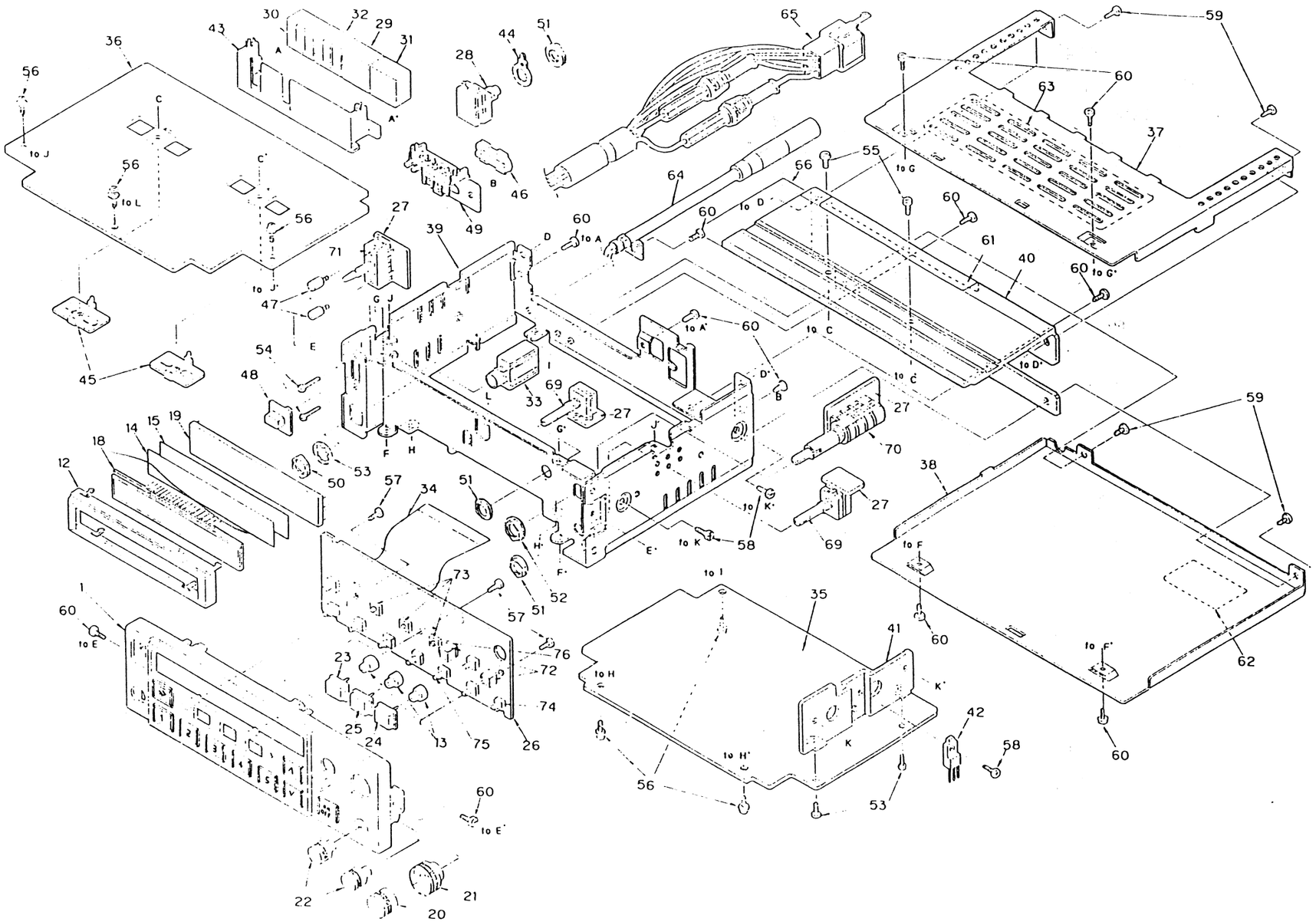
■EXPLODED VIEW • PARTS LIST:

◎Main section



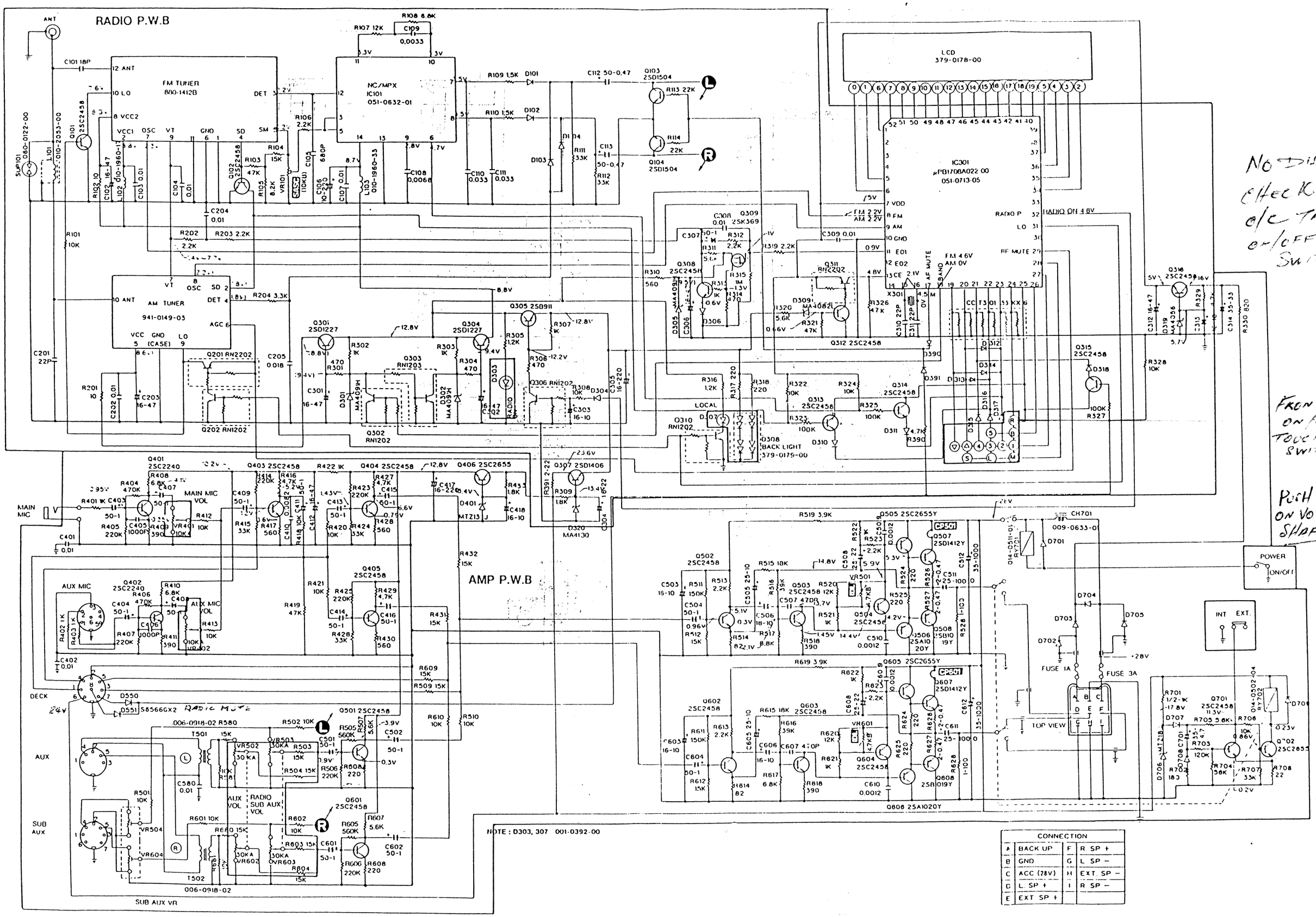
REF.NO.	PART NO.	DESCRIPTION	Q'TY
27	099-8144-00	VOL-P.W.B (A,B,C,D)	1
28	012-4477-00	Variable resistor (AUX)	1
29	074-0713-00	Outlet socket (AUX)	1
30	074-0713-01	Outlet socket (AUX MIC)	1
31	074-0713-02	Outlet socket (SUB AUX)	1
32	074-0713-03	Outlet socket (DECK)	1
33	075-0177-01	Jack	1
34	099-8140-00	P.W.B	1
35	099-8141-00	P.W.B (RADIO)	1
36	099-8142-01	P.W.B (AMP)	1
37	303-0352-00	Upper cover	1
38	304-0399-00	Lower cover	1
39	312-0294-00	Chassis	1
40	313-1321-00	Heat sink	1
41	313-1322-00	Heat sink	1
42	103-1406-00	Transistor (2SD1406)	1
43	330-8726-00	DIN holder	1
44	330-8727-00	VR holder	1
45	330-8728-00	Transistor holder	2
46	335-0818-00	Lead holder	1
47	341-1377-00	Extension	2
48	380-4942-00	Knob (EXT, INT)	1
49	944-0747-00	Filter ass'y	1
50	722-0348-00	Nut	1
51	722-0368-00	Nut	3
52	722-0370-00	Nut	1
53	745-0569-00	Washer	1
54	714-2604-11	Machine screw (M2.6x4)	2
55	714-3012-80	Machine screw (M3x12)	2
56	716-0743-00	Screw (M3x8)	6
57	700-3006-81	Tapping screw (M3x6)	3
58	702-3006-80	Tapping screw (M3x6)	5
59	731-3008-80	Tap tight (M3x8)	4
60	731-3006-80	Tap tight (M3x6)	12
61	285-1313-02	Guide label	1
62	286-3678-00	Set plate	1
63	353-0085-00	Shade	1
64	092-0542-02	Antenna receptacle	1
65	854-0025-00	Extension lead	1
66	347-2503-00	Insulator	1
67	120-0010-00	Fuse (1A)	1
68	120-0030-00	Fuse (3A)	1
69	012-4612-00	Variable resistor (MIC)	2
70	012-4643-00	Variable resistor (SW/VOL)	1
71	013-3344-00	Switch (EXT, INT)	1
72	001-0392-00	LED (RED)	2
73	013-3640-00	Switch (ME, AM/FM, LO/DX)	3
74	013-3839-00	Switch (POWER)	1
75	013-3839-01	Switch (≫ ∧∨ 1~5)	8
76	340-1434-00	Spacer	1

