

XR-5450/5550

SERVICE MANUAL

US Model
Canadian Model
XR-5450/5550
AEP Model
XR-5450

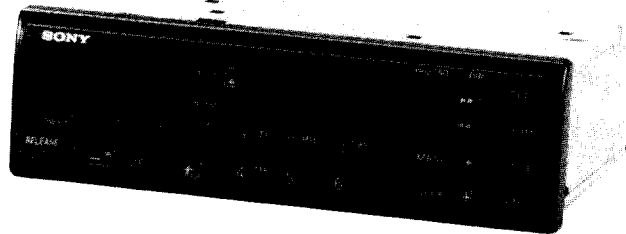


Photo: XR-5450

Model Name Using Similar Mechanism	NEW
Tape Transport Mechanism Type	MG-36SZ1-32 (XR-5450) MG-36AS-32 (XR-5550)

SPECIFICATIONS

AUDIO POWER SPECIFICATIONS

POWER OUTPUT AND TOTAL HARMONIC DISTORTION 10 watts per channel minimum continuous average power into 4 ohms, both channels driven, from 30 to 20,000 Hz with no more than 1% total harmonic distortion.

Other Specifications

Power amplifier section

Outputs Speaker outputs (sure seal connectors)
Speaker impedance 4 - 8 ohms
Maximum power output 20 W x 4 (at 4 ohms)*
* Measured at 14.4 V

Cassette player section

Tape track 4-track 2-channel stereo
Frequency response 30 - 16,000 Hz
Signal-to-noise ratio (XR-5450) 55dB

Signal-to-noise ratio (XR-5550)

Cassette type	Dolby B	Dolby NR off
TYPE II, IV	66 dB	58 dB
TYPE I	63 dB	55 dB

Wow and flutter 0.13% (WRMS)

Tuner section

System Superheterodyne tuner computerized quartz-locked synthesizer system
Antenna terminal External antenna connector

FM

Tuning range 87.5 - 108MHz (AEP)
87.9 - 107.9MHz (US/Canadian)

Intermediate frequency

10.7 MHz
Usable sensitivity 12 dBf (75 ohms)
Selectivity 75 dBf at 400 kHz
Signal-to-noise ratio 65 dB (stereo), 70 dB (mono)
Harmonic distortion at 1 kHz 0.5% (stereo), 0.3% (mono)
Separation 35 dB at 1 kHz
Frequency response 30 - 15,000 Hz
Capture ratio 2 dB

AM

Tuning range 531 - 1,602KHz (AEP)
530 - 1,701KHz (US/Canadian)
Intermediate frequency 450 kHz
Sensitivity 35 µV

General

Tone controls Bass ±8 dB at 100 Hz
Treble ±8 dB at 10 kHz
Loudness +6 dB at 100 Hz
+6 dB at 10 kHz
Output lead Power antenna relay control lead
Power amplifier control lead
Power requirements 12 V DC car battery (negative ground)
Dimensions Approx. 184 x 57 x 173 mm
(w/h/d)
(7 1/8 x 2 1/4 x 6 7/8 in.)
not incl. projecting parts and controls
Mounting dimensions Approx. 178 x 50 x 154 mm
(w/h/d)
(7 1/8 x 2 x 6 1/8 in.)
not incl. projecting parts and controls
Weight Approx. 1.3 kg (2 lb. 14 oz.)
Accessories supplied Mounting hardware (1 set)
Power connecting cord (1)
Front panel case (1)

Design and specifications subject to change without notice.

FM/AM CASSETTE CARSTEREO
SONY®



● Test mode

Setting the test mode

To set to the test mode, conduct the following key operations in the tuner mode. Display "ATA" is blinking in the test mode.

- 1) While pressing the **LEVEL +** key,
- 2) press the **DSPL** key and **SENS** key (or **SDK** with ARI) simultaneously.
- 3) Check that "ATA" is blinking.

Releasing the test mode

To release the test mode, conduct the one of the following procedures.

- OFF key
- Power ON reset (Vdd 0 V → 5 V)
- CE reset (ACC OFF → ON)

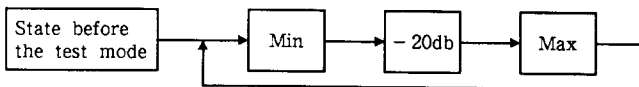
LCD display test (all LCDs are lit)

Turn all LCDs ON by pressing the **SELECT** and **M4** keys simultaneously. All LCDs are lit only when the two key are being pressed simultaneously.

Electrical volume test

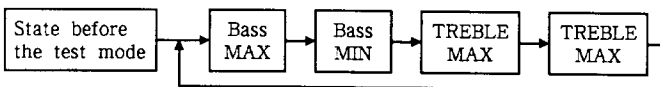
1. Volume selection **LEVEL +** / **LEVEL +**

The volume level is selected by pressing the **LEVEL +** or **LEVEL +** key in the following order.



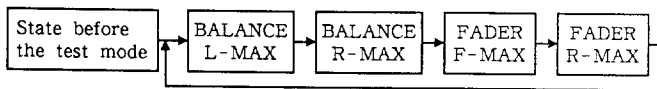
2. BASS/TREBLE selection **SELECT**

BASS or TREBLE is selected by pressing the **SELECT** key in the following order. When BASS-MAX is selected, TREBLE, BALANCE and FADER is set to the center.



3. BALANCE/FADER selection **DISPLAY**

BALANCE or FADER is selected by pressing the **DISPLAY** key in the following order. When BALANCE-L-MAX is selected, TREBLE, BASS and FADER are set to the center.



Tuner pack adjustment

1. SD signal display

When the SD signal is active, "||" is displayed.

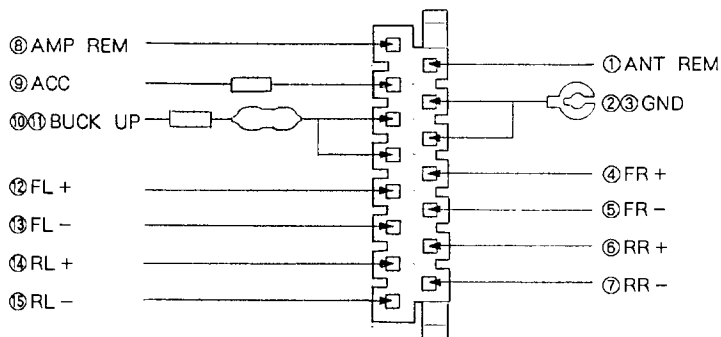
2. LOCAL terminal control (Pin No. 18)

The output of the LOCAL terminal is independent on the SEEK operation. When "LCL" is displayed, the high signal is output from the LOCAL terminal.

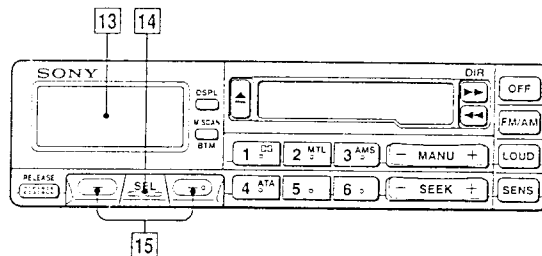
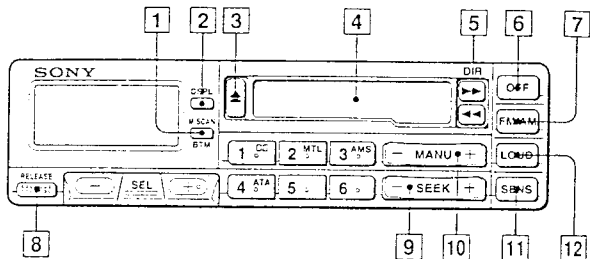
3. IF COUNT terminal control (Pin No. 55)

The output of the IF COUNT terminal is independent on the SEEK operation. When "LOUD" is displayed, the high signal is output from the IF COUNT terminal.

- CNJ914 Cord (with connector)



Location and Function of Controls



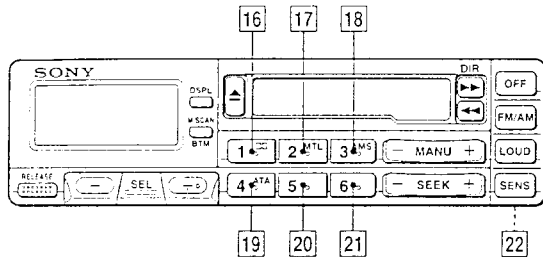
Refer to the pages in ● for details.

- 1** M.SCAN (memory scan)/BTM (best tuning memory) button Press lightly to scan the memorized stations, or press for more than two seconds to memorize the clearest receiving stations.
- 2** DSPL (display change/time set) button
- 3** (eject) button Press to stop tape playback and to eject the cassette.
- 4** Cassette insertion door
- 5** (fast winding)/DIR (tape transport direction change) buttons During playback, press for fast winding, or press both and simultaneously to listen to the other side of the cassette.
- 6** OFF (power off) button Press to turn off the unit.
- 7** FM/AM (radio on/band select) button
- 8** RELEASE (front panel release) button
- 9** SEEK (automatic tuning) button Press the side to search stations in lower frequencies and the side to search stations in higher frequencies.
- 10** MANU (manual) button Press to tune in the desired stations manually.
- 11** SENS (sensitivity) button
- 12** LOUD (loudness) button Press to reinforce bass and treble especially when listening at a low volume level. To disengage the button, press it again.

- 13** Display window
- 14** SEL (control mode select) button Press to select the desired mode, BAS (bass), TRE (treble), BAL (balance), FAD (fader) or VOL (volume).
- 15** (bass/treble/balance/fader/volume control) buttons These buttons normally function as the volume control. Adjust the level within three seconds after selecting the desired control mode. Otherwise, the mode will go back to the volume control mode.

Display window	Control mode		
		Press	Press
BAS	Bass control	For less bass	For more bass
TRE	Treble control	For less treble	For more treble
BAL	Balance control	To decrease the right-speakers' volume	To decrease the left-speakers' volume
FAD	Fader control	To decrease the rear-speakers' volume	To decrease the front-speakers' volume
VOL	Volume control	For less volume	For more volume

Location and Function of Controls



	During tape playback	During radio reception
16	□□ (Dolby noise reduction) button Ⓜ	Preset number buttons Ⓜ
17	MTL (metal/CrO ₂) button Ⓜ	
18	AMS (automatic music sensor) button Ⓜ	
19	ATA (automatic tuner activation) button Ⓜ	
20	—	
21	—	

- 22** POWER SELECT switch (located on the bottom of the unit)
See the description about the POWER SELECT switch in the Installation/Connections manual.

To mute the beep sound

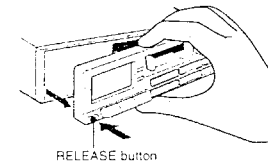
Press **Ⓜ** while pressing the SEL button.
To obtain the beep sound again, press these buttons once more.

Detaching and Attaching the Front Panel

The front panel of this unit can be detached in order to prevent the unit from being stolen.

Detaching the Front Panel

Before detaching the front panel, be sure to press the OFF button first. Then press the RELEASE button and detach the panel by putting it towards you as illustrated.

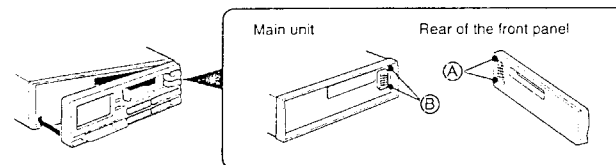


Note

Be sure not to drop the panel when detaching it from the unit.

Attaching the Front Panel

Apply the right hand side of the front panel to the unit by attaching the part **A** of the front panel to the part **B** of the unit as illustrated and push until it clicks.

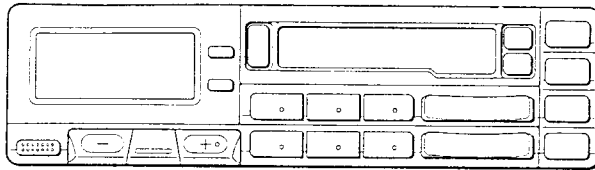


Notes

- Make sure that the front panel is the right way up when attaching it to the unit as it cannot be attached upside down.
- Do not press the front panel hard against the unit when attaching it. It can be easily attached by pressing it lightly against the unit.
- When you carry the front panel with you, put it in the supplied front panel case.
- Do not press hard or give excessive pressure to the display window of the front panel when attaching it to the unit.

