

ST-EX77

SERVICE MANUAL

*AEP Model
UK Model
E Model*



This set is the tuner section in
MHC-EX66,DHC-EX77MD/MD77.

SPECIFICATIONS

FM stereo, FM/AM superheterodyne tuner

FM tuner section

Tuning range	87.5 – 108.0 MHz (50 kHz step)
Antenna	FM lead antenna
Antenna terminals	75 ohms unbalanced
Intermediate frequency	10.7 MHz

AM tuner section

Tuning range	
AEP, UK models:	
MW:	531 – 1,602 kHz (with the interval set at 9 kHz)
LW:	153 – 279 kHz (with the interval set at 3 kHz)
Hong Kong, Singapore models:	
AM:	531 – 1,602 kHz (with the interval set at 9 kHz) 530 – 1,710 kHz (with the interval set at 10 kHz)

Antenna

AM loop antenna,
outdoor antenna
terminals

Intermediate frequency 450 kHz
Dimensions (w/h/d) incl. projecting parts and
controls: Approx.

280 × 90 × 288 mm

Mass

Approx. 1.6 kg

Design and specifications are subject to change
without notice.

FM STEREO/FM-AM TIMER TUNER



SONY®

SERVICING NOTES

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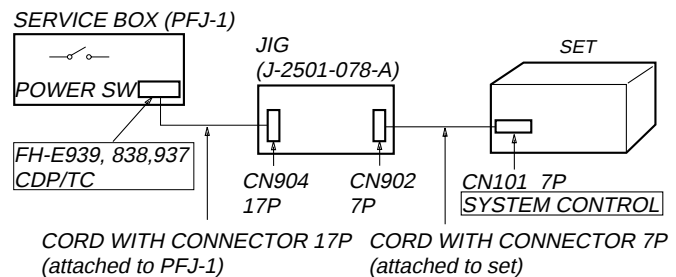
How to operate with a single unit.

Normally, this set is not operated with its own.

The exclusive jig (J-2501-078-A) and service box (PFJ-1) are necessary to operate the set with a single unit.

Turn the power set of the service box ON. Then press the **ENTER/NEXT** button and **SLEEP** button at the same time to turn the power on.

Connection:



• KEY/FL tube/LED check mode.

To enter KEY/FL tube/LED check mode, press the **ENTER/NEXT** and **REC** buttons at the same time.

Under mode, every time when press any key or turn **MULTI CONTROLLER** knob, change to next situation.

- ① All LED indicators light on
- ② All FL tube indicators light on
- ③ A part of FL tube light on mode 1. (Indicated ST-SEG)
- ④ A part of FL tube light on mode 2. (Indicated RDS-SEG)
- ⑤ KEY check mode

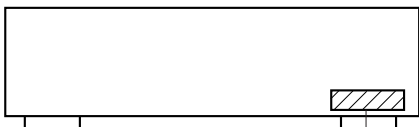
Note:

- 1) All LED light on mode is kept, when buttons which is pressed to enter all LED light on mode, release same time. When release them separate timing, it is moved to next All LED light on mode.
- 2) After all LED light on mode, light on point remove one by one, when any button pressed or **MULTI CONTROLLER** knob turned.
- 3) Under KEY check mode, every time buttons pressed numerical value of "KEY" in FL tube increase. And that time, numerical value of "ECDR" increase when **MULTI CONTROLLER** button turn to + direction, and it decrease turn to - direction.

When you want to finish this mode, unplug the power of amplifier or turn off PFJ-1 of POWER switch.

MODEL IDENTIFICATION

– Back Panel –



4-985-904-1 □ : AEP, UK model
4-985-904-2 □ : Hong Kong, Singapore model

SAFETY-RELATED COMPONENT WARNING!!

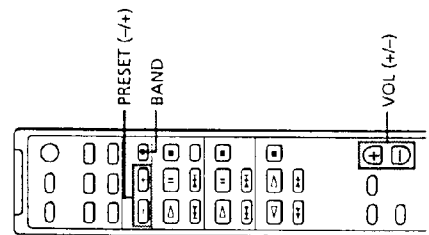
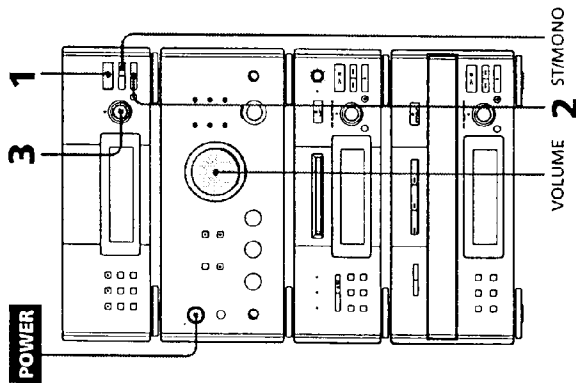
COMPONENTS IDENTIFIED BY MARK OR DOTTED LINE WITH MARK ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

Listening to the radio

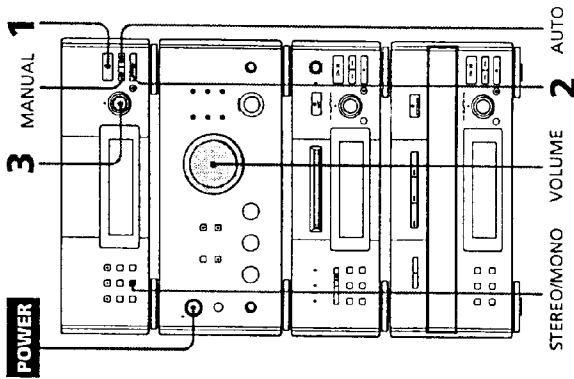
— Preset Tuning

Preset radio stations in the tuner's memory first (see page 10).

For AEP, UK models



For Hong Kong, Singapore models



1 Press TUNER/BAND (or BAND on the remote) repeatedly until the band you want appears.

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

AEP, UK models:

FM → MW → LW

Hong Kong, Singapore models:

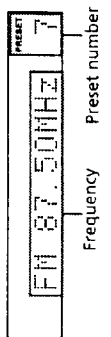
FM → AM

2 For AEP, UK models:
Press TUNING MODE repeatedly until "PRESET" appears.

For Hong Kong, Singapore models:
Press PRESET.

3 Turn MULTI CONTROLLER to tune in the desired preset station.

Turn counter-clockwise (or press PRESET - on the remote) for lower preset numbers.
Turn clockwise (or press PRESET + on the remote) for higher preset numbers.



To	Do this
Turn off the radio	Press SYSTEM POWER.
Adjust the volume	Turn VOLUME (or press VOL + or - on the remote).

To listen to non-preset radio stations

For AEP, UK models:

Press TUNING MODE repeatedly until "TUNING" appears in step 2, then turn MULTI CONTROLLER to tune in the desired station (Manual Tuning).

Press TUNING MODE repeatedly until "AUTO TUNING" appears in step 2, then turn MULTI CONTROLLER.

The frequency indication changes and scanning stops when the system tunes in a station (Automatic Tuning).

For Hong Kong, Singapore models:
Press MANUAL in step 2, then turn MULTI CONTROLLER to tune in the desired station (Manual Tuning).

Press AUTO in step 2, then turn MULTI CONTROLLER.
The frequency indication changes and scanning stops when the system tunes in a station (Automatic Tuning).

Tips

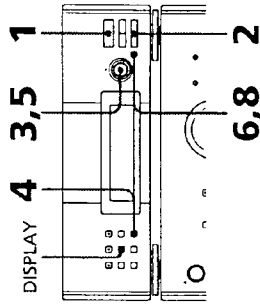
- Pressing TUNER/BAND when the power is off automatically turns the power on and tunes to the last received station (One Touch Play).
- You can switch from another source to the tuner just by pressing TUNER/BAND (Automatic Source Selection).
- To improve broadcast reception, reorient the supplied antennas.
- When an FM program is noisy, press ST/MONO (European model) or STEREO/MONO (other models) so that "MONO" appears. There will be no stereo effect, but the reception will improve. Press the button again to restore the stereo effect.

Basic Operations

Labeling the preset stations

— Station Name

You can put a name of up to eight characters (Station Name) to a preset station. The Station Name appears when you tune in the station.



1 Press TUNER/BAND repeatedly until the band you want appears.

AEP, UK models:

FM → MW → L

Hong Kong, Singapore models:

FM → AM

* You cannot assign a name to an LW station.

2 For AEP, UK models:

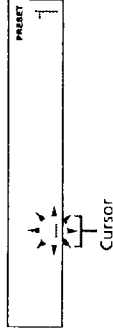
Press TUNING MODE repeatedly until "PRESET" appears.

For Hong Kong, Singapore models:
Press PRESET.

3 Turn MULTI CONTROLLER until the preset number of the station you want to label appears.

4 Press NAME IN.

The cursor starts flashing.