REF.NO.	PART NO.	DESCRIPTION	Q'TY
1	940-1026A	Escutcheon ass'y	1
12	335-2233-00	Front cover	1
13	345-4039-03	Spacer	3
14	371-3352-00	Trim plate	1
15	371-3353-00	Trim plate	1
18	379-0178-00	Indicator	1
19	379-0179-00	Indicator	1

REF.NO.	PART NO.	DESCRIPTION	Q'TY
20	380-4927-00	Knob (R. SW)	1
21	380-4928-00	Knob (AUX)	1
22	380-4865-01	Knob (MIC)	2
23	382-1486-03	Button (ME)	1
24	382-1486-04	Button (LO/DX)	1
25	382-1486-02	Button (AM/FM)	1
26	099-8143-00	SW-P.W.B	1

■CIRCUIT DIAGRAM:

◎AE-500A



No Display
Check
o/c TAC
on/off
Switch

Front
on/off
Touch
Switch

Push on/off
on Volume
Shaft.

PRESETTING:

5 AM stations and 5 FM stations can be preset.

① Choose a band to receive by AM/FM band switching button.

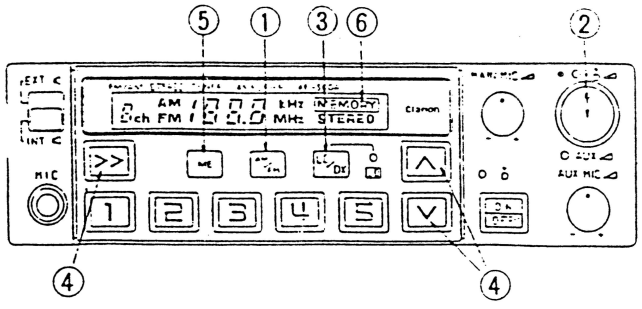
② Set to appropriate volume by the radio volume knob.

③ Change over selectivity by the reception selectivity changeover button (LOCAL/DISTANT).

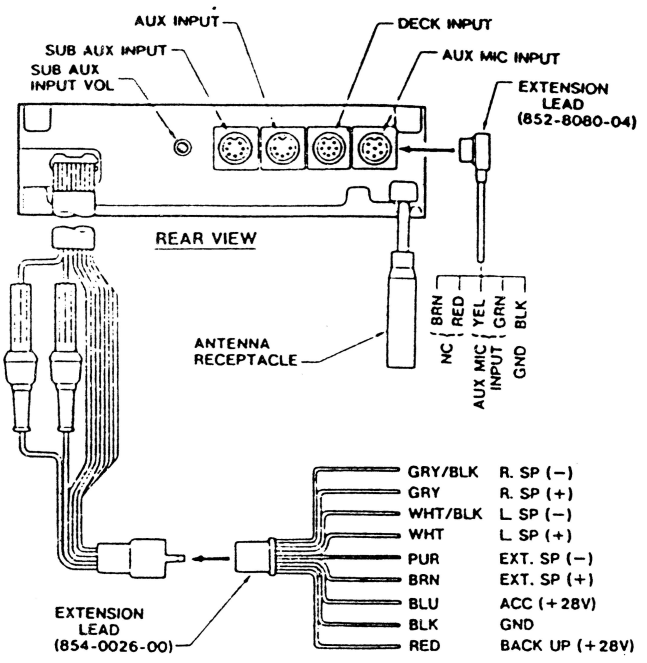
④ Receive a station by the manual tuning button or the automatic tuning button.

⑤ Press the preset memory button. "MEMORY" display is lit.

⑥ Press either one of the preset buttons "1" through "5" while "MEMORY" display is on (within 5 seconds).



WIRE CONNECTION:



MOUNTING PROCEDURE:

For PQA-120-100

Fig. 1

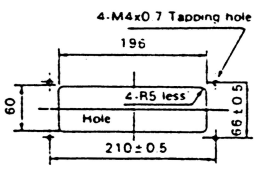


Fig. 2

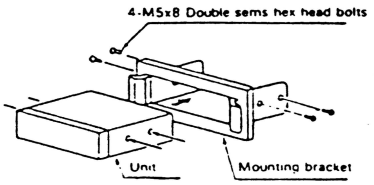
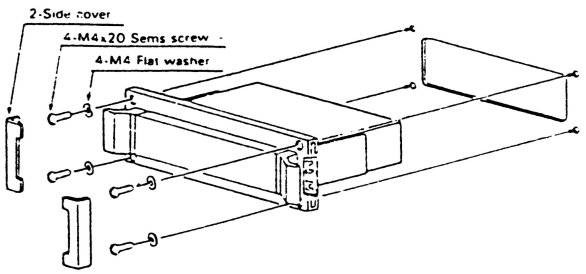


Fig. 3



Procedure

1. Bore assembling holes of the dimensions in Fig. 1 on the assembling locations.
2. Secure the unit body to the mounting bracket by four double SEMS hex head bolts M5x8 (attached to the mounting bracket). — Fig. 2 —
3. Secure the mounting bracket (with the unit) to the body of the car by four SEMS screws M4x20 and four sheets of flat washers for M4 (attached to the mounting bracket). — Fig. 3 —
4. Insert two sheets of side covers to a hook of the mounting bracket.