Cassette deck operation

Tape Playback



1 Insert a cassette.
Playback starts automatically.

2 Adjust the volume.

Before turning off the unit:
Be sure to eject the tape to avoid tape damage.

To get the clock indication during tape playback

Press the DSPL button. Press again to go back to the previous indication.

Side of the cassette being played back

Indicator	Operation mode
▶	The side facing upwards
◀	The side facing downwards

Other Operations

To listen to the other side of the cassette

Press (simultaneously).

To wind the tape rapidly

Direction indicator*	To advance	To rewind
▶	Press .	Press .
◀	Press .	Press .

To resume playback, press or lightly so as not to depress it.

To stop playback and listen to the radio

Press .

To stop playback and turn off the unit

Press and then press .

Listening to the CrO₂ (TYPE II) or Metal (TYPE IV) Tapes


Press .

"MTL" indication appears on the display window. To listen to the normal (TYPE I) tapes, press it again.

* "<>" indicator will flash while fast-winding the tape.


Tape Playback

Listening to Dolby NR-processed Tapes

Press **1** 

Press to activate the Dolby B NR (Noise Reduction) system. Select the same Dolby NR system used for the recorded cassette. The Dolby NR system reduces tape hiss noise in low-level, high-frequency signals.

Locating the Beginning of a Track (AMS Function)

1 Press **3** 

2 Press **◀** or **▶**, referring to the following table.

Indicator	Cassette side being played	Desired track	
		Next track	Current track
▶	Side facing upwards	Press ▶▶	Press ◀◀
◀	Side facing downwards	Press ◀◀	Press ▶▶

The desired track may not be located if ...


- there is a noise in the space between tracks.
- the space is less than four seconds long.
- the ◀◀ or ▶▶ button is pressed immediately before or after the desired track, or within the blank space.

Playback may begin in the middle of the track when AMS is activated, as the followings are treated as blanks:

- a long pause in the track
- a passage of low frequencies or very low volume
- gradual increase or decrease of volume, as in some classical music.

XR-5550 Model

Turning on the Radio Automatically while Fast-winding the Tape (ATA Function)

Press **4** 

The tuner turns on automatically when you press the ◀◀ or ▶▶ button during tape playback. When you resume tape playback, the tuner turns off automatically. "ATA" indication flashes while the ATA function is activated.

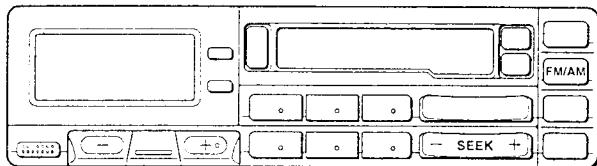
To cancel the mode
Press the button once more.


Note
You can release this function only during tape playback.

The car antenna will automatically be extended while the ATA function is activated. (Only the cars equipped with power antennas)

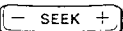
if you do not press the ATA button again to stop the ATA function, the car antenna will be kept extended in order to receive radio programs during tape playback.

Automatic Tuning



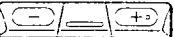
- 1** 

Press to select the desired band, FM I, FM II, FM III, AM I or AM II.


The tuner turns on at the same time.
- 2** 

Press to start scanning.
 -: For lower frequency stations
 +: For higher frequency stations

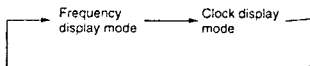
The scanning automatically stops when a station is tuned in.

Repeat this step until the desired station is tuned in.
- 3** 

Adjust the volume.

Note
 AM has two bands (AM I and AM II).
 Two bands cover the same frequency range.
 To change the band, press .

To get the clock indication during radio reception
 Press the DSPL button. Each time you press the button, the display mode changes as follows:




Other Operations


To stop the radio and start tape playback



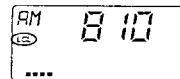
To stop the radio and turn off the unit

Press 


When there are too many stations and the scanning stops too frequently during automatic tuning

Press  once.

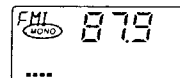
Only the stations with relatively strong signals can be tuned in.



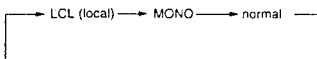
When the FM Stereo Program is Too Weak and Noisy

Press  twice.

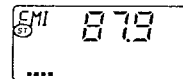
The noise will be reduced. The sound will be monaural instead.



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



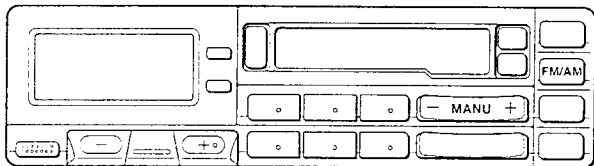
When an FM stereo program of sufficient signal strength is tuned in



The program is automatically received in stereo.

Manual Tuning

Use this method when you know the frequency of the desired station, or when the desired station is too weak to be tuned in by the automatic tuning.



1

FM/AM

Press to select the desired band, FMI, FMII, FMIII or AM.

The tuner turns on at the same time.

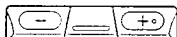
2

- MANU +

Press to select the desired station.
-: For lower frequency stations
+: For higher frequency stations

To change the frequency rapidly, keep the button pressed.

3



Adjust the volume.

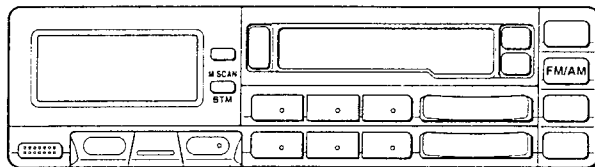
Warning

While driving, keep your eyes on the road and use the automatic tuning or memory preset tuning!

Memory-Preset Tuning

Memorizing the Stations Automatically (BTM Function)

Clearer receiving stations are automatically scanned and memorized on each band, FMI, FMII, FMIII and AM.



1

FM/AM

Press to select the desired band, FMI, FMII, FMIII or AM.

The tuner turns on at the same time.

2

M.SCAN
BTM

Keep the BTM button pressed for more than two seconds.

Checking What is Being Broadcasted on the Memorized Stations (Memory Scan Function)

Press  lightly.

The tuner will receive in order, all the memorized stations for five seconds each. To cancel this function, press the button lightly once more.

Note

There may be cases where even the memorized stations cannot be received due to weak signals in the vicinity of your car.

Memory Preset Tuning

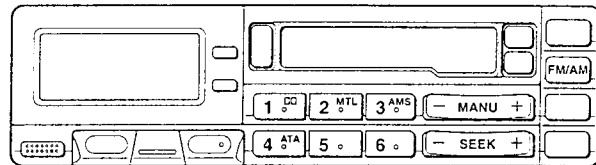
The BTM function – how this function operates?

This function starts by scanning stations from the lowest frequency of the currently tuned in band. When a station is tuned in, it will be stored in the memory on the preset number button whose number is indicated on the display window. If there is no preset number indicated, it will be stored in the memory on the preset number button 1 onward. It continues to store the stations in the memory until all the preset number buttons are occupied. For example, if the FMII band was selected, it will continue until the preset number button 6 on the FMIII band is occupied. When all the preset number buttons are occupied with the memories before the highest receivable frequency is scanned, the unit will start scanning higher frequencies from where it was left off. This is to check if there are any more stations with clearer receptions than the ones already stored in the memory.

If a station with clearer reception is found, the unit will store it in the memory in place of a station with an inferior reception. Lastly, it rearranges all the stations in the order of frequency from the lowest and stores them in the memory. The whole operation is now completed. The stations with clearer receptions are stored in the memory on the preset number buttons in the order of frequency.

Memorizing Only the Desired Stations Manually

You can memorize up to 6 stations on each band (FMI, FMII, FMIII and AM) in order of your choice.



Example: To memorize on the preset number button 1

		Press to select the desired band, FMI, FMII, FMIII or AM.
		The tuner turns on at the same time.
	 or 	Tune in a desired station using the automatic or manual tuning.
	 	Press for more than two seconds. The number of the pressed preset number button will be displayed. "MEM" indication appears to show that the station has been memorized. ("MEM" indication will disappear in a few seconds.)

Repeat these steps for each preset number button.

Important

Every preset number button has only one memory for a band. The previously memorized station will be erased when you enter a new station of the same band on the same preset number button.

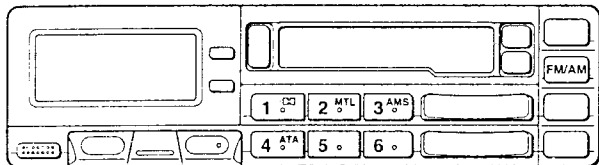
Notes

- There may be a situation where there are not enough receivable stations due to the lack of stations in the vicinity or weak broadcasting signals. In such cases, the BTM operation may stop without all the preset number buttons being stored with a memory.
- If you start the BTM operation from the FMI band, it will continue to store stations in the memory to the FMII and FMIII bands. Care must be taken if you wish to keep the stored stations on the FMII or FMIII bands.

• If you start the BTM operation from the FMIII band, it will stop when all the memories on the FMIII band are occupied. It will not continue to the FMI band.

Memory Preset Tuning

Receiving the Preset Station



1

FM/AM

Press to select the desired band.

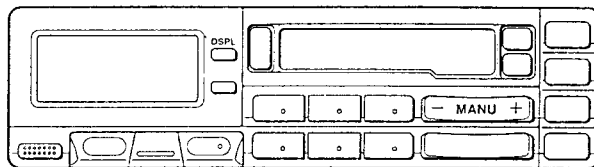
2

1 ^{DS}

6 ^o

Press the desired preset number button lightly.

Setting the Clock



Turn the ignition key to the ON position before setting the clock.

1

DSPL



Press once to display the time digits.

2

DSPL



Press to set the time digits while pressing the DSPL button.

- MANU +

-: To advance the hour digits
+: To advance the minute digits

To advance the digits rapidly, keep the button pressed.

Notes

- If you keep pressing the preset number button for more than two seconds, the currently received station will be memorized. To receive the previously memorized station, press the preset number button lightly.
- There may be cases where even the memorized stations cannot be received due to weak signals in the vicinity of your car.

When setting the time digits

- Minute and hour digits do not go backward.
- "00" comes after "59". The hour digits do not change then.

Note

If the POWER SELECT switch of the unit is set to the OFF position, the clock cannot be set unless the power is turned on. Set the clock after you turn on the radio or play back a tape.

Connections/Connexions

Caution

- This unit is designed for negative ground 12 V DC operation only.
- Before making connections, disconnect the ground terminal of the car battery to avoid short circuits.
- Connect the red power input lead only after all other leads are connected. And be sure to connect it to the positive 12 V power terminal which is energized when the ignition key is set to the accessory position.
- Run all ground wires to a common ground point.

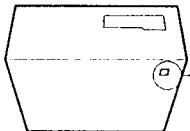
Précautions

- Cet appareil est conçu pour fonctionner sur courant CC 12 V à la masse négative.
- Avant d'effectuer les connexions, débrancher la borne de terre de la batterie de voiture pour éviter un court-circuit.
- Connecter le fil d'entrée d'alimentation rouge en dernier. Le raccorder à la borne d'alimentation positive de 12 V qui est énergisée quand la clé de contact est sur la position accessoire.
- Raccorder les fils de terre à un point de masse commun.

POWER SELECT Switch

The illumination on the front panel is factory-set to be turned on even when the unit is not being played. However, this setting may cause some car battery wear if the unit is used in a car with no accessory position on the ignition key.

To avoid this battery wear when using the unit in such a car, set the POWER SELECT switch located at the bottom of the unit to the OFF position. The illumination is reset to stay off while the unit is not being played.



Change the position with a ball-point pen or similar objects.
Changer la position avec un stylo à bille ou un objet similaire.

Maintenance

Fuse Replacement

If the fuse blows, check the power connection and replace the fuse. If the fuse blows again after the replacement, there may be an internal malfunction. In this case, consult your nearest Sony dealer.

Warning

Use the specified amperage fuse for each lead. Use of a higher amperage fuse may cause serious damage.

Cleaning the Head and the Tape Path

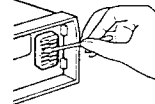
Prolonged use may contaminate the tape head and the tape path. Contamination may cause sound drop-out in playback. Clean the tape head and the tape path every two weeks to enjoy optimum hi-fi stereo sound. Use a commercially available cleaning cassette.