5 Turn MULTI CONTROLLER until the desired character appears.
The selected character is flashing.



You can use the following characters and symbols:

ABCDEFGHIJKLMNOPQRSTUVWXYZ
UVWXYZ[\] ^ _ ` a b c d e f g h i j k l m
n o p q r s t u v w x y z { | } ~ ¡ ¢ £ ¤ ¥ ¦ § ¨
© ª « ¬ ® ¯ ° ± ² ³ ´ µ ¶ · ¸ ¹ º » ¼ ½ ¾
(space) ! " # \$ % & ' () * + , - . / 0 1 2 3 4 5
6 7 8 9 : ; < = > ? @

6 Press ENTER/NEXT.

The cursor shifts rightward and starts flashing.

7 Repeat steps 5 and 6 to complete the name.

8 Press ENTER/NEXT repeatedly until "FILE" appears to store the name.

To cancel labeling

Press NAME IN.

To erase the name

Start over from step 1 and enter spaces to the characters you want to erase.

To check the name

Press DISPLAY.

Each time you press the button, the display changes as follows:

Preset number and ↔ Station name
(if you put one)

Using the Radio Data System (RDS)

(AEP, UK models only)

What is the Radio Data System?

Radio Data System (RDS) is a broadcasting service that allows radio stations to send additional information along with the regular program signal. This tuner offers convenient RDS features, such as monitoring traffic, news, or information programs and locating a station by program type (PTY). RDS is available only on FM stations*.

Note

RDS may not work properly if the station you are tuned to is not transmitting the RDS signal properly or if the signal strength is weak.

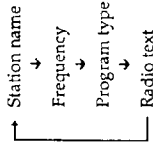
- * Not all FM stations provide RDS service, nor do they provide the same types of services. If you are not familiar with the RDS system, check with your local radio stations for details on RDS services in your area.

Receiving RDS broadcasts

Simply select a station from the FM band.

When you tune in a station that provides RDS services, the station name appears in the display.

To check the RDS information
Each time you press DISPLAY, the display changes as follows:



Notes

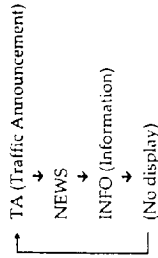
- "No PTY Data" appears when the receiving station does not broadcast the program type you selected.
- "No Text Data" appears when the receiving station does not broadcast the radio text data.
- "PTY Alarm" flashes when there is an emergency announcement by governmental authorities.

Monitoring traffic, news, or information programs (EON)

Enhanced Other Networks (EON) allows the tuner to automatically switch to a station broadcasting traffic, news, or other information. After the program ends, the tuner switches back to the station you were listening to (or the function you were using).

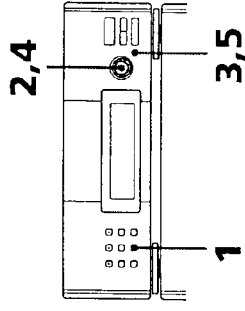
Press EON to select the desired EON program.

Each time you press EON, the display changes as follows:



Locating a station by program type (PTY)

You can locate a station you want by selecting a program type. The system tunes in the type of programs currently being broadcast from the RDS stations stored in the tuner's preset memory.



- 1** Press PTY.
"PTY Select" appears.
- 2** Turn MULTI CONTROLLER until the desired program type appears.
See "List of program types (PTY)."
- 3** Press ENTER/NEXT.
The system starts searching for the preset RDS stations ("PTY Search" and the selected program type appear alternately).
When the tuner receives a program, the preset station number flashes.
- 4** Turn MULTI CONTROLLER until the desired preset station number flashes.
- 5** Press ENTER/NEXT while the preset station number is flashing.

To stop monitoring

Press EON once.

Tip

You can receive the incoming RDS information while the system power is turned off. After selecting the desired EON program (TA, NEWS or INFO), press SYSTEM POWER to turn off the system ("EON Wait" and "Push EON KEY" appear alternately). Within six seconds, press EON so that "EON WAITING" appears.

Every time the tuner receives an EON program, the system automatically turns on and returns to the standby mode when the program is finished.

Notes

- The EON feature does not work while recording. So, turn off the EON feature when you want to record a program without interruptions, especially when you want to do timer recording.
- Not all RDS stations provide EON service.
- The station will not switch if the current receiving station broadcasts the program you selected.
- "Weak Signal" appears when the current EON station cannot provide RDS data due to a weak signal and "Returning" appears when the system is attempting to retune the EON station.

Using the Radio Data System (RDS) (continued)

List of program types (PTY)

News

News programs.

Affairs

Topical programs that expand on current news.

Information

Programs about consumer affairs, medical advice, and weather.

Sport

Sports programs.

Education

Educational programs, such as a "how-to" programs and advice.

Drama

Radio plays and serials.

Culture

Programs about national or regional culture, such as religion, language, and societal concerns.

Science

Programs about the natural sciences.

Varied

Programs containing celebrity interviews, panel games, and comedy

Pop Music

Popular music programs.

Rock Music

Rock music programs.

M.O.R. Music

Easy listening (middle of the road music).

L. Classical

Classical music, such as instrumentals, and vocal and choral works.

S. Classical

Performances of major orchestras, chamber music, opera, etc.

Other Music

Music, such as jazz, rhythm and blues, and reggae.

Alarm

Emergency broadcasts.

PTY undefined

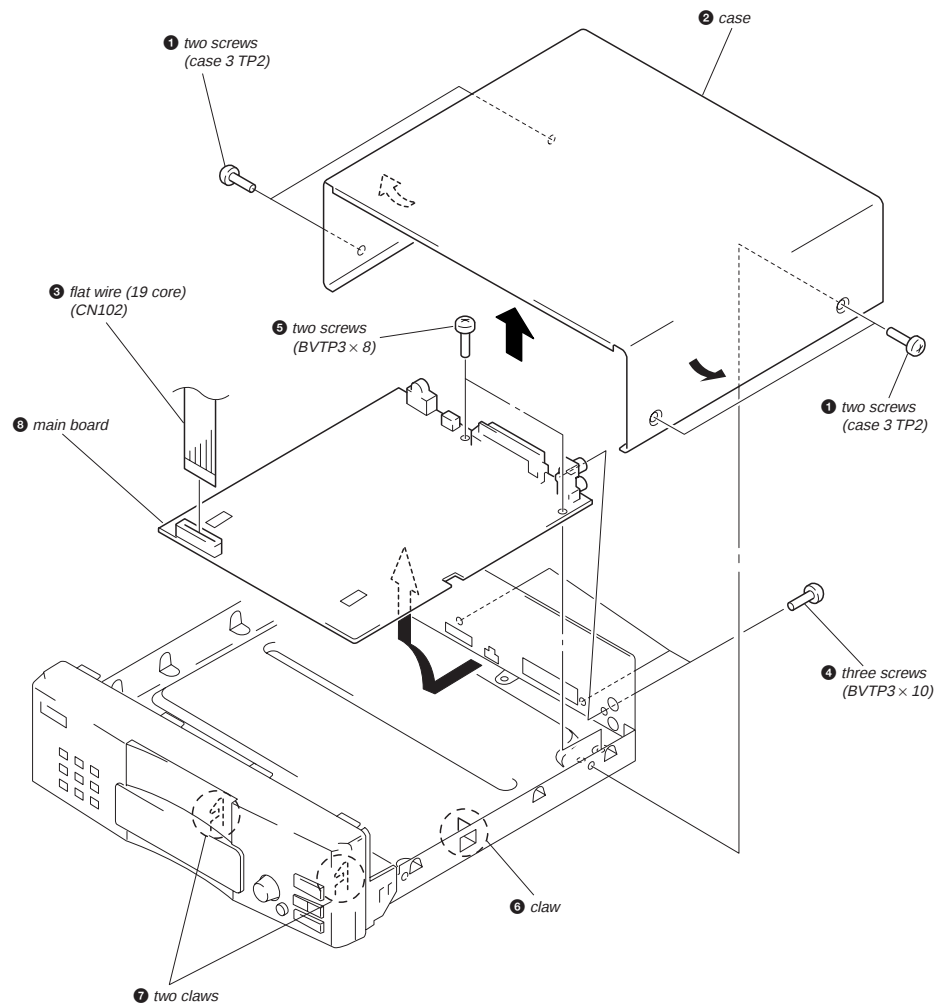
Any programming not defined above.

Notes

- "PTY not found" appears when the program you selected is not currently being broadcast.
- "PTY change" appears when the program type you selected has ended while PTY scanning. You will receive another station if it broadcasts the same type of program.
- "Text waiting" appears when Radio Text Data is not being provided.

SECTION 2 DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.



SECTION 3 ELECTRICAL ADJUSTMENTS

Precautions in Repairing

If the front unit fails, it is difficult to repair the inner circuits, so replace the entire front end unit.

