEANL010M50
C251		CEANP4R7M50
C205		CEAS010M50
C312		CEAS100M50
C701		CEAS101M10
C501		CEAS101M16
C611		CEAS101M35
C605		CEAS102M25
C511		CEAS1R5M50
C803		CEAS221M10
C708,C808		CEAS2R2M50
C104,C209,C304,C311,C402		CEAS330M16
C409		CEAS330M16
C609		CEAS331M50
C512		CEAS3R3M50
C504,C716,C810,C852		CEAS470M10
C207		CEAS470M16
C614		CEAS470M25
C610		CEAS470M35
C212,C253,C313,C316		CEAS4R7M50
C510		CEASR22M50

Mark	No.	Description	Parts No.	Mark
	C254		CEEA101M16	
	C553,C554		CEEA2R2M50	
	C607		CEEA332M35	
	C560,C612,C613		CEEA470M25	
	C507,C508,C555,C556		CEEA4R7M50	
	C606		CEHAQ101M10	
	C608		CEHAQ470M25	
	C410		CFTXA224J50	
	C252		CKDYB122K50	
	C709,C710		CKDYB332K50	
	C557,C558		CKDYB471K50	
	C711,C712		CKDYB472K50	
	C559	(HEWZIXK AND HZIXK TYPES)	CKDYX103M25	
	C101,C102,C107,C305,C411		CKDYX103M25	
	C152,C615		CKDYX104M25	
	C111,C112,C153,C201,C202		CKDYX223M25	
	C204,C206,C306,C314,C5		CKDYX223M25	
	C7,C705,C707,C717,C8		CKDYX223M25	
	C105,C108,C210,C302,C309		CKDYX473M25	
	C502,C706		CKDYX473M25	
	C6,C805,C851		CKPUYB101K50	
	C10,C3,C301,C307,C308		CKPUYB102K50	
	C4,C715,C807		CKPUYB102K50	
	C503		CKPUYB121K50	
	C203		CKPUYB221K50	
	C802,C809		CKPUYF473Z16	
	C103,C106,C109,C11,C110		CKPUYY103M16	
	C208,C211,C303,C310,C401		CKPUYY103M16	
	C408,C509,C702,C713,C714		CKPUYY103M16	
	C801,C806		CKPUYY103M16	
	C551,C552		CQMA222J50	
	C505,C506		CQMXA102J100	
	C513		CQPA471J100	
RESISTORS				
	R834		RA5T104J	
	R606		RD1/2PM152J	
	R103,R608		RD1/2PM821J	
	R307		RD1/4PM151J	
	R301		RD1/4PM331J	
	R571,R572		RDR1/4PM101J	
	R555,R556		RDR1/4PM104J	
	R567,R568	(HEXK AND HBXK TYPES)	RDR1/4PM122J	
	R561,R562		RDR1/4PM222J	
	R559,R560	(HEXK AND HBXK TYPES)	RDR1/4PM223J	
	R551,R552		RDR1/4PM242J	
	R565,R566		RDR1/4PM271J	
	R567,R568	(HEWZIXK AND HZIXK TYPES)	RDR1/4PM271J	
	R557,R558		RDR1/4PM472J	
	R559,R560	(HEWZIXK AND HZIXK TYPES)	RDR1/4PM472J	
	R553,R554,R569,R570		RDR1/4PM562J	
	R502,R509,R510		RDR1/4PM563J	
	VR501		ACP1042	
	VR301		ACP1043	
	VR201		ACP1044	
	VR701		ACP1045	
		Other Resistors	RD1/8PM□□□J	
OTHERS				
		SCREW	ABA−298	
		ANTENNA TERMINAL 4−P (HEXK AND HBXK TYPES)	AKA1010	
		ANTENNA TERMINAL 4−P (HEWZIXK AND HZIXK TYPES)	AKA1012	

Mark	No.	Description	Parts No.	Mark
	CN8208	PIN JACK(2P)	AKB1039	
	CN3	JACK	AKN1006	
		CABLE HOLDER (10P)	AKT1083	
	X702	CERAMIC RESONATOR	ASS1025	
	X401	CRYSTAL RESONATOR	ASS1042	
	X801	CERAMIC RESONATOR	ASS1055	
	X701	CRYSTAL RESONATOR	ASS1061	
	X301	CERAMIC RESONATOR	ATF1027	
		AM RF TUNING BLOCK	AXX1043	
	CN1	CONNECTOR(10P)	KPE10	
	CN2	CONNECTOR(11P)	KPE11	
		4 SERIAL F.E. MODULE ASSY	AXQ1004	

Note: 4 serial F.E. module assy has no servise part.

POWER ASSEMBLY

SEMICONDUCTORS

	Q601,Q602		2SC2878
	D601−D606		S5566

COIL

	L601	(HEWZIXK AND HZIXK TYPES)	ATF1135

TRANSFORMERS

⚠	T601	(13.0VA)	ATT1253

CAPACITORS

⚠	C601		ACG1054
	C603		CEAS330M25
	C604		CKDYF473Z50
	C617		CKDYX473M25
	C602,C616		CQMA473J50

RESISTORS

	R601,R603		RD1/4PM010J
		Other Resistors	RD1/8PM□□□J

OTHERS

		CABLE HOLDER (10P)	AKT1083

DISPLAY ASSEMBLY

SEMICONDUCTORS

	IC901		LC75712E
	D901		1SS252
	D907		AEL1099
	D902−D906		MTZJ7.5

SWITCHES AND RELAYS

	S901−S922		ASG1029

CAPACITORS

	C901		CCPUSL300J50
	C904−C906		CCPUSL470J50
	C909		CEJA220M35
	C902		CEJA221M6
	C907,C908		CKDYX223M25
	C910−C920		CKPUYB101K50
	C903,C921		CKPUYY103M16

RESISTORS

		All Resistors	RD1/8PM□□□J

OTHERS

	V901	FL TUBE(25×214.0)	AAV1193

1.7 ADJUSTMENTS

1.7.1 FM TUNER ADJUSTMENTS

- Connect as shown in Fig. 2.
- Set the function to FM.

Step	Adjustment name	FM SG (1 kHz ± 75 kHz dev.)			FL display, IF BAND etc.	Location	Adjustment
		Frequency (MHz)	Modulation	Level (dBμV)			
1	IF sensitivity-UP adjustment	98	MONO	Low input level	98 MHz MONO	T101	Adjust so that the voltage between TP9 and GND becomes maximum.
2	T meter adjustment	98	MONO	60	98 MHz NARROW	T201	Adjust so that the voltage between TP1 and TP2 becomes 0±50 mV.
3	MONO distortion adjustment	98	MONO	60	98 MHz NARROW	T202	Adjust so that the distortion becomes minimum.
4	Repeat step 2 and 3 until optimum adjustment is obtained.						
5	VCO adjustment	108	OFF	60	108MHz NARROW	VR501	Adjust so that the output at TP3 becomes 76 kHz ±0.5 kHz.
6	STEREO distortion adjustment (NARROW)	89(*2)	L−ONLY	60	89 MHz NARROW	T101	Turn the core of T101 within a range of ±90° and adjust so that the distortion becomes minimum.
7	Muting level adjustment	98	MONO	15 ±5dB	98 MHz NORMAL	VR201	Adjust so that the muting is released at the input level shown on the left.
8	SK level adjustment	88	EXTERNAL *1 (RDS SG)	60	88 MHz NORMAL	VR701	Adjust so that the voltage between TP6 and GND becomes maximum.

*1 : RDS SG (AUDIO, PILOT, RDS, BK and DK : OFF, SK : ON)

*2 : Stereo modulation : Main 1 kHz L+R, ±68.25 kHz.
Pilot 19 kHz, ±6.75 kHz.

