

CDP-M50

SERVICE MANUAL

*AEP Model
UK Model
E Model*



SPECIFICATIONS

COMPACT DISC PLAYER CDP-M50

System	Compact disc digital audio system
Laser output	Max. 44.6 μ W*
	* This output is the value measured at a distance of about 200 mm from the objective lens surface on the Optical Pick-up Block.
Frequency response	2 Hz - 20 kHz (± 0.5 dB)
Signal-to-noise ratio	More than 96 dB
Dynamic range	More than 93 dB
Harmonic distortion	Less than 0.005% (at 1 kHz)
Wow and flutter	Below measurable limit
Channel separation	More than 96 dB (at 1 kHz)
Outputs	LINE OUT (phono jacks) Output level 2 V (at 50 kilohms) Load impedance over 10 kilohms HEADPHONES (phone jack) Output level 3.6 mW (at 32 ohms) DIGITAL OUT (phono jack) Output level 0.5 Vp-p Load impedance 75 ohms

REMOTE COMMANDER RM-D350A

Remote control system	Infrared control
Power requirements	3 V DC with two R6 (size AA) batteries
Dimensions	67 $\times$ 20 $\times$ 175 (w/h/d) (2 $\frac{3}{4}$ $\times$ $\frac{33}{36}$ $\times$ 7)
Weight	145 g (5 oz) including batteries

General

Power requirements

AEP model	220 V (240 V) AC, 50/60 Hz
UK model	240 V AC, 50/60 Hz
E, SAUDI ARABIA model	110 - 120, 220 - 240 V AC adjustable, 50/60 Hz

Power consumption

10 W

Dimensions

Approx. 355 $\times$ 85 $\times$ 280 mm (w/h/d)
(14 $\times$ 3 $\frac{3}{8}$ $\times$ 11 $\frac{1}{8}$ inches)

not including projecting parts and controls

Weight

Approx. 3.2 kg (7 lbs 1 oz), net

There are two types of sets, new type and former type, in this model.

IDENTIFICATION

NEW TYPE: with TR mute board

FORMER TYPE: without TR mute board

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND 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.

COMPACT DISC PLAYER
SONY[®]

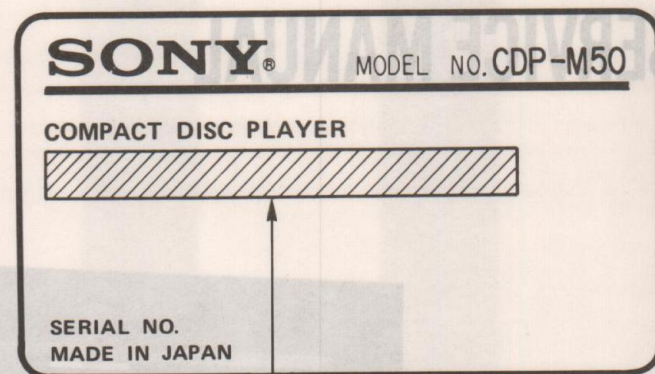


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MODEL IDENTIFICATION

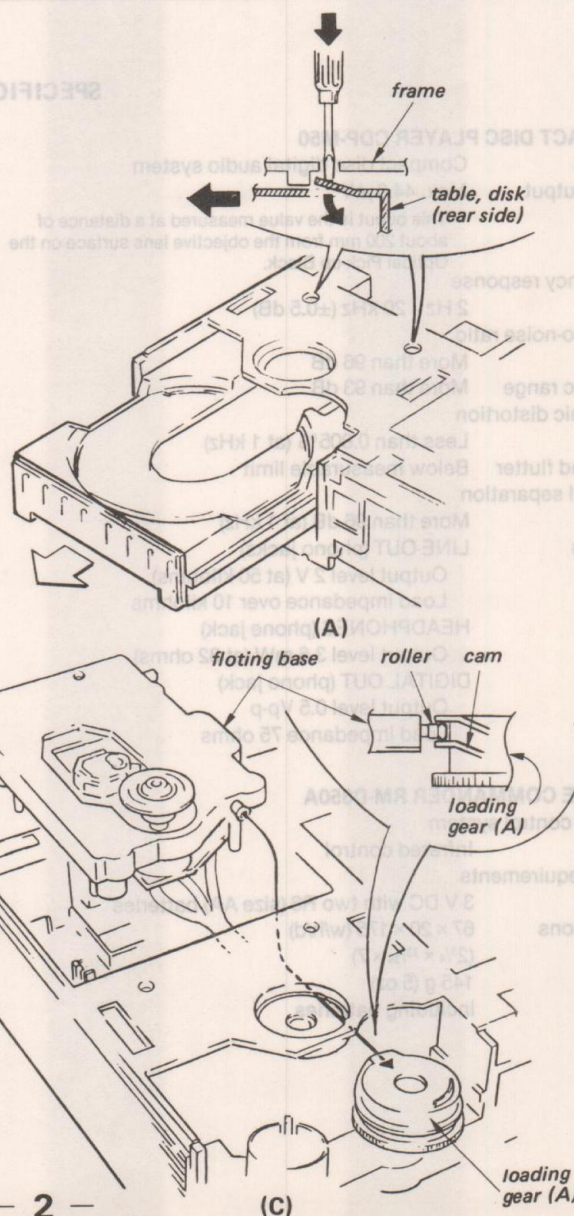
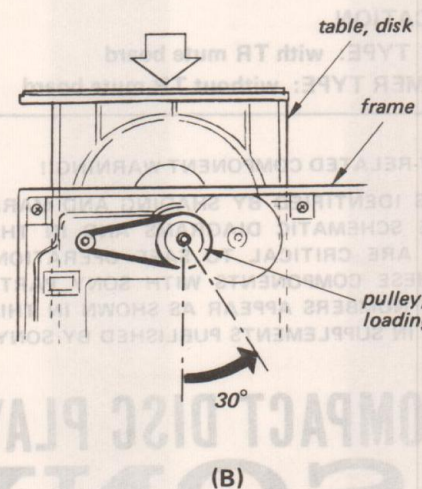
— Specifications Labels —



AEP model: AC. 220V ~ 50/60Hz 10W
 UK model : AC: 240V ~ 50/60Hz 10W
 E, SAUDI ARABIA model: AC: 110, 120, 220,
 240V ~ 50/60Hz 10W

NOTES ON REPAIR

- When removing the disk-table, put the small screwdriver into the hole. Pull off the disk-table toward you while pushing the screwdriver. See figure (A).
- When re-assembling the disk-table, rotate the loading pulley by 30-degree in the direction of the arrow by finger, and put the table slowly. See figure (B).
- When re-assembling the floating base, set it so that the floating-base roller is engaged with the cam of the loading gear (A). See figure (C).

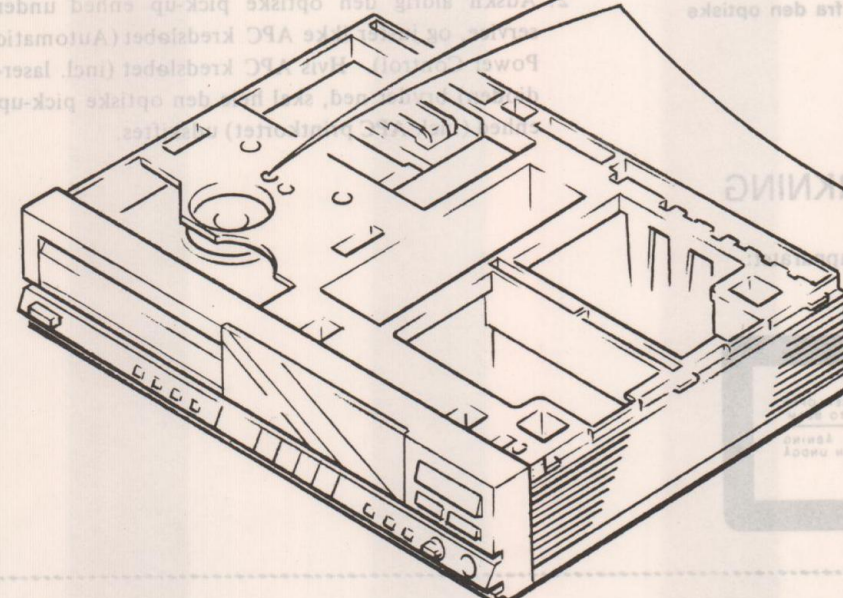
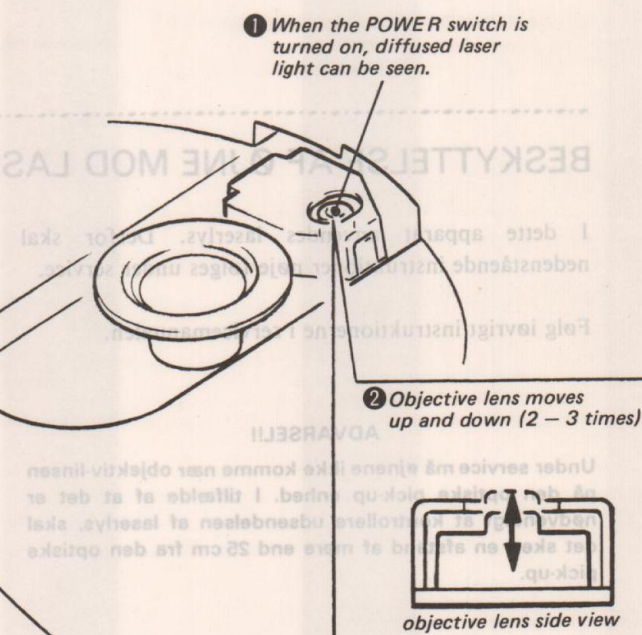


NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.

LASER DIODE AND FOCUS SERCH OPERATION CHECK

1. Make POWER switch on with no disc inserted and disc table closed.
2. Confirm that the following operation is performed while observing the objective lens.



PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

1. Laser Diode Properties

- Material: GaAlAs
 - Wavelength: 780 nm
 - Emission Duration: continuous
 - Laser Output: max. 44.6 μW^*
- * This output is the value measured at a distance of about 200 mm from the objective lens surface on the Optical Pick-up Block.

- During service, do not take the Optical Pick-up Block apart, and do not adjust the APC circuit. If there is a breakdown in the APC circuit (including laser diode), replace the entire Optical Pick-up Block (including APC board).

BESKYTTELSE AF ØJNE MOD LASERSTRÅLING UNDER SERVICE

I dette apparat anvendes laserlys. Derfor skal nedenstående instruktioner nøje følges under service.

Følg iøvrigt instruktionerne i servicemanualen.

ADVARSEL!!

Under service må øjnene ikke komme nær objektiv-linsen på den optiske pick-up enhed. I tilfælde af at det er nødvendigt at kontrollere udsendelsen af laserlys, skal det ske i en afstand af mere end 25 cm fra den optiske pick-up.

1. Laser-didoe data

- Materiale: GaAlAs
 - Bølgelængde: 780 nm
 - Udstråling: Kontinuerlig
 - Laseroutput: Max. 0,4 mW*
- * Målt i 1,6 mm afstand fra overfladen af objektiv-linsen på den optiske pick-up enhed.
- Klassifikation: Klasse IIIb.

- Adskil aldrig den optiske pick-up enhed under service, og juster ikke APC kredsløbet (Automatic Power Control). Hvis APC kredsløbet (incl. laserdioden) bryder ned, skal hele den optiske pick-up enhed (incl. APC printkortet) udskiftes.