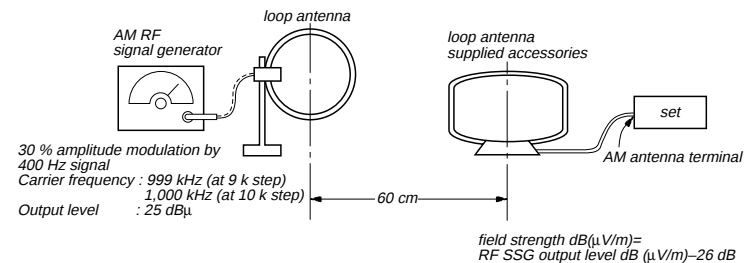
The FM TUNED level must be adjusted after the AM TUNED level adjustment has completed.

AM SECTION

AM Tuning Level Adjustment

Setting :

BAND switch : MW(AM)



Procedure:

1. Set loop antenna A so that the loop antenna B input level becomes 55 dBμ/m.
2. Tune the set to 999 kHz or 1,000 kHz.
3. Adjust RV1 so that the TUNED indicator goes on.

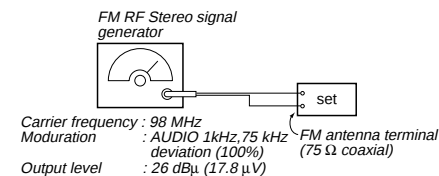
Adjustment Location : MAIN board.

FM SECTION

FM Tuning Level Adjustment

Setting :

BAND switch : FM

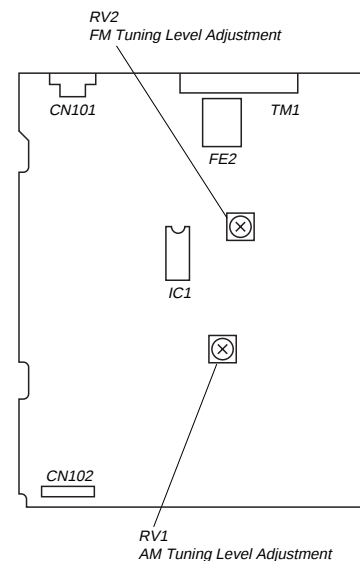


Procedure:

1. Tune the set to 98 MHz.
3. Adjust RV2 so that the TUNED indicator goes on.

Adjustment Location : MAIN board.

Adjustment Location :
[MAIN BOARD] – Component Side –



SECTION 4 DIAGRAMS

4-1. IC PIN FUNCTION DESCRIPTION

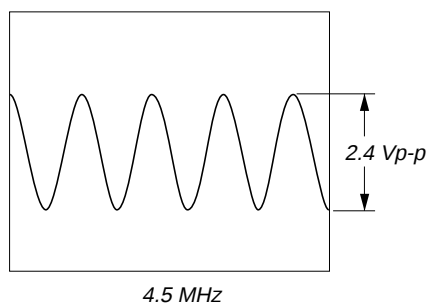
MAIN BOARD IC201 μ PD78013FGC-544-AB8 (SYSTEM CONTROL)

Pin No.	Pin Name	I/O	Function
1	DESTINATION	I	Destination selection input.
2	DESTINATION	I	
3	DESTINATION	I	
4	DESTINATION	I	
5	IF +50	I	Not used. (Ground)
6	IF -50	O	
7	BACK UP	I	Back up mode input.
8	NC	-	Not used. (open)
9	V _{ss}	-	Ground
10	$\overline{\text{POWER}}$	O	Power ON/OFF switch control.
11	MUTE	O	Mute output.
12	ANALOG-BUS	-	Not used. (open)
13	NC	-	
14	NC	-	
15	AM MONO	-	
16	AM/FM	-	
17	IFNG	-	
18	STEREO	I	Stereo signal input.
19	SIGNAL	I	Tuned signal input.
20	DATA IN	I	Data input. (IC51)
21	DATA OUT	O	Data output. (IC51)
22	CLOCK	O	Clock output. (IC51)
23	CE	O	Chip enable output. (IC51)
24	V _{ss}	-	Ground
25	NC	-	Not used. (open)
26	NC	-	
27	ONCE	O	LED drive output (Not used)
28	DAILY	O	LED drive output.
29	REC	O	
30	SLEEP	O	
31	ENCODER	O	
32	NEXT	O	Encoder input. (B)
33	ENCODER IN B	I	
34	AU BUS OUT	O	Audio bus output.
35	RESET	I	System reset input.
36	AU BUS IN	I	Audio bus input.
37	ENCODER IN A	I	Encoder input. (A)
38	RDS-CLOCK	I	RDS clock input.
39	RDS-DATA	I	RDS data input.
40	V _{DD}	-	Power supply 5V.

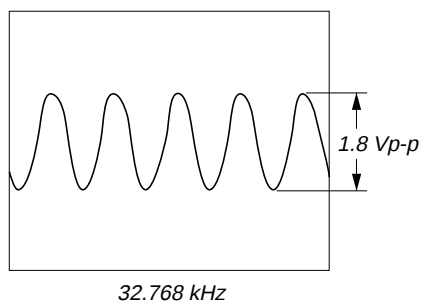
Pin No.	Pin Name	I/O	Function
41	X2	O	System main clock. (10 MHz)
42	X1	I	
43	GND	-	Ground
44	XT2	O	System sub clock. (32.768 kHz)
45	XT1	I	
46	GND	-	Ground
47	KEY IN K1	I	Key input. (analog)
48	KEY IN K2	I	
49	KEY IN	I	Ground
50	GND	-	
51	GND	-	
52	GND	-	
53	GND	-	
54	GND	-	Analog power supply +5V.
55	AV _{DD}	-	
56	AV _{REF}	I	Analog system reference voltage input.
57	GND	-	Ground
58	SDATA	O	Flourescent indicator tube data output. (IC601)
59	SCK	O	Flourescent indicator tube clock output. (IC601)
60	$\overline{\text{CS}}$	O	Flourescent indicator tube chip select signal output. (IC601)
61	RESET	O	Flourescent indicator tube reset signal output. (IC601)
62	ERRORS	I	Not used. (open)
63	CORRECTION	O	
64	RECEIVED	O	