1.7.2 AM TUNER ADJUSTMENT

- Connect as shown in Fig. 2.
- Set the function to AM.

Step	Adjustment name	AM SG(400kHz, 30% modulation)		FL Display	Adjustment	
		Frequency(kHz)	Level(dBμV/m)		Location	Specifications
1	S meter adjustment	1008	100	1008 kHz	VR301	Adjust so that the voltage between TP4 and GND becomes 4.5V ±0.1 V.

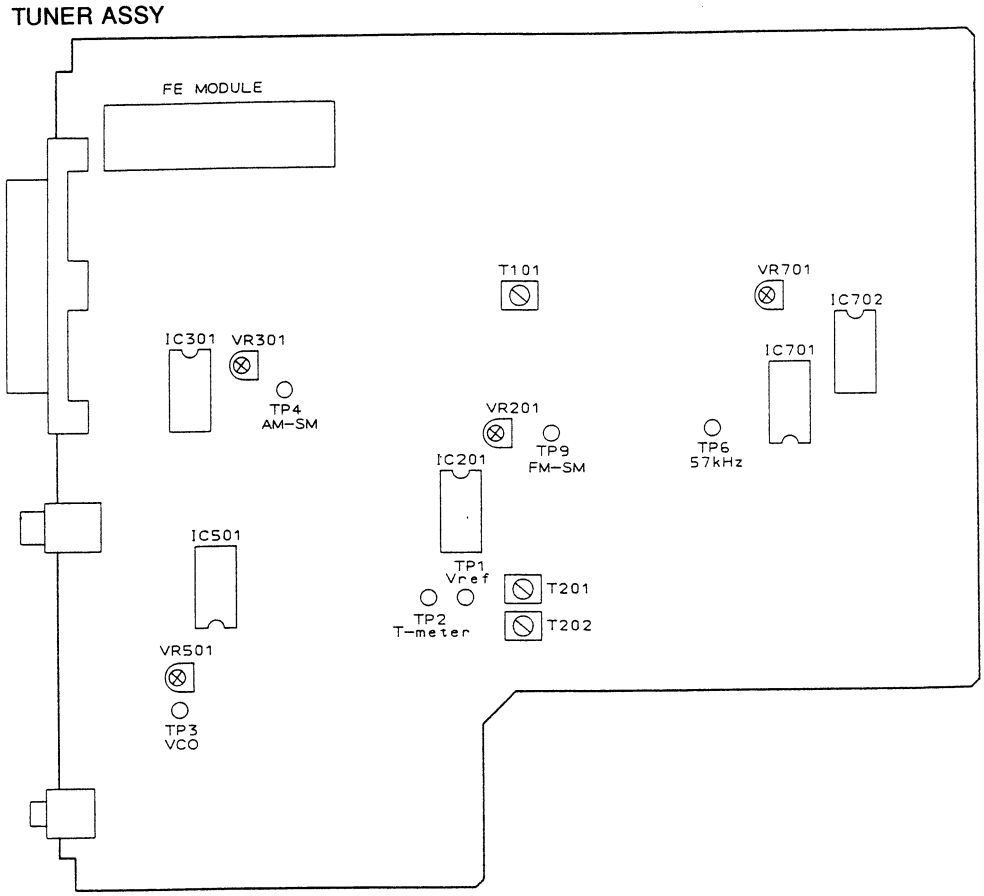


Fig. 1 Adjustment Points

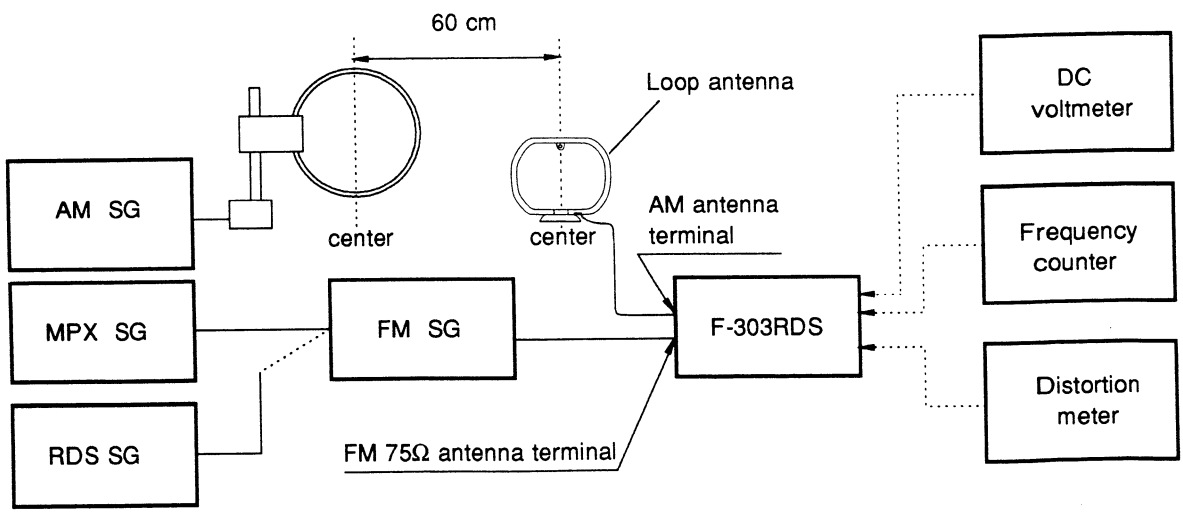


Fig. 2 Connection Diagram

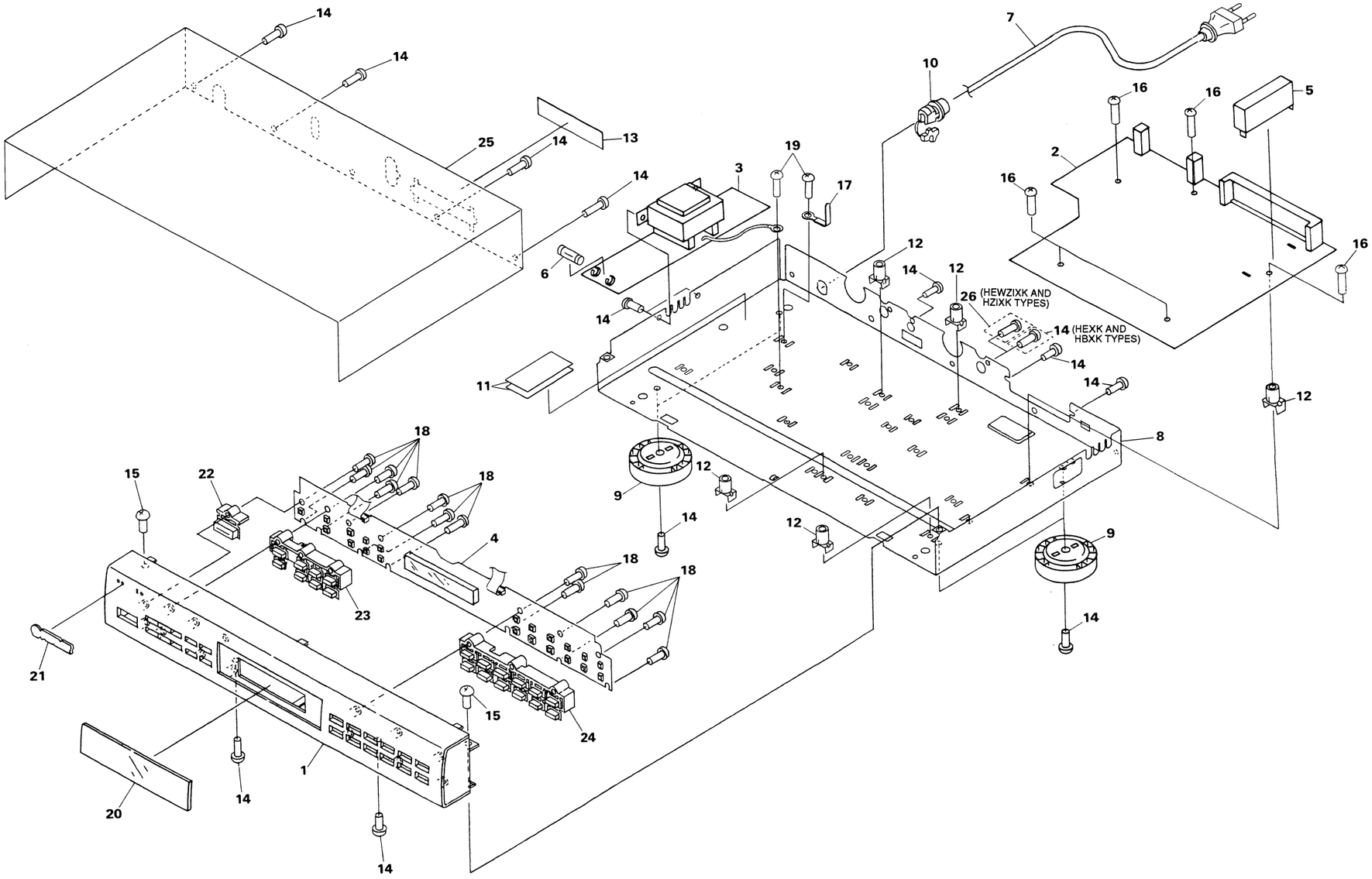
1.8 PARTS LIST FOR EXPLODED VIEWS AND PACKING