LASER ADVARSEL MÆRKNING

Følgende mærkning findes indvendig i apparatet:

1. Advarsel Mærkning

CAUTION : INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.
ADVARSEL : USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.

VAROITUS: Laite sisältää, laserdiodin, joka lähettää (näkyvätöntä) silmille vaarallista lasersäteilyä.

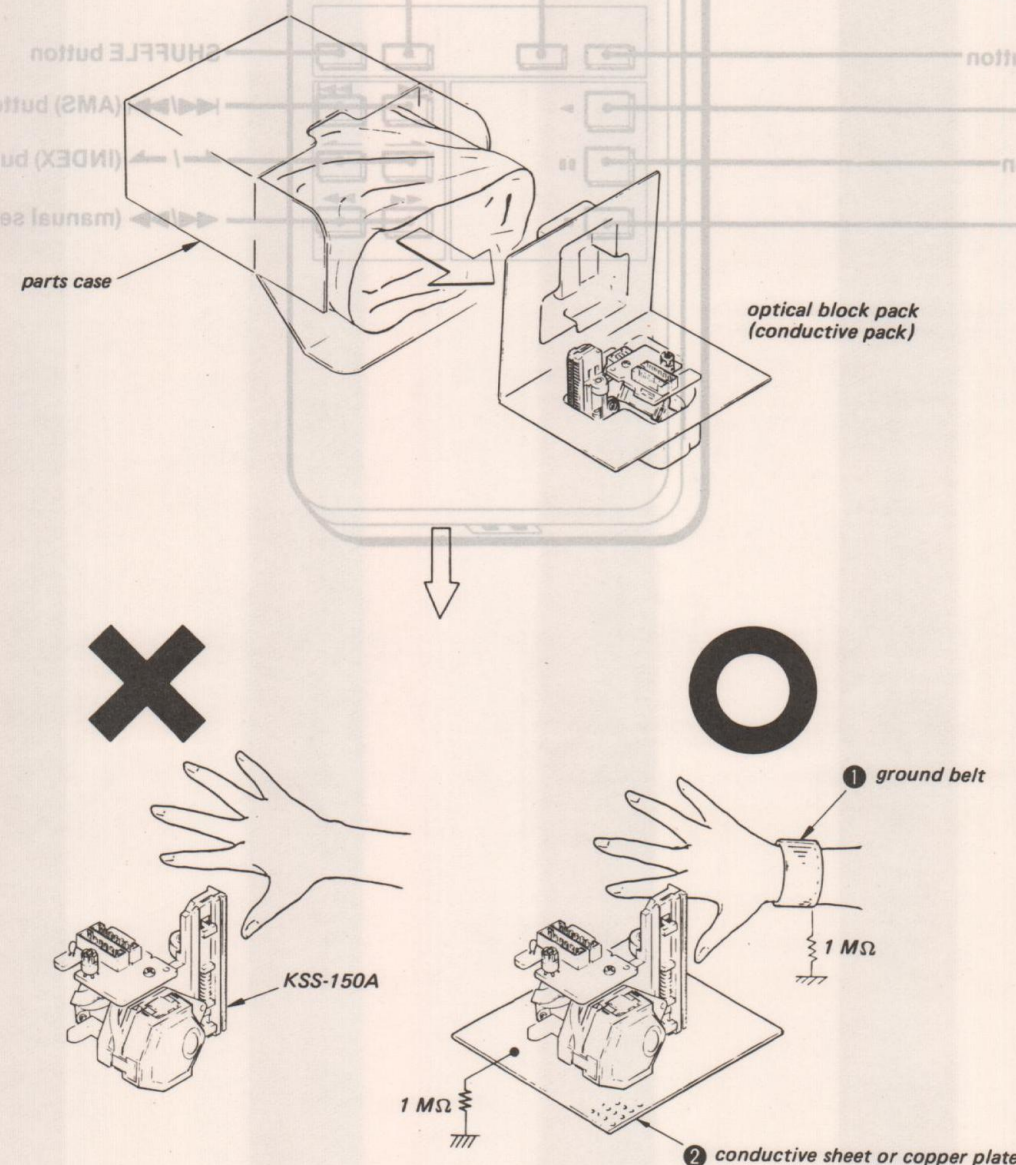
— CAUTION FOR ELECTROSTATIC BREAKDOWN —

NOTES ON HANDLING THE OPTICAL BLOCK (KSS-150A)

The laser diode inside the optical block may be damaged by static electricity in clothes or the human body.

The following procedures are required when unpacking and repairing KSS-150A in order to avoid static electricity damage.

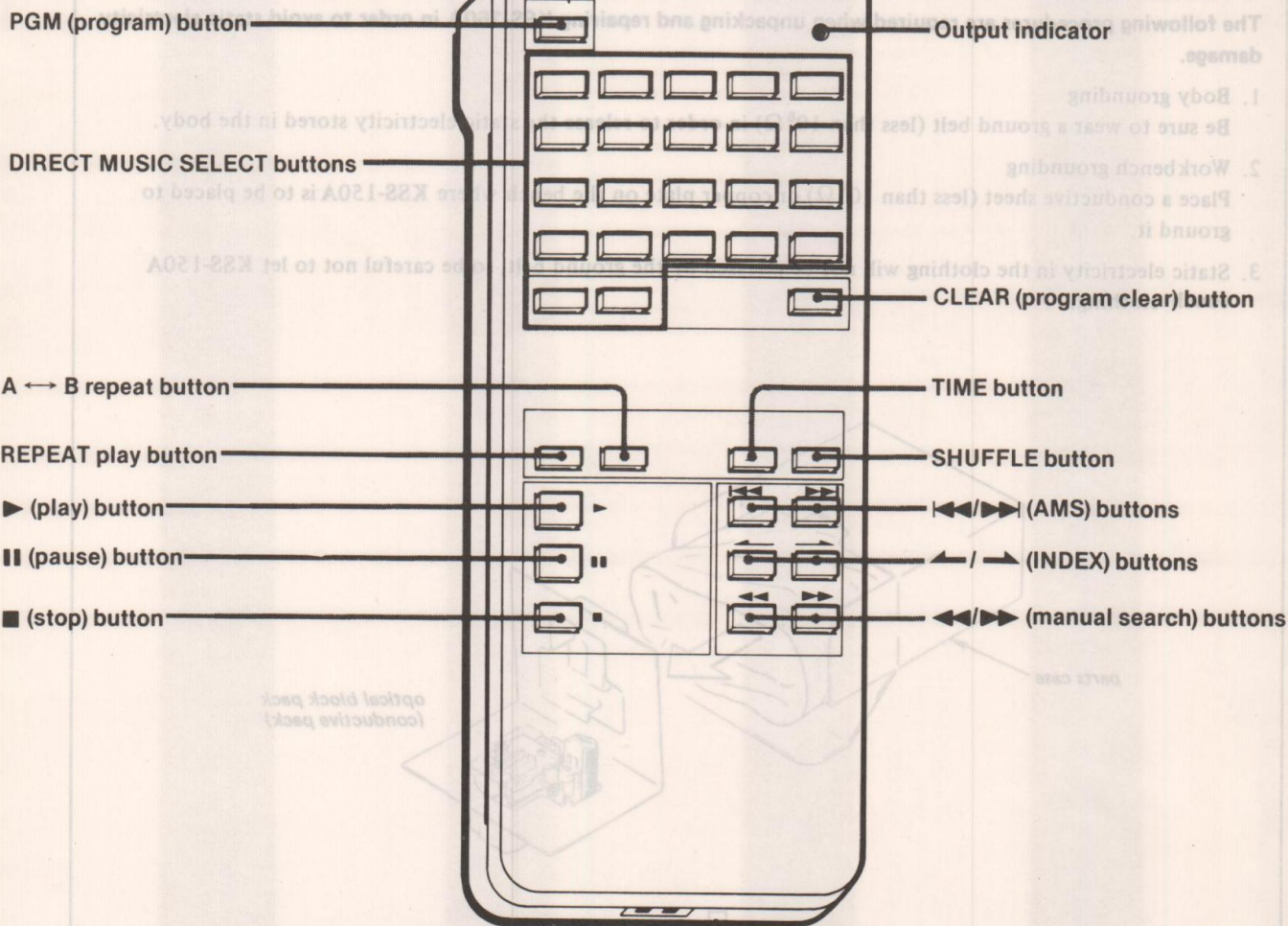
- Body grounding
Be sure to wear a ground belt (less than $10^8 \Omega$) in order to release the static electricity stored in the body.
- Workbench grounding
Place a conductive sheet (less than $10^9 \Omega$) or copper plate on the bench where KSS-150A is to be placed to ground it.
- Static electricity in the clothing will not be released by the ground belt, so be careful not to let KSS-150A touch clothing.



— CAUTION FOR ELECTROSTATIC BREAKDOWN —

LOCATION AND FUNCTION OF CONTROLS

REMOTE COMMANDER



optical block pack (conductive pack)

parts case

Ground belt

1 MΩ

K22-150A

1 MΩ

conductive sheet or copper plate

FRONT PANEL

Remote sensor

Picks up the infrared signal transmitted from the supplied remote commander.

Disc compartment

POWER switch

TIME/NEXT button

REPEAT button

AUTO SPACE button

SHUFFLE button

▲ OPEN/CLOSE button

◀▶ (AMS*) buttons

▶ (play) button

■ (stop) button

|| (pause) button

HEADPHONES jack
(stereo phone jack)HEADPHONE LEVEL
(headphones level) control

CLEAR (program clear) button

CHECK (program check) button

PROGRAM button

◀▶ (manual search) buttons

DISPLAY WINDOW

|| (pause) indicator

▶ (play) indicator

DISC indicator

Lights up when the disc compartment is opened or when a disc is inside the compartment.

SPACE indicator

Lights up when the AUTO SPACE button is pressed.

REPEAT indicator

REPEAT 1: Lights up while a single selection is being repeated.
REPEAT: Lights up while all the selections on the disc are being repeated.
REPEAT A - B: Lights up while a particular portion on the disc is being repeated.

SHUFFLE indicator

INDEX/STEP indicator

Shows the index numbers of the selection being played. Also, shows the program numbers while programming selections or while checking the programmed selections.

Music calendar display

Displays track numbers 1 to 20.

Time counter

Shows the elapsed playing time or the remaining time of the selection being played, or the total remaining time of the whole disc. While playing programmed selections, this shows the two preceding programmed selections.

TRACK indicator

RMS** (program) indicator
Illuminates during program play.

TRACK

INDEX

8888

8888

8888

MINUTE SECOND

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

* AMS is the abbreviation for Automatic Music Sensor.
** RMS is the abbreviation for Random Music Sensor.

SECTION 1

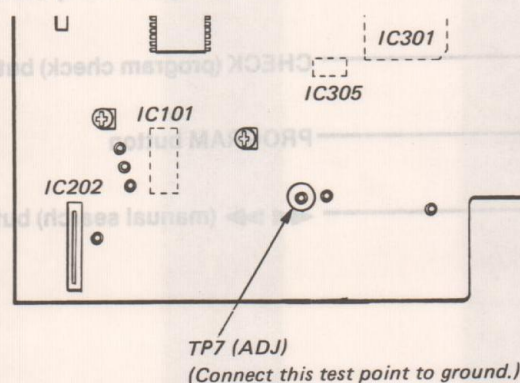
ELECTRICAL ADJUSTMENTS

1. Perform adjustments in the order given.
2. Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
3. Use the oscilloscope with more than 10 M Ω impedance.