• Waveforms

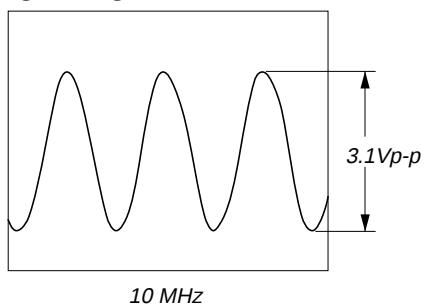
❶ IC51 ①



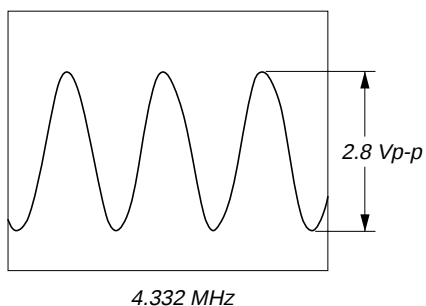
❸ IC201 ④5



❷ IC201 ④2

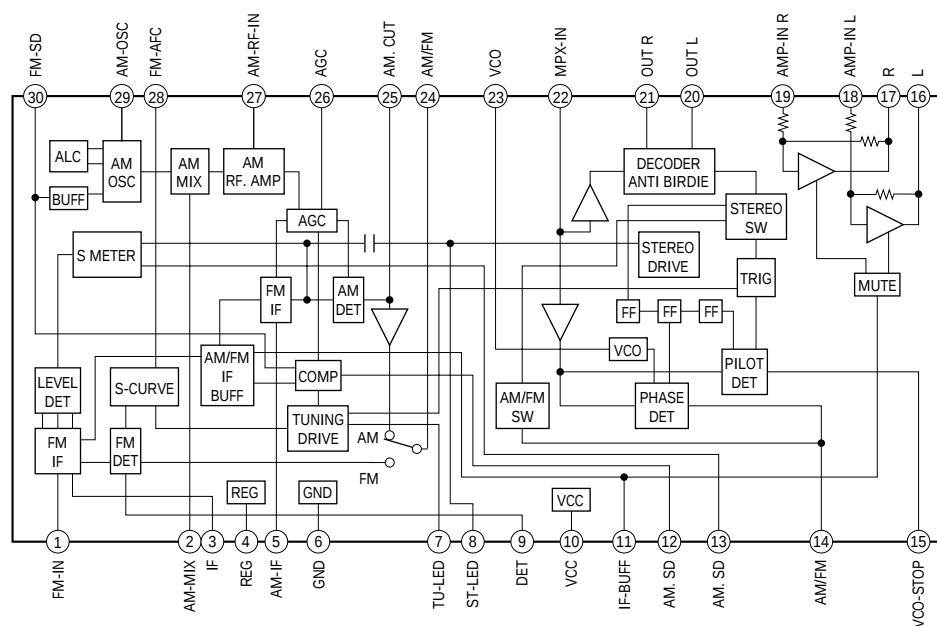


❹ IC302 ⑬

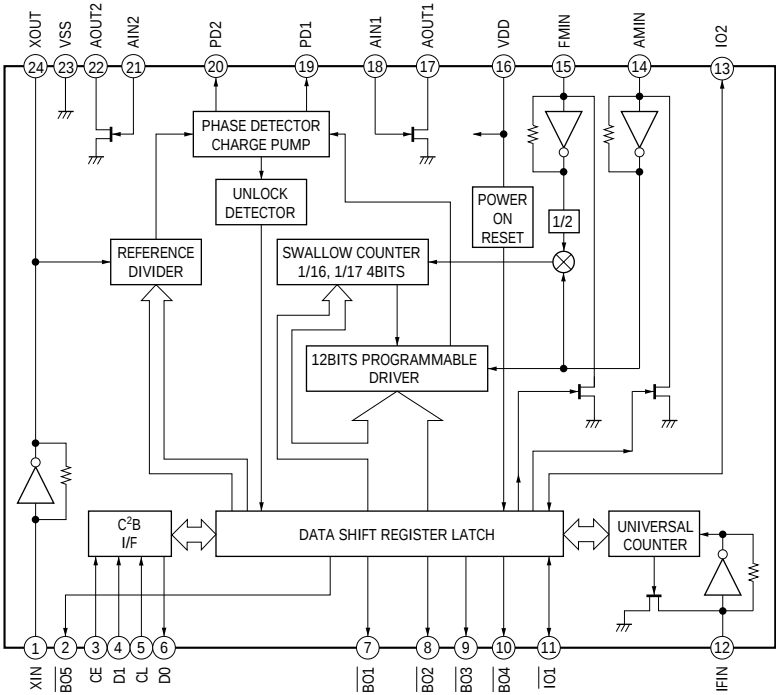


• IC Block Diagrams

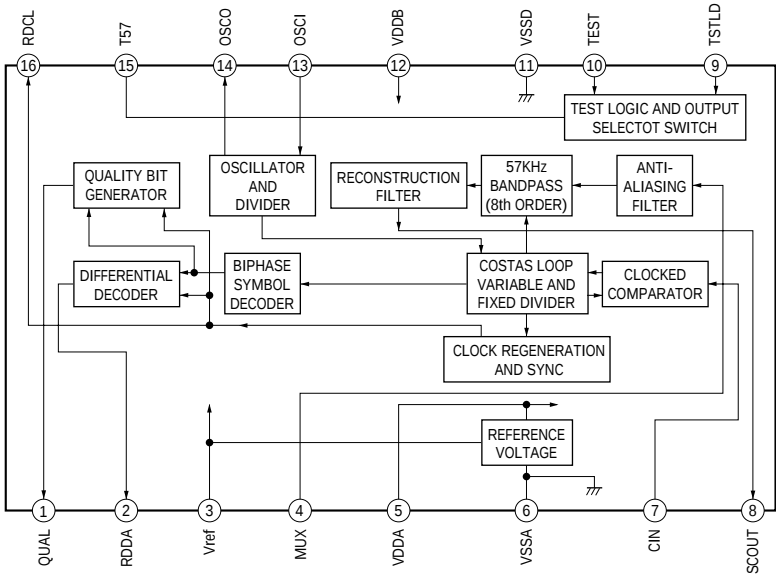
IC1 LA1835



IC51 LC72130



IC302 SAA6579



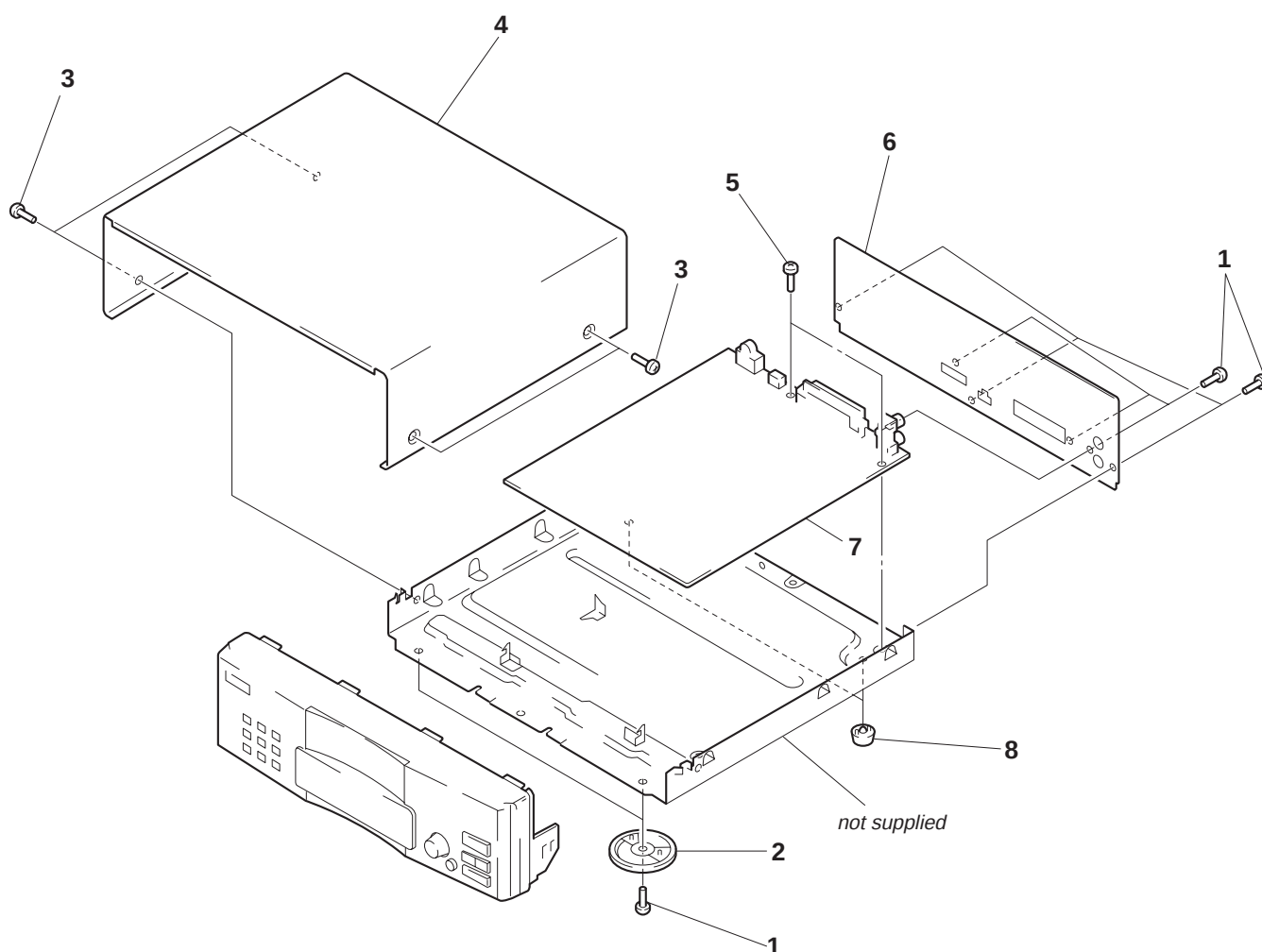
SECTION 5

EXPLODED VIEWS

NOTE:

