

# MDX-U1/U1RDS

## SERVICE MANUAL

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

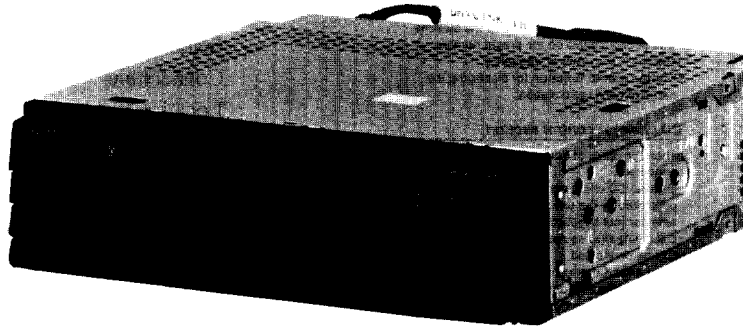


Photo: US, Canadian, E Model



Model Name Using Similar Mechanism

NEW

### SPECIFICATIONS

#### MiniDisc section

Signal-to-noise ratio	90 dB
Frequency response	20 – 20,000 Hz
Wow and flutter	Below measurable limit
Laser Diode Properties	
Material	GaAlAs
Wavelength	780 nm
Emission duration	Continuous
Laser output power	Less than 44.6 $\mu$ W*

\* This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block.

#### Tuner section

##### FM

Tuning range	US, Canadian, E: 87.9 – 107.9 MHz AEP: 87.5 – 108.0 MHz
Antenna terminal	External antenna connector
Intermediate frequency	10.7 MHz
Usable sensitivity	12 dBf (75 ohms)
Selectivity	75 dB 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	30 dB at 1 kHz
Frequency response	30 – 15,000 Hz
Capture ratio	2 dB

##### AM

Tuning range	US, Canadian: 530 – 1,710 kHz E: 530 – 1,620 kHz (at 10 kHz step) 531 – 1,602 kHz (at 9 kHz step) AM tuning interval 9 kHz/10 kHz switchable AEP: MW: 531 – 1,602 kHz LW: 153 – 281 kHz
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Antenna terminal	External antenna connector
Intermediate frequency	450 kHz
Sensitivity	35 $\mu$ V 50 $\mu$ V (LW)

#### General

Output lead	Power antenna relay control lead Power amplifier control lead
Tone controls	Bass $\pm$ 10 dB at 100 Hz Treble $\pm$ 10 dB at 10 kHz
Power requirements	12 V DC car battery (negative ground)
Dimensions	Approx. 178 x 50 x 170 mm (w/h/d), (7 1/8 x 2 x 6 3/4 inches) not incl. projecting parts and controls
Mounting dimensions	Approx. 178 x 50 x 153 mm (7 1/8 x 2 x 6 1/8 inches) (w/h/d), not incl. projecting parts and controls
Mass	Approx. 1.3 kg (2 lb 14 oz.)
Accessories supplied	Remote commander (1) Mounting hardware (1 set) Size AA (R6) battery (2) Power connecting cord (1) Front panel case (1) Optical cable adaptor (1)

**FM/AM MINIDISC PLAYER**  
MDX-U1

**FM/MW/LW MINIDISC PLAYER**  
MDX-U1RDS

**SONY®**



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### Features

#### General

- Switchable two color illumination (amber and green).
- **Telephone-mute function** for decreasing the volume automatically with a telephone call.
- **Detachable-front panel** enables you to take the front panel away with you when you leave your car.
- **Caution alarm** will be activated if you turn off the ignition key without removing the front panel from the unit.
- **Digital calendar clock** with the month, date and time display.
- LCD with dot elements for a clear display.
- **DIGITAL IN jack** for connecting CD changer(s) equipped with digital outputs which is(are) compatible with the Sony UNILINK system.

#### MiniDisc Player Section

- **Title Function\*** for displaying the disc and track titles while playing a MiniDisc.
- **4 Mbit Shock Resistant Memory** for preventing sound skipping.
- **1 bit DAC** (Digital-to-Analog Converter) for a clear sound reproduction.
- **Shuffle play** function for playing tracks in random order.
- **Repeat play** function for playing a track or a MiniDisc repeatedly.
- **Intro scan** function for playing the first 10 seconds of each track.

\* Only with the MiniDiscs whose titles are prerecorded. Some prerecorded MiniDiscs may not have been electronically labeled, therefore such MiniDiscs cannot have the titles displayed.