For PQA-121-100

Fig. 1

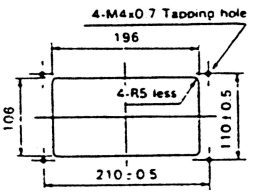


Fig. 2

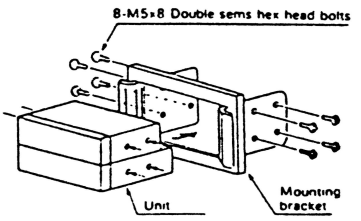
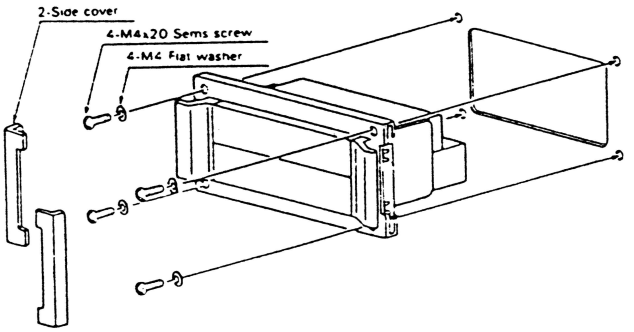


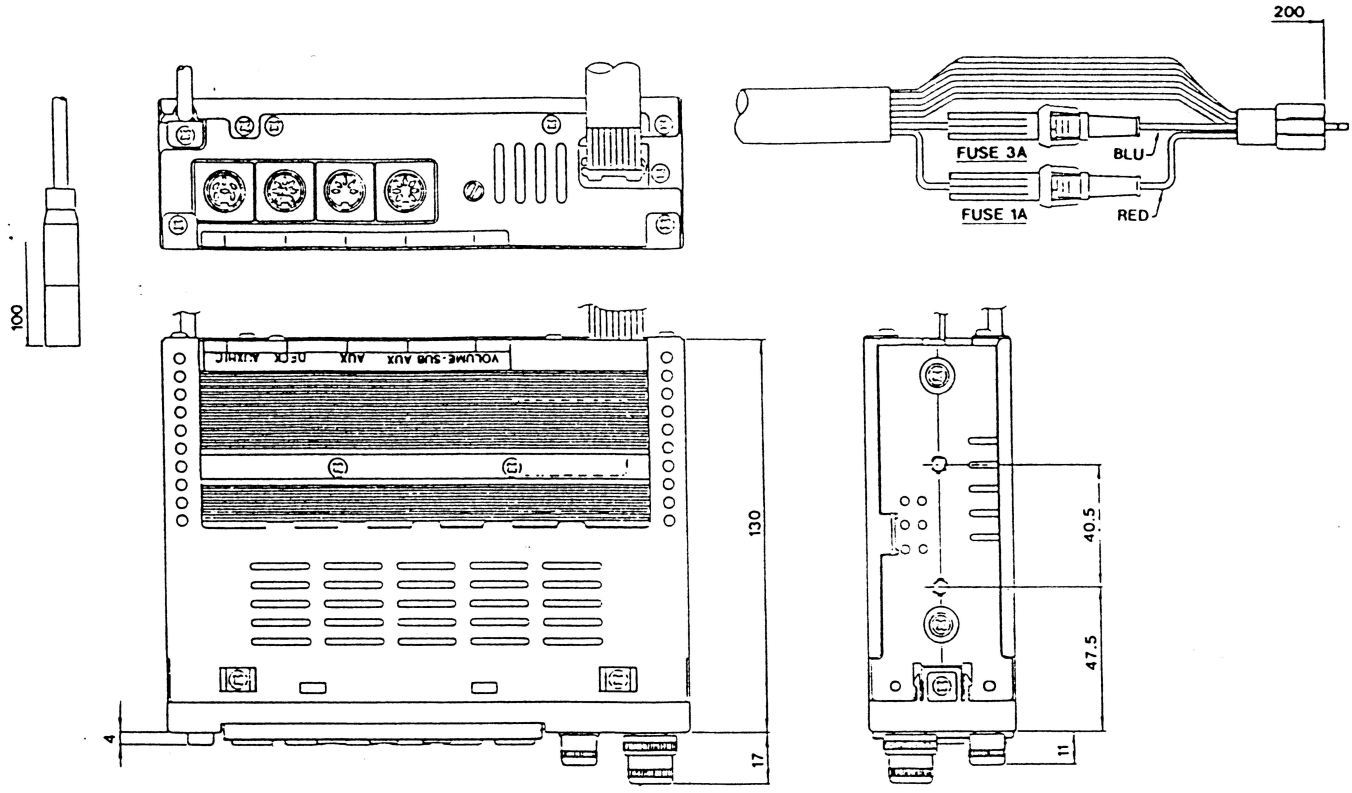
Fig. 3



Procedure

1. Bore assembling holes of the dimensions in Fig. 1 on the assembling locations.
2. Secure the unit body to the mounting bracket by four double SEMS hex head bolts M5x8 (attached to the mounting bracket).
   • Since AA-500A has a radiator on the top part of the unit, be sure to assemble on the upper part. — Fig. 2 —
3. Secure the mounting bracket (with the unit) to the body of the car by four SEMS screws M4x20 and four sheets of flat washers for M4 (attached to the mounting bracket). — Fig. 3 —
4. Insert two sheets of side covers to a hook of the mounting bracket.

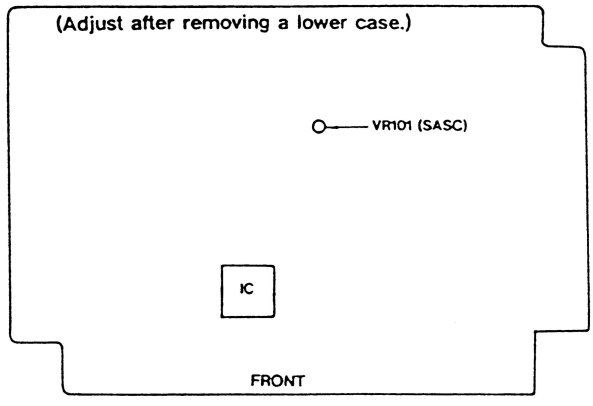
EXTERNAL APPEARANCE:

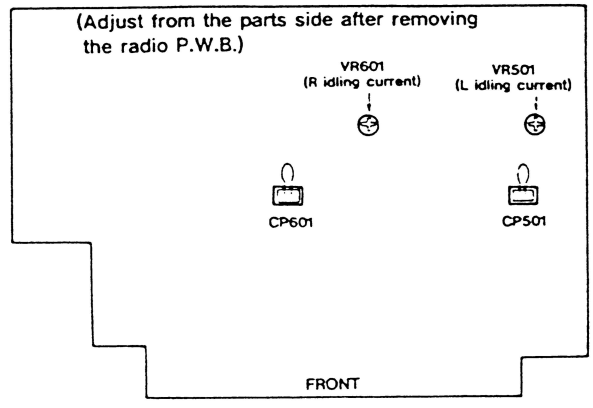


ADJUSTMENTS:

Adjustment item	Adjustment point	Procedure
SASC	VR101	1. Tune at 98.1MHz, input an 65dB, 7kHz modulation frequency, 30% modulation degree SSG signal. 2. Adjust the output level of the volume controller to 0dBm (0.775V). 3. Set the SSG output to 38dB and adjust VR101 so that the output level is −2dB.
Idling Current	VR501 and VR601	1. After putting the unit on the ambient temperature, remove the connector CP501 or CP601. 2. Connect an ammeter to CP501 or CP601 and adjust VR501 or VR601 so that the idling current becomes 15mA at no signal. Be sure to re-insert a connector after adjustment.