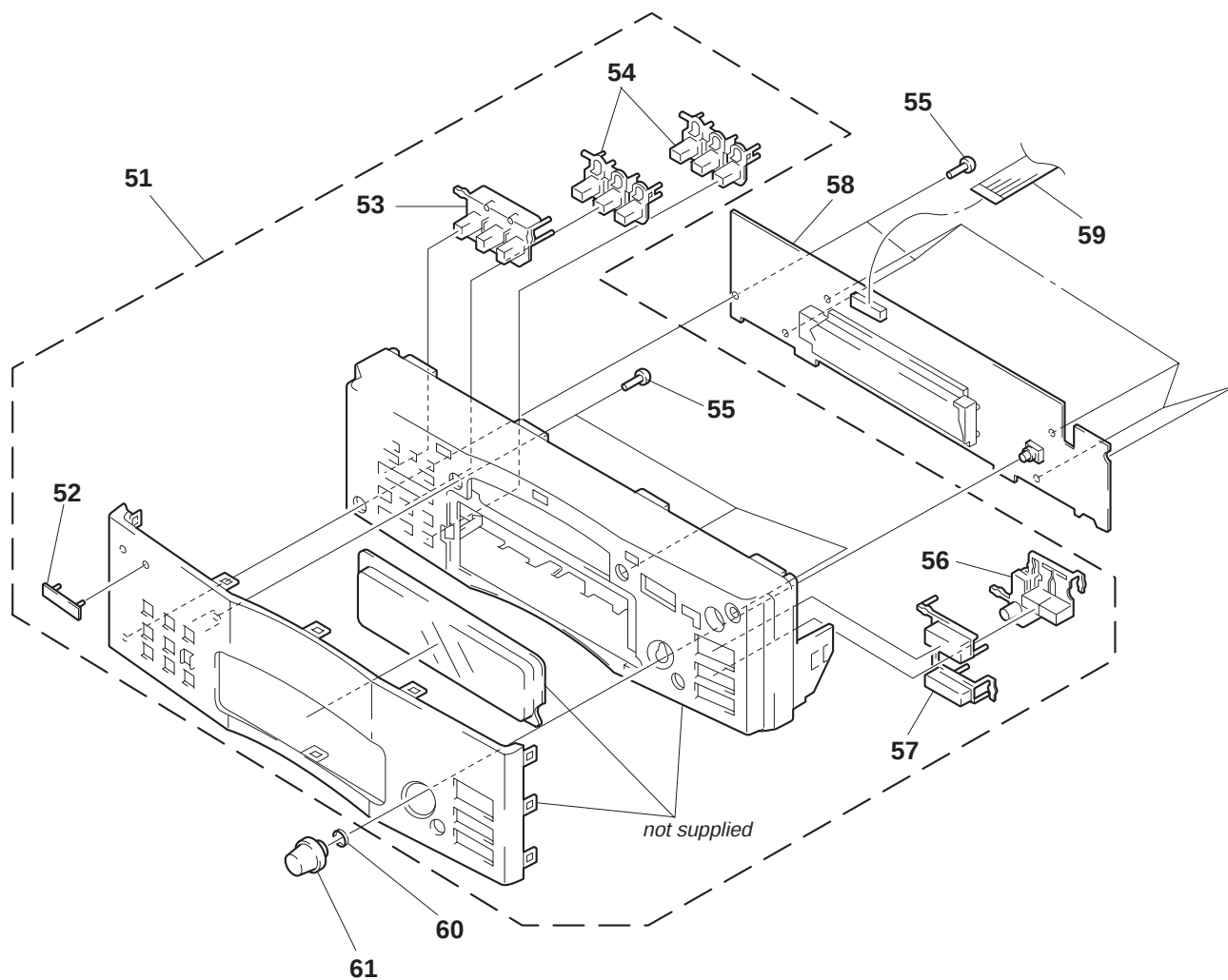
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts Example:
 KNOB, BALANCE (WHITE) . . . (RED)
 ↑ ↑
 Parts ColorCabinet's Color
- Abbreviation
 HK: Hong Kong
 SP : Singapore
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

(1) CHASSIS SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S		* 6	4-985-904-11	PANEL (ST), BACK (AEP, UK)	
2	4-977-699-11	LEG (F)		* 6	4-985-904-21	PANEL (ST), BACK (HK, SP)	
3	3-363-099-01	SCREW (CASE 3 TP2)		* 7	A-4398-064-A	MAIN BOARD, COMPLETE (AEP, UK)	
* 4	4-985-899-11	CASE		* 7	A-4398-069-A	MAIN BOARD, COMPLETE (HK, SP)	
5	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S		8	4-965-822-01	FOOT	

(2) FRONT PANEL SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	X-4948-355-1	PANEL ASSY, FRONT (AEP, UK)		57	4-985-892-11	BUTTON (PLAY) (TUNER/BAND, PRESET)	
51	X-4948-357-1	PANEL ASSY, FRONT (HK, SP)					(HK, SP)
52	4-962-708-01	EMBLEM (4-A), SONY		57	4-985-892-21	BUTTON (PLAY)	
53	X-4947-762-1	BUTTON (TIMER) ASSY				(TUNER/BAND, TUNING MODE) (AEP, UK)	
54	4-985-890-01	BUTTON (MODE)		* 58	A-4398-065-A	PANEL BOARD, COMPLETE (AEP, UK)	
				* 58	A-4398-070-A	PANEL BOARD, COMPLETE (HK, SP)	
55	4-951-620-01	SCREW (2.6X8), +BVTP		59	1-773-108-11	WIRE (FLAT TYPE) (19 CORE)	
56	X-4947-849-1	BUTTON (M/A) ASSY					
		(MANUAL, AUTO, ENTER) (HK, SP)		60	4-988-161-01	SPRING, RING	
56	X-4948-356-1	BUTTON (MEMO) ASSY (MEMORY, ST/MONO)		61	4-985-925-01	KNOB (JOG)	
		(AEP, UK)					

SECTION 6 ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
All resistors are in ohms.
METAL: Metal-film resistor.
METAL OXIDE: Metal oxide-film resistor.
F: nonflammable
- Abbreviation
HK: Hong Kong SP: Singapore

- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
In each case, u: μ , for example:
uA. . : μ A. . uPA. . : μ PA. .
uPB. . : μ PB. . uPC. . : μ PC. .
uPD. . : μ PD. .
- CAPACITORS
uF: μ F
- COILS
uH: μ H

The components identified by mark Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
*	A-4398-064-A	MAIN BOARD, COMPLETE (AEP, UK)				C38	1-162-198-31	CERAMIC	8.2PF	10%	50V
*	A-4398-069-A	MAIN BOARD, COMPLETE (HK, SP)				C40	1-162-306-11	CERAMIC	0.01uF	20%	16V
		*****				C41	1-162-306-11	CERAMIC	0.01uF	20%	16V
						C43	1-162-294-31	CERAMIC	0.001uF	10%	50V
*	4-924-988-11	PLATE (ST), GROUND				C44	1-164-159-11	CERAMIC	0.1uF		50V
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S									
		< CAPACITOR >				C45	1-164-159-11	CERAMIC	0.1uF		50V
						C47	1-164-095-11	CERAMIC	0.01uF	10%	16V
											(HK, SP)
C1	1-162-306-11	CERAMIC	0.01uF	20%	16V	C51	1-102-518-11	CERAMIC	33PF	5%	50V
C2	1-126-967-11	ELECT	47uF	20%	16V	C52	1-102-514-11	CERAMIC	22PF	5%	50V
C3	1-162-306-11	CERAMIC	0.01uF	20%	16V	C53	1-126-964-11	ELECT	10uF	20%	50V
C4	1-164-159-11	CERAMIC	0.1uF		50V						
C5	1-164-159-11	CERAMIC	0.1uF		50V	C54	1-164-159-11	CERAMIC	0.1uF		50V
						C55	1-126-933-11	ELECT	100uF	20%	10V
C6	1-164-159-11	CERAMIC	0.1uF		50V	C56	1-162-294-31	CERAMIC	0.001uF	10%	50V
C7	1-126-967-11	ELECT	47uF	20%	16V	C58	1-162-306-11	CERAMIC	0.01uF	20%	16V
C8	1-162-306-11	CERAMIC	0.01uF	20%	16V	C64	1-164-159-11	CERAMIC	0.1uF		50V
C9	1-162-306-11	CERAMIC	0.01uF	20%	16V						
C10	1-162-306-11	CERAMIC	0.01uF	20%	16V	C65	1-126-933-11	ELECT	100uF	20%	16V
						C67	1-162-306-11	CERAMIC	0.01uF	20%	16V
C11	1-126-964-11	ELECT	10uF	20%	50V	C71	1-126-961-11	ELECT	2.2uF	20%	50V
C12	1-126-959-11	ELECT	0.47uF	20%	50V	C73	1-164-159-11	CERAMIC	0.1uF		50V
C13	1-126-960-11	ELECT	1uF	20%	50V	C75	1-162-306-11	CERAMIC	0.01uF	20%	16V
C14	1-126-960-11	ELECT	1uF	20%	50V						
C15	1-126-964-11	ELECT	10uF	20%	50V	C91	1-162-286-31	CERAMIC	220PF	10%	50V
											(AEP, UK)
C16	1-126-964-11	ELECT	10uF	20%	50V	C92	1-162-286-31	CERAMIC	220PF	10%	50V
C17	1-126-964-11	ELECT	10uF	20%	50V						(AEP, UK)
C18	1-126-964-11	ELECT	10uF	20%	50V	C93	1-162-286-31	CERAMIC	220PF	10%	50V
C19	1-136-158-00	FILM	0.027uF	5%	50V						(AEP, UK)
C20	1-136-158-00	FILM	0.027uF	5%	50V	C94	1-162-306-11	CERAMIC	0.01uF	20%	16V
											(AEP, UK)
C21	1-137-436-11	FILM	0.0039uF	5%	50V	C95	1-164-159-11	CERAMIC	0.1uF		50V
C22	1-137-436-11	FILM	0.0039uF	5%	50V						
C23	1-126-960-11	ELECT	1uF	20%	50V	C96	1-164-159-11	CERAMIC	0.1uF		50V
C24	1-162-294-31	CERAMIC	0.001uF	10%	50V	C97	1-162-294-31	CERAMIC	0.001uF	10%	50V
C25	1-162-600-11	CERAMIC	0.0047uF	30%	16V						(AEP, UK)
						C98	1-162-294-31	CERAMIC	0.001uF	10%	50V
C26	1-126-967-11	ELECT	47uF	20%	16V						(AEP, UK)
C27	1-126-962-11	ELECT	3.3uF	20%	50V	C111	1-126-942-61	ELECT	1000uF	20%	25V
C28	1-164-159-11	CERAMIC	0.1uF		50V	C112	1-164-159-11	CERAMIC	0.1uF		50V
C29	1-126-964-11	ELECT	10uF	20%	50V						
C30	1-164-159-11	CERAMIC	0.1uF		50V	C113	1-126-933-11	ELECT	100uF	20%	10V
						C121	1-104-666-11	ELECT	220uF	20%	25V
C32	1-102-527-11	CERAMIC	82PF	5%	50V	C122	1-104-666-11	ELECT	220uF	20%	25V
					(AEP, UK)	C123	1-126-952-11	ELECT	1000uF	20%	35V
C33	1-162-306-11	CERAMIC	0.01uF	20%	16V	C124	1-126-967-11	ELECT	47uF	20%	16V
C35	1-162-306-11	CERAMIC	0.01uF	20%	16V						
C36	1-162-306-11	CERAMIC	0.01uF	20%	16V	C125	1-126-933-11	ELECT	100uF	20%	16V
C37	1-164-159-11	CERAMIC	0.1uF		50V	C126	1-136-165-00	FILM	0.1uF	5%	50V
						C141	1-128-563-11	ELECT	100uF	20%	100V