#### Tuner section

- Provided with a **FM diversity reception system** for a better radio reception.
- Up to 24 stations can be preset, 18 stations on FM and 6 stations on AM.
- **BTM (Best Tuning Memory) function** automatically selects and stores the stations with strong signals on the preset number buttons in the order of frequency.
- **Station memo** function for displaying the name of each radio station.

#### CD changer control section

- (when the optional Sony CD changers are connected)
- Several CD changers can be connected and controlled by the use of the Sony source selector (not supplied) with the unit.
  - CD changer(s) equipped with digital outputs can be connected.
  - **Intro scan** function for playing the first 10 seconds of each track on every disc.
  - **Repeat play** function for playing a track, a disc or a changer repeatedly.
  - **Shuffle play** function for playing tracks in random order.
  - **Custom file** function for displaying the title of each disc and setting the PLAY/SKIP mode on each track.

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## SECTION 1 GENERAL

### 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 may 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 detach the front panel before you start installing the unit.
- The unit is equipped with a cooling fan at the back. Make sure that its air vent is not covered when installing.

**Mounting angle adjustment**  
Adjust the mounting angle to less than 20°.

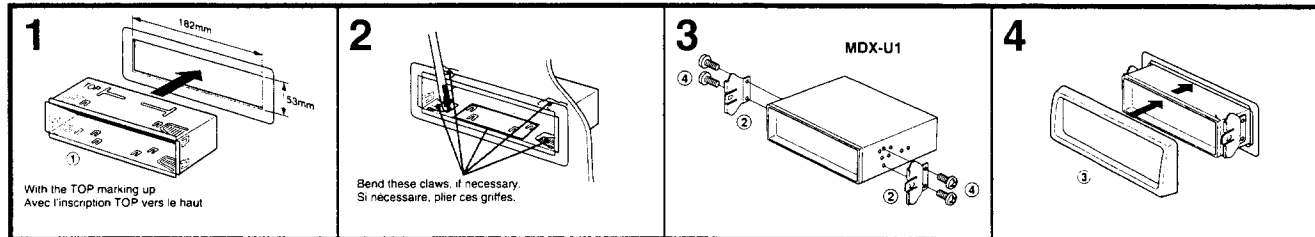
#### Précautions

- Choisir soigneusement l'emplacement du montage, de manière que l'appareil ne gêne pas les mouvements du conducteur.
- Éviter d'installer l'appareil dans un endroit où il serait soumis à des températures élevées, comme en plein soleil ou à proximité d'une bouche d'air chaud, ou dans un endroit où il serait exposé à de la poussière, de la saleté ou des vibrations violentes.
- Pour garantir un montage sûr, n'utiliser que le matériel fourni.
- Veiller à détacher le panneau avant d'installer l'appareil.
- L'appareil est équipé d'un ventilateur de refroidissement à l'arrière. S'assurer que les fentes d'aération ne sont pas recouvertes au moment de l'installation.

**Réglage de l'angle de montage**  
Ajuster l'inclinaison à un angle inférieur à 20°.

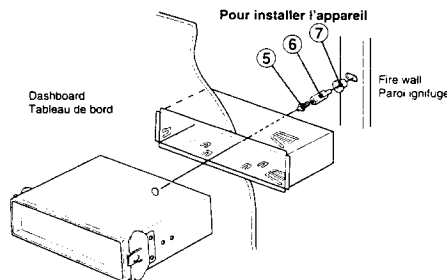
#### Mounting Example

Installation in the dashboard



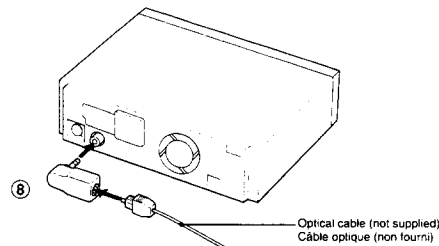
Encastrement dans le tableau de bord

To support the unit



#### Adaptor for Sony Digital UNILINK System

Use the supplied adaptor (8) when connecting a CD changer which is compatible with the Sony digital UNILINK system. Connect the optical cable of the CD changer to the adaptor (8), and plug it into the jack on the back of the unit as illustrated.