Adjustment Mode

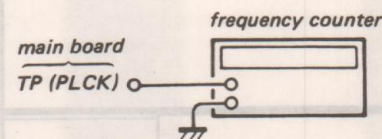
1. Connect main board test pin TP7 (ADJ) and ground. This is to prevent the disc rotation from stopping even though pits are not read, by making microcomputer IC801 pin (14) low.
 2. Turn POWER switch on.
(To reset microcomputer.)
- After adjustment, remove the lead wire connecting test pin TP7 (ADJ) and ground.

Adjustment Location: main board



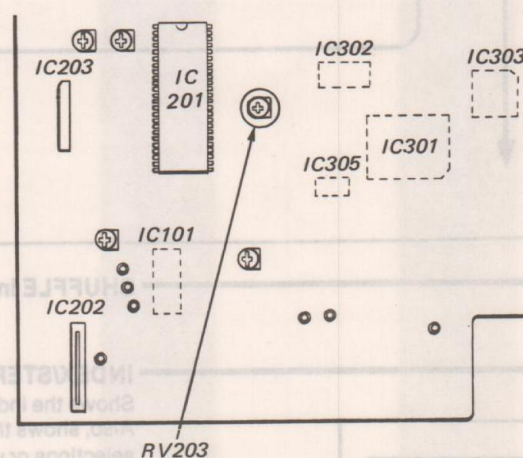
RF PLL Frequency Adjustment

Procedure:



1. Turn POWER switch on.
2. Connect test point TP (ASY) to ground with jumper wire.
3. Connect the frequency counter to test points TP (PLCK).
4. Adjust RV203 so that the reading on frequency counter is 4.3218 MHz $\pm$ 20 kHz.
5. Remove lead wire connecting TP (ASY) and ground.
6. Put disc (YEDS-18) in and press $\triangleright$ button.
7. Confirm that the reading on frequency counter is 4.3218 MHz.

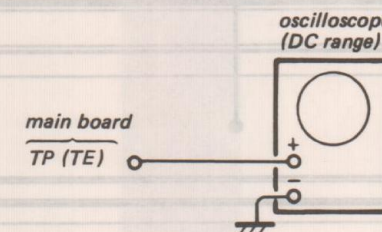
Adjustment Location: main board



E-F Balance Adjustment

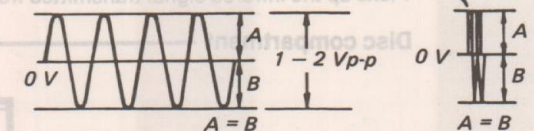
This adjustment should be made when replacing Optical Pick-up Block.

Procedure:

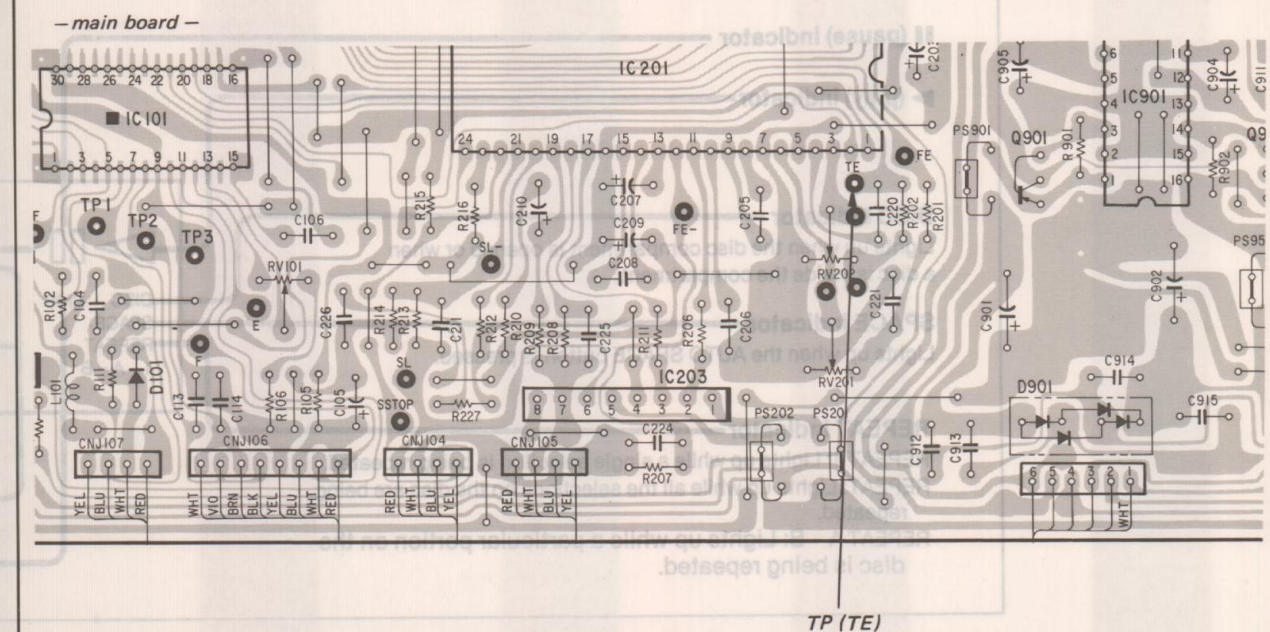
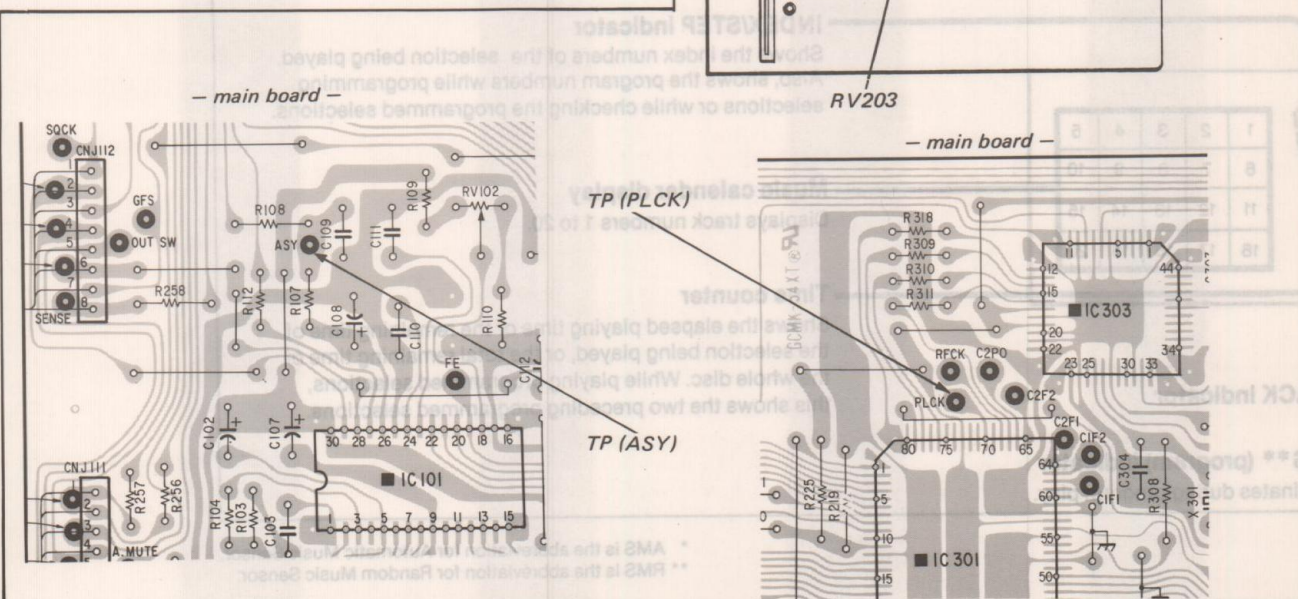
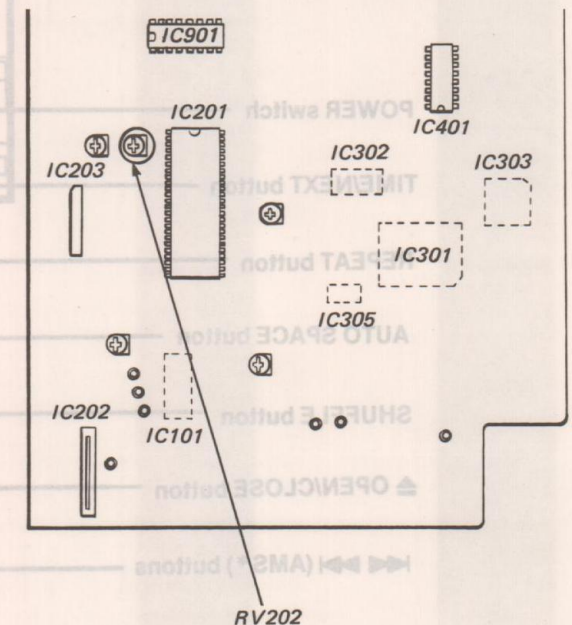


1. Connect oscilloscope to test point TP (TE) and ground.
2. Put set into adjustment mode. (See page 9.)
3. Turn POWER switch on.
4. Put disc (YEDS-18) in and playback the 6th selection.
5. Adjust RV202 so that the oscilloscope waveform is symmetrical on the top and bottom in relation to 0 V.
6. After adjustment, cancel the adjustment mode. (See page 9.)