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
C142	1-128-576-11	ELECT	100uF	20%	63V	C314	1-101-884-00	CERAMIC	56PF	5%	50V
C145	1-126-967-11	ELECT	47uF	20%	50V						(AEP, UK)
C146	1-164-159-11	CERAMIC	0.1uF		50V	C315	1-126-967-11	ELECT	47uF	20%	16V
C161	1-128-563-11	ELECT	100uF	20%	100V						(AEP, UK)
C162	1-128-563-11	ELECT	100uF	20%	100V	C316	1-164-159-11	CERAMIC	0.1uF		50V
C163	1-126-941-11	ELECT	470uF	20%	25V						(AEP, UK)
C164	1-126-941-11	ELECT	470uF	20%	25V			< FILTER >			
C171	1-126-964-11	ELECT	10uF	20%	50V	CF1	1-567-389-11	FILTER, CERAMIC (HK, SP)			
C181	1-125-705-11	CAPACITOR	0.22F		5.5V	CF1	1-579-374-71	FILTER, CERAMIC (AEP, UK)			
C191	1-126-964-11	ELECT	10uF	20%	50V	CF2	1-760-393-11	FILTER, CERAMIC (AEP, UK)			
C201	1-126-933-11	ELECT	100uF	20%	10V	CF3	1-567-389-11	FILTER, CERAMIC (HK, SP)			
C202	1-136-177-00	FILM	1uF	5%	50V	CF3	1-760-393-11	FILTER, CERAMIC (AEP, UK)			
C203	1-164-159-11	CERAMIC	0.1uF		50V	CF4	1-527-981-00	FILTER, CERAMIC			
C204	1-102-953-00	CERAMIC	18PF	5%	50V	CF5	1-577-075-11	OSCILLATOR, CERAMIC			
C205	1-164-056-11	CERAMIC	27PF	5%	50V	CF6	1-760-220-11	FILTER, CERAMIC			
C206	1-164-159-11	CERAMIC	0.1uF		50V			< CONNECTOR >			
C207	1-162-282-31	CERAMIC	100PF	10%	50V						
C208	1-162-294-31	CERAMIC	0.001uF	10%	50V	CN101	1-770-158-21	HOUSING, CONNECTOR 7P			
C209	1-164-159-11	CERAMIC	0.1uF		50V			(SYSTEM CONTROL)			
C210	1-164-159-11	CERAMIC	0.1uF		50V	CN102	1-695-342-31	PIN, CONNECTOR (PC BOARD) 19P			
C211	1-164-159-11	CERAMIC	0.1uF		50V	* CN281	1-565-561-11	PIN, CONNECTOR 3P (AU BUS)			
C212	1-164-159-11	CERAMIC	0.1uF		50V			< DIODE >			
C213	1-162-306-11	CERAMIC	0.01uF	20%	16V	D1	8-719-987-63	DIODE 1N4148M			
C214	1-162-306-11	CERAMIC	0.01uF	20%	16V	D2	8-719-987-63	DIODE 1N4148M			
C215	1-162-282-31	CERAMIC	100PF	10%	50V	D102	8-719-987-63	DIODE 1N4148M (AEP, UK)			
C216	1-162-282-31	CERAMIC	100PF	10%	50V	D103	8-719-987-63	DIODE 1N4148M			
C217	1-162-282-31	CERAMIC	100PF	10%	50V	D104	8-719-987-63	DIODE 1N4148M			
C218	1-162-282-31	CERAMIC	100PF	10%	50V	D105	8-719-987-63	DIODE 1N4148M			
C219	1-162-282-31	CERAMIC	100PF	10%	50V	D111	8-719-200-82	DIODE 11ES2			
C220	1-162-282-31	CERAMIC	100PF	10%	50V	D112	8-719-200-82	DIODE 11ES2			
C221	1-162-282-31	CERAMIC	100PF	10%	50V	D113	8-719-200-82	DIODE 11ES2			
C271	1-126-960-11	ELECT	1uF	20%	50V	D121	8-719-200-82	DIODE 11ES2			
C272	1-164-159-11	CERAMIC	0.1uF		50V	D122	8-719-200-82	DIODE 11ES2			
C281	1-162-282-31	CERAMIC	100PF	10%	50V	D123	8-719-200-82	DIODE 11ES2			
C301	1-164-159-11	CERAMIC	0.1uF		50V	D124	8-719-200-82	DIODE 11ES2			
					(AEP, UK)	D125	8-719-001-42	DIODE UZL-11M1			
C302	1-162-288-31	CERAMIC	330PF	10%	50V	D126	8-719-200-82	DIODE 11ES2			
					(AEP, UK)	D127	8-719-200-82	DIODE 11ES2			
C303	1-164-159-11	CERAMIC	0.1uF		50V	D141	8-719-200-82	DIODE 11ES2			
					(AEP, UK)	D142	8-719-200-82	DIODE 11ES2			
C304	1-126-964-11	ELECT	10uF	20%	50V	D143	8-719-934-23	DIODE HZS30-3L			
					(AEP, UK)	D161	8-719-014-48	DIODE UZP-4.7B			
C305	1-126-967-11	ELECT	47uF	20%	16V						
					(AEP, UK)	D191	8-719-933-33	DIODE HZS6A1L			
C306	1-136-177-00	FILM	1uF	5%	50V	D271	8-719-987-63	DIODE 1N4148M			
					(AEP, UK)	D281	8-719-987-63	DIODE 1N4148M			
C307	1-164-159-11	CERAMIC	0.1uF		50V	D282	8-719-987-63	DIODE 1N4148M			
					(AEP, UK)			< GROUND TERMINAL >			
C308	1-126-967-11	ELECT	47uF	20%	16V						
					(AEP, UK)	E101	1-537-770-21	TERMINAL BOARD, GROUND			
C309	1-136-177-00	FILM	1uF	5%	50V	E103	1-537-770-21	TERMINAL BOARD, GROUND (AEP, UK)			
					(AEP, UK)			< FRONTEND >			
C310	1-164-159-11	CERAMIC	0.1uF		50V						
					(AEP, UK)	FE1	1-233-532-11	ENCAPSULATED COMPONENT (HK, SP)			
C311	1-126-961-11	ELECT	2.2uF	20%	50V	FE1	1-233-542-11	ENCAPSULATED COMPONENT (AEP, UK)			
					(AEP, UK)	FE2	1-233-514-11	ENCAPSULATED COMPONENT (AEP, UK)			
C312	1-162-291-31	CERAMIC	560PF	10%	50V	FE2	1-239-634-11	ENCAPSULATED COMPONENT, AM.RF			
					(AEP, UK)			(HK, SP)			
C313	1-101-884-00	CERAMIC	56PF	5%	50V						
					(AEP, UK)						