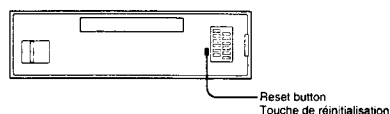


#### Adaptateur pour le système numérique UNILINK de Sony

Utiliser l'adaptateur fourni (8) pour raccorder un changeur CD compatible avec le système numérique UNILINK de Sony. Raccorder le câble optique du changeur de CD à l'adaptateur (8), et brancher celui-ci sur la prise située à l'arrière de l'appareil, comme illustré.

#### Reset Button

When the installation and connections are over, be sure to press the reset button with a ball-point pen etc. The reset button is located on the left of the connector on the unit side when the front panel is detached.



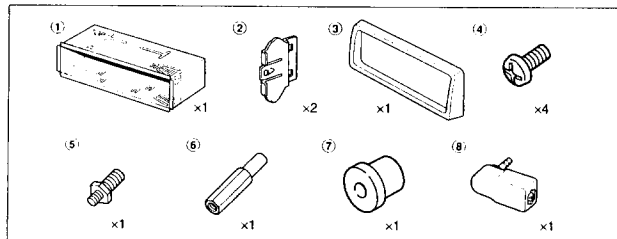
#### Touche de réinitialisation

Lorsque l'installation et les connexions sont terminées, ne pas oublier d'actionner la touche de réinitialisation avec un stylo-bille, ou un objet similaire. Cette touche se trouve à gauche du connecteur sur le côté de l'appareil lorsque le panneau avant est détaché.

**Supplied Mounting Hardware**  
**Matériel de montage fourni**

The numbers in the list are keyed to those in the instructions.

Les numéros de la liste correspondent à ceux mentionnés dans les procédures.



## 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.

### Switches Requiring the Initial Settings

#### When the Unit is Used in a Car with No Accessory Position on the Ignition Key — 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, then press the reset button. The illumination is reset to stay off while the unit is not being played.

#### Note

The caution alarm for the front panel is not activated when the POWER SELECT switch is set to the OFF position.

#### When an FM Diversity Antenna is Used — FM DIVERSITY switch

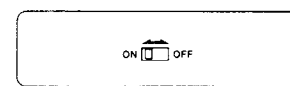
This unit can be connected with diversity antennas. If you use this unit with the diversity antennas, set the FM DIVERSITY switch located at the bottom of the unit to the ON position to activate the diversity system.

#### When you do not use the FM diversity antennas

If you wish to connect a conventional rod antenna, be sure to connect it to the antenna connector of the unit marked "MAIN", and set the FM DIVERSITY switch to the OFF position. Never connect the antenna to the connector marked "SUB", otherwise if the FM DIVERSITY switch is set to the ON position, the radio signals may not be received properly.

#### Note

The radio reception will be disturbed by noise if the connection of the antennas was not made properly or the FM DIVERSITY switch was not set correctly.



Use a jeweler's screwdriver etc. to change the positions of the switches.

### Précautions

- Cet appareil est conçu pour fonctionner exclusivement sur courant continu de 12 V avec masse négative.
- Avant de procéder aux connexions, débrancher la borne de mise à la masse de la batterie du véhicule pour éviter tout court-circuit.
- Brancher le fil d'entrée d'alimentation rouge uniquement après que tous les autres fils ont été connectés. En outre, veiller à le raccorder à la borne d'alimentation positive de 12 V qui est alimentée quand la clé de contact est commutée sur la position accessoire.
- Rassembler tous les fils de mise à la masse en un point de masse commun.

### Interrupteurs nécessitant des réglages initiaux

#### Quand l'appareil est utilisé dans une voiture dont la clé de contact ne possède pas de position accessoire — Interrupteur POWER SELECT

L'éclairage du panneau avant est réglé en usine de façon à s'allumer même quand l'appareil ne fonctionne pas. Cependant, ce réglage risque d'épuiser la batterie si l'appareil est utilisé dans une voiture dont la clé de contact ne possède pas de position accessoire.

Pour éviter ce désagrement, commutateur l'Interrupteur POWER SELECT se trouvant sur le fond de l'appareil sur OFF, puis appuyer sur la touche de réinitialisation. L'éclairage est réinitialisé pour rester éteint quand l'appareil n'est pas utilisé.

#### Remarque

Quand l'Interrupteur POWER SELECT est commuté sur OFF, l'avertisseur du panneau avant ne fonctionne pas.