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *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.*
- *Parts marked by " ◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

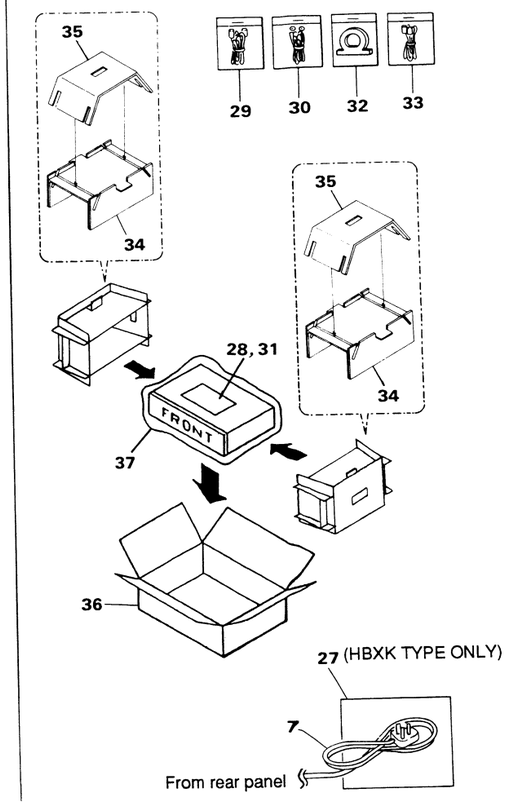
Mark	No.	Description	Parts No.
	1	FRONT PANEL ASSY (F−303RDS SERIES)	AMB2506
	1	FRONT PANEL ASSY (F−303RDS−G SERIES)	AMB2511
	2	TUNER ASSEMBLY (HEXK AND HBXK TYPES)	AWZ5319
	2	TUNER ASSEMBLY (HEWZIXK AND HZIXK TYPES)	AWZ5317
	3	POWER ASSEMBLY (HEXK TYPE)	AWZ5320
	3	POWER ASSEMBLY (HBXK TYPE)	AWZ5321
	3	POWER ASSEMBLY (HEWZIXK AND HZIXK TYPES)	AWZ5318
	4	DISPLAY ASSEMBLY	AWP1054
	5	4 SERIAL F.E. MODULE ASSY	AXQ1004
⚠	6	FU1 (I=T400MA,V=250)	AEK−504
⚠	7	AC POWER CORD (HEXK, HEWZIXK AND HZIXK TYPES)	ADG1138
⚠	7	AC POWER CORD (HBXK TYPE)	ADG1148
⚠		FUSE (T5A/250V) (For HBXK type of AC POWER CORD)	AEK1046
NSP	8	CHASSIS	ANA1122
	9	INSULATOR	PNW1912
⚠	10	STRAIN RELIEF	AEC−882
NSP	11	BARRIER	AEC1416
NSP	12	PCB MOULD	AMR1525
	13	ANTENNA LABEL (HEXK AND HBXK TYPES)	AAX1691
	13	ANTENNA LABEL (HEWZIXK AND HZIXK TYPES)	AAX1609
	14	SCREW	ABA−298
	15	SCREW (STEEL)	ABA1011
	16	SCREW	ABA1018
	17	BINDER	AEC−826
	18	SCREW	BBZ26P100FMC
	19	SCREW	VCZ30P060FMC
	20	PANEL	AAK2466
	21	NAME PLATE (F−303RDS SERIES)	PAM1608
	21	NAME PLATE (F−303RDS−G SERIES)	AAM1059
	22	POWER BUTTON (ABS) (F−303RDS SERIES)	AAD2425
	22	POWER BUTTON (ABS) (F−303RDS−G SERIES)	AAD4066
	23	BAND BUTTON (ABS) (F−303RDS SERIES)	AAD2502
	23	BAND BUTTON (ABS) (F−303RDS−G SERIES)	AAD4067
	24	STATION BUTTON(ABS) (F−303RDS SERIES)	AAD4055
	24	STATION BUTTON(ABS) (F−303RDS−G SERIES)	AAD4065
	25	BONNET (F−303RDS SERIES)	ANE1518
	25	BONNET (F−303RDS−G SERIES)	ANE1519
	26	EARTH SCREW (HEWZIXK AND HZIXK TYPES)	ABA1047
	27	AIR CAP (HBXK TYPE ONLY)	AHG1203
	28	OPE.INSTRUCTIONS (English/French/German/Italian/ Swedish/Dutch/Spanish/Portuguese) (HEXK TYPE)	ARE1296
	28	OPE.INSTRUCTIONS (German/Italian) (HEWZIXK AND HZIXK TYPES)	ARE1322
	28	OPE.INSTRUCTIONS (English) (HBXK TYPE)	ARB1462
	29	PLUG CORD	ADE−052
	30	FM ANTENNA (HEXK AND HBXK TYPES)	ADH1016
	30	FM ANTENNA (HEWZIXK AND HZIXK TYPES)	ADH1019
NSP	31	WARRANTY CARD	ARW1048
	32	LOOP ANTENNA	ATB1011
	33	CORD WITH PLUG	PDE1095
	34	SIDE PAD A (HEXK, HEWZIXK AND HZIXK TYPES)	AHA2015
	34	SIDE PAD A (HBXK TYPE)	AHA2017
	35	SIDE PAD B	AHA2016
	36	PACKING CASE (F−303RDS/HEXK AND F−303RDS/HEWZIXK)	AHD2727
	36	PACKING CASE (F−303RDS−G SERIES)	AHD2733
	36	PACKING CASE (F−303RDS/HBXK)	AHD2728
	37	PACKAGING SHEET	AHG1107

2.1 EXPLODED VIEWS AND PACKING



NOTE: Screws adjacent to ▼ mark on product are used for disassembly.