• ADJUSTMENT POINT

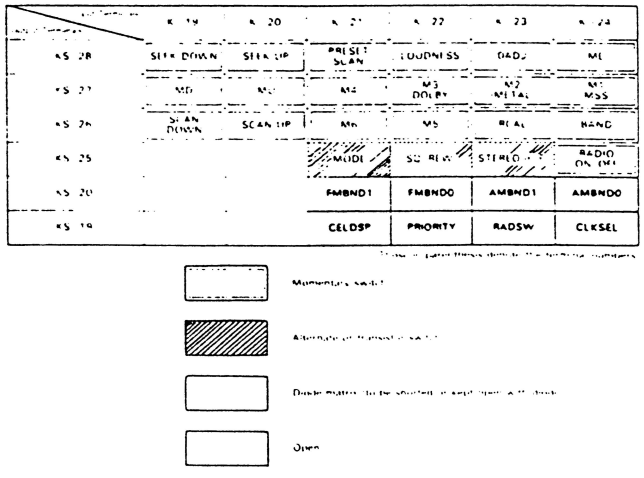




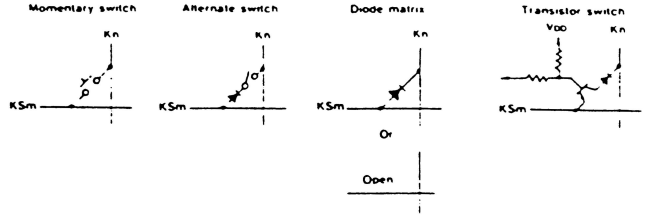
Terminal No	Symbol	Terminal Name	Function
19 20	KS_1/K_1 KS_2/K_2	Key Return Signal Source & Key Return Signal Input	These can be used as the key return signal sources to read in the status of initialization diode matrix upon the initial power input (V_{DD} rise) or when returned from the back up condition (CE low to high) only Otherwise these terminals function as the key return signal input terminals for key matrix. Connect the pull down resistor (CMOS input/output)
21 24	K_1 K_4	Key Return Signal Input	Key return signal input terminals for key matrix Connect the pull-down resistor (CMOS input)
25 28	KS_1 KS_4	Key Return Signal Sources	Key return signal output terminals for the key matrix No diodes need be provided on the key source side that prevent reverse current flow, for the sink current is reduced as much as possible for the convenience of configuration (CMOS output)
29	RF MUTE METAL	RF MUTE & METAL Output Terminal	RADIO mode It can be used as the stop sensing control signal output terminal for automatic tuning If any of the automatic tuning keys (SEEK DOWN, SEEK UP, SCAN DOWN, SCAN UP) is depressed, the high level is effected about 60ms later from the AF MUTE and it is kept during the search TAPE mode It can be used as the METAL ON/OFF signal output terminal The high level signal is output while "MTL" is displayed on the LCD panel or the low level signal if the display is out The low-level signal is output upon the initial power input (V_{DD} rise) (CMOS output)
30	DX/MSS	LOCAL/DX & MSS Output Terminal	RADIO mode It can be used as the stop sensing control signal output terminal for automatic tuning The low-level signal is output with "DX" displayed on the LCD panel if it failed to find any station within one-cycle search from the frequency currently being received, or the high-level signal is output while "DX" is out TAPE mode It can be used as the MSS ON/OFF signal output terminal The high-level signal is output while "MSS" is displayed on the LCD panel or the low-level signal is output if "MSS" is out The low-level signal is output upon the initial power input (V_{DD} rise) (CMOS output)
31	LOUDNESS	LOUDNESS Output Terminal	LOUDNESS signal output terminal, the high-level signal is output while "LOU" is displayed on the LCD panel or the low-level signal if "LOU" is out The low-level signal is output upon the initial power input (V_{DD} rise) (CMOS output)
32	RADIO POWER	RADIO ON/OFF Output Terminal	RADIO power ON/OFF signal output terminal when the momentary key method is chosen as the radio power supply (with the diode switch RADSW = ON) When RADIO is ON, the high-level signal is output or the low-level if the switch is off (CMOS output)

V Key Matrix

§ 1 Key Matrix Arrangement



§ 2 Switch Connection



§ 3 Initialization Diode Matrix

Eight diode matrices are provided for initialization, and the status of each matrix is read in only upon the initial power input to V_{DD} (Power-ON reset) or if the CE terminal level changes between low and high (CE reset), otherwise the status of diode matrices are ignored

Symbol	Functions
FMBND1 FMBND0	Both are the switches to set the receive FM band frequency range and the channel spaces as shown below

FMBND1	FMBND0	Frequency Range	Channel Space
0	0	87.9 107.9MHz	200kHz
0	1	87.5 107.9MHz	100kHz
1	0	76.0 90.0MHz	100kHz
1	1	87.604 107.900MHz	86kHz

Symbol	Functions
AMBND1 AMBND0	Switches to set the receive AM band frequency range and the channel spaces as shown below

AMBND1	AMBND0	Frequency Range	Channel Space
0	0	530 1.620kHz	10kHz
0	1	530 1.620kHz	5kHz
1	0	522 1.629kHz	9kHz
1	1	531 1.602kHz	9kHz

Symbol	Functions
RADSW	Switch to select the radio power supply between the momentary key method and the alternate method 0 Alternate (CE terminal to be used) 1 Momentary (CE terminal always set to high level and RADIO ON/OFF key to be used)
CLKSEL	Switch to select if the clock function is attached 0 Not attached 1 Attached
PRIORITY	Switch to select the priority display mode if the clock function is attached Either of the following two priority modes is displayed about 5sec later when the other display mode is called 0 Clock display 1 Frequency display
CELDSP	Switch to select if clocks need be displayed when the clock function is attached and while RADIO is off 0 Blanks 1 Clock display

§ 4 Mode Switches

Unlike the initialization switches, the mode switches are always operable (in the table below "1" indicates the switch is turned ON or OFF if "0" is shown)

Symbol	Functions
MODE	To select either the RADIO mode or the TAPE mode. 1……TAPE mode 0……RADIO mode
SD (REW)	RADIO mode It can be used as the station detector input under SEEK, SCAN and PRESET-SCAN. This must be turned off about 50ms after locking PLL SEEK, SCAN or PRESET-SCAN is automatically stopped as if the intended station has been detected if this switch has been found OFF by each of five detections that were made every 1ms TAPE mode It can be used as the tape direction display input switch "◁" is displayed on the LCD panel when this switch is turned on
STEREO (F/F)	RADIO mode It can be used as the stereo signal input switch, when it is turned off, "ST" is displayed on the LCD panel but this display is kept out while the clocks are displayed or under the automatic tuning or PRESET-SCAN (the AF-MUTE terminal is active) TAPE mode It can be used as the tape direction display input switch "▷" is displayed on the LCD panel when this switch is turned on

§ 5 Momentary Switch

Symbol	Functions
MU MD	Keys for the manual tuning or the clock adjustment ○Frequency display With each depression the frequency can be stepped up (MU) by one step (channel space) or down (MD). The frequency can be continuously stepped up or down by depressing the keys for 0.5sec or more ○Clock display With the MU or MD key depressed together with the ME key, the minute digit or the hour digit can be adjusted
M1 M6	RADIO mode These keys can be used to write into or call the preset memory. Both the FM and AM bands can be individually memorized by each key (1) To write into memory With any key depressed out of M1 to M6 within 5sec after depressing the ME key under the frequency display mode, the frequency current being received can be written into the memory corresponding to the depressed key (2) To call memory The data (frequency) can be called out from the memory corresponding to the key depressed out of M1 to M6 When the radio is turned on with the initial input V_{DD} input, the lowest AM band frequency can be called. The table below shows the frequencies that are stored in the corresponding memories of M1 to M6 keys for the convenience of mass production of the sets