#### Quand une antenne à rayonnement zénithal réduit est utilisée — Interrupteur FM DIVERSITY

Cet appareil accepte le branchement d'antennes à rayonnement zénithal réduit. Pour pouvoir utiliser l'appareil avec ce type d'antenne, commutateur l'Interrupteur FM DIVERSITY situé sur le socle de l'appareil sur ON, afin d'activer le système de diversité.

#### Quand on n'utilise pas d'antenne à rayonnement zénithal réduit

Pour brancher une antenne conventionnelle, veiller à raccorder celle-ci au connecteur d'antenne de l'appareil, marqué "MAIN" et commutateur l'Interrupteur FM DIVERSITY sur OFF. Ne jamais raccorder l'antenne au connecteur marqué "SUB", sinon, si l'Interrupteur FM DIVERSITY est commuté sur ON, les signaux radiodiffusés seront mal reçus.

#### Remarque

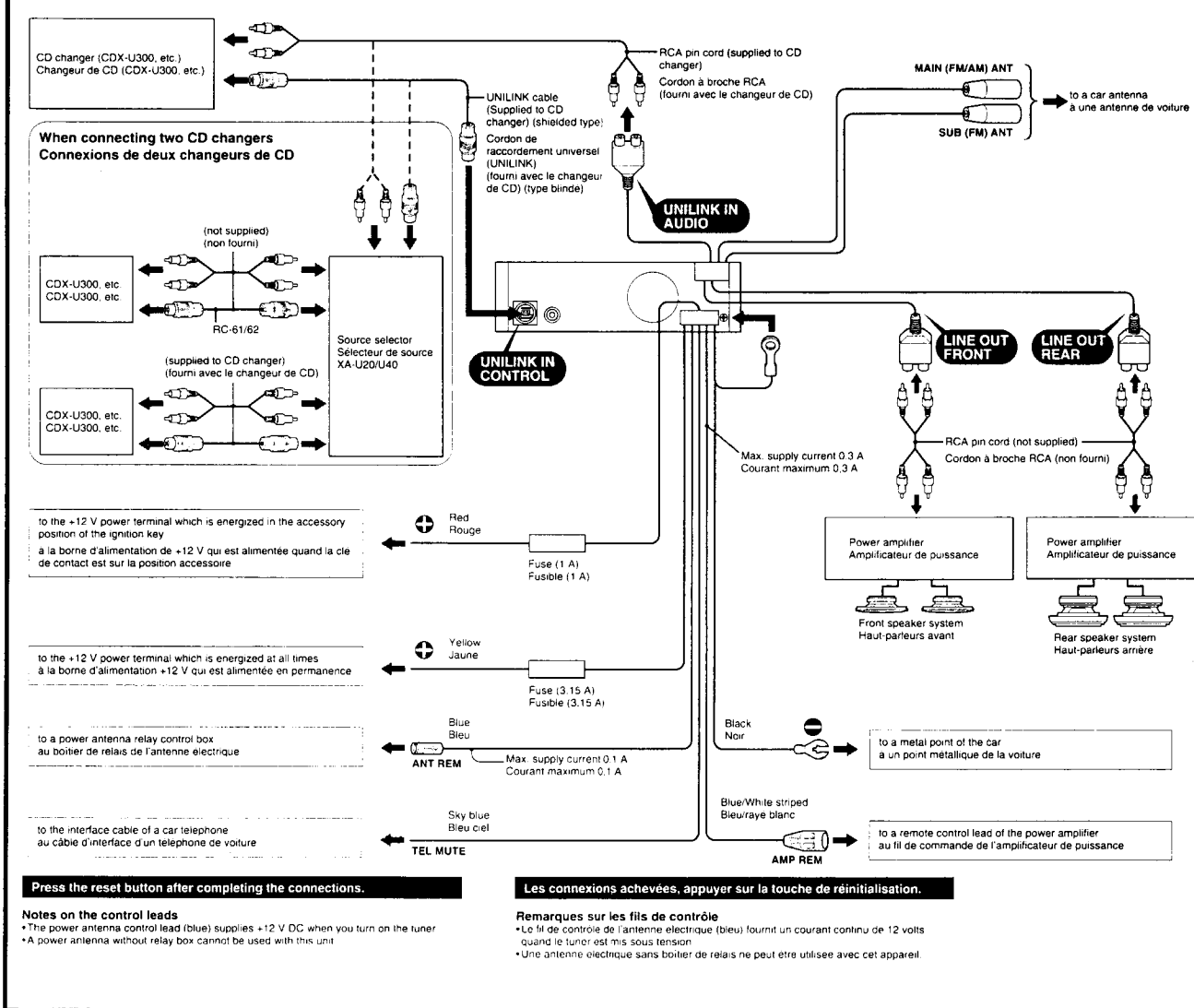
La réception radio risque d'être parasitée si le raccordement des antennes a été mal réalisé ou si l'Interrupteur FM DIVERSITY n'est pas correctement réglé.