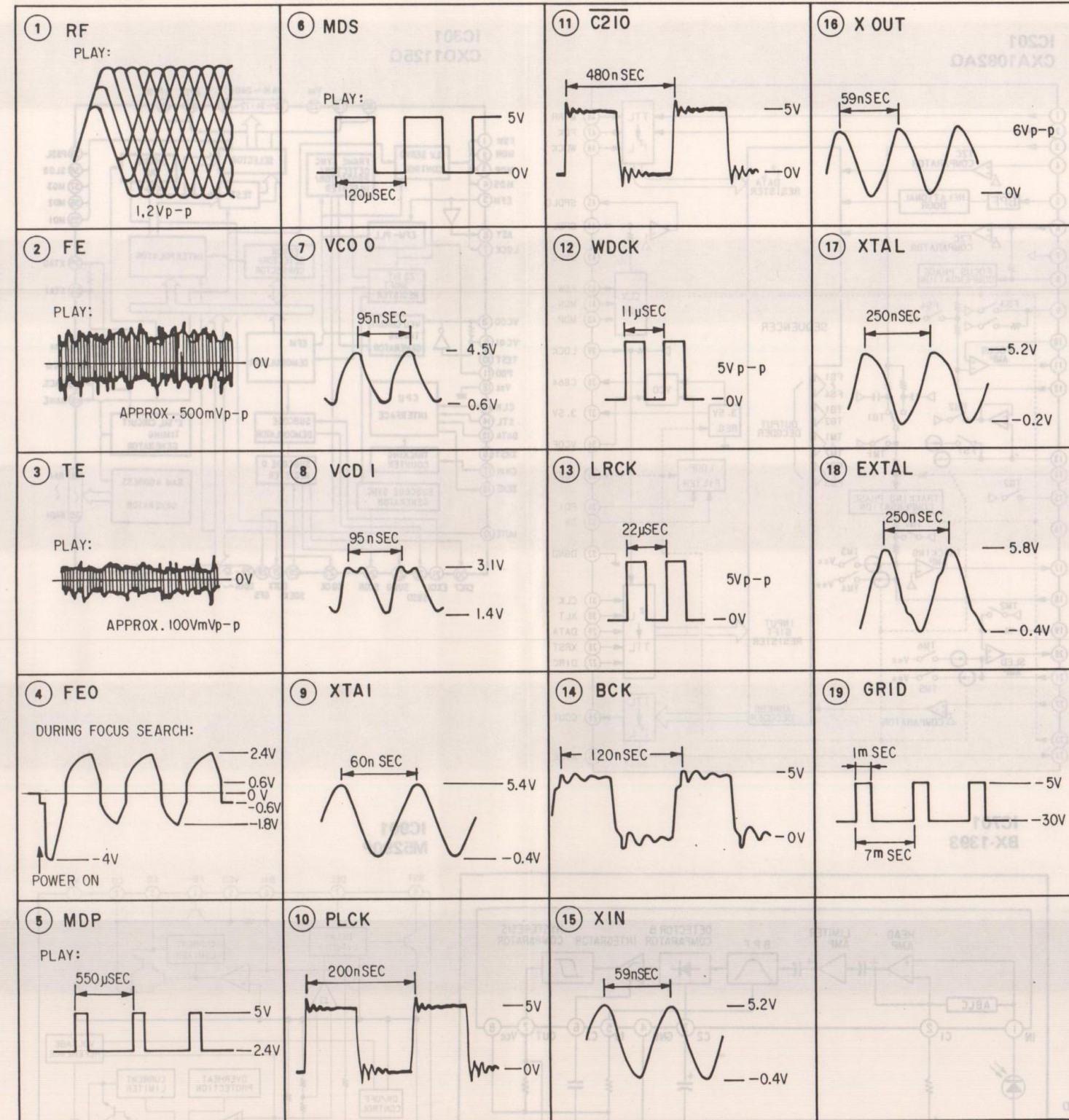
Note: Take sweep time as long as possible to obtain best waveform.



Adjustment Location: main board



• WAVEFORMS

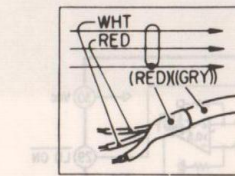


SECTION 2 DIAGRAMS

2-1. MOUNTING DIAGRAM

Note:

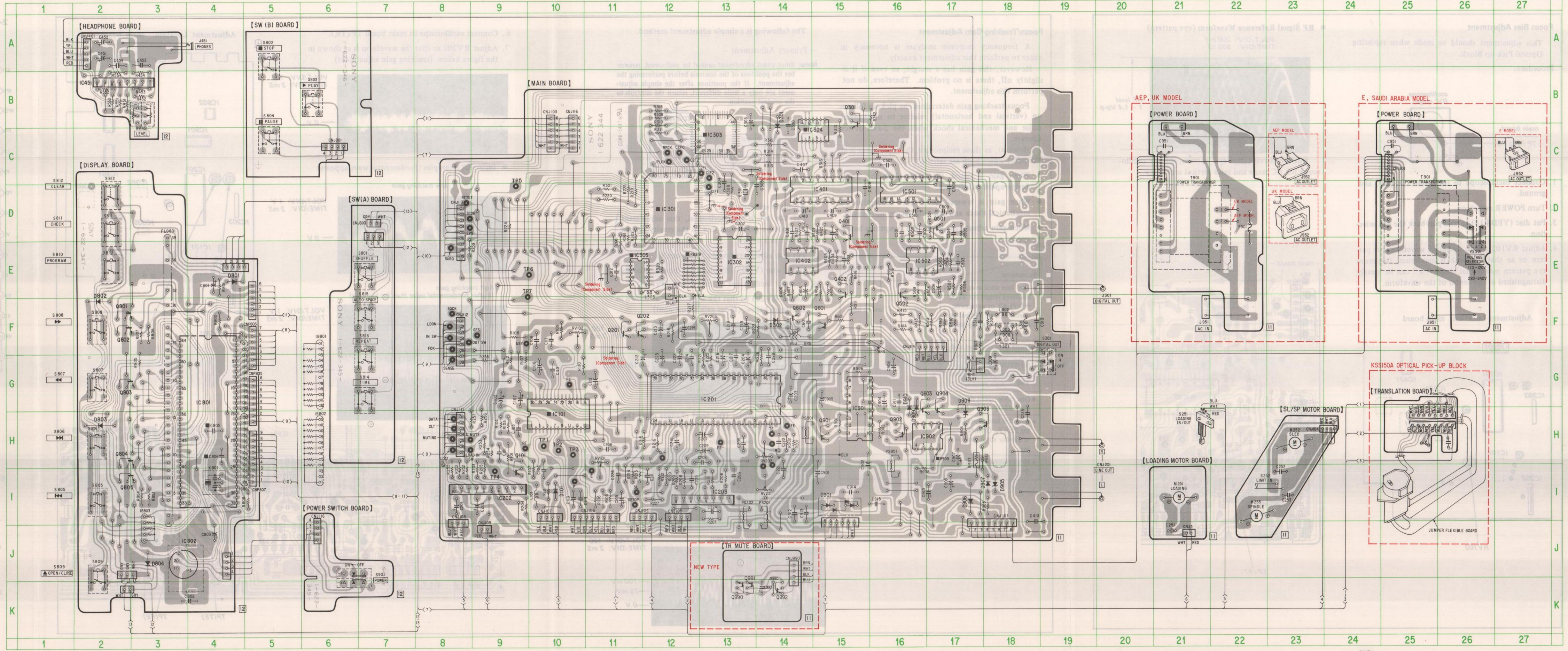
- Color code of sleeving over the end of the jacket.



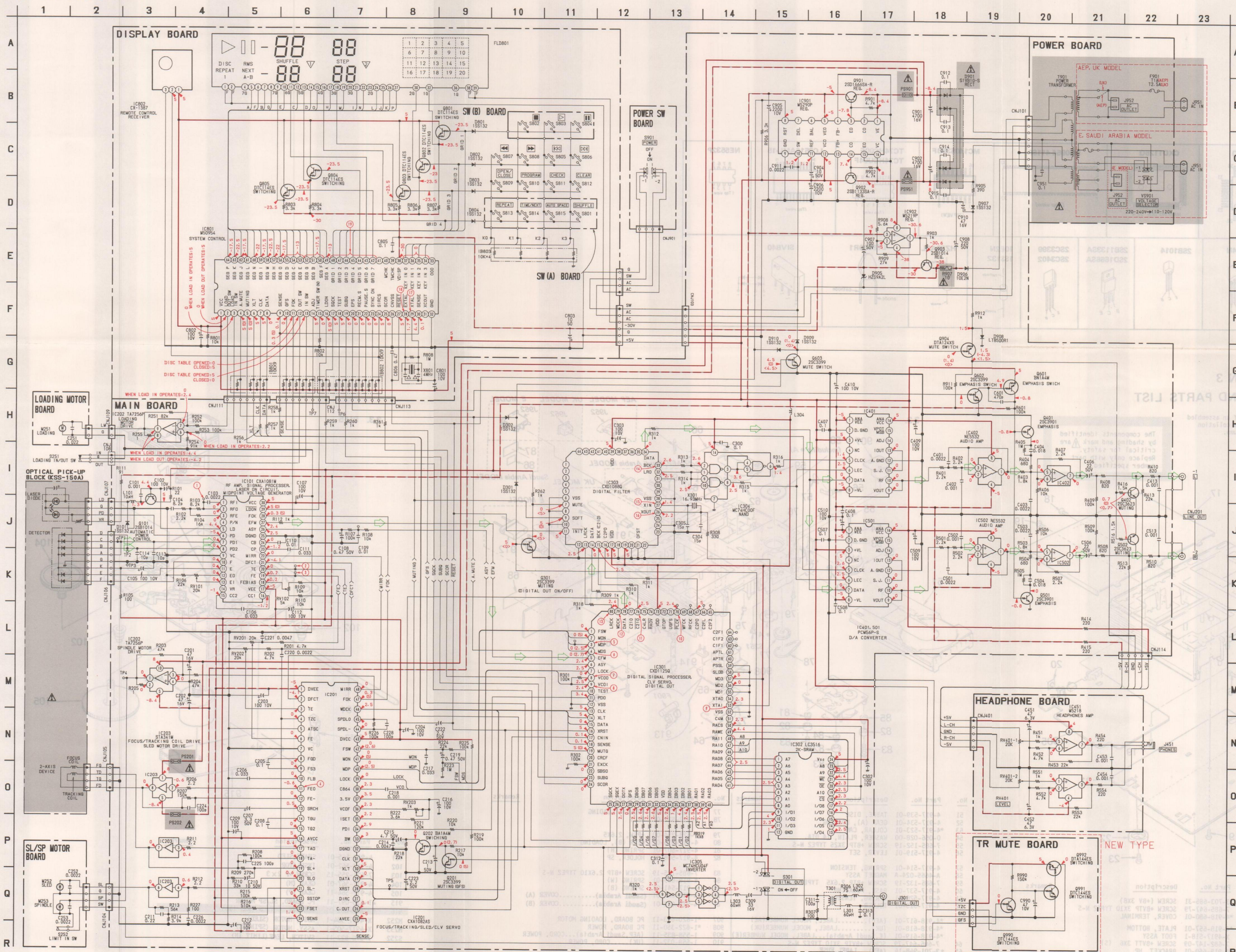
- : parts extracted from the component side.
- : part mounted on the conductor side.

• SEMICONDUCTOR LOCATION

Ref. No.	Location	Ref. No.	Location
IC101	H-10	Q101	H-9
IC201	G-13	Q201	F-11
IC202	I-9	Q202	T-12
IC203	I-13	Q301	B-15
IC301	D-12	Q401	D-15
IC302	E-13	Q402	E-15
IC303	C-13	Q501	D-17
IC304	C-15	Q502	F-16
IC305	E-11	Q601	T-15
IC401	D-15	Q602	T-14
IC402	E-14	Q603	G-17
IC451	B-2	Q801	T-2
IC501	D-16	Q802	T-2
IC502	E-16	Q803	H-2
IC801	G-4	Q804	H-2
IC802	J-3	Q805	I-2
IC901	G-15	Q901	H-15
IC902	H-17	Q902	T-16
		Q903	T-18
		Q904	G-17
		D101	I-10
		D301	B-14
		D302	T-14
		D801	T-2
		D802	T-2
		D803	H-2
		D804	J-3
		D901	I-15
		D905	I-18
		D906	I-17
		D907	I-18
		D908	G-17
		D909	G-16
		D910	G-16



2-2. SCHEMATIC DIAGRAM



● Note on Schematic Diagram.