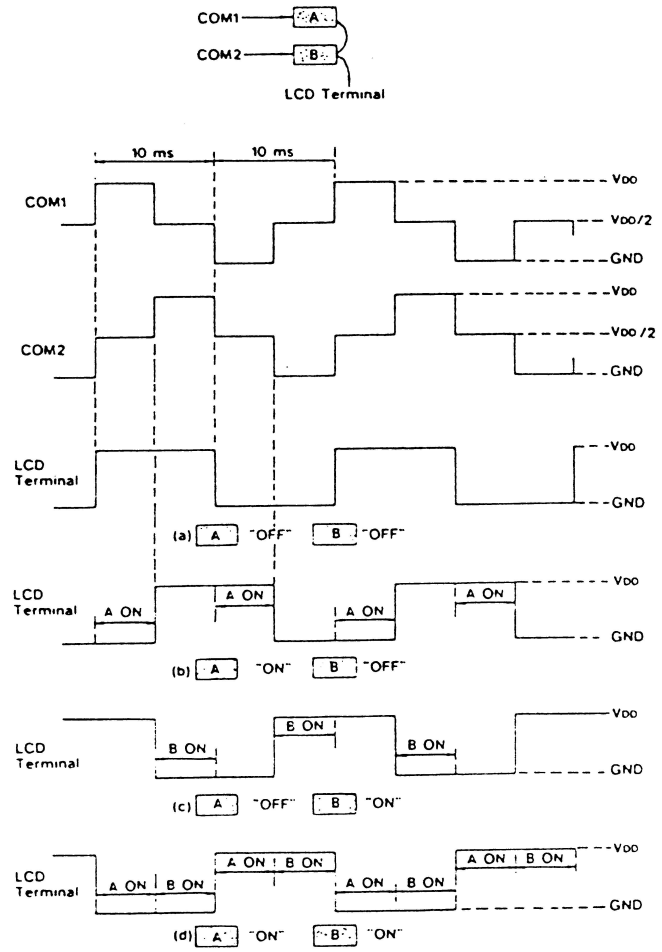
Symbol	Functions
M1 M6	 Note The frequencies shown above are for display purpose only and differ from the actual frequencies that can be received TAPE mode M1 to M3 can be used to switch MSS, METAL and DOLBY, the other keys M4 to M6 are invalid o M1 (MSS) Can be used to switch MSS With every depression both the MSS terminal output and the "MSS" display on the LCD panel are inverted With "MSS" kept on the high-level signal is output from the MSS terminal or the low-level signal if "MSS" is out o M2 (METAL) Can be used to switch METAL With every depression both the METAL terminal output and the "METAL" display on the LCD panel are inverted With "METAL" kept on, the high-level signal is output from the METAL terminal or the low-level signal if "METAL" is out o M3 (DOLBY) Can be used to switch DOLBY With every depression both the DOLBY terminal output and the "DO" display on the LCD panel are inverted With "DOLBY" kept on, the high-level signal is output from the DOLBY terminal or the low-level signal if "DOLBY" is out
SEEK UP SEEK DOWN	Automatic tuning key to hold the current frequency even after the SD switch is turned off during the automatic tuning This mode can be further held on even if any of the LOUDNESS, OADJ or ME keys is depressed, but the automatic tuning stops and it changes to the operation corresponding to any key that has been depressed
SCAN UP SCAN DOWN	Automatic tuning key to hold the current frequency for 5 seconds after the SD key is depressed during the automatic tuning, the same frequency reception continues if either the SCAN UP or SCAN DOWN key is depressed during the above 5-sec period Or the automatic tuning suspended by the SD key is restored if no keys are depressed for the period of 5sec The automatic tuning continues even if the LOUDNESS, OADJ or ME key is depressed, but the scanning stops if the ME key is depressed during the 5-sec reception, and the set is changed to allow the memory write The automatic tuning stops with the depression of any other key and changes to the operation specified by the depressed key
ME	Preset memory write key or it can be used to adjust the clock if it is displayed Frequency display mode This key can be used to write new frequencies into the preset memory When it is depressed, "ME" is displayed on the LCD panel and it keeps on for 5 sec even after this key is released If any of M1 to M6 keys was depressed while "ME" was kept on the displayed frequency is written into the memory corresponding to the depressed key To release the memory write mode depress any key other than M1 to M6, ME and LOUDNESS Clock display mode Both the "minutes" and "hours" digits can be adjusted by depressing either the MU or MD key together with this ME key If the MD key was depressed together with the ME key the clock is advanced by one hour with each depression or it continues at a speed of 4 hours/sec until the MD key is released after it has been depressed for 0 5sec or longer This hour correction does not affect either the minute-digits or the second-digits (and the display remains out) The clock advances by one minute with every depression of the MU key together with the ME key or it continues at a speed of 8 min/sec until the MU key is released after it has been depressed for 0 5sec or longer While they are not displayed the seconds are reset by every minute correction to 0 No carry-over to the hour unit takes place, however
OADJ	This key can be used to set the clock on the hour As it is depressed the second counter insider is reset and the clock is reset to 0min 0sec by rounding off the minute digit even if it is less or more than 29 In the latter case the minute display is carried over to the hour digit or the clock is advanced by one hour
BAND	To switch the frequency band from FM to AM with each depression The lowest AM frequency is called upon the initial power input (V_{DD} rise)