Utiliser un tournevis de joaillier, ou un objet similaire, pour changer la position des interrupteurs.

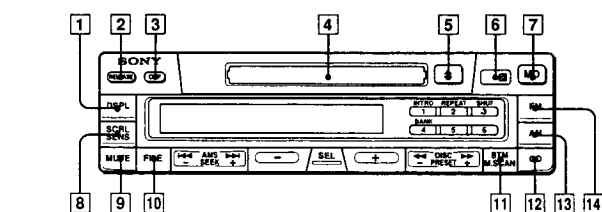
### Connections of Example 1

### Connexions de l'exemple 1



## Location and Function of Controls

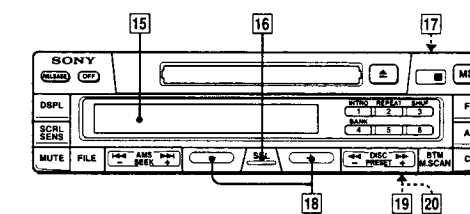
### Main Unit



Refer to the pages in ● for details.

- 1 DSPL (date/time set + display mode change) button ①②③④⑤⑥⑦⑧⑨⑩⑪⑫⑬⑭⑮⑯⑰⑱⑲⑳㉑㉒㉓㉔㉕㉖㉗㉘㉙㉚㉛㉜㉝㉞㉟㊱㊲㊳㊴㊵㊶㊷㊸㊹㊺㊻㊼㊽㊾㊿
  - 2 RELEASE (front panel release) button ㉞
  - 3 OFF (power off) button ㉟
  - 4 MiniDisc compartment ㊱
  - 5 Eject button ㊲
  - 6 Infrared receptor for the remote commander
  - 7 MD (MiniDisc play) button ㊳
  - 8 SCRL/SENS (Scroll/Sensitivity) button ㊴㊵
  - 9 MUTE button ㊶
  - 10 MUTE button ㊷
  - 11 BTM/M.SCAN (Best Tuning Memory/Memory Scan) button ㊸㊹㊺㊻㊼㊽㊾㊿
  - 12 CD (disc play/CD changer select) button\* ㊱㊲
  - 13 AM (radio on) button ㊳
  - 14 FM (radio on + FM1/FM2/FM3 band select) button ㊴
- \* When the CD changer(s) is(are) connected.
- Press to mute the sound. Press again to restore the volume to the previous level. The function of this button will also be canceled when the ㊶ button is pressed.