● **PACKING**

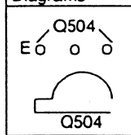
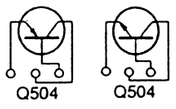
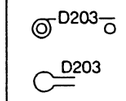
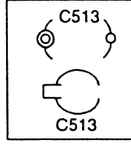
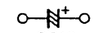


2.2 SCHEMATIC AND PCB CONNECTION DIAGRAMS

2.2.1 DISPLAY ASSEMBLY

NOTE FOR PCB DIAGRAMS:

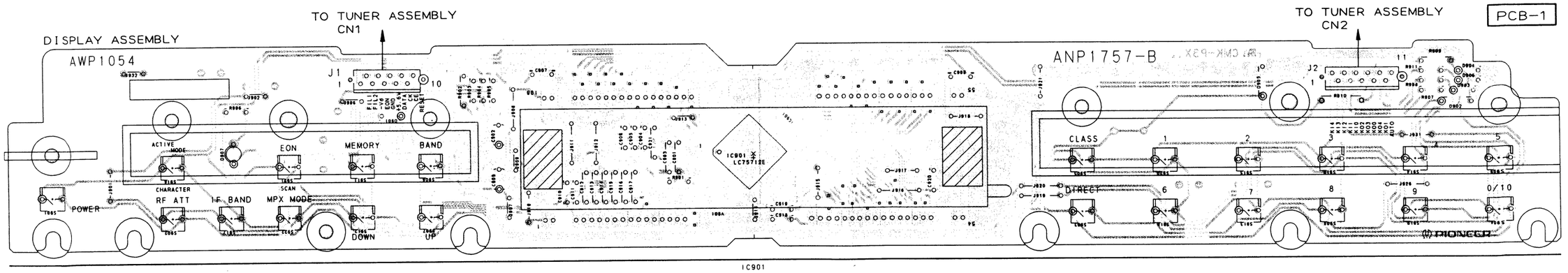
1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
		Transistor
		Diode
		Capacitor (Polarized)

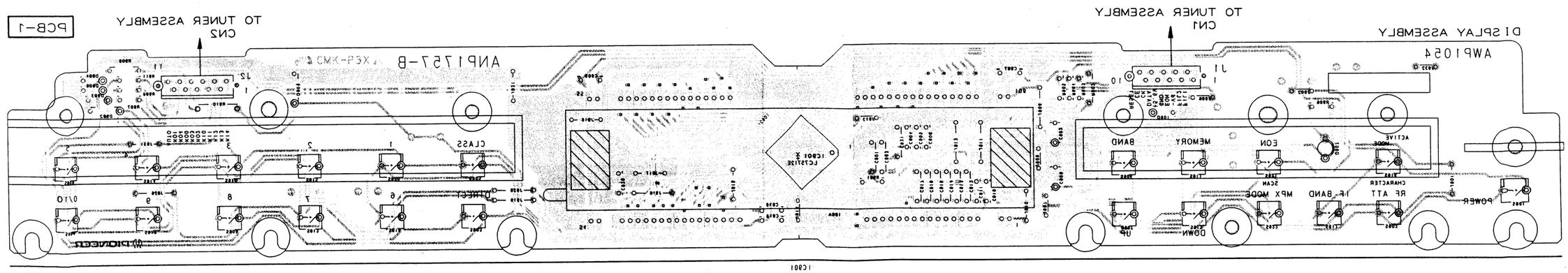
3. The transistor terminal marked with E or ⊏ shows the emitter.
4. The diode terminal marked with ◎ or ⊂ shows cathode side.
5. The capacitor terminal marked with ◎ or ⊏ shows negative terminal.

● This diagram is viewed from the mounted parts side.

PCB-1



● This diagram is viewed from the foil side.

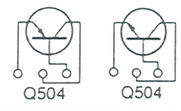
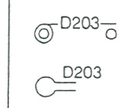
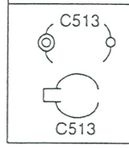
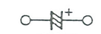


2.2 SCHEMATIC AND PCB CONNECTION DIAGRAMS

2.2.1 DISPLAY ASSEMBLY

NOTE FOR PCB DIAGRAMS:

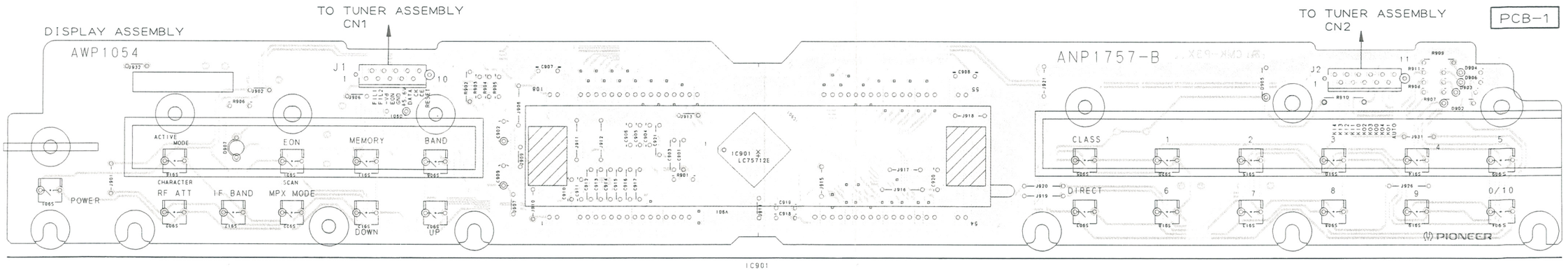
1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
		Transistor
		Diode
		Capacitor (Polarized)

3. The transistor terminal marked with E or ⊏ shows the emitter.
4. The diode terminal marked with ◎ or ⊂ shows cathode side.
5. The capacitor terminal marked with ◎ or ⊏ shows negative terminal.

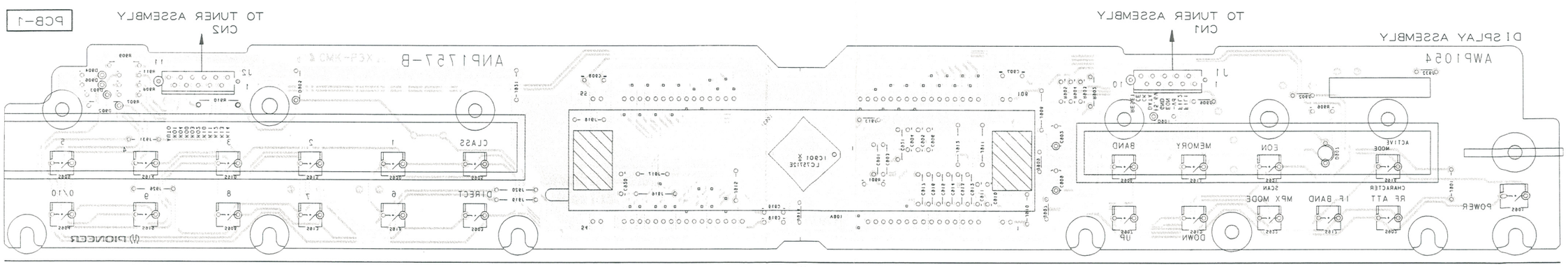
● This diagram is viewed from the mounted parts side.