Cleaning the Connector

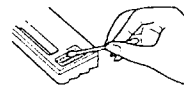
The unit may not function properly if the connectors between the unit and the front panel are contaminated with dirt. In order to prevent this from happening, detach the front panel by pressing the RELEASE button and clean the connectors from time to time.

Clean the connectors with a cotton swab as illustrated. Be sure to clean them with a horizontal motion. Never clean them vertically as this could damage the connecting points.

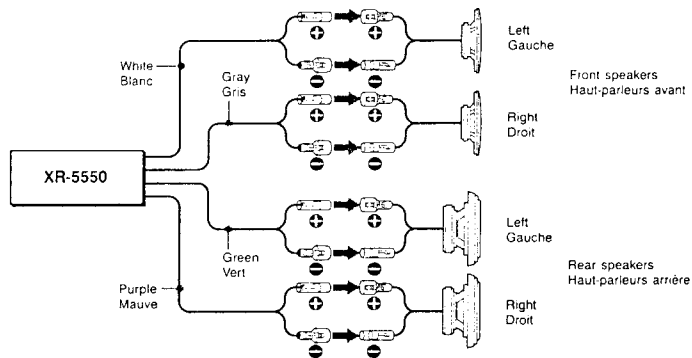
Main unit



Rear of the front panel



Speaker Connection/Connexion des haut-parleurs



Notes on speaker connection

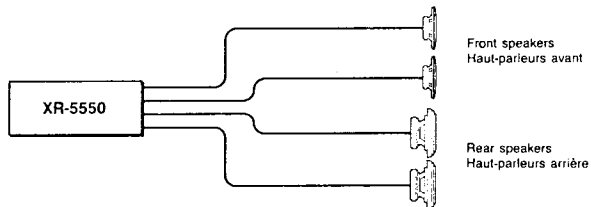
- Use speakers with an impedance of 4 to 8 ohms, and with adequate power handling capacities. Otherwise, the speakers may be damaged.
- Do not connect the terminals of the speaker system to the car chassis, and do not connect the terminals of the right speaker with those of the left speaker.
- Do not attempt to connect the speakers in parallel.

Remarques sur la connexion des haut-parleurs

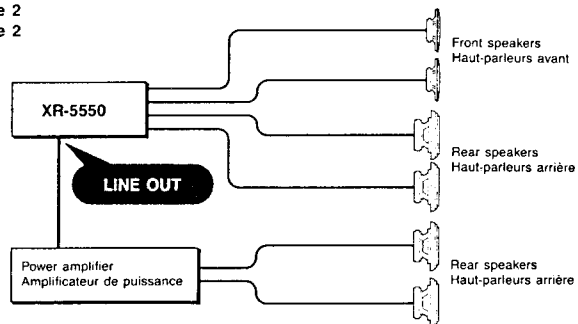
- Utiliser des haut-parleurs avec une impédance de 4 à 8 ohms et qui peuvent supporter l'alimentation fournie sinon ils risqueraient d'être endommagés.
- Ne pas connecter les bornes du système de haut-parleur au châssis de la voiture et ne pas raccorder les bornes du haut-parleur droit aux bornes du haut-parleur gauche.
- Ne pas essayer de connecter les haut-parleurs en parallèle.

Connection Diagram/Schéma de connexion

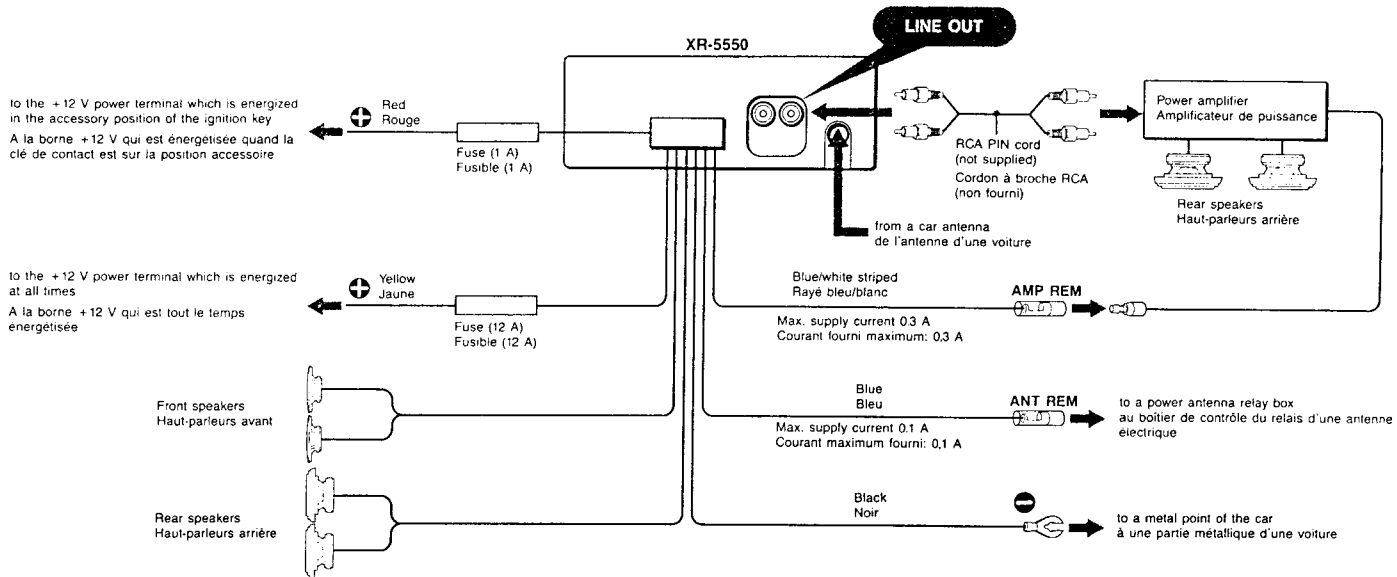
Example 1 Exemple 1



Example 2 Exemple 2



Connections of Example 2/Connexions de l'exemple 2



Notes on the control leads

- The power antenna control lead (blue) supplies +12 V DC when you turn on the tuner or when you activate the ATA (Automatic Tuner Activation) function.

- A power antenna without relay box cannot be used with this unit. For details about the power antenna, refer to its instructions manual.

Remarques sur les fils de contrôle

- Le fil de contrôle de l'antenne électrique (bleu) fournit du courant continu de 12 V quand le tuner est mis sous tension ou quand la fonction ATA (Activation automatique du tuner) est activée.

- Une antenne électrique sans boîtier de relais ne peut pas être utilisée avec cet appareil. Pour plus de détails au sujet de l'antenne électrique, consulter son mode d'emploi.

Installation/Installation

Precautions

- Choose the mounting location carefully so that the unit will not interfere with the normal driving functions of the driver.
- Avoid installing the unit where it would be subject to high temperatures, such as from direct sunlight or hot air from the heater, or where it would be subject to dust, dirt or excessive vibration.
- Use only the supplied mounting hardware for a safe and secure installation.
- Be sure to remove the front panel before installing the unit.

Mounting angle adjustment

Adjust the mounting angle to less than 20°.

Précautions

- Choisir soigneusement l'emplacement du montage, de manière que l'appareil ne gêne nullement les mouvements du conducteur.
- Éviter d'installer l'appareil dans un endroit exposé à des températures élevées, comme en plein soleil ou à proximité d'une bouche d'air chaud, à de la poussière, de la saleté ou des vibrations violentes.
- Pour garantir un montage sûr, n'utiliser que le matériel fourni.
- Avant d'installer l'appareil, enlever le panneau avant.

Réglage de l'angle de montage

Ajuster l'inclinaison à un angle inférieur à 20°.

Mounting Example

Installation in the dashboard

Exemple de montage

Encastrement dans le tableau de bord

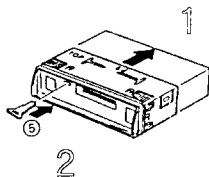
Ejemplo de montaje

Instalación en el salpicadero

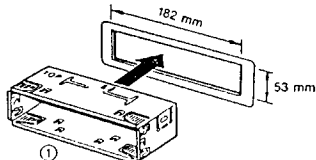
Montage-voorbeeld

Inbouw in het dashboard

1

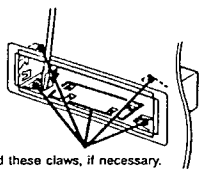


2



with the TOP marking up
avec l'inscription TOP dirigé vers le haut
con la marca TOP hacia arriba
met de zijde met het woord "TOP" naar boven gericht.

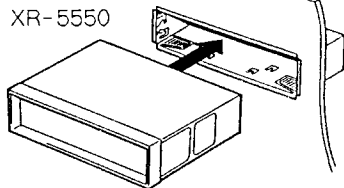
3



Bend these claws, if necessary.
Si nécessaire, plier ces griffes.
Si es necesario, doble estas pestañas.
Indien nodig kunt u deze lipjes ombuigen.

4

XR-5550



Note

Keep the release key in the safe place as you may need it in future to remove the unit from the car.

Remarque

Conserver la clé dans un endroit sûr car elle peut être nécessaire par la suite pour enlever l'appareil de la voiture.

Nota

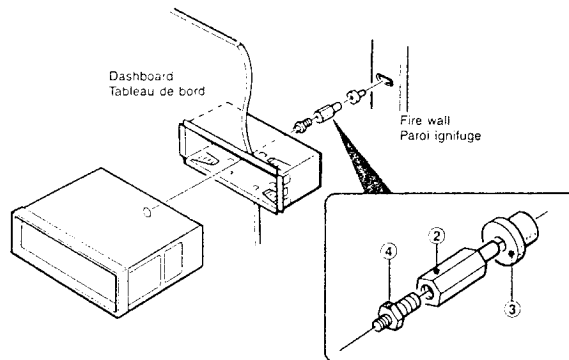
Guarde la llave de liberación en un lugar seguro, ya que es posible que la necesite en el futuro a fin de desmontar la unidad del automóvil.

Opmerking

Bewaar de ontgrendel-sleutel op een veilige plaats aangezien u deze nodig zult hebben wanneer u het apparaat bij het verlaten van de auto met u mee wilt

To Support the Unit

Pour installer l'appareil



How to Detach and Attach the Front Panel

To detach

Press the RELEASE button to open up the front panel, then pull it out.

To attach

Align the part **A** and **B**, and push the front panel until it clicks.

Dépose et pose du panneau avant

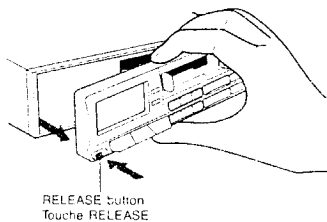
Dépose

Appuyer sur la touche RELEASE pour ouvrir le panneau avant, puis le tirer.

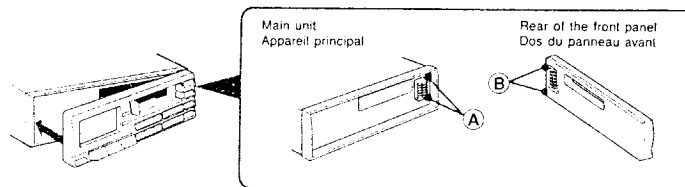
Pose

Aligner les parties **A** et **B** et pousser le panneau avant jusqu'à ce qu'il soit encastré.