### Location and Function of Controls

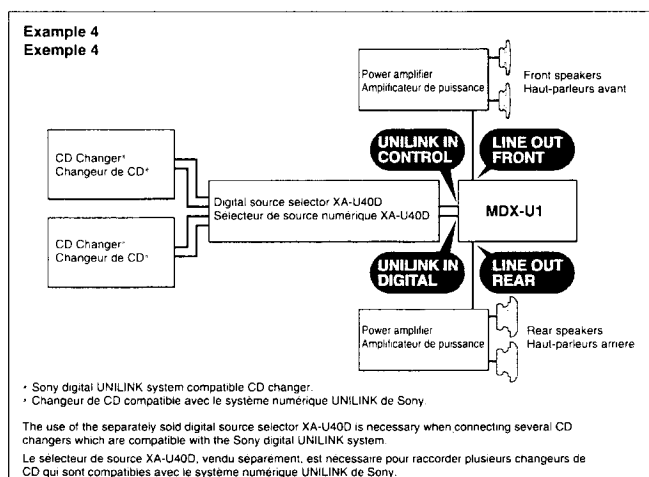
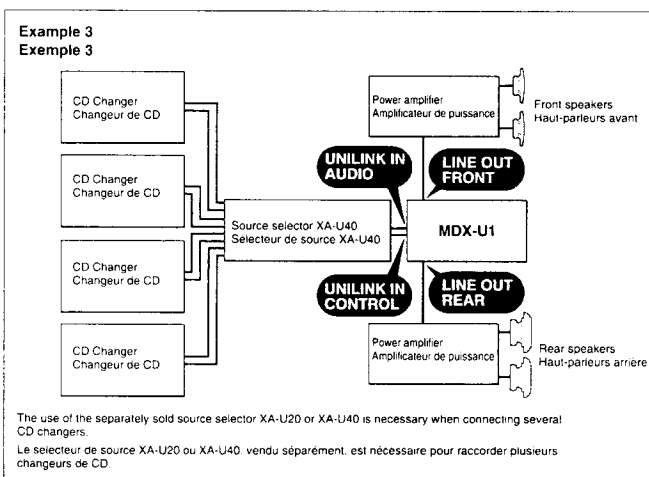
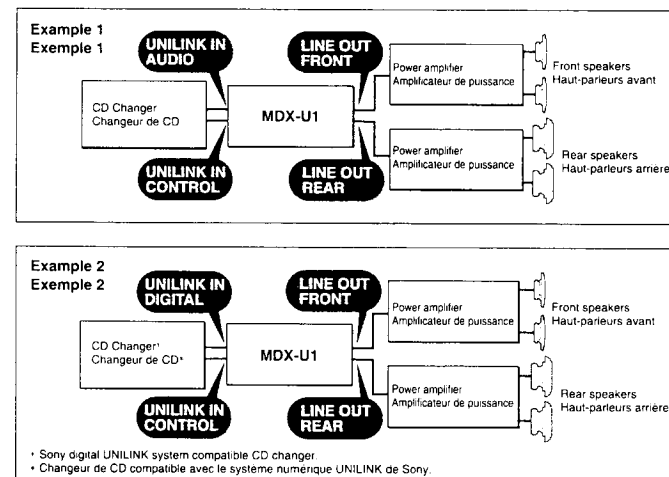


### Connection Diagrams

### Schémas de connexion

- You can only connect the CD changer(s) which are compatible with the Sony UNILINK system.
- When you are connecting the Sony Mobile ES series CD changer XES-C1, you cannot connect it through the UNILINK IN AUDIO terminals of this unit. In this case, use the Sony digital UNILINK system connection featuring optical fiber cables.

- Seuls les changeurs de CD compatibles avec le système UNILINK de Sony peuvent être raccordés.
- Dans le cas du changeur de CD XES-C1 de la série Mobile ES de Sony, il ne peut pas être raccordé par les bornes UNILINK IN AUDIO de cet appareil. Utilisez des câbles en fibres optiques pour la connexion du système numérique UNILINK.



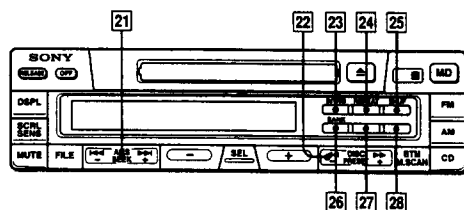
Display window	Control mode	Press -	Press +
BAS	Bass control	For less bass	For more bass
TRE	Treble control	For less treble	For more treble
BAL	Balance control	To decrease the right-speakers' volume	To decrease the left-speakers' volume
FAD	Fader control	To decrease the rear-speakers' volume	To decrease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

17 Reset button (located on the left of the connector on the unit side when the front panel is detached)  
 Press this button with a ball-point pen etc. when the buttons of this unit do not function.

18 ㊶ ㊷ (volume/bass/treble/balance/fader/character select) buttons  
 These buttons normally function as the volume control. To adjust other modes, press the ㊶ or ㊷ button within three seconds after selecting the desired mode with the SEL button. The control mode automatically goes back to the volume control mode in three seconds.

19 POWER SELECT switch (located on the bottom of the unit)  
 See "POWER SELECT switch" in the Installation/Connections manual.

20 FM DIVERSITY switch (located on the bottom of the unit)  
 See "FM DIVERSITY switch" in the Installation/Connections manual.



During MiniDisc/CD play	During radio reception
21 AMS (Automatic Music Sensor) button ②③	SEEK (automatic tuning) button ②③
22 DISC (manual search/disc search*) button ②③④	PRESET (preset search/manual tuning) button ②③④
23 INTRO (intro scan) button ②③	Preset number buttons ②③
24 REPEAT (repeat play) button ②③	
25 SHUF (shuffle play) button ②③	
26 BANK button* ②	
27 -	
28 -	

\* Only when the optional CD changer(s) is(are) connected.