Ref. No.	Part No.	Description	Remark
< IC >			
IC1	8-759-176-03	IC LA1835	
IC51	8-759-288-54	IC LC72130	
IC111	8-759-231-53	IC TA7805S	
IC171	8-759-165-80	IC PST600C-T	
IC201	8-759-467-14	IC uPD78013FGC-544-AB8	
IC301	8-759-634-51	IC M5218AP (AEP, UK)	
IC302	8-759-169-99	IC SAA6579 (AEP, UK)	
< IFT >			
IFT1	1-409-636-11	TRANSFORMER, IF (CERAMIC FILTER)	
< JACK >			
J101	1-770-272-11	JACK, PIN 2P (TUNER OUT)	
< COIL >			
L1	1-407-500-00	INDUCTOR 4.7mH (AEP, UK)	
L1	1-410-688-31	INDUCTOR 1.5mH (HK, SP)	
L3	1-410-470-11	INDUCTOR 10uH	
L4	1-410-509-11	INDUCTOR 10uH	
L7	1-410-397-21	FERRITE BEAD INDUCTOR	
L10	1-410-470-11	INDUCTOR 10uH (AEP, UK)	
L11	1-410-324-11	INDUCTOR 4.7uH	
L13	1-410-324-11	INDUCTOR 4.7uH	
L101	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, UK)	
L102	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, UK)	
L103	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, UK)	
L104	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, UK)	
L108	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, UK)	
L109	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, UK)	
L201	1-410-482-31	INDUCTOR 100uH	
L202	1-410-482-31	INDUCTOR 100uH	
L203	1-410-521-11	INDUCTOR 100uH	
L204	1-410-521-11	INDUCTOR 100uH	
L205	1-410-521-11	INDUCTOR 100uH	
L206	1-410-521-11	INDUCTOR 100uH	
L207	1-410-521-11	INDUCTOR 100uH	
L208	1-410-521-11	INDUCTOR 100uH	
< FILTER >			
LPF1	1-239-597-11	FILTER, LOW PASS	
LPF2	1-239-597-11	FILTER, LOW PASS	
< TRANSISTOR >			
Q1	8-729-230-99	TRANSISTOR 2SC2669-OY	
Q2	8-729-230-99	TRANSISTOR 2SC2669-OY	
Q9	8-729-230-99	TRANSISTOR 2SC2669-OY	
Q10	8-729-230-99	TRANSISTOR 2SC2669-OY	
Q11	8-729-900-80	TRANSISTOR DTC114ES (AEP, UK)	
Q12	8-729-900-80	TRANSISTOR DTC114ES (AEP, UK)	
Q13	8-729-900-80	TRANSISTOR DTC114ES (AEP, UK)	
Q14	8-729-900-80	TRANSISTOR DTC114ES (AEP, UK)	
Q15	8-729-119-76	TRANSISTOR 2SA1175-HFE (AEP, UK)	

Ref. No.	Part No.	Description	Remark
Q55	8-729-422-57	TRANSISTOR UN4111	
Q121	8-729-202-67	TRANSISTOR 2SK246-GR3	
Q122	8-729-209-15	TRANSISTOR 2SD2012	
Q123	8-729-900-80	TRANSISTOR DTC114ES	
Q141	8-729-118-00	TRANSISTOR 2SB1116-L	
Q142	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q201	8-729-900-80	TRANSISTOR DTC114ES	
Q271	8-729-422-57	TRANSISTOR UN4111	
Q272	8-729-900-80	TRANSISTOR DTC114ES	
Q281	8-729-620-05	TRANSISTOR 2SC2603-EF	
< RESISTOR >			
R1	1-249-411-11	CARBON 330 5% 1/4W	
R2	1-249-411-11	CARBON 330 5% 1/4W	
R3	1-249-409-11	CARBON 220 5% 1/4W	
i R4	1-249-402-11	CARBON 56 5% 1/4W	F
R5	1-249-411-11	CARBON 330 5% 1/4W	
R6	1-249-411-11	CARBON 330 5% 1/4W	
R7	1-249-432-11	CARBON 18K 5% 1/4W	
R8	1-249-432-11	CARBON 18K 5% 1/4W	
R11	1-249-411-11	CARBON 330 5% 1/4W	
R12	1-249-429-11	CARBON 10K 5% 1/4W	
R13	1-249-442-11	CARBON 510 5% 1/4W	
i R14	1-249-403-11	CARBON 68 5% 1/4W	F
R15	1-249-411-11	CARBON 330 5% 1/4W	
R16	1-249-425-11	CARBON 4.7K 5% 1/4W	
R17	1-247-842-11	CARBON 3K 5% 1/4W	
R18	1-249-429-11	CARBON 10K 5% 1/4W	
R19	1-249-429-11	CARBON 10K 5% 1/4W	
R21	1-249-429-11	CARBON 10K 5% 1/4W	
R22	1-249-437-11	CARBON 47K 5% 1/4W	
R23	1-249-399-11	CARBON 33 5% 1/4W	
R24	1-249-425-11	CARBON 4.7K 5% 1/4W (AEP, UK)	
R25	1-249-429-11	CARBON 10K 5% 1/4W (AEP, UK)	
R28	1-249-432-11	CARBON 18K 5% 1/4W	
R29	1-249-411-11	CARBON 330 5% 1/4W	
R35	1-249-421-11	CARBON 2.2K 5% 1/4W	
R36	1-249-421-11	CARBON 2.2K 5% 1/4W	
R37	1-249-411-11	CARBON 330 5% 1/4W	
R38	1-249-432-11	CARBON 18K 5% 1/4W	
R39	1-249-393-11	CARBON 10 5% 1/4W (AEP, UK)	
R39	1-249-401-11	CARBON 47 5% 1/4W (HK, SP)	
R45	1-249-425-11	CARBON 4.7K 5% 1/4W	
R46	1-249-425-11	CARBON 4.7K 5% 1/4W	
R49	1-249-441-11	CARBON 100K 5% 1/4W	
R51	1-249-429-11	CARBON 10K 5% 1/4W	
R56	1-249-417-11	CARBON 1K 5% 1/4W	
R58	1-249-417-11	CARBON 1K 5% 1/4W	
i R60	1-249-405-11	CARBON 100 5% 1/4W	F
R61	1-247-843-11	CARBON 3.3K 5% 1/4W	
R62	1-249-425-11	CARBON 4.7K 5% 1/4W	
R63	1-249-425-11	CARBON 4.7K 5% 1/4W	

The components identified by mark $\triangle$ or dotted line with mark $\triangle$ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark	Ref. No.	Part No.	Description			Remark
R64	1-249-425-11	CARBON	4.7K	5%	1/4W			< VARIABLE RESISTOR >			
R65	1-249-425-11	CARBON	4.7K	5%	1/4W						
R70	1-249-425-11	CARBON	4.7K	5%	1/4W (AEP, UK)	RV1	1-238-601-11	RES, ADJ, CARBON 22.0K			
R71	1-249-425-11	CARBON	4.7K	5%	1/4W	RV2	1-238-600-11	RES, ADJ, CARBON 10.0K			
R72	1-247-807-31	CARBON	100	5%	1/4W			< TERMINAL >			
R122	1-247-807-31	CARBON	100	5%	1/4W	TM1	1-537-238-21	TERMINAL BOARD (FM/AM ANTENNA)			
R141	1-249-429-11	CARBON	10K	5%	1/4W						(HK, SP)
R142	1-249-441-11	CARBON	100K	5%	1/4W	TM1	1-537-488-11	TERMINAL BOARD (ANT) (FM/AM ANTENNA)			
R143	1-249-397-11	CARBON	22	5%	1/4W						(AEP, UK)
R161	1-249-441-11	CARBON	100K	5%	1/4W			< VIBRATOR >			
R162	1-249-413-11	CARBON	470	5%	1/4W						
R163	1-249-413-11	CARBON	470	5%	1/4W	X201	1-579-175-11	VIBRATOR, CERAMIC (10MHz)			
R171	1-249-417-11	CARBON	1K	5%	1/4W	X202	1-567-098-41	VIBRATOR, CRYSTAL (32.768kHz)			
R181	1-247-807-31	CARBON	100	5%	1/4W	X301	1-579-900-21	VIBRATOR, CRYSTAL (4.332MHz) (AEP, UK)			
R191	1-249-411-11	CARBON	330	5%	1/4W	XT51	1-760-549-31	VIBRATOR, CRYSTAL (4.5MHz)			