To detach the front panel Dépose du panneau avant



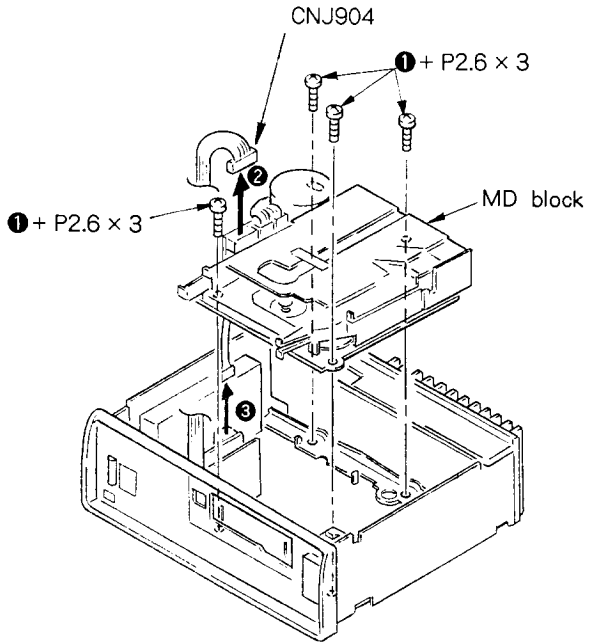
To attach the front panel Pose du panneau avant



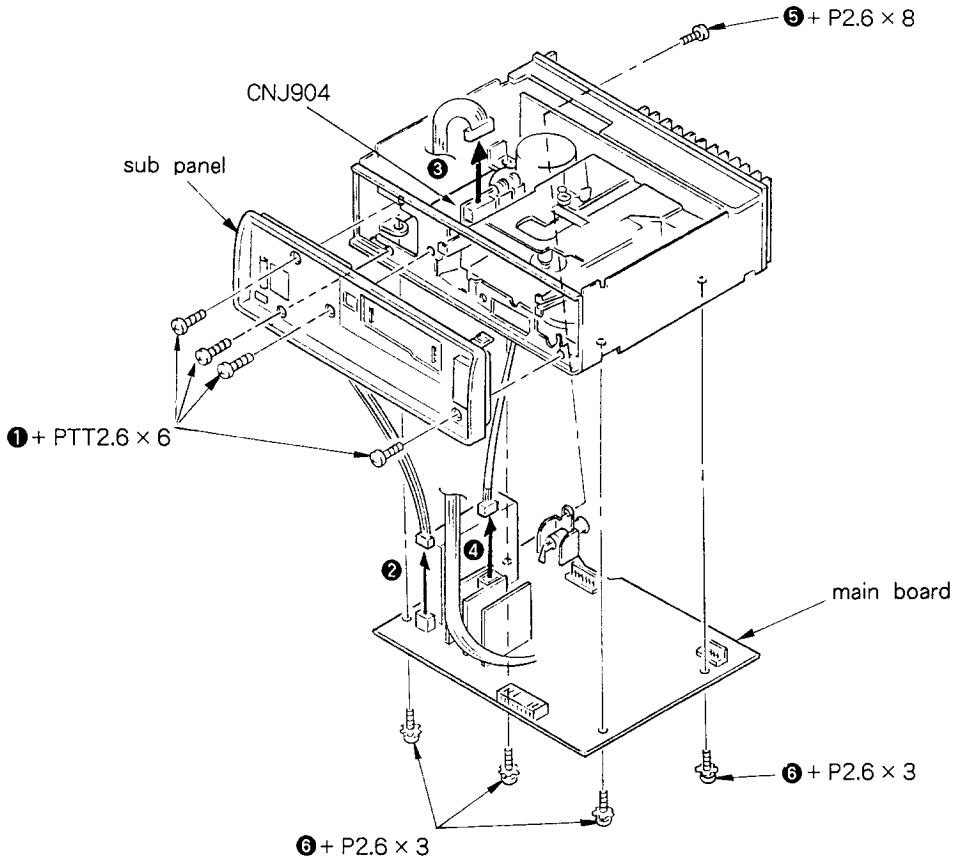
DISASSEMBLY

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

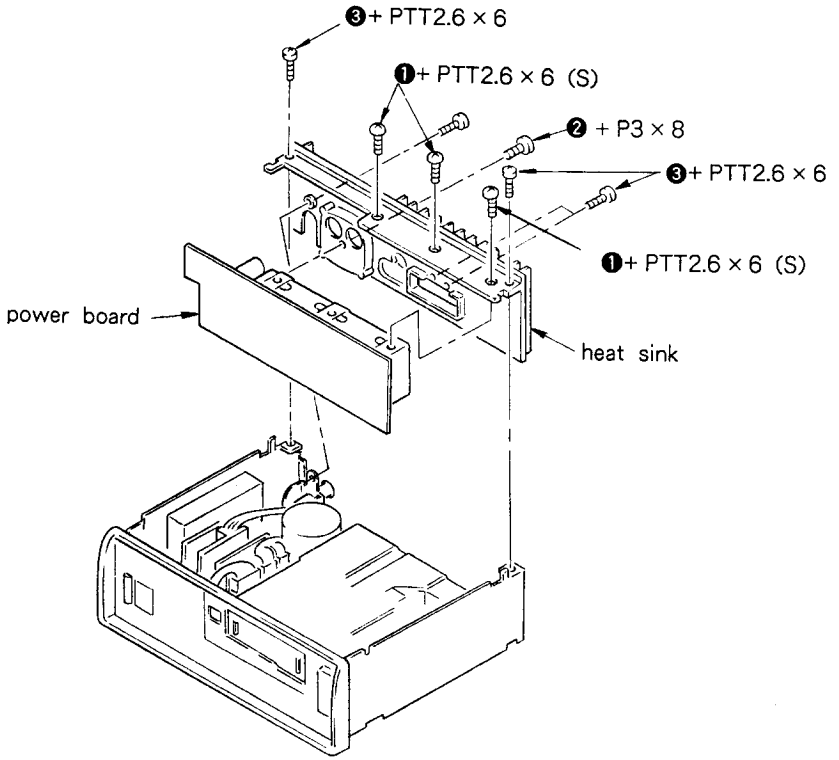
• MD BLOCK



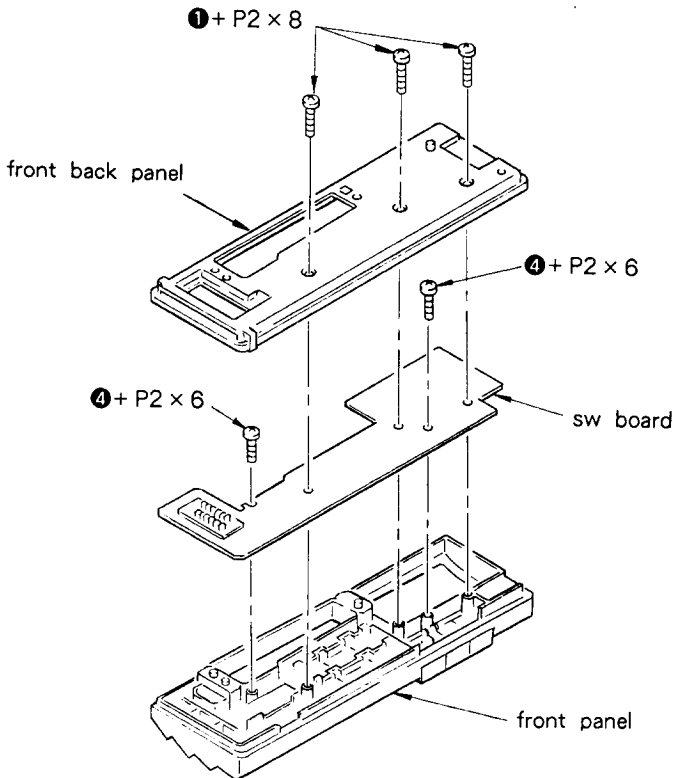
• SUB PANEL / MAIN BOARD



• POWER BOARD



• SW BOARD (XR-5450FP/5550FP)



3-1. MECHANICAL ADJUSTMENT

PRECAUTION

- Wipe the following components with an absorbent cotton cloth moistened with alcohol before adjustment:

PB head	Pinch roller
Idler	Rubber belt
Capstan	
- Demagnetize the PB head using a head demagnetizer.
- Be careful not to use a magnetized screwdriver.
- After adjustment is completed, lock the adjustment parts using screws.
- Unless otherwise specified, make adjustments at the specified voltage (14.4 V).

Torque Measurement

Measure the torque at a supply voltage of 14.4 V DC.

	Torque meter	Meter reading
FWD	CQ-102C	25 to 55 g·cm (0.35 to 0.77 oz·inch)
FF, REW	CQ-201B	55 to 150 g·cm (0.77 to 2.1 oz·inch)
Back tension	CQ-102C	1.5 to 4 g·cm or less (0.02 to 0.05 oz·inch or less)

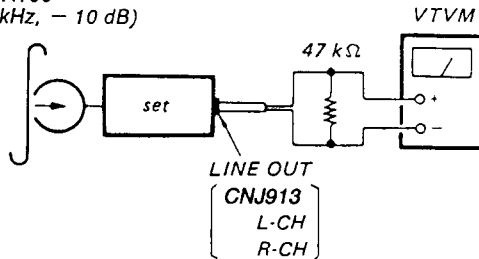
3-2. ELECTRICAL ADJUSTMENTS DECK SECTION

PB Head Vertical Adjustment

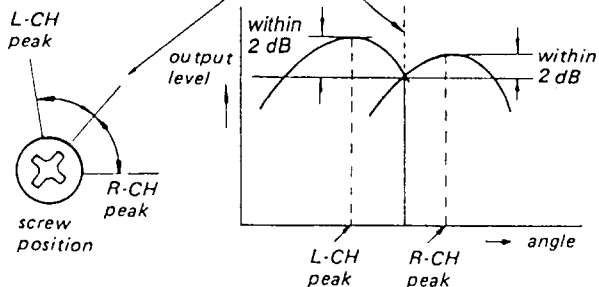
Procedre:

- Put the set into the FWD PB mode.

test tape
P-4-A100
(10 kHz, -10 dB)

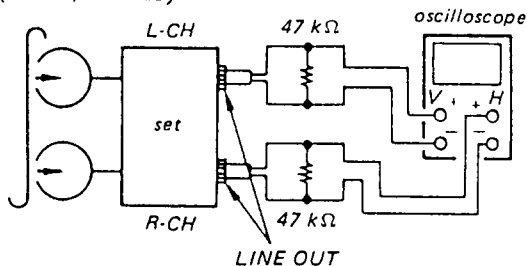


- Turn the screw and check the output peak value. Adjust the screw so that peak value in channels L and R coincides within 2 dB.

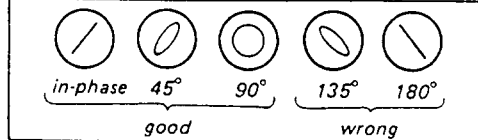


- Check the phase in the PB mode.

test tape
P-4-A100
(10 kHz, -10 dB)

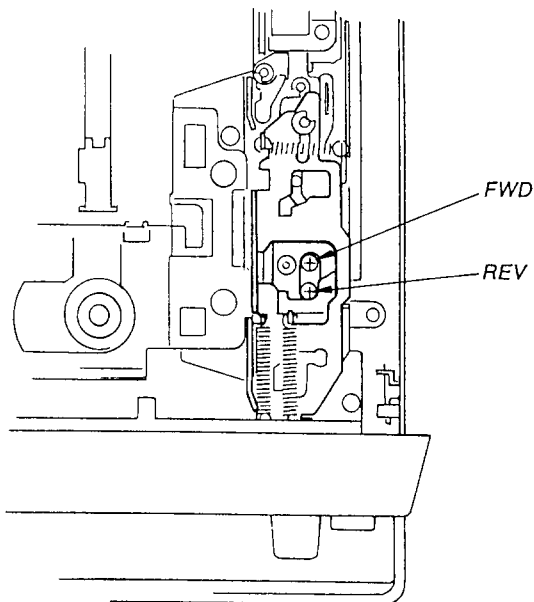


Lissajous's waveform on oscilloscope



- Repeat the above adjustment for the REV PB mode.
- Check that output level difference between FWD PB mode and REV PB mode is within 4 dB.