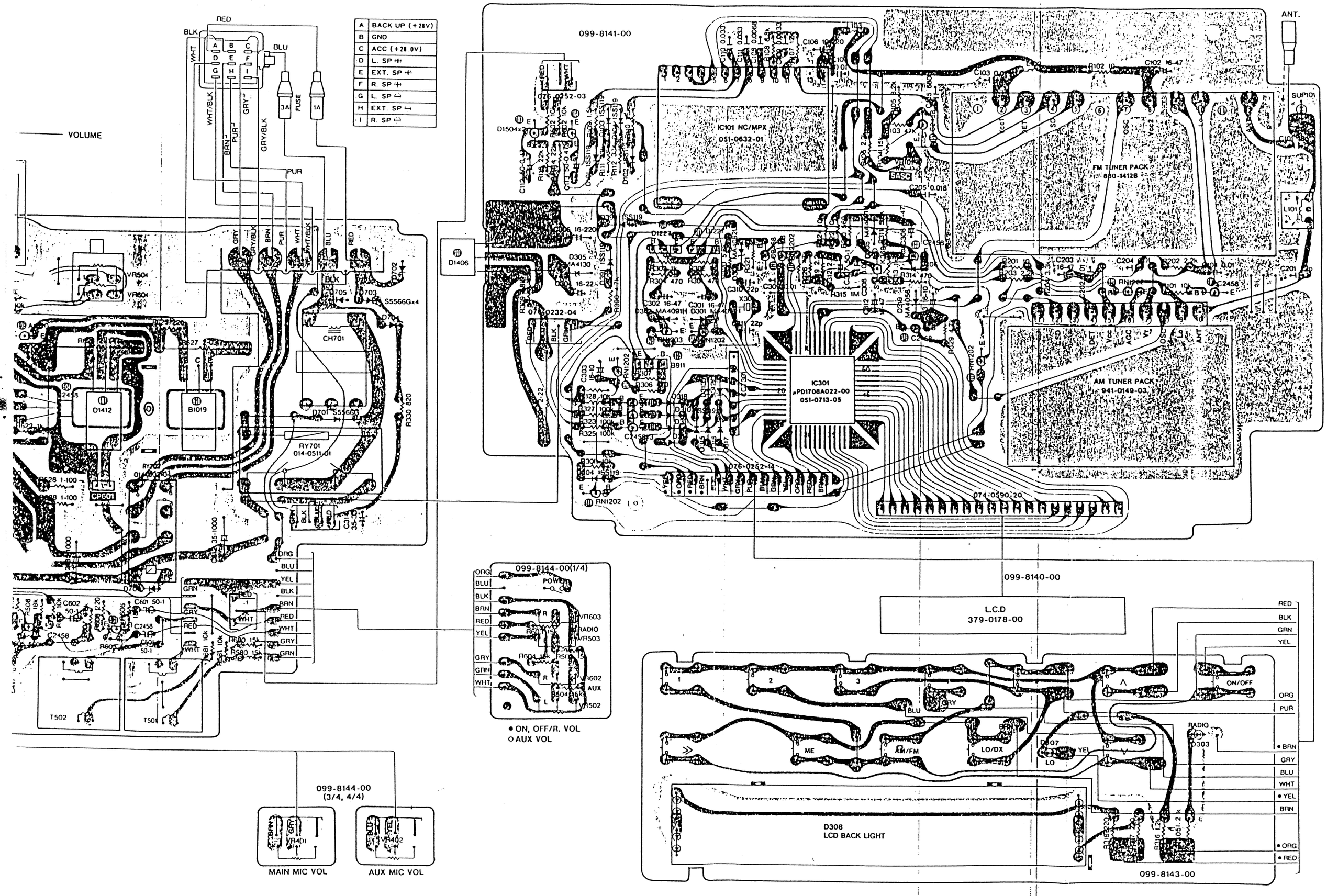
Symbol	Functions
PRESET SCAN	Automatic preset scan key to start the scanning from the channel next to the preset channel being received (or from M1 if no preset channels being received) and receive the preset channel for 5 seconds that is selected when the SD switch is turned off The same preset channel can be continued by the PRESET SCAN key before the above period of 5 seconds elapses The scanning continues even if the LOUDNESS, OADJ or ME key is depressed during the automatic preset scan mode, or the automatic preset scan stops if any other key is depressed, and it changes to the operation as specified by the depressed key
LOUDNESS	To be used to switch LOUDNESS, the LOUDNESS output terminal and the "LOU" display on the LCD panel are inverted with every depression The high-level signal is output from the LOUDNESS terminal while "LOU" is kept on or the low-level signal if the display is out The "LOU" display is out upon the initial power input (V_{DD} rise) and the low-level frequency is output from the LOUDNESS terminal
RCAL	Key to switch the display and valid under the RADIO mode only With this key depressed, the clock display changes to the frequency display or vice versa, provided that the priority mode display is restored (according to PRIORITY of the diode matrix) 5sec after this key is depressed This key is invalid if no clocks are provided (CLKSEL = 0)

Note 1 The frequency is changed after confirming the PLL lock under the automatic tuning and PRESET SCAN modes If, therefore PLL is unlocked under either mode the same frequency is held on until PLL is locked again The momentary keys (other than RADIO OFF) cannot be controlled while the alternate switch is available
To change the frequency during the set adjustment as PLL seems to be unlocked, use the memory buttons (M1 - M6) or MU or MD to set the PLL data without worrying about its unlocking

Note 2 If the frequency band is changed to the original band during the automatic tuning or PRESET SCAN mode, or if the power supply is resumed, the station finally being received is called out