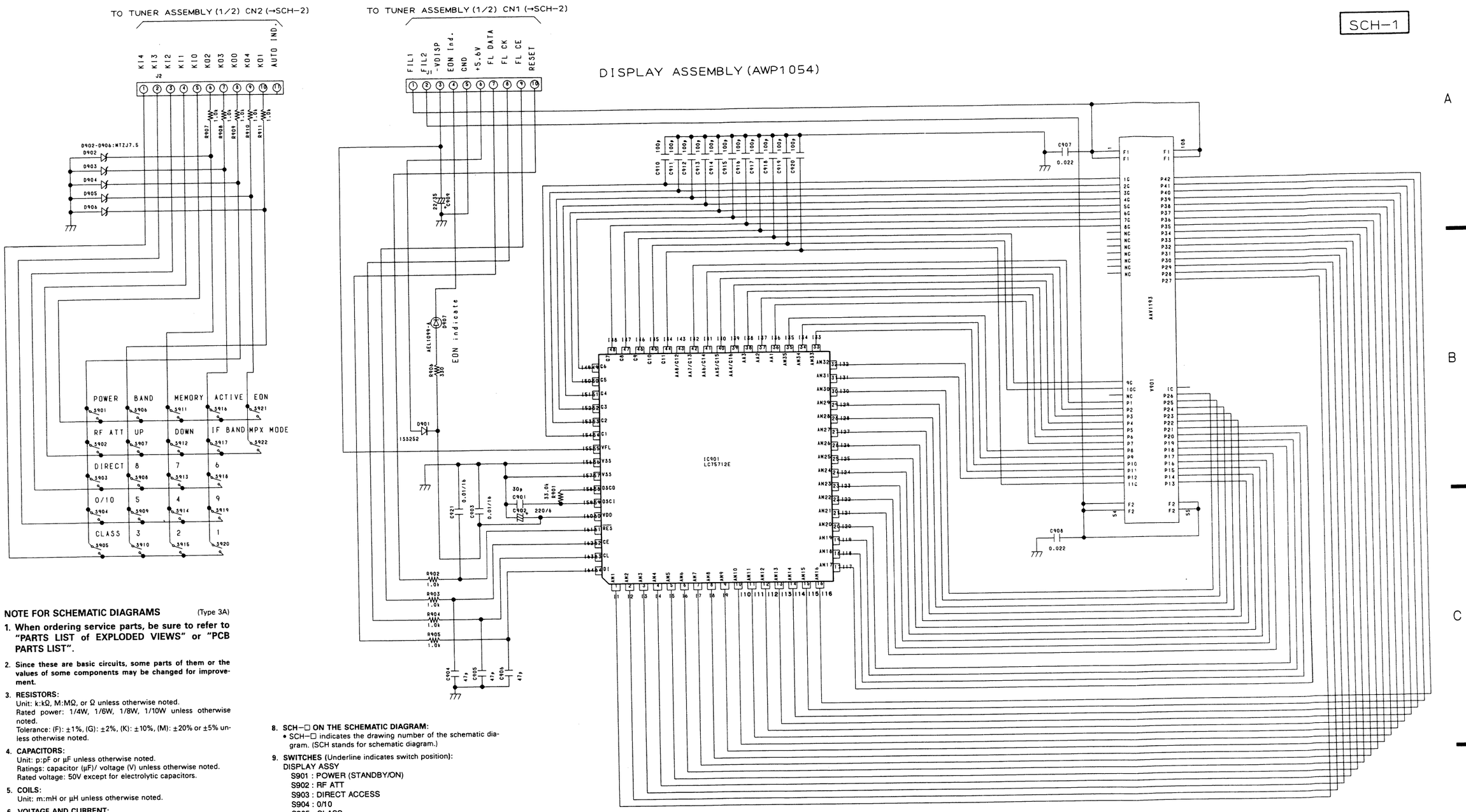
PCB-1



● This diagram is viewed from the foil side.

PCB-1





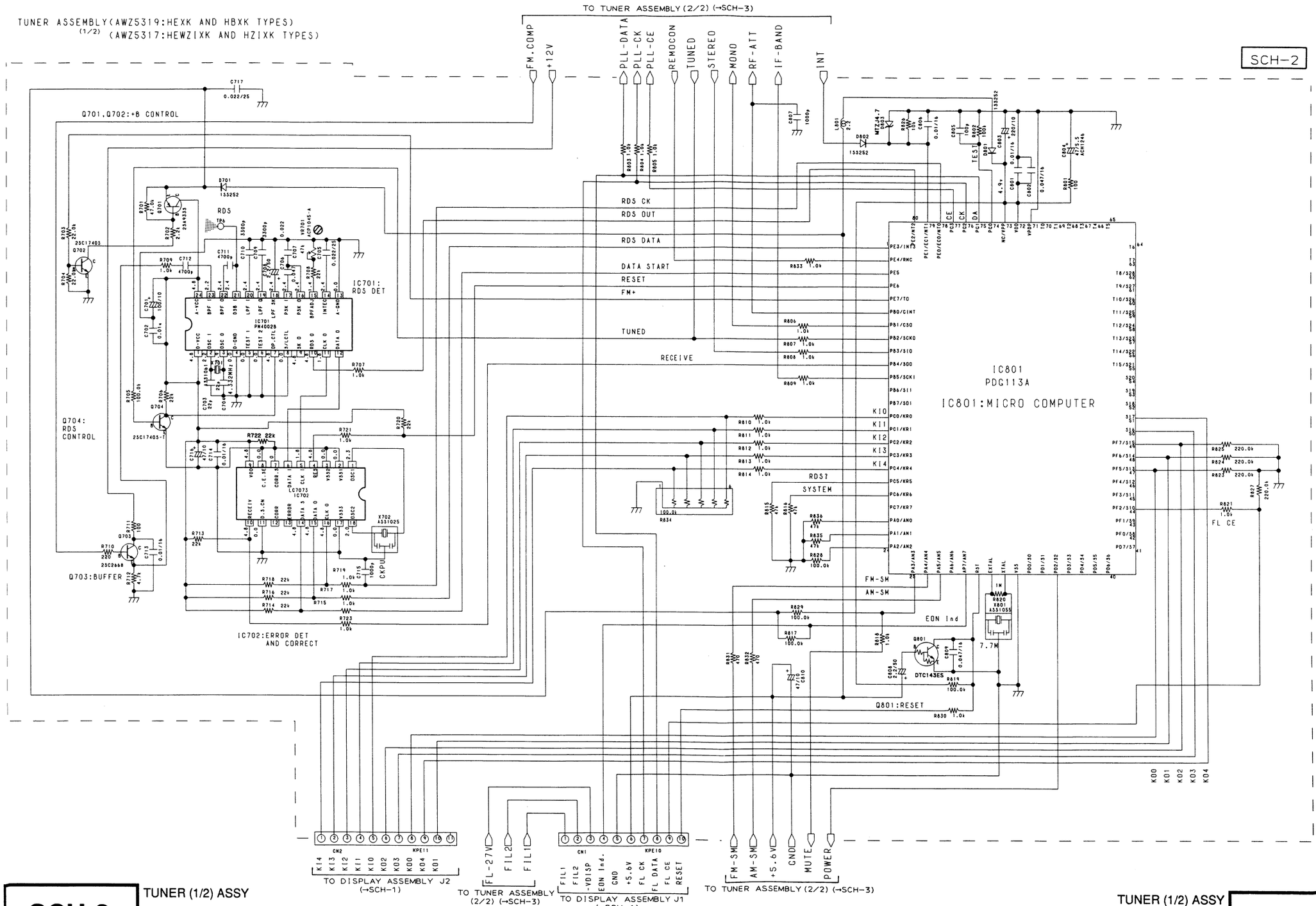
NOTE FOR SCHEMATIC DIAGRAMS (Type 3A)

1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**
2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**
3. **RESISTORS:**
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.
4. **CAPACITORS:**
   Unit: p:pF or μF unless otherwise noted.
   Ratings: capacitor (μF)/ voltage (V) unless otherwise noted.
   Rated voltage: 50V except for electrolytic capacitors.
5. **COILS:**
   Unit: m:mH or μH unless otherwise noted.
6. **VOLTAGE AND CURRENT:**
   mV : Signal voltage at FM 1kHz, 100% MOD.
   or ← V :
   DC voltage (V) at no input signal unless otherwise noted.
   Value in ( ) is DC voltage at rated power.
   ⇦ mA or ← mA :
   DC current at no input signal unless otherwise noted.
7. **OTHERS:**
   - ⊘ or ⊘ : Adjusting point.
   - • ➡ : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.

8. **SCH—□ ON THE SCHEMATIC DIAGRAM:**
   - SCH—□ indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)
9. **SWITCHES** (Underline indicates switch position):
   DISPLAY ASSY
   S901 : POWER (STANDBY/ON)
   S902 : RF ATT
   S903 : DIRECT ACCESS
   S904 : 0/10
   S905 : CLASS
   S906 : BAND
   S907 : TUNING/STATION NAME (+)
   S908 : 8
   S909 : 5
   S910 : 3
   S911 : MEMORY
   S912 : TUNING/STATION NAME (−)
   S913 : 7
   S914 : 4
   S915 : 2
   S916 : ACTIVE MODE
   S917 : IF BAND
   S918 : 6
   S919 : 9
   S920 : 1
   S921 : EON
   S922 : MPX MODE AUTO/MONO

DISPLAY ASSY **SCH-1**

2.2.2 TUNER (1/2) ASSEMBLY



Line Voltage Selection

Line Voltage can be changed by the following modification:

1. Disconnect the AC power cord.
2. Remove the cover.
3. Change the position of the jumper-lines Ⓐ follows.

Voltage	jumper—line Ⓐ position
220V—230V	①
240V	②

NOTE: When replacing a PCB which has the primary winding circuit of Power-transformer, be sure to compare its circuit with the diagram in Service Manual.
jumper-lines on the PCB may have to be removed.
Forgetting this check-up will cause a serious damage.

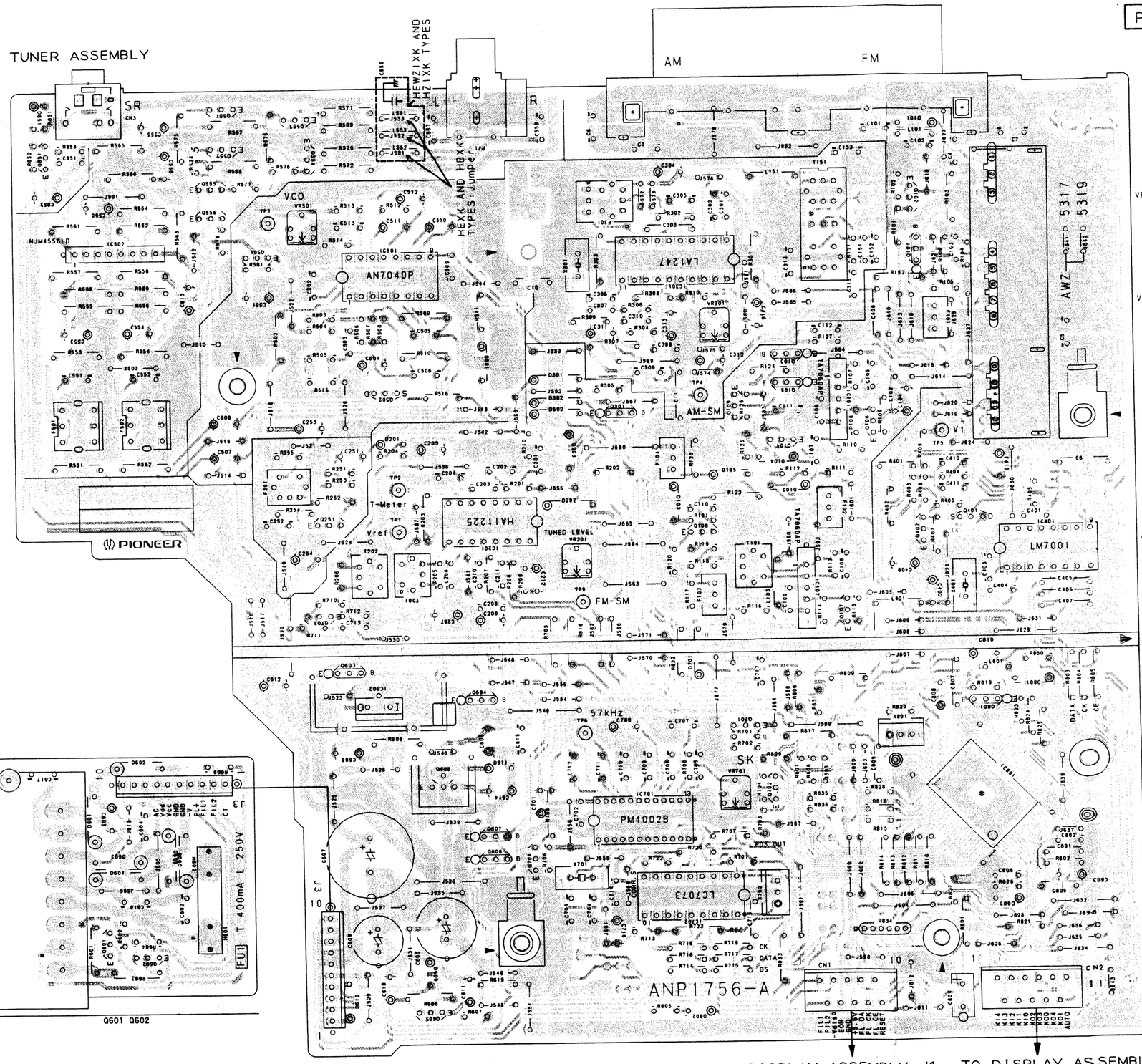
4. Stick a line voltage label on the rear panel.

Part No.	Description
AAX—193	220V label
AAX—192	240V label

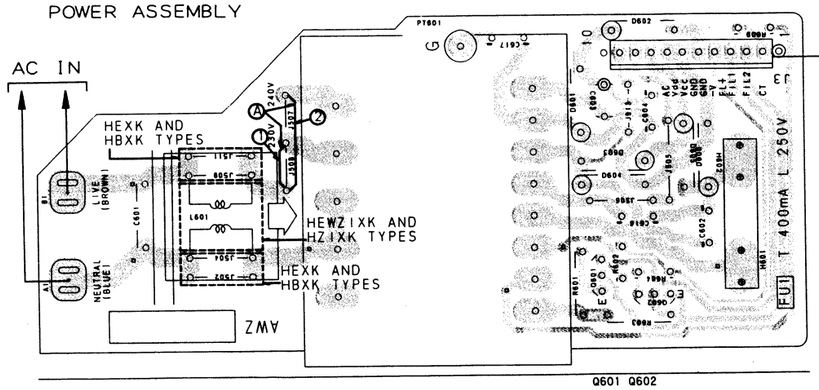
● This diagram is viewed from the mounted parts side.

PCB—2

TUNER ASSEMBLY



POWER ASSEMBLY



TO DISPLAY ASSEMBLY J1 TO DISPLAY ASSEMBLY J2

● This diagram is viewed from the mounted parts side.

PCB-2

TUNER ASSEMBLY

Line Voltage Selection

Line Voltage can be changed by the following modification:

1. Disconnect the AC power cord.
2. Remove the cover.
3. Change the position of the jumper-lines Ⓐ follows.

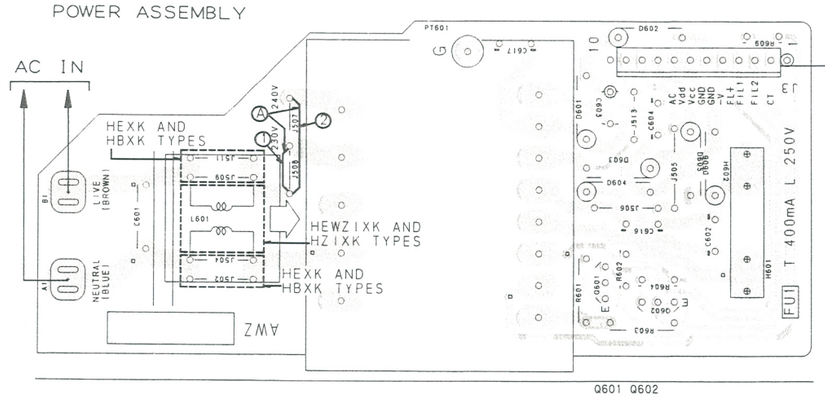
Voltage	jumper—line Ⓐ position
220V—230V	①
240V	②

NOTE: When replacing a PCB which has the primary winding circuit of Power-transformer, be sure to compare its circuit with the diagram in Service Manual.
jumper-lines on the PCB may have to be removed.
Forgetting this check-up will cause a serious damage.