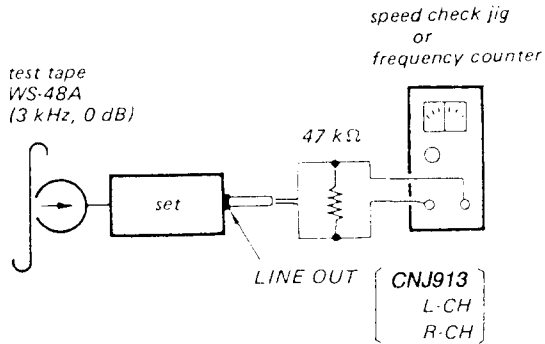
Adjustment Location:



Capstan Motor Tape Speed Adjustment

Procedure:

1. Put the set into the FWD PB mode.

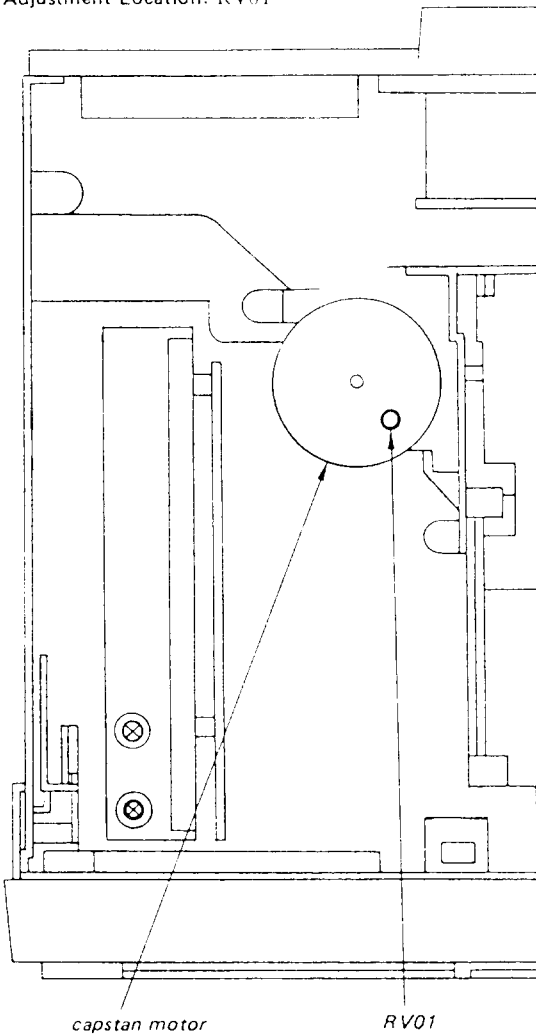


Specification: Constant speed

Speed check jig	Frequency counter
- 1.5 to +0.5%	3,000 ± $\frac{1}{2}$ Hz

Adjust so that the frequency difference between the FWD and REV modes is within 1.5% (45 dB).

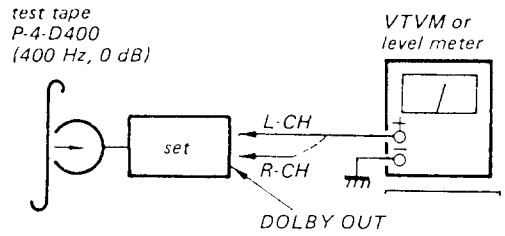
Adjustment Location: RV01



DOLBY NR Level Adjustment

Setting:

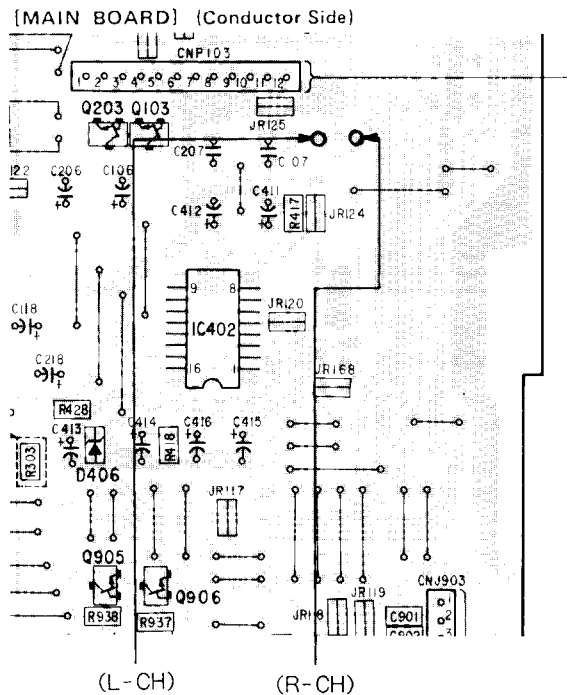
- DOLBY NR switch: OFF
METAL switch: OFF



Procedure:

1. Put the set into the FWD PB mode.
2. Adjust RV101 (L-CH) so that VTVM reading is -6 ±1.5 dB.
3. Put the set into the REV PB mode.
4. Adjust RV201 (L-CH) so that VTVM reading is -6 ±1.5 dB.
(-6 ±1.5 dB: approx. 0.35 to 0.54 V)

Adjustment Location: Main board



TUNER SECTION

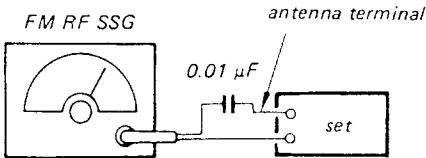
Cautions during repair

When the front end is defective, replace it by a new one because its internal block is difficult to repair.

FM Auto Scan/Stop Level Adjustment

Setting:

- Band switch: FM
- MONO switch: ON
- Frequency: 97.9MHz (US/Canadian)
98.0MHz (AEP)



- Carrier frequency: 97.9MHz (US/Canadian)
98.0MHz (AEP)
- Output level: 98.0MHz (AEP)
- Mode: mono, unmodulated

Procedure:

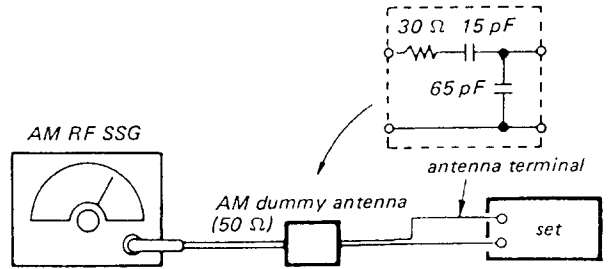
1. Tune in 97.9MHz (US/Canadian)
Tune in 98.0MHz (AEP)
2. Adjust RV02 so that the VOM reading changes from low to high (5 V reference voltage).
3. When the FM RF SSG's output level is $25 \pm 5 \text{ dB } \mu\text{V}$ check that the auto scan stopped.

AM Auto Scan/Stop Level Adjustment

Note: This adjustment should be made after FM auto scan stop level adjustment is completed.

Setting:

- Band switch: AM
- Frequency: 1,000kHz (US/Canadian)
999kHz (AEP)

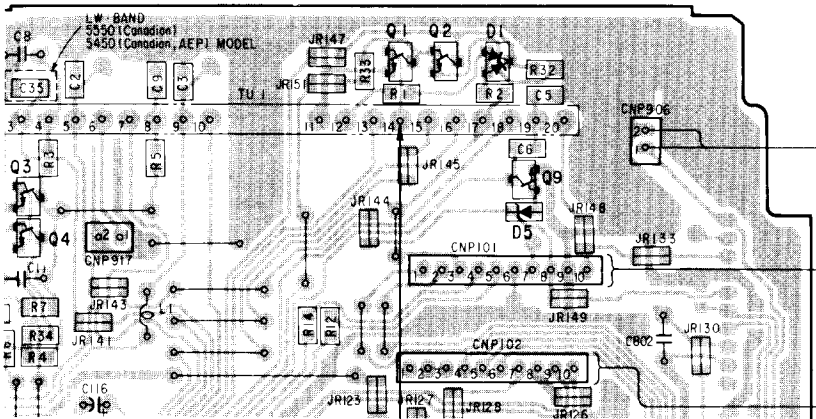


- 1,000 kHz
- 30 dB μV (31.8 μV)

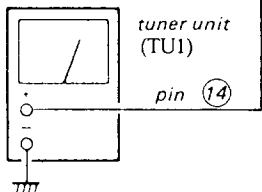
Procedure:

1. Turn in 1,000kHz (US/Canadian)
Turn in 999kHz (AEP)
2. Adjust RV03 so that the VOM reading changes from low to high (5.6 V reference voltage).
3. When the AM RF SSG's output level is $30 \pm 5 \text{ dB } \mu\text{V}$ check that the auto scan stopped.

[MAIN BOARD] (Conductor Side)

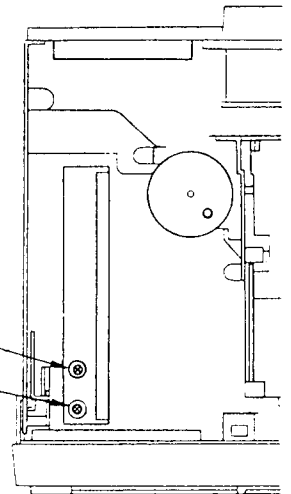


VOM (DC range)



FM and AM auto scan/stop level adjustment VOM is connected as illustrated.

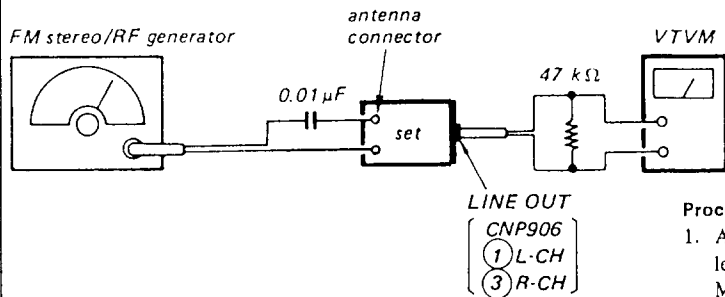
RV03 AM Auto Scan/Stop Level Adjustment
RV02 FM Auto Scan/Stop Level Adjustment



FM Stereo Separation Adjustment

Setting:

Band switch: FM
 Frequency: 97.9MHz (US/Canadian)
 98.0MHz (AEP)



Procedure:

- Adjust RV2 for a best stereo separation at a LINE OUT level of approximately -10 dB. More than 25 dB is good.

Carrier frequency: 97.9MHz (US/Canadian)
 98.0MHz (AEP)
 Output level: 70 dB μ V (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

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

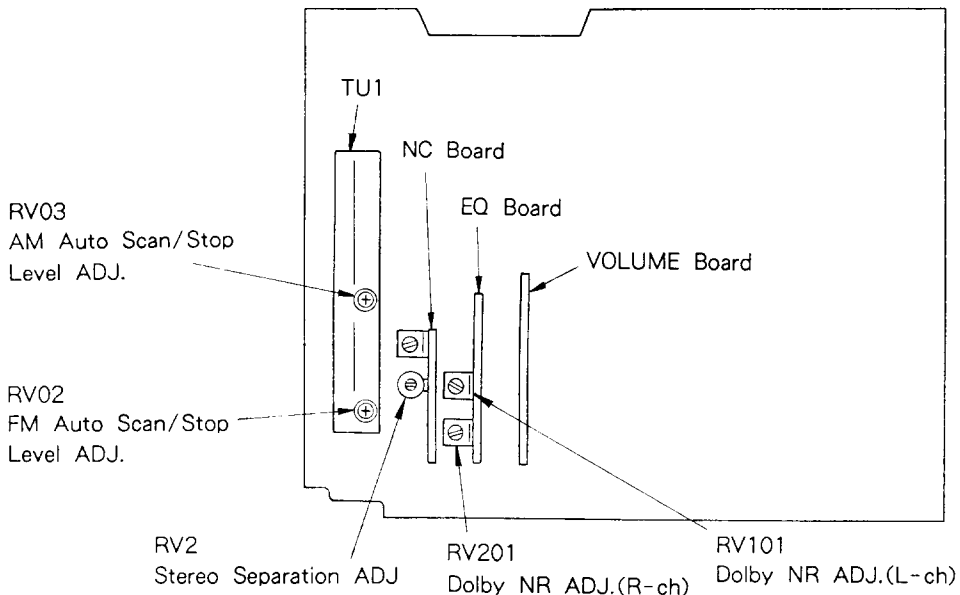
L-CH Stereo separation: (A) - (B)

R-CH Stereo separation: (C) - (D)

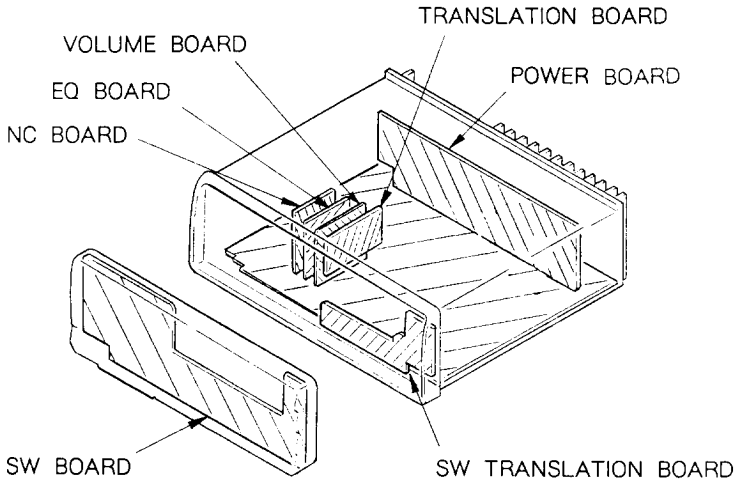
The separations of both channels should be equal.

• Adjustment Location

[MAIN BOARD] (Component Side)

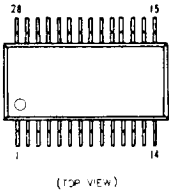


4-1. CIRCUIT BOARDS LOCATION

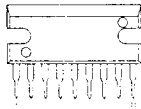


4-2. SEMICONDUCTOR LEAD LAYOUT

AN7463S

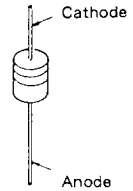


TA8215

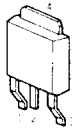


DTZ4.7B
DTZ5.1C
DTZ5.6C
DTZ6.2C
DTZ7.5C
DTZ9.1C
DTZ11A
1SS355

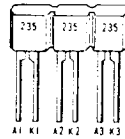
11ES2



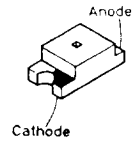
2SD1802-S



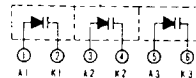
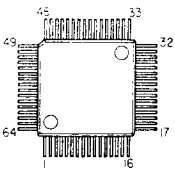
1 BASE
 2 COLLECTOR
 3 EMITTER
 4 COLLECTOR



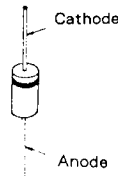
CL-150Y-CD



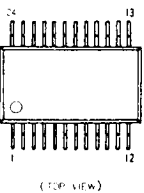
LC7582



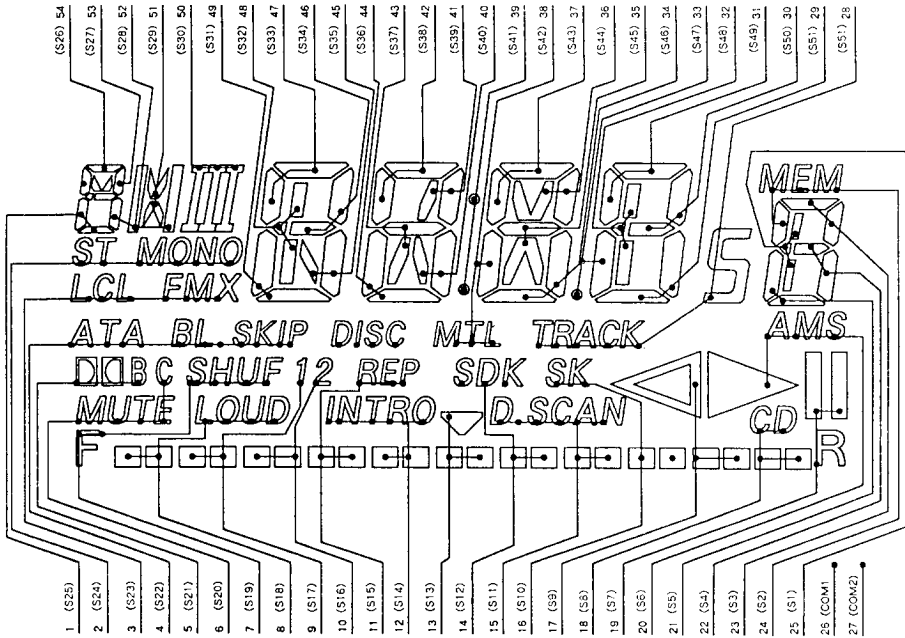
1S2472



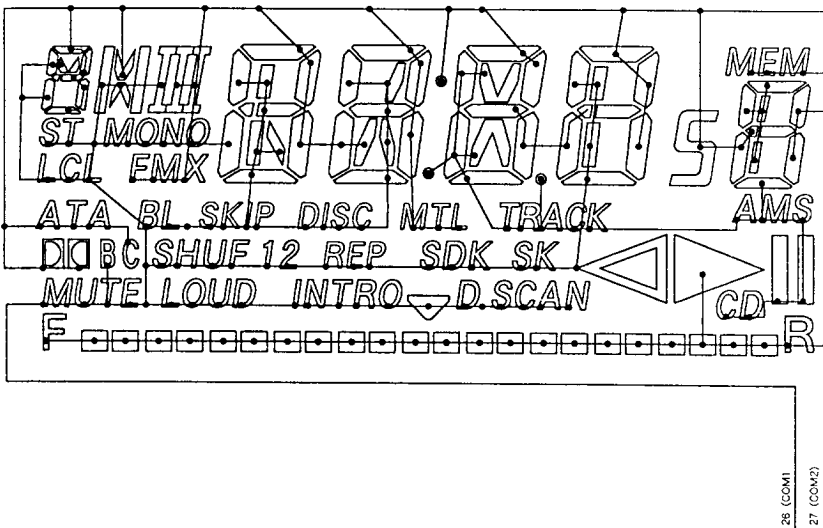
M51524FP



• SEGMENT



• COMMON



• IC701, LC7582 (LCD Driver)

CD driver for displaying the frequency of the electronic tuning

Pin No.	Pin Name	I/O	Description
1 to 23	S1 to S23	O	Segment output terminal
24	OPEN	-	NC
25 to 44	S24 to S43	O	Segment output terminal
45	S44 (DSP2)	I/O	Segment output or DSP input terminal
46	S45 (AD2)	I/O	Segment output or AD input terminal
47	S46 (DSP1)	I/O	Segment output or DSP input terminal
48	S47 (AD1)	I/O	Segment output or AD input terminal
49	S48 (DSP OUT)	I/O	Segment output or DSP output terminal
50	S49 (AD01)	I/O	Segment output or AD1 output terminal
51	S50 (AD02)	I/O	Segment output or AD2 output terminal
52	S51 (AD03)	I/O	Segment output or AD3 output terminal
53	S52 (AD04)	I/O	Segment output or AD4 output terminal
54	S53 (AD05)	I/O	Segment output or AD5 output terminal
55	OSC	-	Oscillation terminal
56	VDD	I	Power supply terminal, + VDD
57	INH	I	Display OFF input terminal (output driver only)
58	VLCD	I	LCD bias voltage setting terminal
59	Vss	I	Power supply terminal, GND
60	CE	I	Serial chip selector input terminal
61	CLK	I	Serial clock input terminal
62	DATA	I	Serial data input terminal
63	COM2	O	Common output terminal (Note)
64	COM1	O	Common output terminal

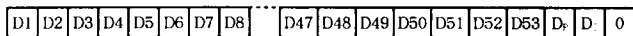
(Note) COM1 is used for 1/1 duty and COM2 is set to OPEN.

• The function selection of DSP and AD I/O is controlled with command from the system controller.

Data Transmission System

• 1/1 duty

Direction of the transmission (56 bits)



D1 to D53 : Display data (1/1 duty). Lit when "1".

(Note) For the AD and DSP selection ;

1/1 duty : D46 to D53 are invalid.

DP: Drive system selection bit

1/1 duty when "0".

DQ: AD and DSP function selection bit

AD and DSP function when "1".

Segment output when "0".

X : Invalid data

(Note) When the AD or DSP function is not selected, make sure to fix AD1, AD2, DSP1 and DSP2 terminals to VDD or Vss.

Transmission Data (external input) and Output Pin

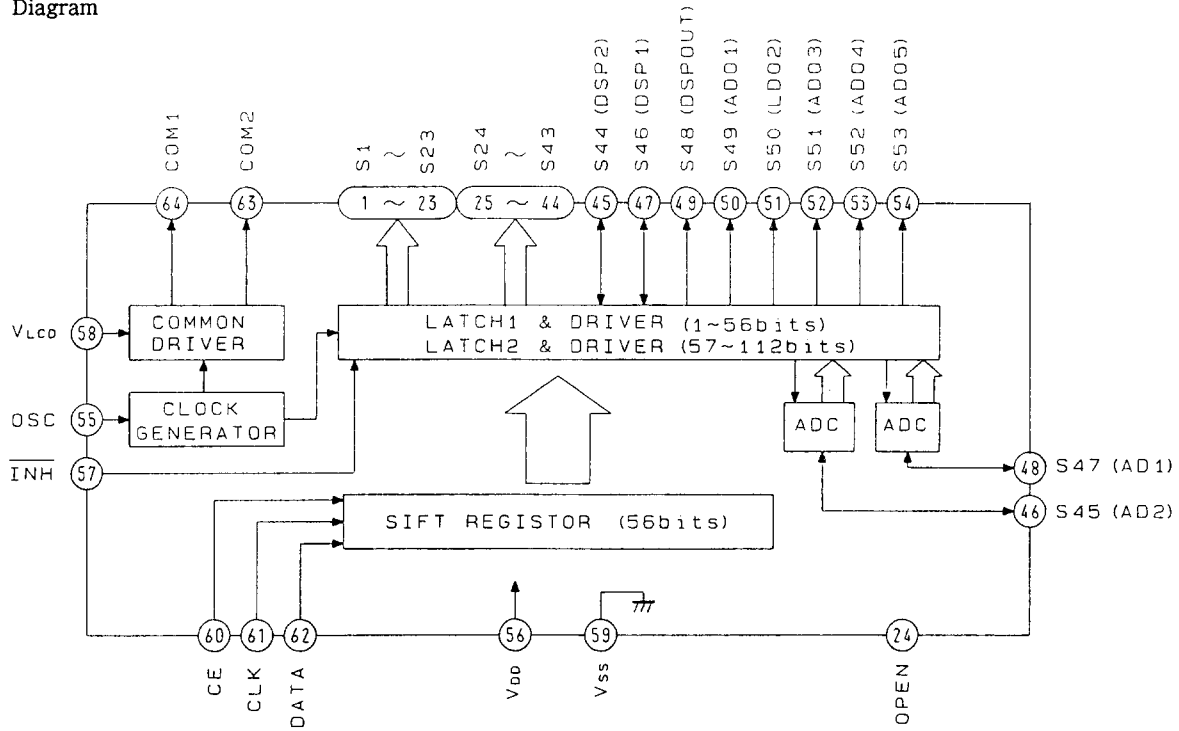
(Note) Only COM1 is used when 1/1 duty.

DP DQ	0		COM1	COM2
	0	1		
Output Terminal	1/1 duty			
S1	D1	D1	○	○
S2	D2	D2	○	○
S3	D3	D3	○	○
⋮	⋮	⋮	⋮	⋮
S26	D26	D26	○	○
S27	D27	D27	○	○
S28	D28	D28	○	○
⋮	⋮	⋮	⋮	⋮
S43	D43	D43	○	○
S44	D44	D44	○	○
S45	D45	D45	○	○
S46	D46	* DSP1	○	○
S47	D47	* ARI	○	○
S48	D48	* DISPO1	○	○
S49	D49	* ARO1	○	○
S50	D50	* ARO2	○	○
S51	D51	* ARO3	○	○
S52	D52	* ARO4	○	○
S53	D53	* ARO5	○	○

Descriptions for “*” :

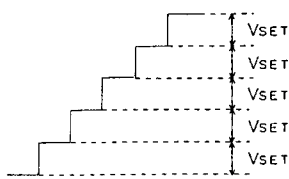
- DSP1 : External display input data name, DSPO1 for output.
- DSPO1 : External display output data name, DSP1 for input.
- ARI : Input data name of AD converter, ARO1 to ARO5 for output.
- ARO1 to ARO5 : Output data name of AD converter, ARI for input.
- ALO1 to ALO5 : Output data name of AD converter, ALI for input.

• Block Diagram



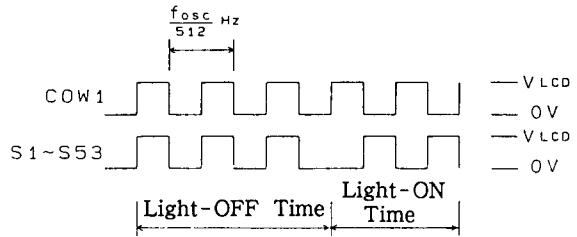
• Step Voltage Difference

Input voltage of S45 (AD2) and S47 (AD1)



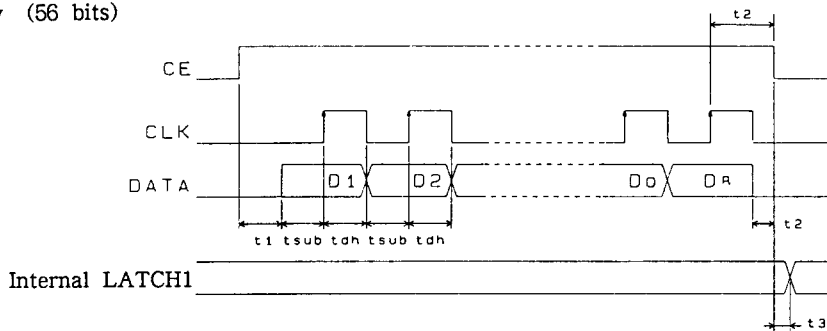
• Output Waveform

• 1/1 duty



• Serial Data

• 1/1 duty (56 bits)



• IC301 μPD17005 (System control)

Pin No.	Pin Name	Name	I/O	Active
1	POC1	KR1	I	-
2	POC0	KR0	I	-
3	SDA	SO	O	-
4	SCL	SCK	O	-
5	POA1	/LCD BLK	O	L
6	POA0	LCD_CE	O-P	H
7	POB3	VOL_CE	O-P	H
8	POB2	SK	I-P	H
9	POB1	DK	I	H
10	POB0	NC	I	-
11	INT1	MUTE_REQ	I	H
12	INT0	BU	I	H
13	CE	CE	I	H
14	P1A3	/FF-REW	I	L
15	P1A2	N-R	I	-
16	P1A1	/TAPE	I	L
17	P1A0	REM_IN	I	H
18	P1B3	/LW	O-N	L
19	P1B2	/AGCC	O-N	L
20	P1B1	/FM-AM	O-N	H
21	CGP	BEEP	O-P	/
22	P1C3	POWER	O-P	H
23	P1C2	COLOR	O-P	H/L
24	P1C1	FM	O-P	H
25	P1C0	AM	O-P	H
26	FMIFC	FMIFC	I	-
27	AMIFC	AMIFC	I	-
28	ADC1	SDL	I	LEVEL
29	P1D0	/STREO	I	L
42	P2A0	NC	O-P	-
43	COM1	NC	O	-
44	COM0	NC	O	-
45	POF3	LOCAL	O	H
46	POF2	MUTE	O-P	H
47	POF1	SIG1	O-P	-
48	POF0	SIG2	O-P	-
49	POE3	LOUD	O-P	H
50	POE2	TAPE + B	O-P	H
51	POE1	/DOLBY	O-P	L
52	POE0	METAL	O-P	H
53	POX5	/AMS OUT	O-P	L
54	POX4	RADIO	O-P	H
55	POX3	IFC_CND	O-P	H
56	POX2	REM_OUT	O-P	H
57	POX1	MOTOR_OUT	O-P	H
58	POX0	MONO	O-P	H
59		NC	O-P	-
70				
71	POY3	KS3	O	H
72	POY2	KS2	O	H
73	POY1	KS1	O	H
74	POY0	KS0	O	H
75		NC	I	-
76	ADC4	KAD0	-	-
77	ADC3	KAD1	-	-
78	ADC2	KAD0	-	-
79	POC3	KR3	I	-
80	POC2	KR2	I	-

* []: IC Pin No.

[1] [2]

A diode switch is read through these terminals and a initial setting mode of a microcomputer is determined.

[3] [4]

Serial data output terminal. Data of LCD and the electric volume outputs.

[5]

LCD display control terminal. Displaying or non-displaying of LCD is controlled.

[6]

LCD data output control terminal. When this terminal is high, the serial data of LCD outputs.

[7]

Electric volume data output control terminal. When this terminal is high, the serial data of the electric volume outputs.

[8]

Traffic data station input terminal. When the ARI system is applicable, this terminal is operated. When this terminal is high, "SK" is displayed on LCD.

[9]

Traffic data station input terminal. When the ARI system is applicable, this terminal is operated. When the DK station is waited and this terminal is high ;

• SDK display blinks

• A current operation is stopped and the DK station is received in the tape/AUX mode.

[11]

MUTE output request signal terminal. When this terminal is high, the MUTE (46) terminal is high.

[12]

Back-up power input terminal. When the CE terminal and this terminal are set to low, the microcomputer conducts the clock stop operation and maintains the data of the preset memory. When VDD is set to 3.5 V or less, the power is turned ON, the memory is reset and initialized.

* : O-P : CMOS push pull output

O-N : N-ch open drain output

[13]

Microcomputer operation selection input terminal. When "High", the microcomputer operates normally. When the BU terminal is set to high and this terminal is set to low, the microcomputer conducts the halt operation and stops instantaneously. This terminal is a Schmitt trigger input includes the hysteresis and the level within 100-165 μ S is not applicable.

Note : When this terminal is low in the FM reception, EO₁₂ may be changed. It is necessary to set the MUTE_REQ terminal to high before setting this terminal to low.

Back-up State

* Vdd = 3.5 V or more

CE	BU	Clock operation	Memory maintain	Microcomputer	Power consumption
L	L	Stop	YES	STOP	15 μ A (Max.)
	H	Operating	YES	HALT	10 mA (Max.)
H	L	Operating	YES	Key input inhibit	Normal
	H	Operating	YES	Normal operation	Normal

[14]

FF-REW state input terminal. FF-REW state is detected.

[15]

N-R input. Tape transition state input terminal. The transition state is detected.

[16]

Tape signal input terminal. A state of the mechanical deck is detected.

Low	Tape
High	No tape

[17]

AUX input terminal. The AUX state is detected.

[18]

LOCAL/DX state terminal. Output is inverted with the SENS key. LOCAL outputs when high.

[19]

/AGCC output. Auto gain cut signal output terminal. High level signal outputs in the memory scan and the SEEK operation.

[21]

Beep sound output terminal. When an applicable key is pressed, the beep sound signal outputs for 40 ms. The frequency of the beep sound is changed with the pressing time.

	Frequency
Pressed normally	2.25 kHz
Pressed for two	750 Hz

[22]

Power control terminal for the whole set. High outputs when radio, tape or aux mode.

[23]

Illumination color switching output terminal. Output is inverted by pressing the SEL + M1 keys.

[24] [25] [45] [20]

Band selection signal is output.

[26]

FM intermediate frequency input terminal. When 10.7 MHz \pm 12.5 kHz signal is input to this terminal, it is discriminated that a broadcast station is selected. The direct current is cut with the capacitor because an alternate amplifier is built in.

[27]

AM (MW/LW) intermediate frequency input terminal. When the signal of 450 kHz \pm 2 kHz is input to this terminal, it is discriminated that a broadcast station is selected. The direct current is cut with the capacitor because an alternate amplifier is built in.

[28]

SDL level signal input terminal. When the voltage of this terminal is more than the specified value, there is a broadcast station is selected.

Note : This terminal and the intermediate frequency in the SEEK operation are checked and the broadcast station selection is discriminated.

FM	10.5/64 Vp-p or more
AM	6.5/64 Vp-p or more

[29] STEREO input terminal. When this terminal is low in the FM stereo input waiting mode, the LCD is lit.

[46] Mute signal output terminal. When switching the function, high outputs for the time more than the noise time.

[47] [48] Mode switching signal output terminal. Outputs are applicable for the mode as shown in the table.

Mode	SIG1	SIG2
OFF	L	L
Radio	L	L
AUX	L	H
Tape	H	L

[49] LOUD signal output terminal. Output is inverted by pressing the LOUD key in the mode other than the OFF.

[50] Tape power control terminal. When the tape function is selected, a high signal outputs.

[51] Dolby control terminal. When Dolby function is selected, a low signal outputs.

[52] Metal control output. When the METAL function is selected, a high signal outputs.

[53] AMS control output. The AMS function is selected and a low signal outputs in the FF-REW mode.

[54] Radio power signal terminal. When ATA is selected in the radio or tape mode, the output signal is high.

[55] IF count request signal output terminal. When the SD level is more than the specified value in the SEEK operation, this terminal is high and the intermediate frequency is requested to be output.

[56] AUX signal state output terminal. When the set is in the AUX mode, a high signal outputs.

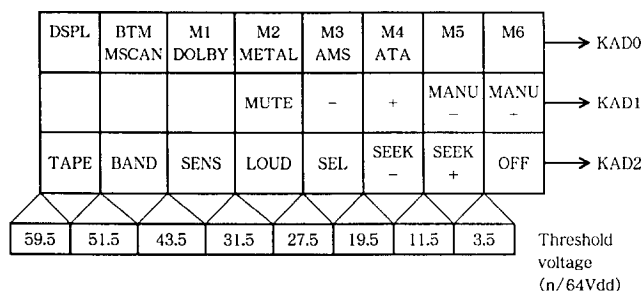
[57] Motor control terminal. When the tape function is selected, a high signal outputs.

[58] Forced MONO output terminal. Output is inverted with the SENS key. Forced MONO outputs when high.

[58] Illumination ON/OFF output terminal

[71] [72] [73] [74] A diode switch is read through these terminals and a initial setting mode of a microcomputer is determined.

[76] [77] [78] A resistance value of the key input resistor circuit is scanned and it is detected which key is pressed.



When the voltages of the terminals are as shown below ;
 $KAD0 = 2.5/64Vdd$
 $KAD1 = 62.5/64Vdd$
 $KAD2 = 62.5/64Vdd$
 it is discriminated that M6 key is pressed.

[79] [80] A diode switch is read through these terminals and a initial setting mode of a microcomputer is determined.

Operation Mode and Function Selection

When the power is ON to reset, the state of the diode switch is read and the initial setting of the microcomputer and a the function are selected. Also, when ACC is ON, the state of the diode is read again and it is inspected whether the state matches the diode switch in the memory of the microcomputer. If not, an operation same as the power-ON-reset is conducted.

Diode Switch

Diode Switch Matrix

	K (02)	K (01)	K2 (80)	K3 (73)
KO (74)	AREA3	AREA2	AREA1	---
KS1 (73)	SDK	BEEP	DOLBY	METAL
KS2 (72)	COLOR	AMS	ATA	P-SEL
KS3 (71)		POWER2	---	---

1) AREA 1, AREA 2 and AREA 3 : Destination Selection

The band selection of the tuner function is conducted. When the setting other than the following table is conducted.

Destination	AREA1	AREA2	AREA3
AEP	0	1	0
US/CND	1	0	0

0 : No diode
1 : Diode

Frequency List for the Destination

Destination	BAND	Freq. (Min.) (Hz)	Freq. (Max.) (Hz)	Intermediate Frequency (Hz)	Reference Frequency (Hz)	Channel Space	PLL System
AEP (ARI)	FM 1, 2, 3	87.5 M	108.0 M	107 M	25 k	50 k	Pulse
	AM 1, 2	531 k	1602 k	450 k	9 k	9 k	Pulse
US/CND	FM 1, 2, 3	87.9 M	107.9 M	10.7 M	25 k	200 k	Pulse
	AM 1, 2	530 k	1710 k	450 k	10 k	10 k	Pulse

* All PLL operation modes are conducted in pulse-swallow system.

Preset Memory List

BAND	AREA	Fmin(Hz)	M1	M2	M3	M4	M5	M6
FM1	AEP	87.5M	--	97.5	98.0	98.5	--	--
	US/CND	87.9M	--	95.9	97.9	99.9	--	--
AM1	AEP	531K	--	909	999	1089	--	--
	US/CND	530K	--	900	1000	1100	--	--

* A lowest frequency is set for the band other than the above bands or for "--".

2) BEEP : Beep Output Selection

It is selected for a beep sound when pressing a key. When it is set to sound beep, the beep sound switching function (SEL + M4) is available.

BEEP	Note
0	Sounds
1	Not sound

3) Dolby : Dolby Function Selection

A Dolby function is selected.

DOLBY	Note
0	Available
1	Not available

4) METAL : Metal Function Tape Selection

Metal function is selected.

METAL	Note
0	Available
1	Not available

5) AMS : AMS Function Selection

AMS function is selected.

AMS	Note
0	Available
1	Not available

6) ATA : ATA Function Selection

ATA function is selected.

ATA	Note
0	Available
1	Not available

7) P_SEL : Illumination ON Selection

The state of the ILL terminal when pressing the OFF key is selected.

7) P_SEL : Illumination ON Selection

The state of the ILL terminal when pressing the OFF key is selected.

P SEL	ILL	Note
0	0	Illumination ON : No display
1	1	Illumination OFF : Clock display

9) COLOR : Illumination color selection

Color switching (SEL + M1) of the illumination is selected.

COLOR	Note
0	Color switching is not available
1	Color switching is available

10) SDK : SDK (ARI) Function Selection

SDK	Note
0	SDK function is not available.
1	SDK function is available.

11) POWER 2 : Operation Mode Selection

SDK	Note
0	Mode A (Tape is prior to others)
1	Mode B (Selected mode is prior to other mode.)

- Mode A (Tape is prior to others)
Tape mode is selected prior to other mode.
Tape > AUX > OFF > Tuner
- Mode B (Selected mode is prior to other mode.)
When a mode is selected, it enters the mode.

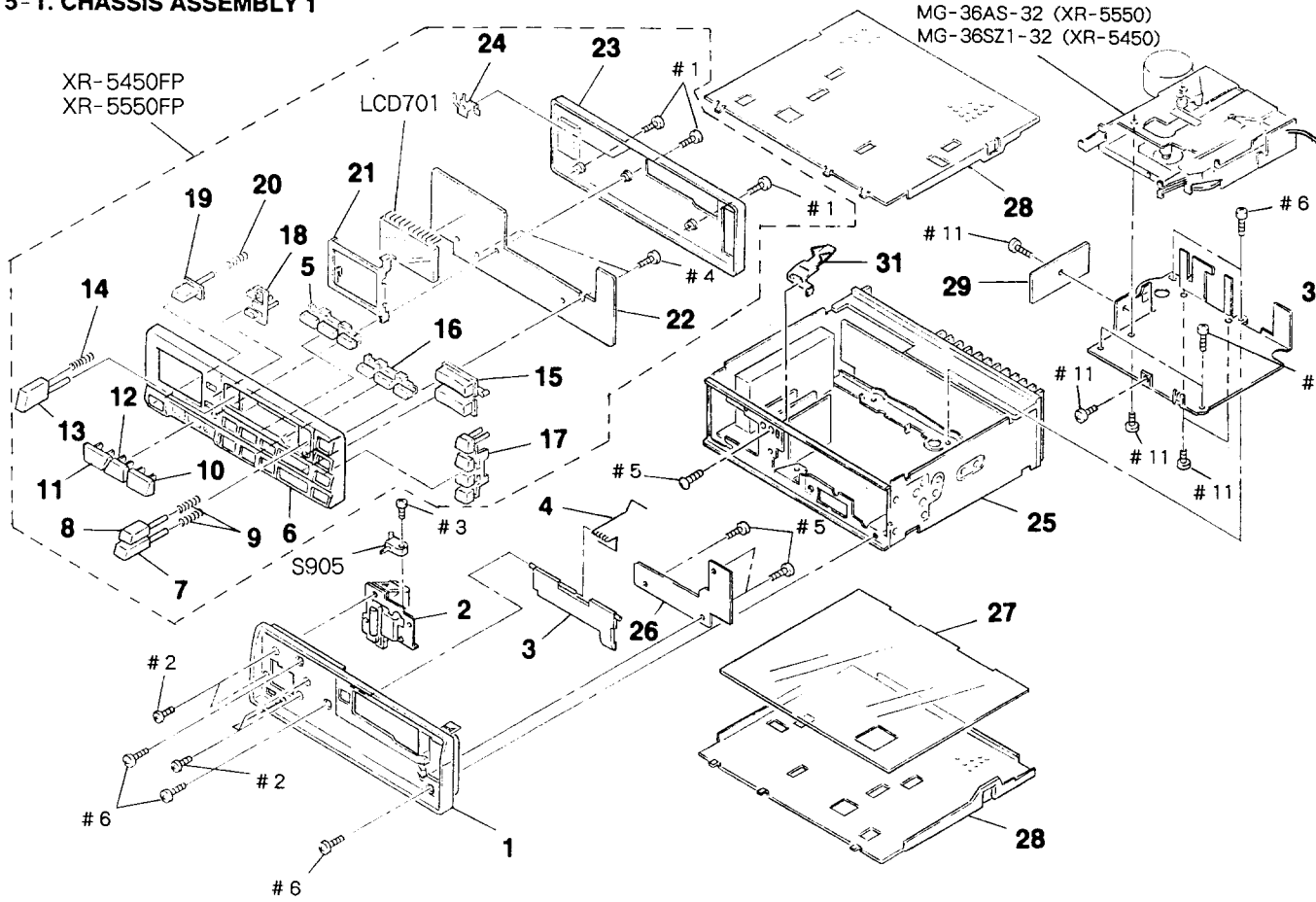
NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.

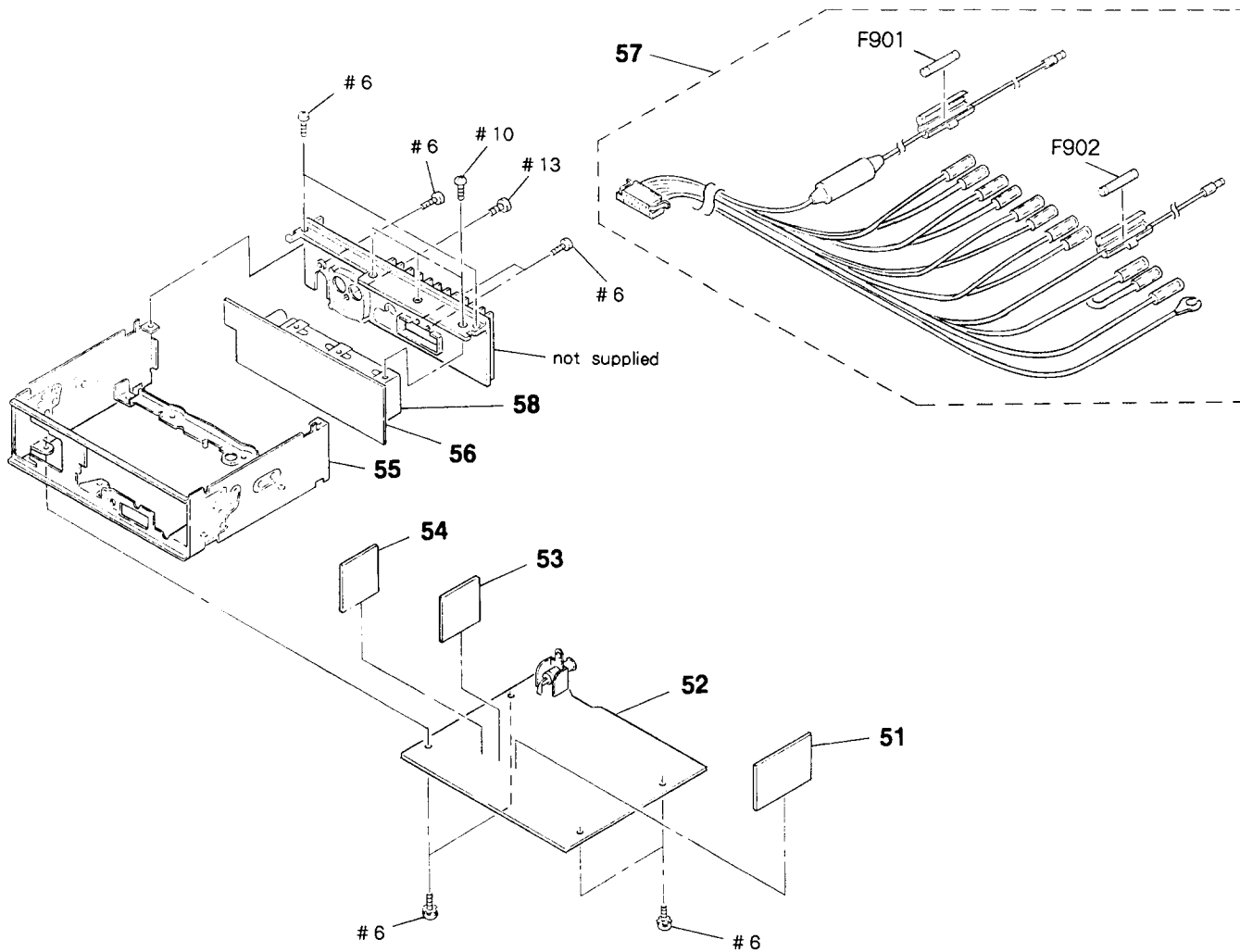
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

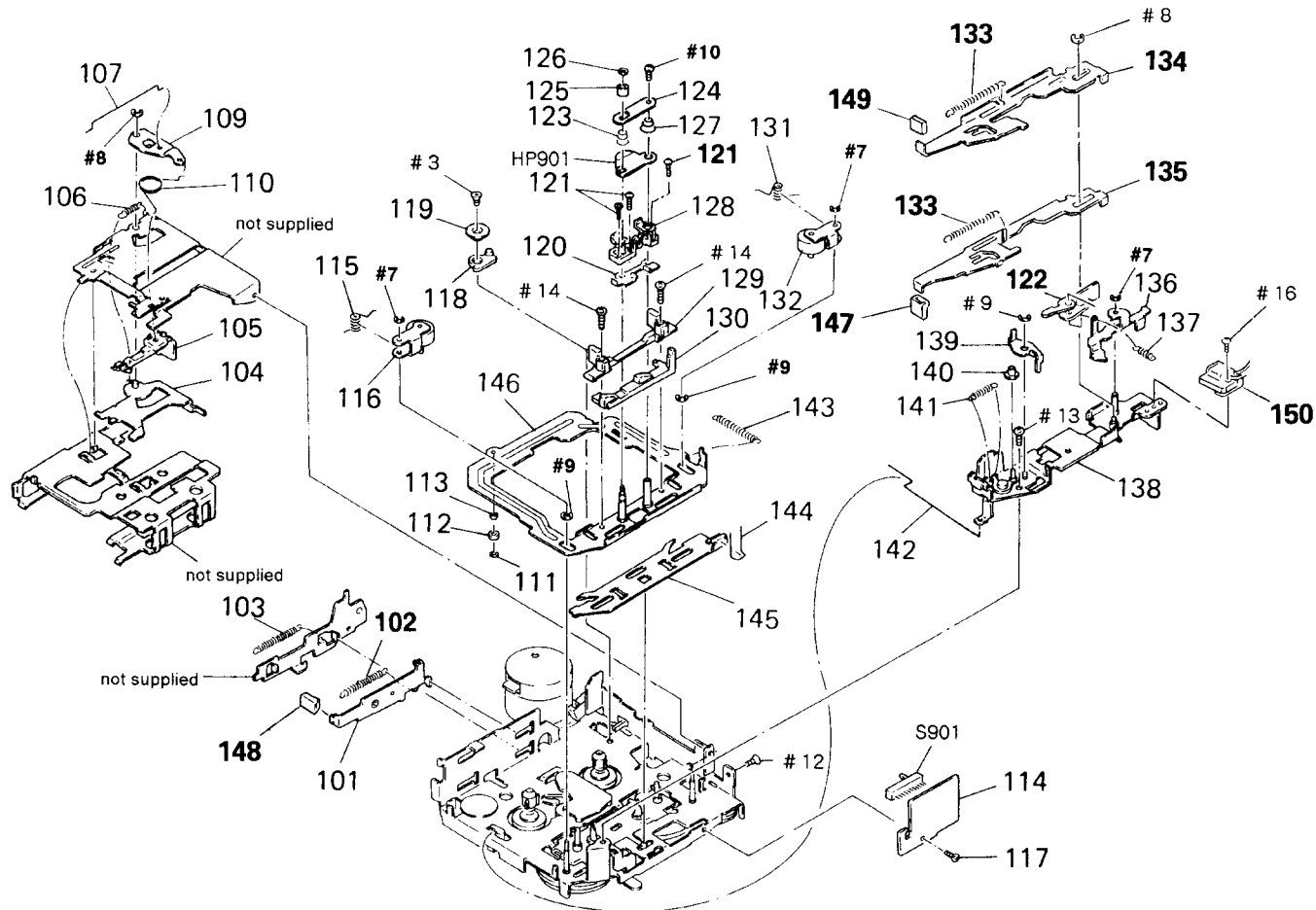
5-1. CHASSIS ASSEMBLY 1



5-2. CHASSIS ASSEMBLY 2



5-3. MD ASSEMBLY 1



5-4. MD ASSEMBLY 2