#### Changing the illumination color of the control buttons

Press the **INTRO** button while pressing the SEL button.

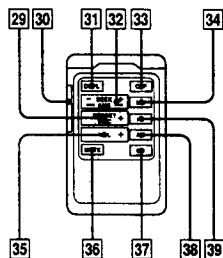
#### Muting the beep tone

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

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### Location and Function of Controls

#### Remote Commander



#### Buttons of the same function as those on the main unit

During MiniDisc/CD play	During radio reception
32 AMS (automatic music sensor) button ②③	32 SEEK (automatic tuning) button ②③

- 33 OFF button
- 34 MD (MiniDisc play) button ①
- 35 MUTE button
- 37 CD (disc play/CD changer select) button ②③
- 38 AM (radio on) button ①
- 39 FM (radio on • FM1/FM2/FM3 band select) button ①

#### Different function buttons

During MiniDisc/CD play	During radio reception
29 DISC (manual search*/disc search) button ②③	29 PRESET (preset search) button** ②

- \* You cannot do the manual search during CD play.
- \*\* You cannot do the manual tuning with the remote commander.

- 30 M.I.L.L (memory illumination) switch  
To illuminate the buttons on the remote commander, slide down this switch. The illumination will go off automatically after approximately 15 seconds.
- 31 DSPL (display mode change) button ②③④⑤
- 33 VOL (volume control) button

When the POWER SELECT switch is set to the OFF position, the unit cannot be operated with the remote commander unless one of the MD, FM, AM or CD buttons on the unit is pressed or a MiniDisc is inserted to activate the unit first.

#### Installing the Batteries



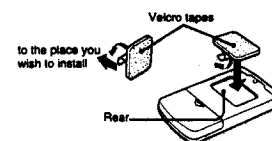
**Battery life**  
When the batteries become weak, you will not be able to operate the unit with the remote commander. Battery life is approx. six months although it depends on the way of use.

#### Notes on batteries

- To avoid damage from battery leakage and corrosion:
  - insert the batteries with correct polarity
  - do not use an old battery with a new one, or different types of batteries together
  - remove the batteries when you do not use the unit for a long period of time
  - do not charge the batteries.

If any battery leakage occurs, replace the batteries with new ones after cleaning the battery compartment.

#### Installing the Supplied Remote Commander



Install the remote commander with velcro tape in a desired place.

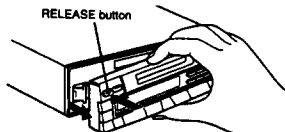
#### Notes

- Do not install or leave the remote commander in a location near any heat sources, or in a place subject to direct sunlight (especially on the dashboard in summer etc.).
- When you park the car in direct sunlight, detach the remote commander and place it in a location not subject to direct sunlight such as the glove-box.
- Before installing the remote commander, be sure to confirm whether you can remote control the unit from the place you intend to install.
- Before attaching the velcro tape, clean the surface.

## Detaching and Attaching the Front Panel

### Detaching the Front Panel

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

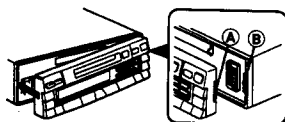


Be sure not to drop the front panel when detaching it from the unit.

**Note**  
The display window may become warm while the unit is operated, however, this is not a sign of a malfunction.

### Attaching the Front Panel

Apply the right hand side of the front panel to the unit by attaching the part ④ of the front panel to the part ⑤ of the unit as illustrated and push until it clicks.



Do not press hard or give excessive pressure to the display window of the front panel.

#### Caution alarm

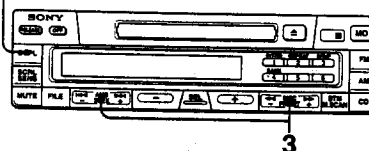
If you turn the ignition key to the OFF position without removing the front panel, the caution alarm will be activated and a beep tone will be heard for a few seconds (only when the POWER SELECT switch is set to the ON position).

#### 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 to the unit. It can be easily attached by pressing it lightly against the unit.
- Never leave the detached front panel in your car if it is parked in direct sunlight as there could be a considerable rise in temperature inside the car.
- When you carry the front panel with you, put it in the supplied front panel case.

## Setting the Calendar Clock

2,3,4



The clock section has a 12-hour digital indication.