4. Stick a line voltage label on the rear panel.

Part No.	Description
AAX—193	220V label
AAX—192	240V label

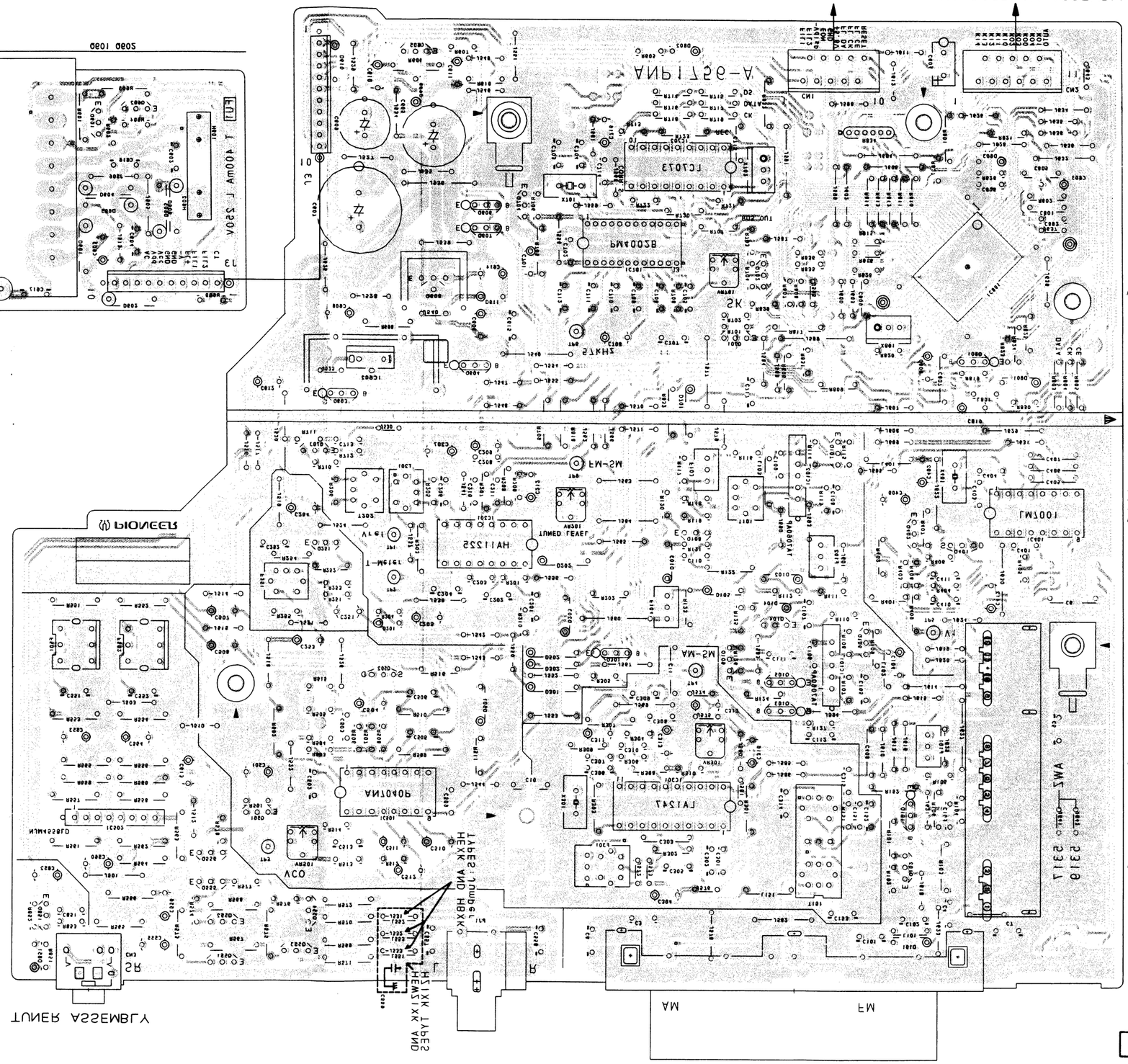
POWER ASSEMBLY



TO DISPLAY ASSEMBLY J1

TO DISPLAY ASSEMBLY J2

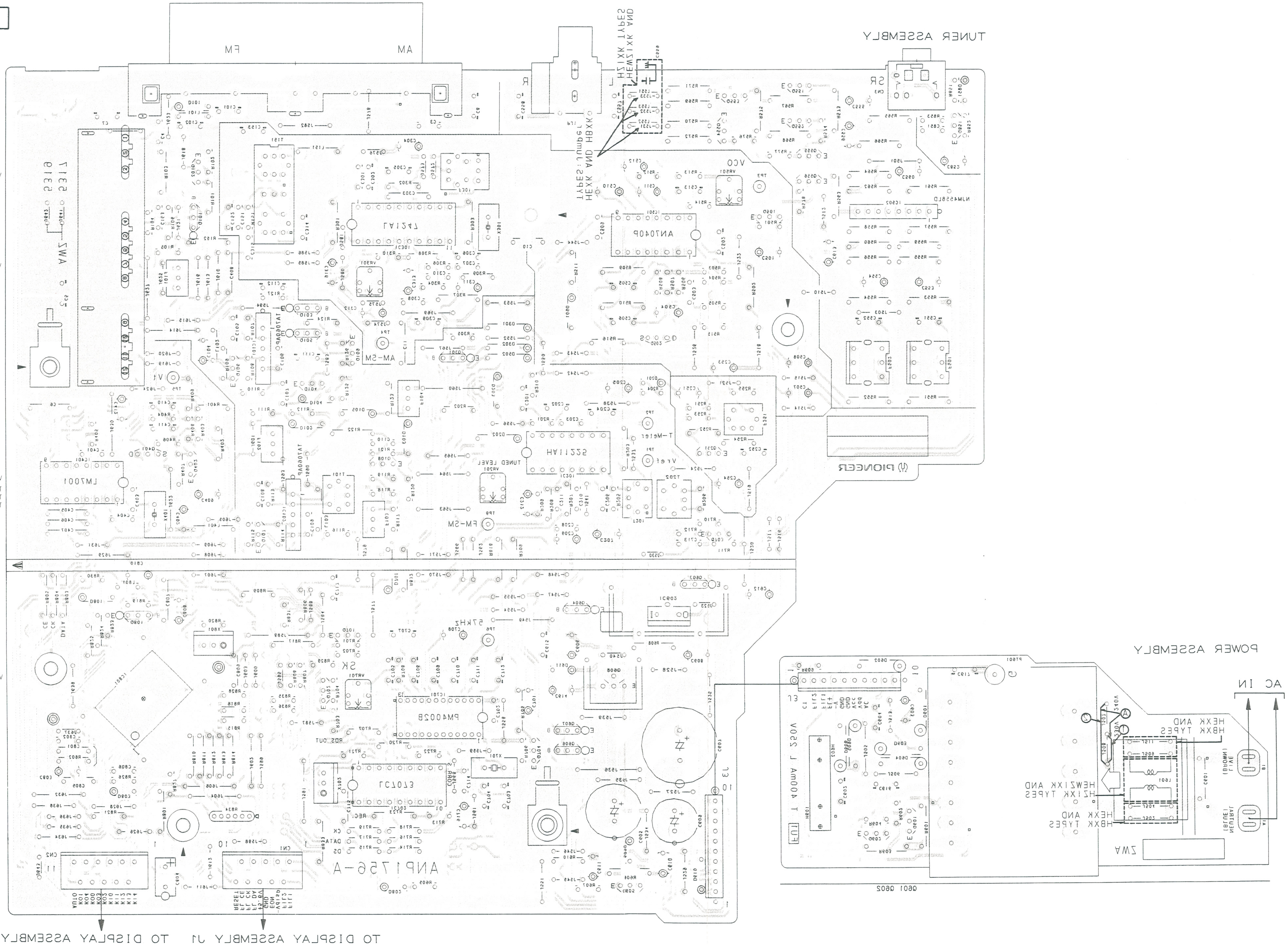
TO DISPLAY ASSEMBLY CL TO DISPLAY ASSEMBLY FL



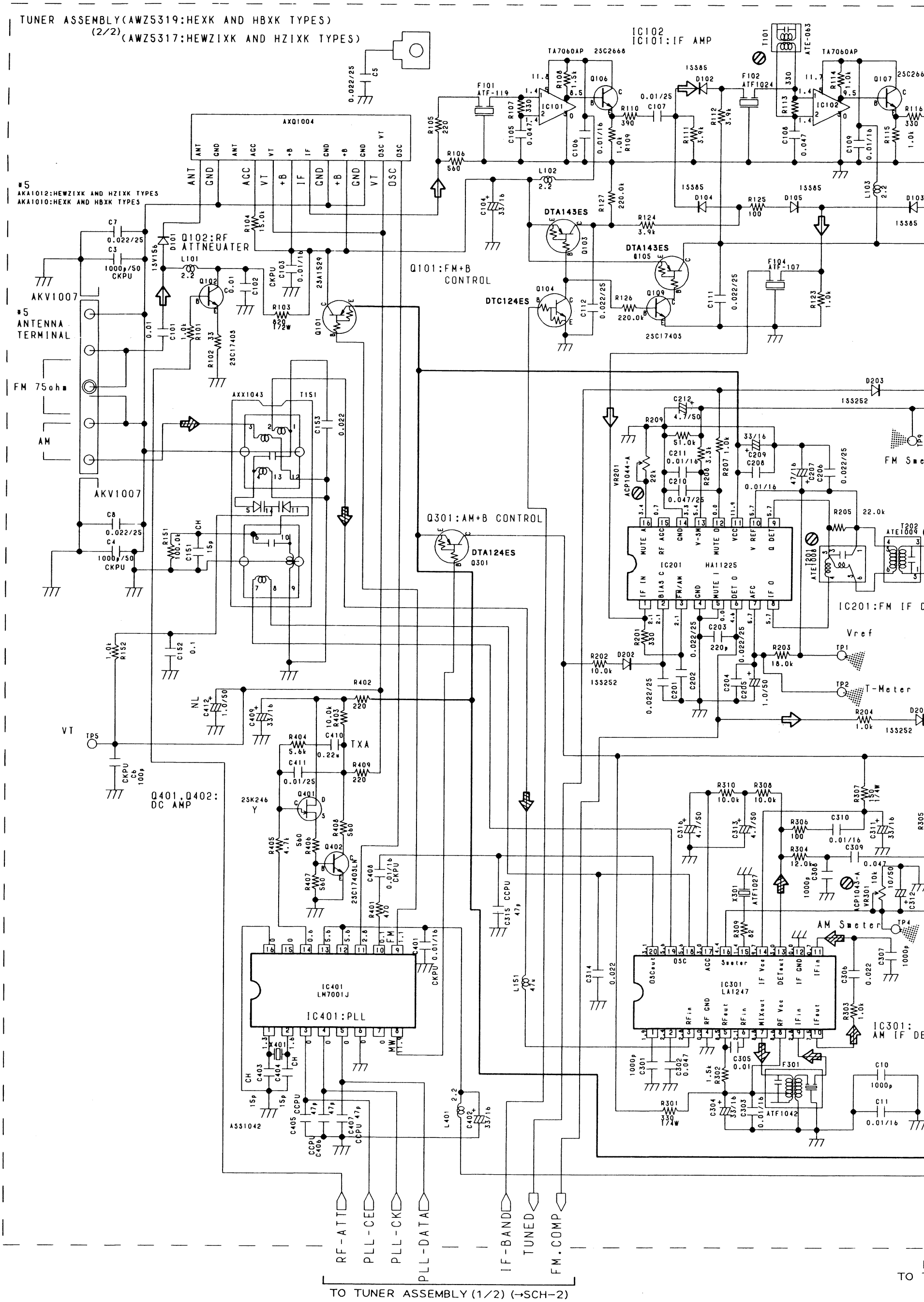
● This diagram is viewed from the foil side.

● This diagram is viewed from the foil side.

PCB-2



2.2.3 TUNER (2/2) AND POWER ASSEMBLIES



SCH-3 TUNER (2/2) ASSY, POWER ASSY

⇨:FM Signal route(Lch)
⇨:AM Signal route(Lch)

IC102
IC101:IF AMP

Q108:IF AMP

Q251:AMP

IC201:FM IF DET

IC301:
AM IF DET

IC501:MPX

IC502:BUFFER

Q604,Q603:
POWER SWITCH

Q606,Q607:
FL POWER
SWITCH

Q601,Q602
FL POWER
SWITCH

Q555,Q556:
MUTE SWITCH

Q551-Q554:MU

IC602:
Q608:REGULATOR

FM Smeter

AM Smeter

VCO

Vref

T-Meter

POWER ASSEMBLY
AWZ5320:HEXK TYPE
AWZ5321:HBXK TYPE
AWZ5318:HEWZIXK AND

AC POPWER CORD
ADG1138:HEXK,HZIXK
AND HEWZIXK

ADG1148:
HBXK TYPE

HBXK
TYPE

HEXK,
HZIXK

*1	HEXK,HBXK
R559,R560	22K

*2	HEXK,HBXK
R567,R568	1.2K

TO TUNER ASSEMBLY (1/2) (→SCH-2)

FL-27V
POWER
+12V
+5.6V
GND
INT
FIL1
FIL2

FM-SM
AM-SM
MONO
STEREO
MUTE

REMOCON

TO TUNER ASSEMBLY (1/

⇨:FM Signal route(Lch)
⇨:AM Signal route(Lch)

SCH-3

TO TUNER ASSEMBLY (1/2) (→SCH-2)

FL-27V
POWER
+12V
+5.6V
GND
INT
FIL1
FIL2

IC602:
Q608:REGULATOR

Q108:IF AMP

Q251:AMP

Q604,Q603:
POWER SWITCH

Q606,Q607:
FL POWER
SWITCH

Q601,Q602:
FL POWER
SWITCH

IC501:MPX

IC502:BUFFER

Q851:BUFFER

Q551-Q554:MUTE

Q555,Q556:
MUTE SWITCH

POWER ASSEMBLY
AWZ5320:HEXK TYPE
AWZ5321:HBXK TYPE
AWZ5318:HEWZIXK AND HZIXK TYPES

AC POPWER CORD
ADG1138:HEXK,HZIXK
AND HEWZIXK

ADG1148:
HBXK TYPE

HBXK
TYPE ONLY

HEXK,HEWZIXK AND
HZIXK TYPES

*3:HEWZIXK AND HZIXK TYPES
*4:HEXK AND HBXK TYPES

*1	HEXK,HBXK	HEWZIXK,HZIXK
R559,R560	22K	4.7K

*2	HEXK,HBXK	HEWZIXK,HZIXK
R567,R568	1.2K	270

TUNER ASSEMBLY (1/2) (→SCH-2)

TO TUNER ASSEMBLY (1/2) (→SCH-2)

TUNER (2/2) ASSY,
POWER ASSY

SCH-3