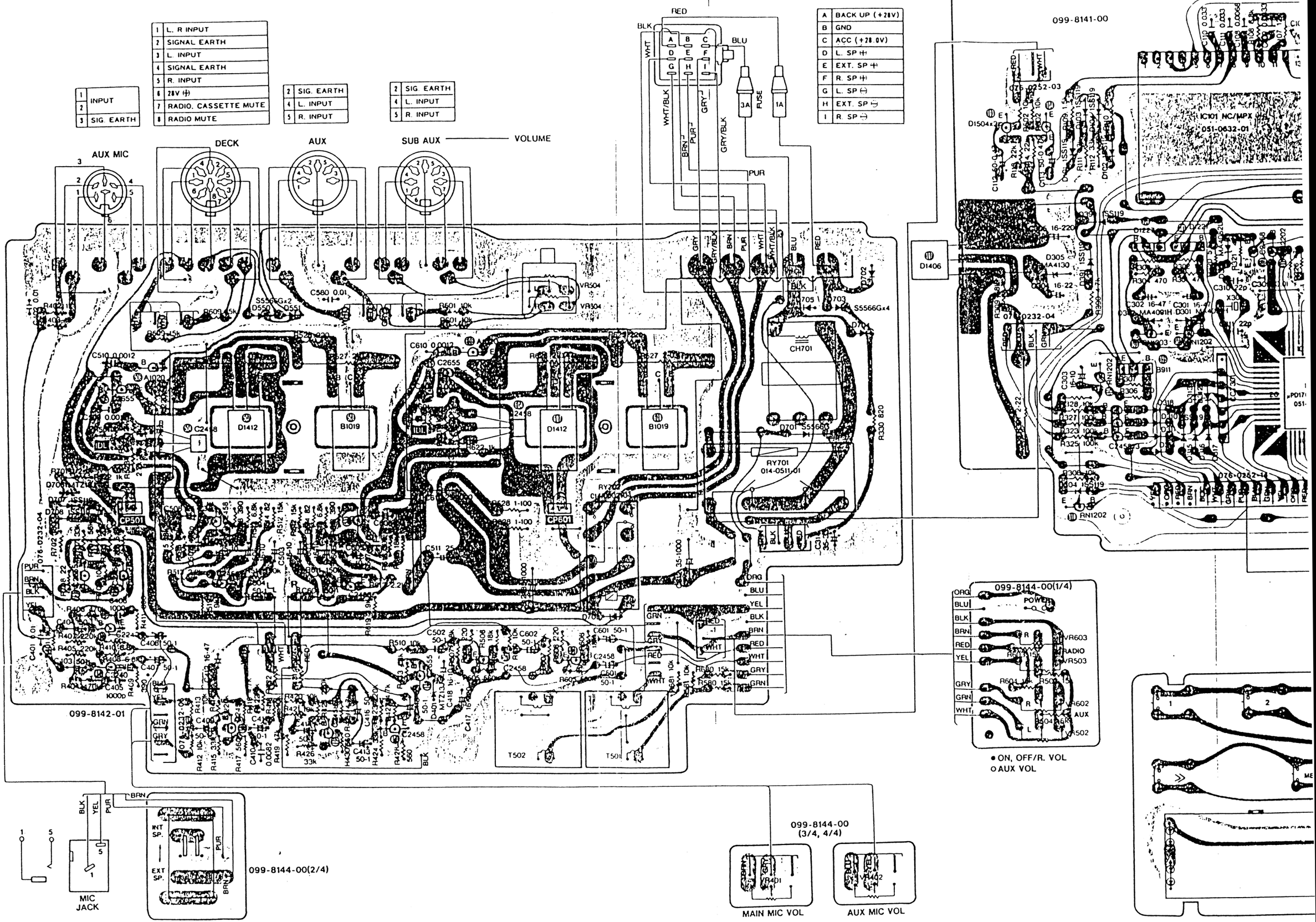
VI LCD Drive Wave



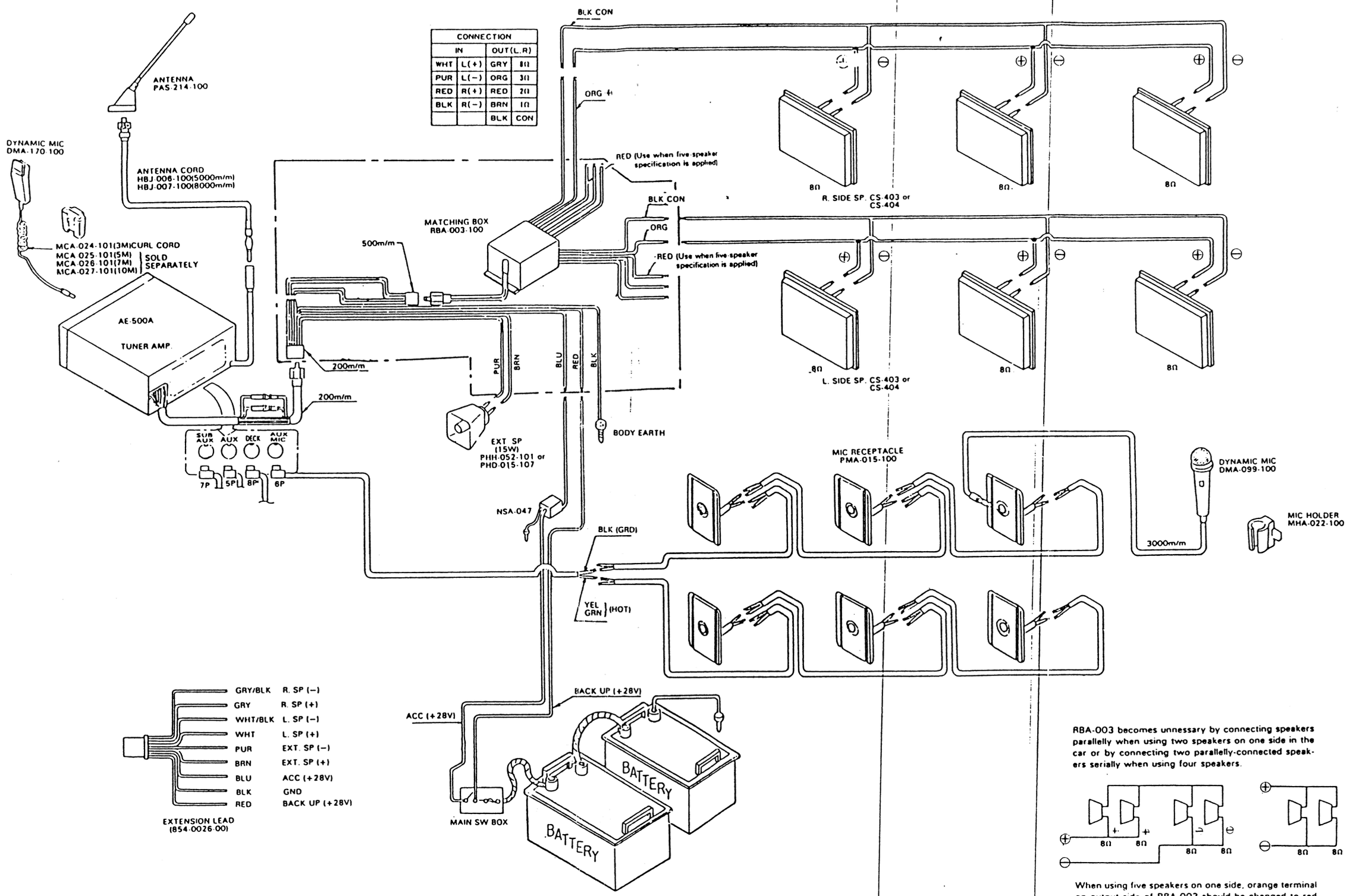

A BACK UP (+28V)
B GND
C ACC (+28.0V)
D L. SP +
E EXT. SP +
F R. SP +
G L. SP −
H EXT. SP −
I R. SP −
VOLUME
FUSE
3A
1A
099-8141-00
IC101 NC/MPX
051-0632-01
FM TUNER PACK
880-1412B
AM TUNER PACK
941-0149-03
IC301
μPD1708A022-00
051-0713-05
ANT.
SUP101
RY701
014-0511-01
CH701
CP601
T502
T501
D1412
B1019
D1406
099-8144-00(1/4)
POWER
VR603
RADIO
VR503
AUX
VR502
• ON, OFF/R. VOL
○ AUX VOL
099-8144-00
(3/4, 4/4)
VR401
VR402
MAIN MIC VOL
AUX MIC VOL
099-8140-00
L.C.D
379-0178-00
ON/OFF
ME
AM/FM
LO/DX
LO
D308
LCD BACK LIGHT
099-8143-00

■PRINTED WIRING BOARD:

◎AE-500A



■CONNECTION DIAGRAM:



RBA-003 becomes unnessary by connecting speakers parallelly when using two speakers on one side in the car or by connecting two parallelly-connected speakers serially when using four speakers.

When using five speakers on one side, orange terminal on output side of RBA-003 should be changed to red one.