Note:

- All capacitors are in μF unless otherwise noted. pF : μF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
- : fusible resistor.
- : Switch

Ref. No.	Switch	Position
S251	LOADING IN/OUT	IN
S252	LIMIT IN	OFF
S301	DIGITAL OUT	OFF
S801	SHUFFLE	OFF
S802		OFF
S803		OFF
S804		OFF
S805		OFF
S806		OFF
S807		OFF
S808		OFF
S809	OPEN/CLOSE	OFF
S810	PROGRAM	OFF
S811	CHECK	OFF
S812	CLEAR	OFF
S813	REPEAT	OFF
S814	TIME/NEXT	OFF
S815	AUTO SPACE	OFF
S901	POWER	OFF
VS901	VOLTAGE SELECTOR	220-240V

- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (50 $\text{k}\Omega/\text{V}$).
- no mark: STOP
- < > : PLAY
- < > : DIGITAL OUT switch ON.
- Voltage variations may be noted due to normal production tolerances.
- : B+ bus.
- : B- bus.
- : waveform numbers
- : signal path.

Note: The components identified by shading and mark are critical for safety. Replace only with part number specified.

SEMICONDUCTOR LEAD LAYOUTS

BX-1387 (Top view)	CXA1081M (Top view)	CXA1082AS (Top view)	CXD1088Q (Top view)	CXD1125Q MARKING SIDE VIEW	M50954-411SP (Top view)	MC140538BF (TOP VIEW)	TC74HC00F TC74HCU04F (Top view)	LC3516AML-15 (Top view)	NE5532P (Top view)	
PCM56P-JS (Top view)	STA341M (BOTTOM VIEW)	TA7256P (Top view)	BN1F4N (Top view)	2SB1014 (Top view)	2SB1133SA 2SD1666SA (Top view)	2SC3399 2SC3402 (Top view)	10E2N 1SS132 (Top view)	HZS9A2L (Top view)	LT8500R1 (Top view)	SIVB40 (Top view)

SECTION 3
EXPLODED VIEWS AND PARTS LIST

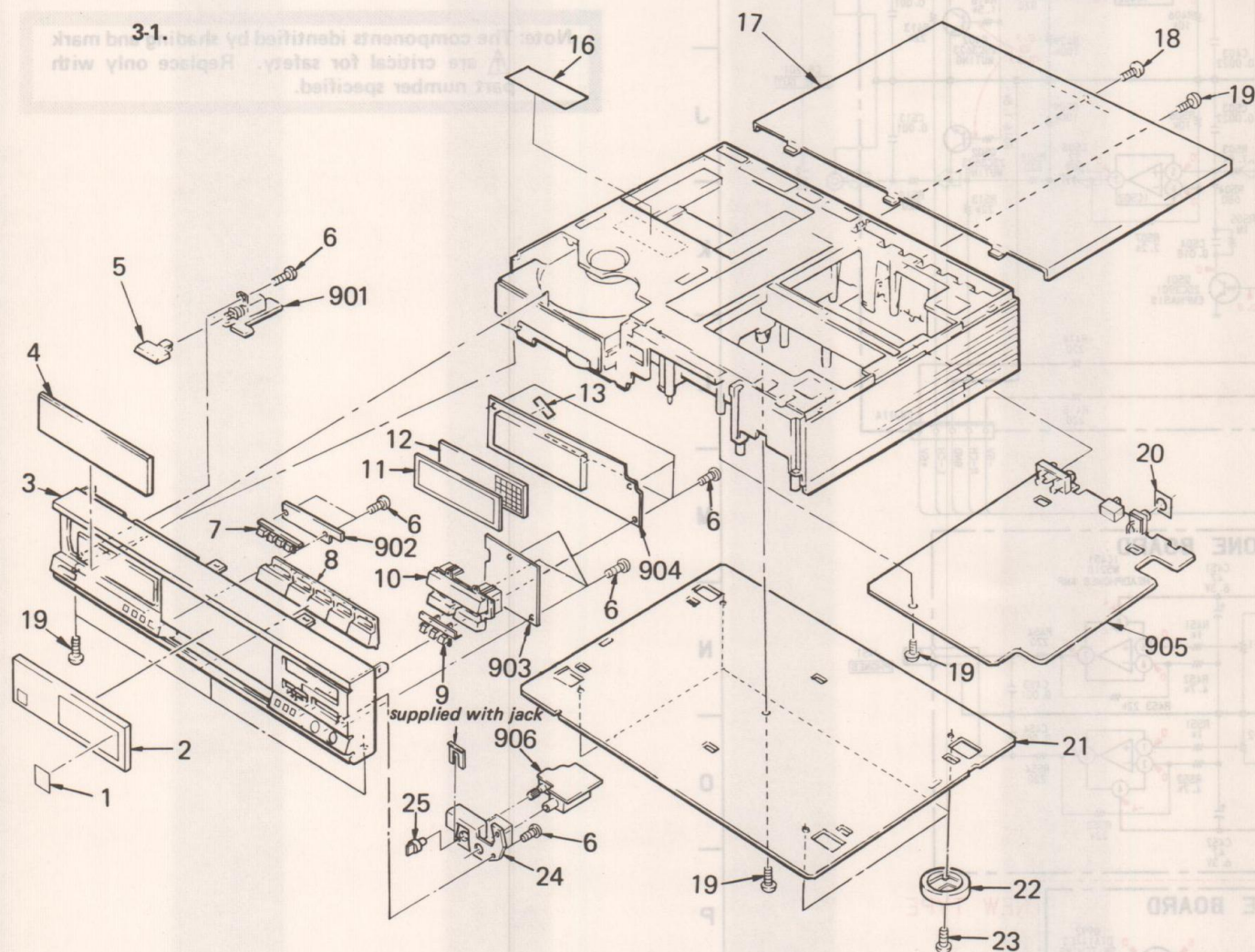
NOTE:

•The mechanical parts with no reference number in the exploded views are not supplied.

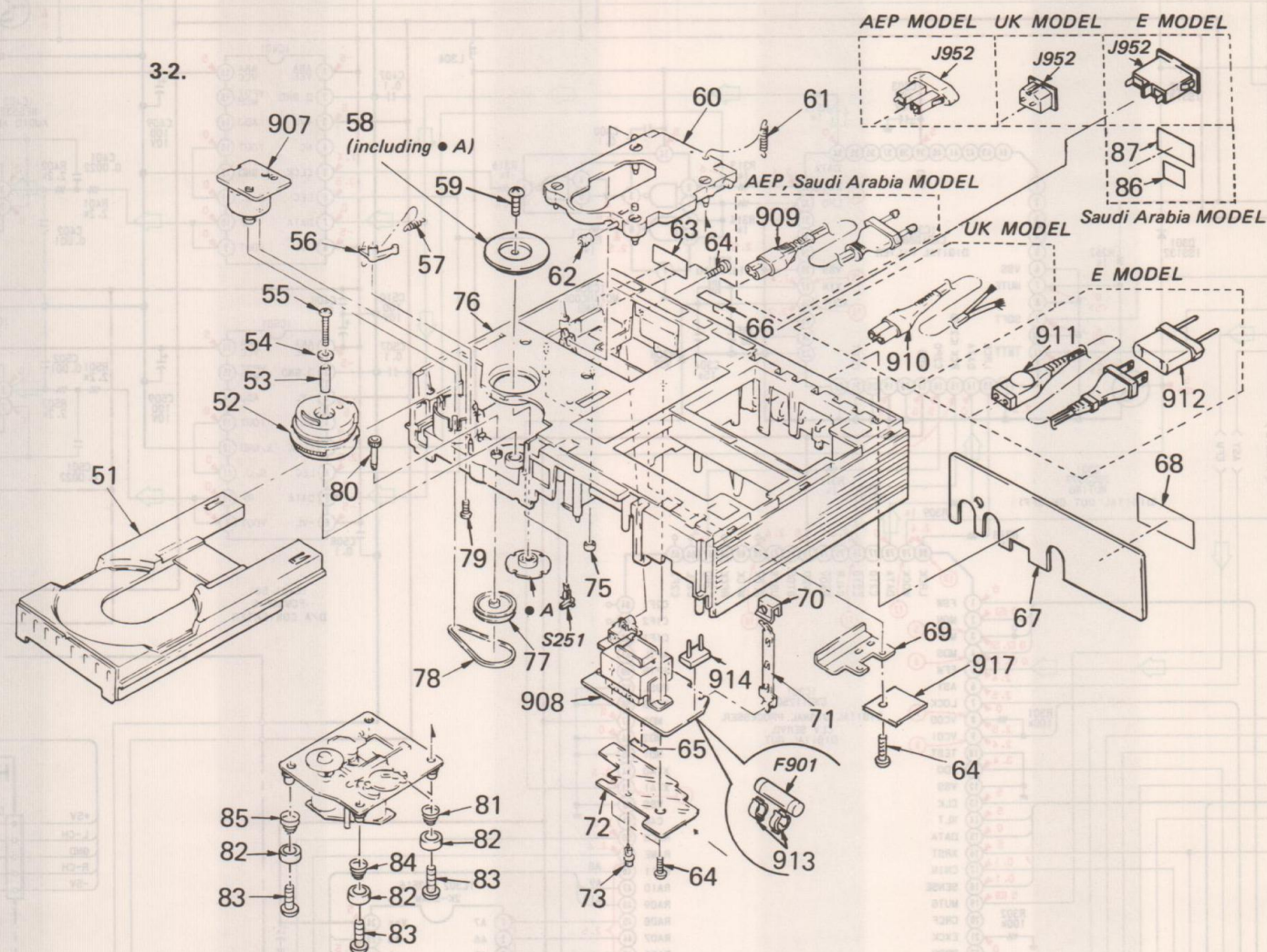
•Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

•The construction parts of an assembled part are indicated with a collation number in the remark column.

The components identified by shading and mark are critical for safety. Replace only with part number specified.

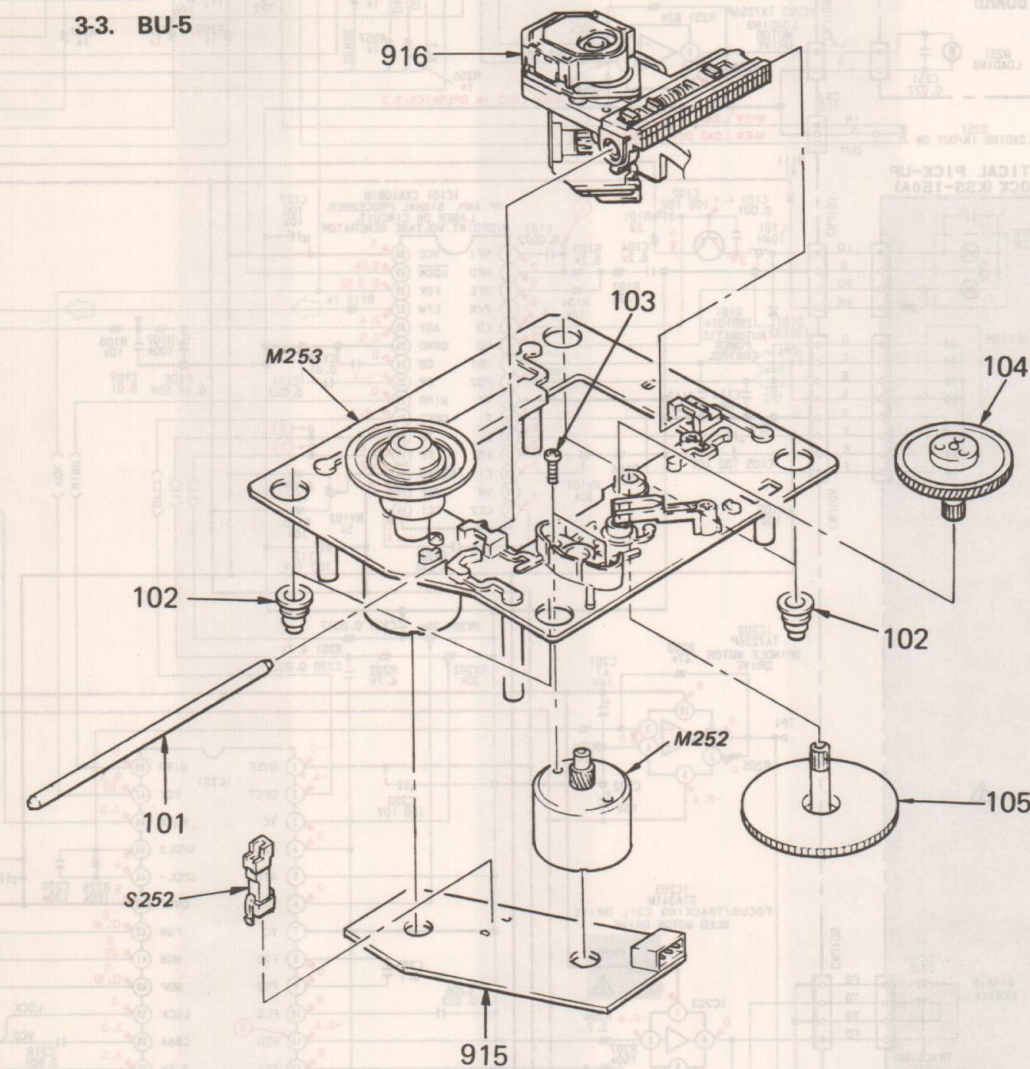


No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
1	3-703-713-41	STICKER, SONY SYMBOL (10)		18	3-703-685-31	SCREW (+BV 3X8)	
2	4-918-649-01	PLATE, INDICATION		19	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
3	X-4917-522-1	PANEL ASSY		20	*4-918-680-01	COVER, TERMINAL	
4	4-918-654-01	PANEL, LOADING		21	*4-918-657-01	PLATE, BOTTOM	
5	4-917-525-11	KNOB, POWER		22	X-4917-518-1	FOOT ASSY	
6	7-685-134-19	SCREW +P 2.6X8 TYPE2 NON-SLIT		23	7-682-147-09	SCREW +BVTT 3X6 (S)	
7	4-918-648-01	KNOB (4 GANG)		24	*4-918-650-01	BRACKET, HP	
8	4-918-655-01	KNOB (5 GANG)		25	4-901-708-11	KNOB, VOL	
9	4-918-647-01	KNOB (3 GANG)					
10	4-918-656-01	KNOB, PLAY		901	*1-622-349-11	PC BOARD, POWER SWITCH	
11	*4-918-652-01	PLATE, SHIELD		902	*1-622-345-11	PC BOARD, SW (A)	
12	*4-918-119-01	FILTER		903	*1-622-346-11	PC BOARD, SW (B)	
13	3-831-441-XX	CUSHION (B), CABINET		904	*1-622-347-11	PC BOARD, DISPLAY	
16	*4-885-843-02	LABEL, CAUTION, LASER		905	*A-4651-129-A	MOUNTED PCB, MAIN	
17	4-917-536-11	CASE		906	*1-622-348-11	PC BOARD, HEADPHONE	



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
51	4-917-539-01	TABLE, DISK		77	4-917-521-01	PULLEY, LOADING	
52	4-917-534-01	GEAR (A), LOADING		78	4-917-522-01	BELT	
53	*4-917-523-01	COLLAR, CAM		79	7-628-254-00	+PSW, 2.6X5	
54	0-056-028-00	WASHER, PLAIN, 14 DIA.		80	4-917-516-01	GEAR (B), LOADING	
55	7-685-152-19	SCREW +BTP 3X25 TYPE2 N-S		81	4-917-507-01	SPRING (H)	
56	4-917-519-01	LEVER, SET		82	4-917-508-01	HOLDER, SP	
57	4-917-514-01	SPRING, TENSION		83	7-685-135-19	SCREW +BTP 2.6X10 TYPE2 N-S	
58	A-4665-024-A	MAGNET ASSY		84	4-918-669-01	SPRING (W)	
59	7-685-132-19	SCREW +BTP 2.6X5 TYPE2 N-S		85	4-917-541-01	SPRING (B)	
60	4-917-537-01	BASE, FLOATING		86	*4-918-681-01	(Saudi Arabia).....COVER (A)	
61	4-917-526-01	SPRING, TENSION		87	*4-918-682-01	(Saudi Arabia).....COVER (B)	
62	4-917-515-01	ROLLER		907	*1-620-603-11	PC BOARD, LOADING MOTOR	
63	*4-918-617-01	(AEP).....LABEL, MODEL NUMBER(AE)		908	*1-622-350-11	PC BOARD, POWER	
64	*4-918-618-01	(UK).....LABEL, MODEL NUMBER(UK)		909	1-558-835-11	(AEP,Saudi Arabia)....CORD, POWER	
65	*4-918-619-01	(E,Saudi Arabia)....LABEL, MODEL NUMBER(E)		910	1-558-032-11	(UK).....CORD, POWER	
66	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S		911	1-556-280-00	(E).....CORD, POWER	
67	*3-701-948-14	(AEP)....LABEL,FUSE		912	1-526-565-00	(E).....AC PLUG ADAPTOR	
68	*3-701-948-18	(UK)....LABEL,FUSE		913	1-533-183-11	(AEP,UK)....HOLDER, FUSE	
69	4-911-028-11	(UK)....LABEL, AC OUTLET		914	*1-560-265-00	BASE POST (U-TYPE)	
70	4-918-620-01	PLATE,INDICATION, O/P TERMINAL		917	*1-623-299-11	(NEW TYPE)....PC BOARD,TR MUTE	
71	*4-885-838-00	LABEL, CLASS 1		F901	1-532-078-00	(AEP)....FUSE, TIME-LAG (1A)	
72	4-917-517-01	GUIDE, LEAD		F901	1-532-286-00	(UK)....FUSE, TIME-LAG (2.5A)	
73	4-918-670-01	SUPPORT, GROUND		J952	1-526-751-11	(UK)....OUTLET, AC	
74	4-917-511-01	PLATE, INSULATING		J952	1-526-774-11	(E)....OUTLET, AC	
75	3-531-576-11	RIVET		J952	1-526-794-11	(AEP)....OUTLET, AC	
76	*3-576-990-01	CUSHION		S251	1-570-203-11	SWITCH, LEAF (LOADING IN/OUT)	
	*4-917-540-71	(AEP).....FRAME					
	*4-917-540-81	(UK).....FRAME					
	*4-917-540-91	(E,Saudi Arabia).....FRAME					

3-3. BU-5



No.	Part No.	Description	Remarks
101	4-917-565-01	SHAFT,SLED	
102	4-917-562-01	INSULATOR	
103	7-621-255-15	SCREW +P 2x3	
104	4-917-567-01	GEAR (M)	
105	4-917-564-11	GEAR (P)	
915	*1-620-097-11	PC BOARD, SL/SP MOTOR	
916	A-8-848-062-01	DEEVICE, OPTICS (KSS-150A)	
M252	X-4917-504-1	ASSY, MOTOR (SLED)	
M253	X-4917-505-1	ASSY, MOTOR (SPINDLE)	
S252	1-570-822-11	SWITCH, LEAF (LIMIT IN)	

The components identified by shading and mark are critical for safety. Replace only with part number specified.

SECTION 4

ELECTRICAL PARTS LIST

NOTE:

Items marked * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

MF: μ F, PF: μ F.

RESISTORS

All resistors are in ohms.

F : nonflammable

COILS

MMH : mH, UH : μ H

SEMICONDUCTORS

In each case, U : μ , for example:UA...: μ A..., UPA...: μ PA..., UPC...: μ PC,UPD...: μ PD...

The components identified by shading and mark  are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description
901	*1-622-349-11	PC BOARD, POWER SWITCH
902	*1-622-345-11	PC BOARD, SW (A)
903	*1-622-346-11	PC BOARD, SW (B)
904	*1-622-347-11	PC BOARD, DISPLAY
905	*A-4651-129-A	MOUNTED PCB, MAIN
906	*1-622-348-11	PC BOARD, HEADPHONE
907	*1-620-603-11	PC BOARD, LOADING MOTOR
908	*1-622-350-11	PC BOARD, POWER
909	1-558-835-11	(AEP,Saudi Arabia)...CORD, POWER
910	1-558-032-11	(UK)...CORD, POWER
911	1-556-280-00	(E)...CORD, POWER
912	1-526-565-00	(E)...AC PLUG ADAPTOR
913	1-533-183-11	(AEP,UK)...HOLDER, FUSE
914	*1-560-265-00	BASE POST (U-TYPE)
915	*1-620-097-11	PC BOARD, SL/SP MOTOR
916	A-X-4917-051-1	PICK UP, OPTICS KSS-150A
917	*1-623-299-11	(NEW TYPE)...PC BOARD, TR MUTE
C101	1-162-294-31	CERAMIC 0.001MF 10% 50V
C102	1-124-443-00	ELECT 100MF 20% 10V
C103	1-130-475-00	MYLAR 0.0022MF 5% 50V
C104	1-162-198-31	CERAMIC 8.2PF 10% 50V
C105	1-124-443-00	ELECT 100MF 20% 10V
C106	1-136-159-00	FILM 0.033MF 5% 50V
C107	1-124-443-00	ELECT 10CMF 20% 10V
C108	1-124-902-00	ELECT 0.47MF 20% 50V
C109	1-136-153-00	FILM 0.01MF 5% 50V
C110	1-136-153-00	FILM 0.01MF 5% 50V
C111	1-136-159-00	FILM 0.033MF 5% 50V
C112	1-124-443-00	ELECT 100MF 20% 10V
C113	1-162-199-31	CERAMIC 10PF 5% 50V
C114	1-162-199-31	CERAMIC 10PF 5% 50V
C201	1-124-236-00	ELECT 47MF 20% 16V
C202	1-124-236-00	ELECT 47MF 20% 16V
C203	1-124-443-00	ELECT 100MF 20% 10V
C204	1-124-443-00	ELECT 100MF 20% 10V
C205	1-136-165-00	FILM 0.1MF 5% 50V
C206	1-136-159-00	FILM 0.033MF 5% 50V
C207	1-124-905-11	ELECT 3.3MF 20% 50V
C208	1-136-165-00	FILM 0.1MF 5% 50V
C209	1-124-443-00	ELECT 100MF 20% 10V
C210	1-123-875-91	ELECT 10MF 20% 50V
C211	1-136-169-00	FILM 0.22MF 5% 50V
C212	1-124-443-00	ELECT 100MF 20% 10V
C213	1-124-791-11	ELECT 1MF 20% 50V
C214	1-130-479-00	MYLAR 0.0047MF 5% 50V
C215	1-124-927-11	ELECT 4.7MF 20% 50V
C216	1-124-443-00	ELECT 100MF 20% 10V

ELECTRICAL PARTS

Ref.No.	Part No.	Description
C217	1-136-159-00	FILM 0.033MF 5% 50V
C218	1-162-294-31	CERAMIC 0.001MF 10% 50V
C219	1-124-902-00	ELECT 0.47MF 20% 50V
C220	1-161-375-00	CERAMIC 0.0022MF 20% 16V
C221	1-161-377-00	CERAMIC 0.0047MF 30% 16V
C222	1-124-925-11	ELECT 2.2MF 20% 50V
C223	1-124-925-11	ELECT 2.2MF 20% 50V
C224	1-162-282-31	CERAMIC 2.2MF 10% 50V
C225	1-162-282-31	CERAMIC 100PF 10% 50V
C226	1-161-375-00	CERAMIC 0.0022MF 20% 16V
C228	1-162-282-31	CERAMIC 100PF 10% 50V
C251	1-136-157-00	FILM 0.022MF 5% 50V
C252	1-106-351-00	MYLAR 0.0022MF 5% 50V
C253	1-106-351-00	MYLAR 0.0022MF 5% 50V
C300	1-136-165-00	FILM 0.1MF 5% 50V
C302	1-124-443-00	ELECT 100MF 20% 10V
C303	1-124-443-00	ELECT 100MF 20% 10V
C304	1-162-203-31	CERAMIC 15PF 5% 50V
C305	1-162-203-31	CERAMIC 15PF 5% 50V
C309	1-124-963-11	ELECT 33MF 20% 16V
C311	1-162-282-31	CERAMIC 100PF 10% 50V
C312	1-136-165-00	FILM 0.1MF 5% 50V
C313	1-136-165-00	FILM 0.1MF 5% 50V
C401	1-130-475-00	MYLAR 0.0022MF 5% 50V
C402	1-130-471-00	MYLAR 0.001MF 5% 50V
C403	1-130-475-00	MYLAR 0.0022MF 5% 50V
C404	1-136-156-00	FILM 0.018MF 5% 50V
C406	1-123-357-00	ELECT 22MF 20% 50V
C407	1-136-165-00	FILM 0.1MF 5% 50V
C408	1-136-165-00	FILM 0.1MF 5% 50V
C409	1-124-443-00	ELECT 100MF 20% 10V
C410	1-124-443-00	ELECT 100MF 20% 10V
C413	1-162-294-31	CERAMIC 0.001MF 10% 50V
C451	1-124-224-00	ELECT 47MF 20% 6.3V
C452	1-124-224-00	ELECT 47MF 20% 6.3V
C453	1-162-294-31	CERAMIC 0.001MF 10% 50V
C454	1-162-294-31	CERAMIC 0.001MF 10% 50V
C501	1-130-475-00	MYLAR 0.0022MF 5% 50V
C502	1-130-471-00	MYLAR 0.001MF 5% 50V
C503	1-130-475-00	MYLAR 0.0022MF 5% 50V
C504	1-136-156-00	FILM 0.018MF 5% 50V
C506	1-123-357-00	ELECT 22MF 20% 50V
C507	1-136-165-00	FILM 0.1MF 5% 50V
C508	1-136-165-00	FILM 0.1MF 5% 50V
C509	1-124-443-00	ELECT 100MF 20% 10V

ELECTRICAL PARTS

Ref.No.	Part No.	Description
C510	1-124-443-00	ELECT 100MF 20% 10V
C513	1-162-294-31	CERAMIC 0.001MF 10% 50V
C601	1-162-290-31	CERAMIC 470PF 10% 50V
C801	1-124-443-00	ELECT 100MF 20% 10V
C802	1-124-443-00	ELECT 100MF 20% 10V
C803	1-123-875-91	ELECT 10MF 20% 50V
C805	1-136-165-00	FILM 0.1MF 5% 50V
C806	1-136-173-00	FILM 0.47MF 5% 50V
C901	1-124-898-11	ELECT 4700MF 20% 16V
C902	1-124-898-11	ELECT 4700MF 20% 16V
C904	1-123-875-91	ELECT 10MF 20% 50V
C905	1-124-893-11	ELECT 2200MF 20% 10V
C906	1-124-893-11	ELECT 2200MF 20% 10V
C907	1-124-122-11	ELECT 100MF 20% 50V
C908	1-124-911-11	ELECT 220MF 20% 50V
C910	1-124-236-00	ELECT 47MF 20% 16V
C911	1-161-375-00	CERAMIC 0.0022MF 20% 16V
C912	1-136-165-00	FILM 0.1MF 5% 50V
C913	1-136-165-00	FILM 0.1MF 5% 50V
C914	1-136-165-00	FILM 0.1MF 5% 50V
C915	1-136-165-00	FILM 0.1MF 5% 50V
C951	1-136-165-00	FILM 0.1MF 5% 50V
C990	1-124-236-00	(NEW TYPE)...ELECT 47MF 20% 10V
CNJ101*1-564-501-11	PIN, CONNECTOR 8P	
CNJ103*1-564-340-00	PIN, CONNECTOR 6P	
CNJ104*1-564-720-11	PIN, CONNECTOR (SMALL TYPE) 4P	
CNJ104*1-564-720-41	PIN, CONNECTOR (SMALL TYPE) 4P	
CNJ105*1-564-720-11	PIN, CONNECTOR (SMALL TYPE) 4P	
CNJ106*1-564-724-11	PIN, CONNECTOR (SMALL TYPE) 8P	
CNJ107*1-564-720-31	PIN, CONNECTOR (SMALL TYPE) 4P	
CNJ108*1-564-719-11	PIN, CONNECTOR (SMALL TYPE) 3P	
CNJ109*1-564-336-00	PIN, CONNECTOR 2P	
CNJ111*1-564-500-11	PIN, CONNECTOR 7P	
CNJ112*1-564-501-11	PIN, CONNECTOR 8P	
CNJ113*1-506-615-11	PIN, CONNECTOR 9P	
CNJ114*1-564-707-11	PIN, CONNECTOR (SMALL TYPE) 5P	
CNJ201*1-562-999-21	JACK, PIN 2P (LINE OUT)	
CNJ401*1-564-707-11	PIN, CONNECTOR (SMALL TYPE) 5P	
CNJ801*1-564-497-11	PIN, CONNECTOR 4P	
CNJ803*1-564-495-11	PIN, CONNECTOR 2P	
CNJ901*1-564-338-00	PIN, CONNECTOR 4P	
D101	8-719-940-76	DIODE 1SS132
D301	8-719-940-76	DIODE 1SS132
D302	8-719-940-76	DIODE 1SS132

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D801	8-719-940-76	DIODE 1SS132
D802	8-719-940-76	DIODE 1SS132
D803	8-719-940-76	DIODE 1SS132
D804	8-719-940-76	DIODE 1SS132
D901	8-719-511-40	DIODE S1V840
D905	8-719-933-54	DIODE HZS9A2L
D906	8-719-200-77	DIODE 10E2N
D907	8-719-940-76	DIODE 1SS132
D908	8-719-941-37	DIODE LT8500R1
D909	8-719-940-76	DIODE 1SS132
D910	8-719-940-76	DIODE 1SS132
F901	1-532-078-00	(AEP)...FUSE, TIME-LAG (1A)
F901	1-532-286-00	(UK)...FUSE, TIME-LAG (2.5A)
FLD801	1-519-411-11	INDICATOR TUBE, FLUORESCENT
IB801	1-233-105-11	COMPOSITION CIRCUIT BLOCK
IB802	1-233-104-11	COMPOSITION CIRCUIT BLOCK
IB803	1-232-986-11	COMPOSITION CIRCUIT BLOCK
IC101	8-752-030-93	IC CXA1081M
IC201	8-752-031-81	IC CXA1082AS
IC202	8-759-202-01	IC TA7256P
IC203	8-759-303-90	IC STA341M
IC301	8-752-322-04	IC CXD1125Q
IC302	8-759-802-74	IC LC3516AML-15
IC303	8-759-939-35	IC CXD1088Q
IC304	8-759-204-94	IC TC74HC00F
IC305	8-759-204-97	IC TC74HC004F
IC401	8-759-937-95	IC PCM56P-S
IC402	8-759-900-72	IC NE5532P
IC451	8-759-600-02	IC M5218L
IC501	8-759-937-95	IC PCM56P-S
IC502	8-759-900-72	IC NE5532P
IC801	8-759-604-72	IC M50954-411SP
IC802	8-741-138-70	IC BX-1387
IC901	8-759-604-03	IC M5290P
IC902	8-759-602-02	IC M5219P
J301	*1-563-866-11	JACK, PIN 1P (DIGITAL OUT)
J451	1-563-485-21	JACK, LARGE TYPE (PHONES)
J951	1-526-929-11	(E).....INLET, AC
J951	1-526-931-11	(AEP,UK,Saudi Arabia)...INLET, AC
J952	1-526-751-11	(UK).....OUTLET, AC
J952	1-526-774-11	(E).....OUTLET, AC
J952	1-526-794-11	(AEP).....OUTLET, AC

The components identified by shading and mark Δ are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description
L101	1-410-328-11	MICRO INDUCTOR 10UH
L301	1-421-972-11	COIL, LINE FILTER
L302	1-421-972-11	COIL, LINE FILTER
L303	1-421-972-11	COIL, LINE FILTER
L304	1-421-972-11	COIL, LINE FILTER
M251	A-4608-330-A	MOTOR ASSY
M252	X-4917-504-1	MOTOR ASSY (SLED)
M253	X-4917-505-1	BASE ASSY (SPINDLE)
PS201	1-532-605-00	LINK, IC
PS202	1-532-605-00	LINK, IC
PS901	1-532-685-00	LINK, IC
PS951	1-532-685-00	LINK, IC
Q101	8-729-802-22	TRANSISTOR 2SB1014
Q201	8-729-806-38	TRANSISTOR 2SC3399
Q202	8-729-806-28	TRANSISTOR 2SC3402
Q301	8-729-806-38	TRANSISTOR 2SC3399
Q401	8-729-806-26	TRANSISTOR 2SC3901
Q402	8-729-806-26	TRANSISTOR 2SC3901
Q501	8-729-806-26	TRANSISTOR 2SC3901
Q502	8-729-806-26	TRANSISTOR 2SC3901
Q601	8-729-806-20	TRANSISTOR 2SA1345
Q602	8-729-806-38	TRANSISTOR 2SC3399
Q603	8-729-806-38	TRANSISTOR 2SC3399
Q801	8-729-806-28	TRANSISTOR 2SC3402
Q802	8-729-806-28	TRANSISTOR 2SC3402
Q803	8-729-806-28	TRANSISTOR 2SC3402
Q804	8-729-806-28	TRANSISTOR 2SC3402
Q805	8-729-806-28	TRANSISTOR 2SC3402
Q901	8-729-807-07	TRANSISTOR 2SD1666SA
Q902	8-729-807-03	TRANSISTOR 2SB1133SA
Q903	8-729-802-22	TRANSISTOR 2SB1014
Q904	8-729-115-17	TRANSISTOR BN1F4N
Q990	8-729-900-89	(NEW TYPE)...TRANSISTOR DTC144ES
Q991	8-729-900-89	(NEW TYPE)...TRANSISTOR DTC144ES
Q992	8-729-900-65	(NEW TYPE)...TRANSISTOR DTA144ES
R101	1-247-692-11	CARBON 22 5% 1/4W
R102	1-249-421-11	CARBON 2.2K 5% 1/6W
R103	1-249-428-11	CARBON 8.2K 5% 1/6W
R104	1-215-450-00	CARBON 16K 5% 1/6W
R105	1-249-405-11	CARBON 100 5% 1/6W
R106	1-249-433-11	CARBON 22K 5% 1/6W
R107	1-249-441-11	CARBON 100K 5% 1/6W
R108	1-249-429-11	CARBON 10K 5% 1/6W
R109	1-249-429-11	CARBON 10K 5% 1/6W
R110	1-249-429-11	CARBON 10K 5% 1/6W
R111	1-215-396-00	CARBON 91 5% 1/6W
R112	1-249-417-11	CARBON 1K 5% 1/6W
R201	1-249-425-11	CARBON 4.7K 5% 1/6W
R202	1-249-425-11	CARBON 4.7K 5% 1/6W
R203	1-249-437-11	CARBON 47K 5% 1/6W
R204	1-249-437-11	CARBON 47K 5% 1/6W
R205	1-249-381-11	CARBON 1 5% 1/6W
R206	1-249-385-11	CARBON 2.2 5% 1/6W
R207	1-247-883-00	CARBON 150K 5% 1/6W
R208	1-249-441-11	CARBON 100K 5% 1/6W
R209	1-215-479-00	CARBON 270K 5% 1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description
R210	1-249-435-11	CARBON 33K 5% 1/6W
R211	1-249-385-11	CARBON 2.2 5% 1/6W
R212	1-249-385-11	CARBON 2.2 5% 1/6W
R213	1-249-438-11	CARBON 56K 5% 1/6W
R214	1-249-424-11	CARBON 3.9K 5% 1/6W
R215	1-249-441-11	CARBON 100K 5% 1/6W
R216	1-215-486-00	CARBON 510K 5% 1/6W
R217	1-249-429-11	CARBON 10K 5% 1/6W
R218	1-249-433-11	CARBON 22K 5% 1/6W
R219	1-215-469-00	METAL 100K 1% 1/6W
R220	1-249-429-11	CARBON 10K 5% 1/6W
R221	1-247-881-00	CARBON 120K 5% 1/6W
R222	1-215-434-00	METAL 3.6K 1% 1/6W
R223	1-215-493-00	CARBON 1M 5% 1/6W
R224	1-249-433-11	CARBON 22K 5% 1/6W
R225	1-215-469-00	METAL 100K 1% 1/6W
R226	1-249-441-11	CARBON 100K 5% 1/6W
R227	1-249-405-11	CARBON 100 5% 1/6W
R251	1-249-440-11	CARBON 82K 5% 1/6W
R252	1-249-441-11	CARBON 100K 5% 1/6W
R253	1-249-441-11	CARBON 100K 5% 1/6W
R254	1-215-468-00	CARBON 91K 5% 1/6W
R255	1-249-381-11	CARBON 100K 5% 1/6W
R256	1-249-417-11	CARBON 1K 5% 1/6W
R257	1-249-417-11	CARBON 1K 5% 1/6W
R258	1-249-417-11	CARBON 1K 5% 1/6W
R259	1-249-417-11	CARBON 1K 5% 1/6W
R260	1-249-417-11	CARBON 1K 5% 1/6W
R261	1-249-417-11	CARBON 1K 5% 1/6W
R262	1-249-417-11	CARBON 1K 5% 1/6W
R301	1-249-441-11	CARBON 100K 5% 1/6W
R302	1-249-441-11	CARBON 100K 5% 1/6W
R306	1-215-394-00	CARBON 75 5% 1/6W
R307	1-249-405-11	CARBON 100 5% 1/6W
R308	1-249-411-11	CARBON 330 5% 1/6W
R309	1-249-417-11	CARBON 1K 5% 1/6W
R310	1-249-417-11	CARBON 1K 5% 1/6W
R311	1-249-417-11	CARBON 1K 5% 1/6W
R312	1-249-417-11	CARBON 1K 5% 1/6W
R313	1-249-417-11	CARBON 1K 5% 1/6W
R314	1-249-417-11	CARBON 1K 5% 1/6W
R315	1-249-417-11	CARBON 1K 5% 1/6W
R316	1-249-417-11	CARBON 1K 5% 1/6W
R318	1-249-417-11	CARBON 1K 5% 1/6W
R320	1-249-417-11	CARBON 1K 5% 1/6W
R401	1-215-429-00	METAL 2.2K 1% 1/6W
R402	1-215-429-00	METAL 2.2K 1% 1/6W
R403	1-215-427-00	METAL 1.8K 1% 1/6W
R404	1-215-417-81	METAL 680 1% 1/6W
R405	1-215-493-00	METAL 1M 1% 1/6W
R406	1-215-445-00	METAL 10K 1% 1/6W
R407	1-215-429-00	METAL 2.2K 1% 1/6W
R408	1-215-419-00	METAL 820 1% 1/6W
R409	1-215-469-00	METAL 100K 1% 1/6W

The components identified by shading and mark Δ are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

ELECTRICAL PARTS

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
R410	1-215-419-00	METAL	820	1%	1/6W
R413	1-249-433-11	CARBON	22K	5%	1/6W
R414	1-249-409-11	CARBON	220	5%	1/6W
R415	1-249-409-11	CARBON	220	5%	1/6W
R416	1-249-419-11	CARBON	1.5K	5%	1/6W
R451	1-249-417-11	CARBON	1K	5%	1/6W
R452	1-249-425-11	CARBON	4.7K	5%	1/6W
R453	1-249-433-11	CARBON	22K	5%	1/6W
R454	1-249-409-11	CARBON	220	5%	1/6W
R501	1-215-429-00	METAL	2.2K	1%	1/6W
R502	1-215-429-00	METAL	2.2K	1%	1/6W
R503	1-215-427-00	METAL	1.8K	1%	1/6W
R504	1-215-417-81	METAL	680	1%	1/6W
R505	1-215-493-00	METAL	1M	1%	1/6W
R506	1-215-445-00	METAL	10K	1%	1/6W
R507	1-215-429-00	METAL	2.2K	1%	1/6W
R508	1-215-419-00	METAL	820	1%	1/6W
R509	1-215-469-00	METAL	100K	1%	1/6W
R510	1-215-419-00	METAL	820	1%	1/6W
R513	1-249-433-11	CARBON	22K	5%	1/6W
R516	1-249-419-11	CARBON	1.5K	5%	1/6W
R551	1-249-417-11	CARBON	1K	5%	1/6W
R552	1-249-425-11	CARBON	4.7K	5%	1/6W
R553	1-249-433-11	CARBON	22K	5%	1/6W
R554	1-249-409-11	CARBON	220	5%	1/6W
R601	1-249-441-11	CARBON	100K	5%	1/6W
R801	1-249-429-11	CARBON	10K	5%	1/6W
R802	1-249-429-11	CARBON	10K	5%	1/6W
R803	1-249-423-11	CARBON	3.3K	5%	1/6W
R804	1-249-423-11	CARBON	3.3K	5%	1/6W
R805	1-249-423-11	CARBON	3.3K	5%	1/6W
R806	1-249-423-11	CARBON	3.3K	5%	1/6W
R807	1-249-423-11	CARBON	3.3K	5%	1/6W
R808	1-215-493-00	CARBON	1M	5%	1/6W
R901	1-249-425-11	CARBON	4.7K	5%	1/6W
R902	1-249-425-11	CARBON	4.7K	5%	1/6W
R903	1-249-417-11	CARBON	1K	5%	1/6W
R905	1-249-412-11	CARBON	390	5%	1/6W
R906	1-249-423-11	CARBON	3.3K	5%	1/6W
R907	1-217-387-00	FUSIBLE	10	5%	1/4W F
R908	1-247-849-00	CARBON	5.6K	5%	1/6W
R909	1-249-434-11	CARBON	27K	5%	1/6W
R911	1-249-441-11	CARBON	100K	5%	1/6W
R912	1-249-417-11	CARBON	1K	5%	1/6W
R990	1-247-883-00	(NEW TYPE)..CARBON 150K 5%	1/6W		
RB319	1-236-009-11	ENCAPSULATED COMPONENT			
RV101	1-237-194-21	RES, ADJ, CARBON 20K			
RV102	1-237-192-21	RES, ADJ, CARBON 5K			
RV201	1-237-194-21	RES, ADJ, CARBON 20K			
RV202	1-237-194-21	RES, ADJ, CARBON 20K			
RV203	1-228-990-00	RES, ADJ, METAL GLAZE 1K			
RV401	1-237-438-11	RES, VAR, CARBON 20K/20K (PHONES LEVEL)			

S251	1-570-203-11	SWITCH, LEAF (LOADING IN/OUT)
S252	1-570-822-11	SWITCH, LEAF (LIMIT IN)
S301	1-570-707-21	SWITCH, SLIDE (DIGITAL OUT)
S801	1-554-303-21	SWITCH, KEY BOARD (SHUFFLE)
S802	1-554-303-21	SWITCH, KEY BOARD (■)
S803	1-554-303-21	SWITCH, KEY BOARD (▶)
S804	1-554-303-21	SWITCH, KEY BOARD (■)
S805	1-554-303-21	SWITCH, KEY BOARD (◀)
S806	1-554-303-21	SWITCH, KEY BOARD (▶)
S807	1-554-303-21	SWITCH, KEY BOARD (◀)
S808	1-554-303-21	SWITCH, KEY BOARD (▶)
S809	1-554-303-21	SWITCH, KEY BOARD (▲ OPEN/CLOSE)
S810	1-554-303-21	SWITCH, KEY BOARD (PROGRAM)
S811	1-554-303-21	SWITCH, KEY BOARD (CHECK)
S812	1-554-303-21	SWITCH, KEY BOARD (CLEAR)
S813	1-554-303-21	SWITCH, KEY BOARD (REPEAT)
S814	1-554-303-21	SWITCH, KEY BOARD (TIME/NEXT)
S815	1-554-303-21	SWITCH, KEY BOARD (AUTO SPACE)
S901	1-552-928-00	SWITCH (POWER)

T301 1-421-946-11 TRANSFORMER, PULSE

T901 1-448-820-11 (AEP,UK).....TRANSFORMER, POWER
T901 1-448-821-11 (E,Saudi Arabia)...TRANSFORMER, POWER

X301 1-567-741-11 VIBRATOR, CRYSTAL, 16.93MHz
X801 1-567-686-11 OSCILLATOR, CERAMIC, 4MHz

VS901 1-570-046-11 (E,Saudi Arabia)...
SWITCH, VOLTAGE CHANGE

ACCESSORY & PACKING MATERIAL

Part No.	Description
1-463-817-11	REMOTE COMMANDER (RM-D350A)
1-506-409-00	(Saudi Arabia)...ADAPTOR, CONVERSION
1-558-543-11	CORD, CONNECTION
3-536-825-00	(AEP,UK,E)...BAG, PROTECTING
3-701-630-00	BAG, POLYETHYLENE
3-769-022-11	MANUAL, INSTRUCTION
3-769-022-41	(AEP).....MANUAL, INSTRUCTION
*3-795-629-11	(AEP).....INSTRUCTION
4-917-494-01	LID, BATTERY (for REMOTE COMMANDER)
4-917-578-01	CUSHION
4-917-589-61	INDIVIDUAL CARTON
7-732-650-75	(AEP,UK,E)...SHEET, PROTECTION
3-312-970-01	(Saudi Arabia)...SHEET, PROTECTION

The components identified by shading and mark  are critical for safety. Replace only with part number specified.