R201	1-249-417-11	CARBON	1K	5%	1/4W						
R202	1-249-417-11	CARBON	1K	5%	1/4W	*	A-4398-065-A	PANEL BOARD, COMPLETE (AEP, UK)			
R203	1-249-417-11	CARBON	1K	5%	1/4W	*	A-4398-070-A	PANEL BOARD, COMPLETE (HK, SP)			
R204	1-247-807-31	CARBON	100	5%	1/4W			*****			
R205	1-249-417-11	CARBON	1K	5%	1/4W						
R206	1-249-417-11	CARBON	1K	5%	1/4W	*	4-970-787-11	HOLDER (FL)			
R207	1-249-412-11	CARBON	390	5%	1/4W			< CAPACITOR >			
R208	1-249-414-11	CARBON	560	5%	1/4W						
R209	1-249-412-11	CARBON	390	5%	1/4W	C601	1-124-584-00	ELECT	100uF	20%	10V
R212	1-249-417-11	CARBON	1K	5%	1/4W	C602	1-164-159-11	CERAMIC	0.1uF		50V
						C603	1-124-248-00	ELECT	22uF	20%	35V
R213	1-249-417-11	CARBON	1K	5%	1/4W	C604	1-164-159-11	CERAMIC	0.1uF		50V
R214	1-249-417-11	CARBON	1K	5%	1/4W	C605	1-162-282-31	CERAMIC	100PF	10%	50V
R215	1-249-417-11	CARBON	1K	5%	1/4W						
R216	1-249-429-11	CARBON	10K	5%	1/4W	C606	1-162-282-31	CERAMIC	100PF	10%	50V
R217	1-249-429-11	CARBON	10K	5%	1/4W	C607	1-162-282-31	CERAMIC	100PF	10%	50V
						C608	1-162-282-31	CERAMIC	100PF	10%	50V
R222	1-247-893-11	CARBON	390K	5%	1/4W	C609	1-162-294-31	CERAMIC	0.001uF	10%	50V
R224	1-247-843-11	CARBON	3.3K	5%	1/4W	C610	1-162-282-31	CERAMIC	100PF	10%	50V
R225	1-247-843-11	CARBON	3.3K	5%	1/4W						
R226	1-247-843-11	CARBON	3.3K	5%	1/4W	C611	1-162-282-31	CERAMIC	100PF	10%	50V
R227	1-249-441-11	CARBON	100K	5%	1/4W	C612	1-162-282-31	CERAMIC	100PF	10%	50V
						C613	1-162-282-31	CERAMIC	100PF	10%	50V
R228	1-249-441-11	CARBON	100K	5%	1/4W	C614	1-162-282-31	CERAMIC	100PF	10%	50V
R229	1-247-807-31	CARBON	100	5%	1/4W	C615	1-162-282-31	CERAMIC	100PF	10%	50V
R230	1-247-807-31	CARBON	100	5%	1/4W						
R231	1-249-425-11	CARBON	4.7K	5%	1/4W	C616	1-162-282-31	CERAMIC	100PF	10%	50V
R271	1-249-429-11	CARBON	10K	5%	1/4W	C617	1-162-282-31	CERAMIC	100PF	10%	50V
						C618	1-162-282-31	CERAMIC	100PF	10%	50V
R281	1-249-429-11	CARBON	10K	5%	1/4W	C619	1-162-282-31	CERAMIC	100PF	10%	50V
R282	1-249-425-11	CARBON	4.7K	5%	1/4W	C620	1-162-282-31	CERAMIC	100PF	10%	50V
R283	1-249-393-11	CARBON	10	5%	1/4W						
R284	1-249-429-11	CARBON	10K	5%	1/4W	C621	1-162-282-31	CERAMIC	100PF	10%	50V
R285	1-249-393-11	CARBON	10	5%	1/4W	C622	1-162-282-31	CERAMIC	100PF	10%	50V
						C623	1-162-282-31	CERAMIC	100PF	10%	50V
R301	1-249-441-11	CARBON	100K	5%	1/4W (AEP, UK)	C624	1-162-282-31	CERAMIC	100PF	10%	50V
R302	1-249-441-11	CARBON	100K	5%	1/4W (AEP, UK)	C625	1-136-173-00	FILM	0.47uF	5%	50V
R303	1-249-441-11	CARBON	100K	5%	1/4W (AEP, UK)	C626	1-136-173-00	FILM	0.47uF	5%	50V
R304	1-249-441-11	CARBON	100K	5%	1/4W (AEP, UK)	C627	1-162-306-11	CERAMIC	0.01uF	20%	16V
R305	1-249-429-11	CARBON	10K	5%	1/4W (AEP, UK)			< CONNECTOR >			
						CN601	1-695-380-31	PIN, CONNECTOR (PC BOARD) 19P			
R306	1-249-426-11	CARBON	5.6K	5%	1/4W (AEP, UK)			< DIODE >			
R308	1-249-421-11	CARBON	2.2K	5%	1/4W (AEP, UK)	D601	8-719-057-09	DIODE LNJ801LPDJA (ENTER/NEXT)			
						D602	8-719-057-09	DIODE LNJ801LPDJA (MULTI CONTROLLER)			
						D603	8-719-057-10	DIODE LNJ301MPUJAB (SLEEP)			

PANEL

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
D604	8-719-057-09	DIODE LNJ801LPDJA (REC)		S609	1-572-184-11	SWITCH, KEYBOARD (TUNER/BAND)	
D605	8-719-057-10	DIODE LNJ301MPUJAB (DAILY)		S610	1-572-184-11	SWITCH, KEYBOARD (TUNING MODE)	
		< FLUORESCENT INDICATOR TUBE >				(AEP, UK)	
FL601	1-517-368-11	INDICATOR TUBE, FLUORESCENT		S610	1-572-184-11	SWITCH, KEYBOARD (PRESET) (HK, SP)	
		< IC >		S611	1-572-184-11	SWITCH, KEYBOARD (ST/MONO) (AEP, UK)	
IC601	8-759-261-63	IC M66004M6FP		S611	1-572-184-11	SWITCH, KEYBOARD (AUTO)(HK, SP)	
		< COIL >					
L601	1-410-482-31	INDUCTOR 100uH		S612	1-572-184-11	SWITCH, KEYBOARD (MEMORY) (AEP, UK)	
L602	1-410-482-31	INDUCTOR 100uH		S612	1-572-184-11	SWITCH, KEYBOARD (MANU) (HK, SP)	
		< TRANSISTOR >		S613	1-572-184-11	SWITCH, KEYBOARD (NAME IN)	
Q601	8-729-422-57	TRANSISTOR UN4111		S614	1-572-184-11	SWITCH, KEYBOARD (CLOCK SET)	
Q602	8-729-422-57	TRANSISTOR UN4111		S615	1-467-938-11	ENCODER, ROTARY (MULTI CONTROLLER)	
		< RESISTOR >		*****			
R601	1-249-413-11	CARBON 470 5% 1/4W				MISCELLANEOUS	
R602	1-249-415-11	CARBON 680 5% 1/4W				*****	
R603	1-249-416-11	CARBON 820 5% 1/4W					
R604	1-249-419-11	CARBON 1.5K 5% 1/4W					
R605	1-249-421-11	CARBON 2.2K 5% 1/4W					
R606	1-249-425-11	CARBON 4.7K 5% 1/4W					
R607	1-249-413-11	CARBON 470 5% 1/4W					
R608	1-249-415-11	CARBON 680 5% 1/4W					
R609	1-249-416-11	CARBON 820 5% 1/4W					
R610	1-249-419-11	CARBON 1.5K 5% 1/4W					
R611	1-249-421-11	CARBON 2.2K 5% 1/4W					
R612	1-249-425-11	CARBON 4.7K 5% 1/4W					
R614	1-249-412-11	CARBON 390 5% 1/4W					
R615	1-249-412-11	CARBON 390 5% 1/4W					
R616	1-247-807-31	CARBON 100 5% 1/4W					
R617	1-247-807-31	CARBON 100 5% 1/4W					
R620	1-247-807-31	CARBON 100 5% 1/4W					
R621	1-249-417-11	CARBON 1K 5% 1/4W					
R622	1-249-417-11	CARBON 1K 5% 1/4W					
R623	1-249-417-11	CARBON 1K 5% 1/4W					
R624	1-249-434-11	CARBON 27K 5% 1/4W					
R625	1-249-429-11	CARBON 10K 5% 1/4W					
		< SWITCH >					
S601	1-572-184-11	SWITCH, KEYBOARD (EON) (AEP, UK)					
S601	1-572-184-11	SWITCH, KEYBOARD (MEMORY) (HK, SP)					
S602	1-572-184-11	SWITCH, KEYBOARD (PTY) (AEP, UK)					
S602	1-572-184-11	SWITCH, KEYBOARD (ST/MONO) (HK, SP)					
S603	1-572-184-11	SWITCH, KEYBOARD (DISPLAY)					
S604	1-572-184-11	SWITCH, KEYBOARD (SLEEP)					
S605	1-572-184-11	SWITCH, KEYBOARD (REC)					
S606	1-572-184-11	SWITCH, KEYBOARD (DAILY)					
S607	1-572-184-11	SWITCH, KEYBOARD (TIMER SET)					
S608	1-572-184-11	SWITCH, KEYBOARD (ENTER/NEXT)					