■PARTS LIST: ◎Electrical section

◎RADIO P.W.B

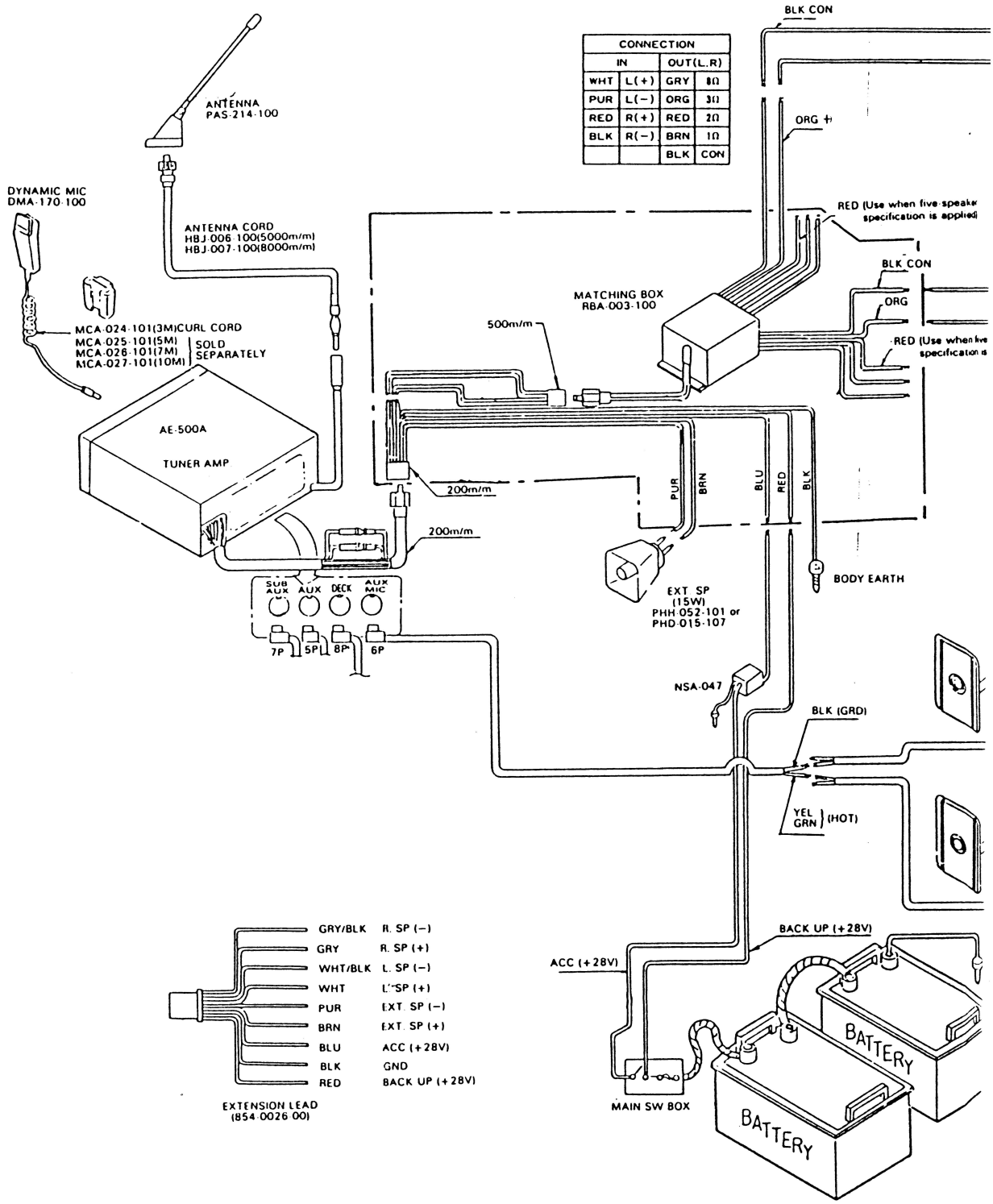
REF.NO.	PART NO.	DESCRIPTION	Q'TY
D 101~104 304,306 310~318 390,391	001-0330-00	Diode 1SS119	17
D309	001-0377-43	Diode MA4082L	1
D301,302,305	001-0377-48	Diode MA4091H	3
D319	001-0423-19	Diode MA4056	1
D320	001-0423-28	Diode MA4130	1
L 102	010-1960-17	Coil	1
L 103	010-1960-33	Coil	1
L 101	010-2053-00	Coil	1
VR101	012-3808-06	Variable resistor 10kΩ	1
CCT301	050-0093-03	Component circuit	1
IC101	051-0632-01	IC MPX-NC-H	1
IC301	051-0713-04	IC μPD1708AG(A)903	1
SUP101	060-0122-00	Surge protector	1
X301	061-1053-00	Crystal-OSC	1
Q305	101-0911-00	Transistor 2SB911MPQR	1
Q 101,102,308 312,313,314 316,318	102-2458-50 (102-2785-60) (102-3330-50)	Transistor 2SC2458Y,GR,BL Transistor (2SC2785) Transistor (2SC3330)	8
Q301,304	103-1227-00	Transistor 2SD1227	2
Q307	103-1406-00	Transistor 2SD1406-O,Y,GR	1
Q103,104	103-1504-00 (103-1450-50)	Transistor 2SD1504-D,E Transistor (2SD1450ST)	2
Q309	108-0369-28 (108-0363-28)	FET 2SK369 FET (2SK363-GR)	1

REF.NO.	PART NO.	DESCRIPTION	Q'TY
Q201,311	125-0003-02 (100-1348-00)	Transistor RN2202 Transistor (2SA1348)	2
Q 202,302,306 310	125-2003-02 (102-3402-00)	Transistor RN1202 Transistor (2SC3402)	4
Q303	125-2003-03 (102-3400-00)	Transistor RN1203 Transistor (2SC3400)	1
R391	114-2201-21	Film resistor 2W22Ω OM	1
C 103,104,107 202,204,308 309	171-1032-06	Ceramic capacitor 0.01μF SC	7
C205	173-1831-10	Polyester capacitor 0.018μF S	1
C109	173-3321-10	Polyester capacitor 0.0033μF S	1
C110,111	173-3331-10	Polyester capacitor 0.033μF S	2
C105	173-6811-10	Polyester capacitor 680pF S	1
C108	173-6821-10	Polyester capacitor 0.0068μF S	1
C101	174-1800-13	Ceramic capacitor 18pF TC	1
C201,310,311	174-2200-13	Ceramic capacitor 22pF TC	3
C106	179-2273-21	Electrolytic capacitor 10V220μF S	1
C305	179-2273-31	Electrolytic capacitor 16V220μF S	1
C307	182-1053-62	Electrolytic capacitor 50V1μF SS	1
C303,313	182-1063-32	Electrolytic capacitor 16V10μF SS	2
C304	182-2263-32	Electrolytic capacitor 16V22μF SS	1
C112,113	182-4743-62	Electrolytic capacitor 50V0.47μF SS	2
C 102,203,301 302,306,312	182-4763-32	Electrolytic capacitor 16V47μF SS	6

◎AMP. P.W.B

REF.NO.	PART NO.	DESCRIPTION	Q'TY
D707,708	001-0330-00	Diode 1SS119	2
D 550,551 701~705 709	001-0379-00	Diode S5566G	8
D401	001-0421-28	Diode MTZ13J	1
D706	001-0421-31	Diode MTZ18J	1
T501,502	006-0918-02	Input trans	2
CH701	009-0633-01	Choke trans	1
VR501,601	012-4101-05	Variable resistor	2
VR504,(604)	012-4477-00	Variable resistor AUX-VOL	1
RY702	014-0502-04	Relay	1
RY701	014-0511-01	Relay	1
C511,611	042-0387-00	Electrolytic capacitor 25V1000μF	2
C512,612	042-0388-00	Electrolytic capacitor 35V1000μF	2
Q506,606	100-1020-25	Transistor 2SA1020YZ	2
Q508,608	101-1019-25	Transistor 2SB1019Y	2
Q401,402	102-2240-00 (102-2362-00)	Transistor 2SC2240GR,BL Transistor (2SC2362)	2
Q 403~405 501~504 601~604 701	102-2458-49 (102-2785-49)	Transistor 2SC2458-Y,GR Transistor (2SC2785)	12
Q 406,505,605 702	102-2655-25	Transistor 2SC2655Y	4

REF.NO.	PART NO.	DESCRIPTION	Q'TY
Q507,607	103-1412-25	Transistor 2SD1412-Y	2
R701	111-1021-82	Film resistor 1/2W1kΩ	1
R528,628	114-1011-11	Film resistor 1W100Ω OM	2
R 526,527,626 627	114-4781-21	Film resistor 2W0.47Ω OM	4
C405,406	160-1022-05	Ceramic capacitor 1000pF B HD	2
C507,607	160-4712-05	Ceramic capacitor 470pF B HD	2
C401,402,580	171-1032-06	Ceramic capacitor 0.01μF SC	3
C 509,510,609 610	173-1221-10	Polyester capacitor 0.0012μF S	4
C410	173-8221-10	Polyester capacitor 0.0082μF S	1
C417	179-2273-33	Electrolytic capacitor 16V220μF S	1
C 403,404 407~409 411 413~416 501,502,504 601,602,604	182-1053-62	Electrolytic capacitor 50V1μF SS	16
C 418,503,506 603,606	182-1063-32	Electrolytic capacitor 16V10μF SS	5
C505,605	182-1063-42	Electrolytic capacitor 25V10μF SS	2
C508,608	182-2263-42	Electrolytic capacitor 25V22μF SS	2
C314	182-3363-52	Electrolytic capacitor 35V33μF SS	1
C701	182-4753-52	Electrolytic capacitor 35V4.7μF SS	1
C412	182-4763-32	Electrolytic capacitor 16V47μF SS	1

NOTE : OM (Oxidized Metal) SC (Semi-Conductor)
S (Small) SS (Super Small)
HD (Higher Dielectric) TC (Temperature-Compensating)

■CONNECTION DIAGRAM: