

MDX-U1/U1RDS

SONY SERVICE MANUAL

US Model
Canadian Model
E Model
MDX-U1
AEP Model
MDX-U1RDS

SUPPLEMENT-1

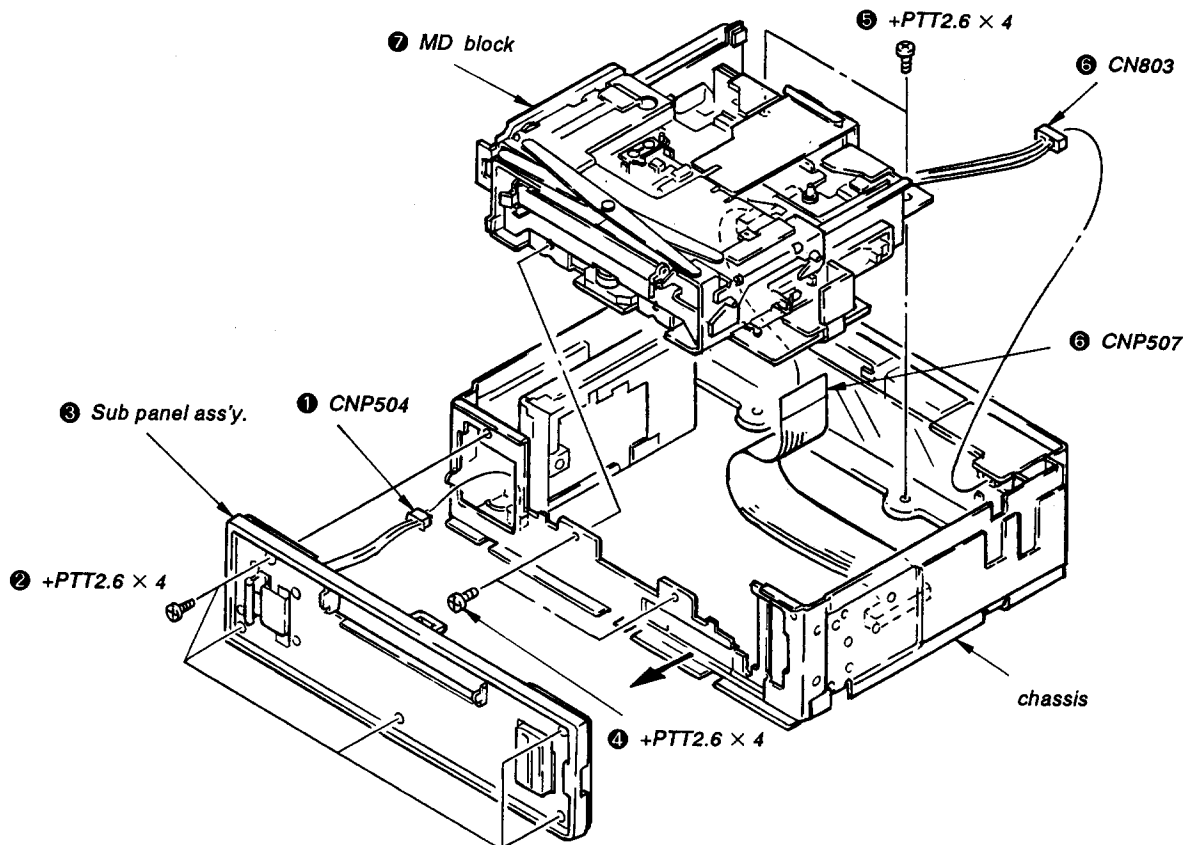
File this supplement with the service manual.

Subject:

- Disassembly.
- Adjustments.
- Keyboard unit Diagram.
- Keyboard unit Electrical Parts List.

SECTION 1 DISASSEMBLY

MD BLOCK



SECTION 2 ADJUSTMENTS

2-1. TEST MODE

Make the Test Mode.

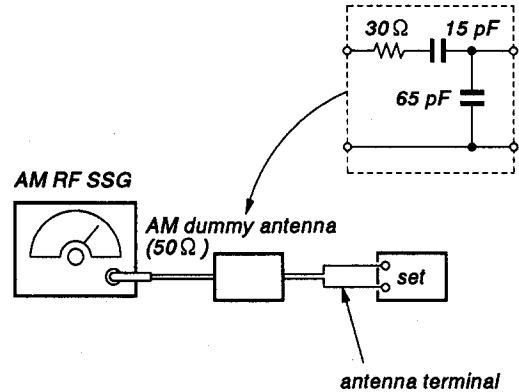
1. Set the "OFF" condition.
2. Push **4** button.
3. Push **5** button.
4. Press **1** button for two seconds.
Then the display indicates 4 patterns and stops.
The test mode is set.

2-2. TUNER SECTION

AM (MW) Auto Scan/Stop Level Adjustment

Setting:

BAND switch : AM or MW

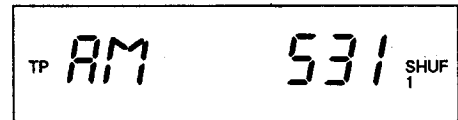


Frequency: 1,000 kHz (US/Canadian/E)
999 kHz (AEP/UK/E/G)
Output level: 30 dB μ V (31.8 μ V)

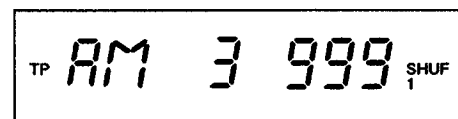
Procedure:

1. Set to the test mode. (See left.)
2. Push the tuner button and set to AM (MW).

Display window (EX.: 2 band model 9 kHz step when 10 kHz step; 530)



3. Push the preset **3** button.



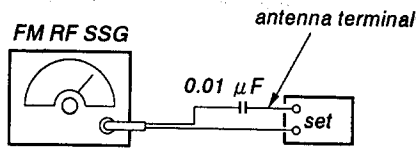
(EX.: 2 band model 9 kHz step, when 10 kHz step; 1000)

4. Adjust with the volume on TU10 so that the "AM (or MW)" indication turns to "AM0 (or MW0)" indication on the display window.

FM Auto Scan/Stop Level Adjustment

Setting:

BAND switch : FM



Carrier frequency: 97.9 MHz (US/Canadian)
 98.0 MHz (AEP/UK/E/G)
 Output level: 25 dB (18 μV) (Except RDS model)
 22 dB (13 μV) (RDS model)
 Mode: mono: unmodulated

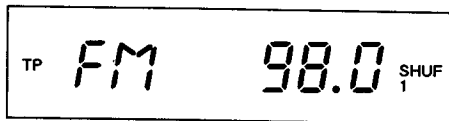
Procedure:

1. Set to the test mode. (See page left.)
2. Push the tuner button and set to FM.

Display window (EX.: AEP, UK, E, G model.
 US, Canadian model; 87.9)



3. Push the preset 3 button.



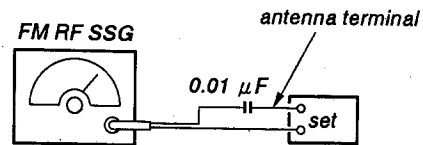
(EX.: AEP, UK, E, G model.
 US, Canadian model; 97.9)

4. Adjust with the volume on TU10 so that the "FM" indication turns to "FM0" indication on the display window.

S Meter (35dB) Adjustment

Setting:

BAND switch : FM



Carrier frequency: 97.9 MHz (US/Canadian)
 98.0 MHz (AEP/UK/E/G)
 Output level: 35 dB (56.2 μV) (Except RDS model)
 32 dB (39.8 μV) (RDS model)
 Mode: 1kHz: unmodulated

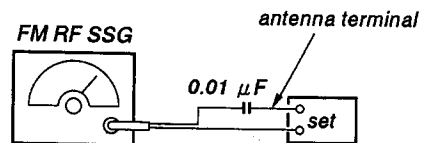
Procedure:

1. Adjust with RV9 so that the voltage on TP S meter (35dB) goes $2.0 \pm 0.1V$ (except RDS model), $V_{ref} \times 0.375 \pm 0.2 V$ (RDS model).
 V_{ref} : Voltage on Pin ⑧ of IC601.

S Meter (70dB) Adjustment

Setting:

BAND switch : FM



Carrier frequency: 97.9 MHz (US/Canadian)
 98.0 MHz (AEP/UK/E/G)
 Output level: 70 dB (3.15mV)
 Mode: 1kHz 75 deviation

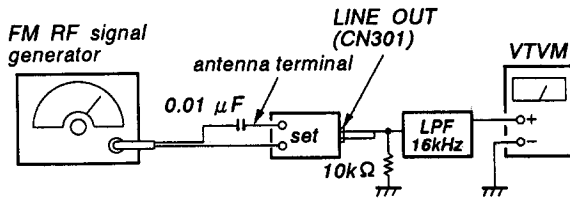
Procedure:

1. Adjust with RV2 so that the voltage on TP S meter (70dB) goes $4.5 \pm 0.5V$.

FM Stereo Separation (4dB) Adjustment

Setting:

BAND switch : FM



Carrier frequency: 97.9 MHz (US/Canadian)
98.0 MHz (AEP/UK/E/G)
Output level: 40 dB (100 μV)
Mode: stereo
Modulation: main; 1 kHz, 33.75 kHz deviation (45%)
sub; 1 kHz, 33.75 kHz deviation (45%)
19 kHz pilot; 7.5 kHz deviation (10%)

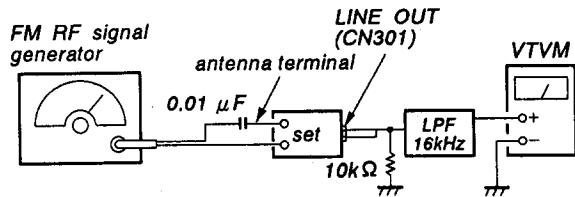
Procedure:

1. Adjust with RV6 so that the LINE OUT level goes 9 ± 1 dB.

FM Stereo Separation (70dB) Adjustment

Setting:

BAND switch : FM



Carrier frequency: 97.9 MHz (US/Canadian)
98.0 MHz (AEP/UK/E/G)
Output level: 70 dB (3.15mV)
Mode: stereo
Modulation: main; 1 kHz, 33.75 kHz deviation (45%)
sub; 1 kHz, 33.75 kHz deviation (45%)
19 kHz pilot; 7.5 kHz deviation (10%)

Procedure:

1. Adjust with RV4 to the best separation

FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ [Ⓟ] Adjust RV2 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ [Ⓟ] Adjust RV2 for minimum reading.

L-CH Stereo separation: Ⓐ - Ⓑ

R-CH Stereo separation: Ⓒ - Ⓓ

The separations of both channels should be equal.

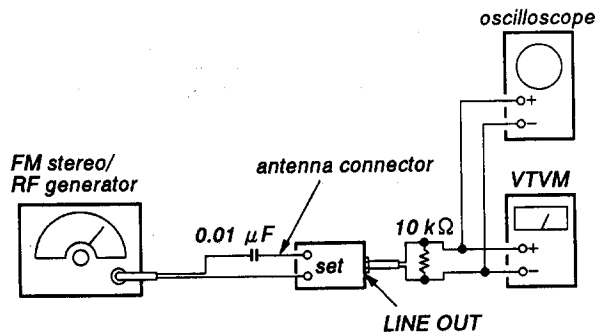
Adjustment Value : - 28dB

Adjustment Location: MAIN board

FM Carrier Leak Adjustment

Setting:

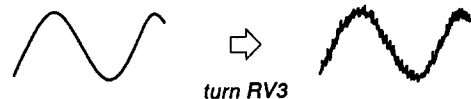
BAND switch : FM



Carrier frequency: 97.9 MHz (US/Canadian)
98.0 MHz (AEP/UK/E/G)
Output level: 70 dB μV (3.15 mV)
Modulation : main; 1 kHz, 33.75 kHz deviation
sub; 1 kHz, 33.75 kHz deviation
19 kHz pilot; 7.5 kHz deviation

Procedure:

1. Check the waveform on the oscilloscope screen becomes as follows when turning RV3.



2. Set the modulation 19 kHz pilot only.
3. Adjust with RV3 so that the 19 kHz signal becomes minimum on both channels L and R.

2-3. MD SECTION

Preparation before Starting Adjustments

- Put the unit in TEST mode. (See page 2.)
- Press **[MD]**, and the illumination turns on.
Press **[4]** (STOP) to put the unit in STOP mode.
Under this condition, the functions of each key are set as follows:
[1] = FOCUS ON
[2] = TRACKING ON
[3] = LASER ON
[4] = STOP
[◀ DISC ▶] = SLED RVS/FWD
[◀ AMS ▶] = AMS \pm (Only for PLAY mode)
[OFF] = RESET (REST MODE RELEASE)
- Set the DISC in position. "SHUF 1" is lit. Be careful with automatic setting of "VOL MAX PLAY".
- Setting **[1]** \rightarrow **[2]** put the unit into PLAY mode without reproducing sound.
In normal (with sound reproduced) PLAY mode, the data is retrieved intermittently. In this (muted) PLAY mode however, an eye pattern of continuous data retrieval can be observed on an oscilloscope. If sound reproduction is desired, setting **[FM]** \rightarrow **[MD]** plays back a sound of "VOL MAX PLAY".
- Adjustments shall be carried out in TEST mode in order of the adjustment sections that follow this preparation section.

Laser Power Adjustment

There are two methods as follows:

- Method by using a laser power wattmeter
Press **[3]** to turn on the laser diode.
Adjust the position of the optical block with the **[◀ DISC ▶]** key.
Adjust RV529 for a laser output of $820 \pm 5 \mu\text{W}$ at 780 nm.
- Method by observing an eye pattern
Set a premaster DISC in position.
Put the unit in PLAY mode.
Adjust RV529 for an eye pattern of 1.5 Vp-p.

FOK OFFSET Adjustment

Connect a VOM between pin ① (VR) and pin ③ (ABCD) of IC502.
Press **[3]** (LASER ON), and adjust RV510 for $-200 \pm 50 \text{ mV}$ on the VOM.
Press **[4]** (STOP).

TRACKING OFFSET Adjustment

Connect the VOM between pin ① (VR) and pin ④ (TE) of IC502.
Press **[3]** (LASER ON), and adjust RV521 for $0 \pm 50 \text{ mV}$ on the VOM.
Press **[4]** (STOP).

E-F BALANCE Adjustment

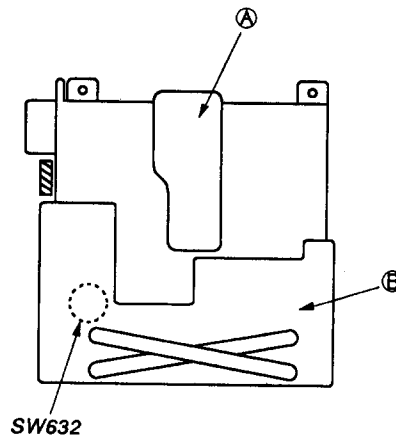
Connect the VOM between pin ① (VR) and pin ④ (TE) of IC502. Set the premaster DISC in position.
Press **[4]** (STOP) before putting the unit in PLAY mode.
Move the optical block once to the most inside of the DISC with **[◀ DISC]**, and then press **[DISC ▶]** once.
Press **[1]** (FOCUS ON), and adjust RV528 for $0 \pm 100 \text{ mV}$ on the VOM.
(Use a digital VOM for reading a level within $0 \pm 100 \text{ mV}$.)
Remove the premaster DISC from the unit.

FOCUS BIAS Adjustment for Record/Playback Type DISC

Connect the VOM between pin ① (VR) and pin ② (FE) of IC502.
Press **[3]** (LASER ON), and adjust RV518 for $-200 \pm 10 \text{ mV}$ on VOM.
Press **[4]** (STOP).

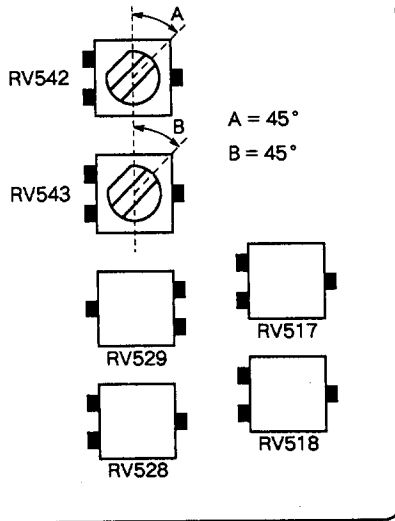
FOCUS BIAS Adjustment for Playback Only Type DISC

Connect the VOM between pin ① (VR) and pin ② (FE) of IC502.
Set the unit in quasi DISC loaded condition without a DISC, by pushing loader (R) ⑤ while holding stopper ④ lifted slightly upward.
Press **[4]** (STOP) before the unit goes into EJECT mode with its display indicating an error condition.
Press **[3]** (LASER ON) while holding **[SW632]** (DISC type detector) pressed with the finger.
Adjust RV517 for $0 \pm 10 \text{ mV}$ on the VOM.
Press **[4]** (STOP).

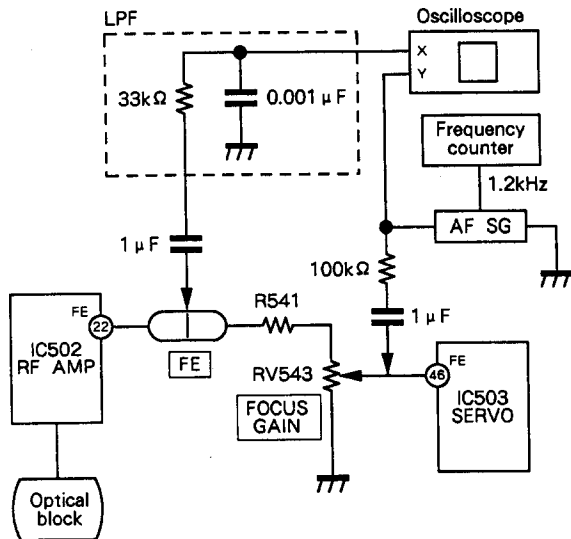


FOCUS/TRACKING GAIN Adjustments

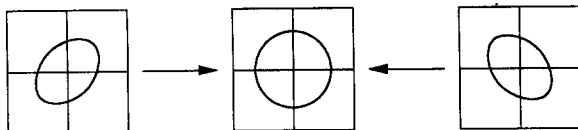
Set both RV542 and RV543 where turned clockwise by 45 degrees, as shown below.



1. FOCUS GAIN Adjustment



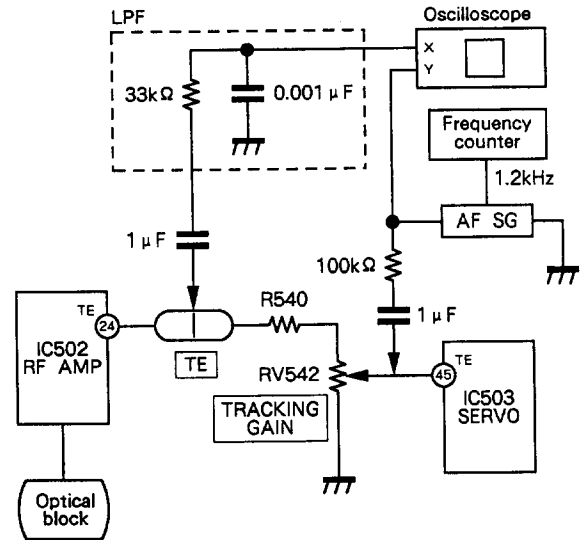
(Waveforms observed on the oscilloscope)



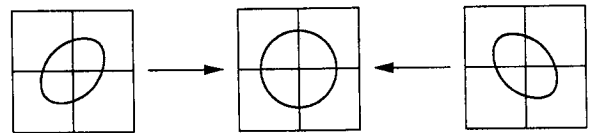
(a) Gain is too low. (b) Gain is appropriate. (c) Gain is too high.

Play back an MO disk, and then adjust RV543 so that the waveform observed on the oscilloscope is symmetrical to the vertical line at the center, as shown in (b) in the figure.

2. TRACKING GAIN Adjustment



(Waveforms observed on the oscilloscope)



(a) Gain is too low. (b) Gain is appropriate. (c) Gain is too high.

Play back the MO disk, and then adjust RV542 so that the waveform observed on the oscilloscope is symmetrical to the vertical line at the center, as shown in (b) in the figure.

Description of ERROR Indication in MD Mode

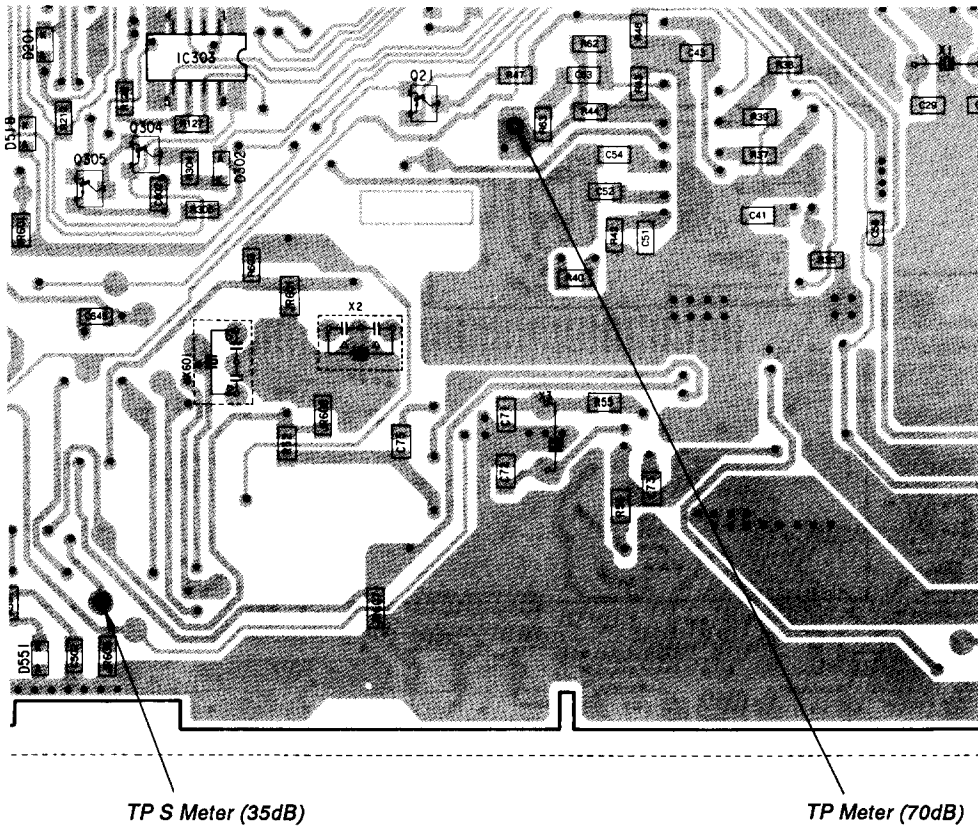
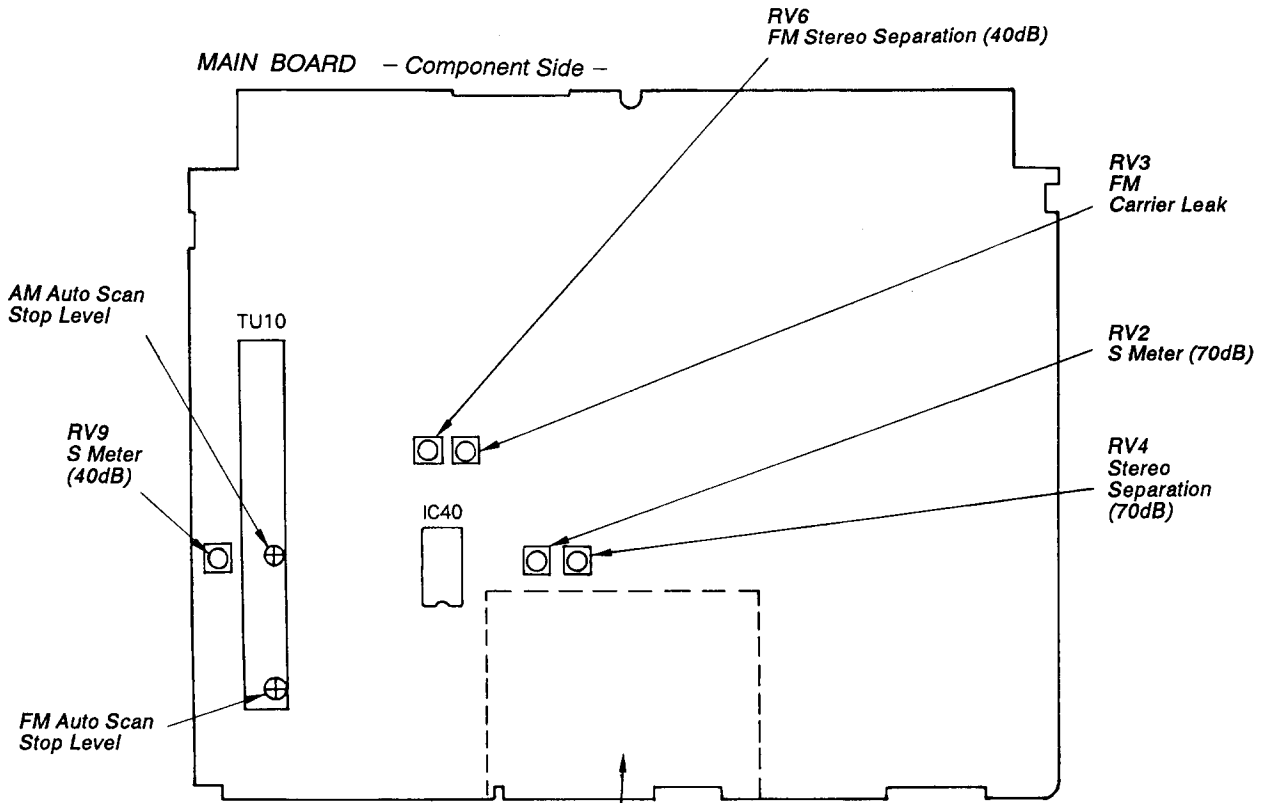
A functional error of the unit is displayed as "ERR - n1n2n3n4".

Items indicated with "n3" and "n4" mean nothing in particular.

The list below shows the error items indicated with "n1" and "n2".

n1	n2	Description
1	*	<ul style="list-style-type: none"> • Servo control error
	1	<ul style="list-style-type: none"> • Focusing error → • Focusing is not achieved in MD PLAY mode. • A condition of FOK = "L" continues for 80 ms in MD PLAY mode, and all servo circuits are deactivated. Focusing is failed again after AGC is turned off.
	2	<ul style="list-style-type: none"> • GFS or LOCK error → • GFS is not activated in four seconds after setting to CLV-A with focusing achieved successfully. Or, focusing is deactivated once after that time, but it is not achieved again. • When a condition of GFS = "L" continues for 2 seconds in MD PLAY mode, CLV/TRACKING/SLED servo loops are set open once. Then, the servo loops are closed again after 600 ms from that time, by moving the sled for 50 ms for the MO DISK (no movement of the sled for the premaster DISK). However, GFS is not activated in four seconds. • When the servo circuits are not locked for 100 ms, TRACKING/SLED servo loops are set open once. Then, the servo loops are closed again, waiting for GFS to be activated. However, GFS is not activated in four seconds from that time.
	3	<ul style="list-style-type: none"> • SUB-Q error → When SUB-Q (for the premaster DISC) or ADIP (for the MO DISC) cannot be retrieved for four seconds, all servo circuits are deactivated once. After 600 ms from that time, the focusing servo circuit is activated. However, the focusing is not achieved.
	4	<ul style="list-style-type: none"> • SYNC error → When SYNC is not detected for 3.5 seconds, TRACKING servo circuit is deactivated once, and the sled is moved to the inside for 150 ms. Then, TRACK/SLED servo circuits are activated again. However, focusing is not achieved this time.
	F	<ul style="list-style-type: none"> • NG DISC → A HYBRID DISC is loaded.
D	*	<ul style="list-style-type: none"> • HIGH TEMPERATURE error
F	*	<ul style="list-style-type: none"> • Control error on the mechanisms of the deck.
	1	<ul style="list-style-type: none"> • EJECT time-out error When time for loading (7 seconds allowed as maximum) is over, eject operation is started. However, time for eject operation is also over (5 seconds allowed as maximum).
	8	<ul style="list-style-type: none"> • LOAD time-out error When time for eject operation (5 seconds allowed as maximum) is over, loading is started. However, time for loading is also over (7 seconds allowed as maximum).
	9	<ul style="list-style-type: none"> • Repetitive time-out error When time for eject operation (5 seconds allowed as maximum) is over, loading is started. But, the unit repeats eject operation. However, eject operation failed finally after the unit is tried eject operation three times (the DISC is chucked in this case).

● Adjusting Parts Location



MD SERVO BOARD - Component Side -