### How to Set the Time

For example, set it to 10:08 A.M.

**1** Turn the ignition key to the ON position.

**2** Press the DSPL button if the clock indication does not come on.



JAN 1 1:00

**3** Press the DSPL button for more than two seconds.



-AM 1:00-

While holding down the DSPL button

Press to set the hour digits  
(to go back) (to go forward)

-AM 10:00-

Press to set the minute digits  
(to go back) (to go forward)

-AM 10:08-

**4** The calendar clock will start activating when you take your finger off the DSPL button.

JAN 1 10:08

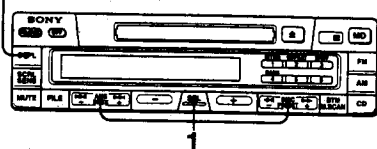
#### Notes

- You cannot set the calendar clock with the supplied remote commander.
- If the POWER SELECT switch of the unit is set to the OFF position, the calendar clock cannot be set unless the power is turned on. Set the calendar clock after you turn on the radio, start CD play, or MiniDisc play.

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## Setting the Calendar Clock

1,2



### How to Set the Date

For example, set it to July 17.

**1** While holding down the DSPL button for more than two seconds as described in step 3 of "How to Set the Time", press the SEL button.



-JAN 1-10:08

While holding down the DSPL button

Press to set the month.  
(to go back) (to go forward)

-JUL 1-10:08

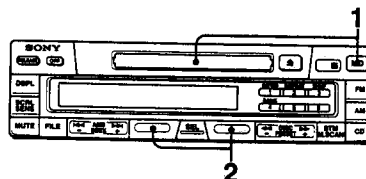
Press to set the day.  
(to go back) (to go forward)

-JUL 17-10:08

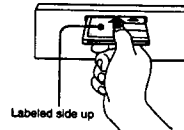
**2** The calendar clock will start activating when you take your finger off the DSPL button.

JUL 17 10:08

## Playing a MiniDisc



**1** Insert a MiniDisc to start playback.

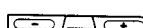


The MiniDisc will be loaded and the title of the MiniDisc\* will be displayed on the display window momentarily then playback will start from the first track with its title being displayed.

If a MiniDisc is already inserted, press the MD button.

After the title of the MiniDisc has been displayed, the title of the currently played track\* will be displayed. If the title is too long (more than 12 characters)\*\* it will be scrolled across the display window.

**2** Adjust the volume with the or button.



When the last track on the MiniDisc is over  
The track number indication will return to "1" and the playback will restart from the first track of the MiniDisc.

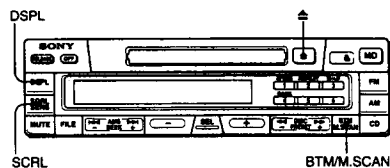
#### Notes

- If a MiniDisc is already loaded in the unit, never try to insert another MiniDisc. Doing so may damage the unit.
- Do not insert a MiniDisc with its labeled side down.
- Only if these titles are prerecorded on the MiniDisc.
- \*\*However, if the title contains more than 32 characters (including blank spaces), only up to the 32nd character will be displayed.

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## Playing a MiniDisc



### Ejecting the MiniDisc

Press the (eject) button.

### To get the calendar clock display during MiniDisc play

Press the DSPL button until the calendar clock display appears.

### To manually get the title of the currently played MiniDisc or the track displayed

Press the DSPL button until the desired display appears on the display window.



If the currently played MiniDisc is not prerecorded with these data, the display will not change.

If the title is too long, you can have it scrolled\* across the display window by pressing the SCRL button.



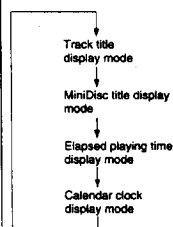
### To get the date of the recording of the currently played MiniDisc

Press the BTM/M.SCAN button while playing back a MiniDisc. The date of recording will be displayed for approx. three seconds.



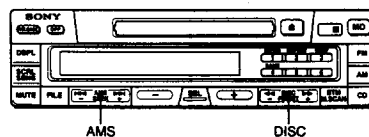
This function will work only if the date of recording is registered on the MiniDisc.

Every time the DSPL button is pressed during playback, the display mode of the unit changes cyclically as follows:



\* Up to 32 characters only.

## Locating a Desired Track or Part of a Track



You can use this function to quickly locate your desired track or a part of a track.

### Locating the Beginning of a Track

#### — AMS function

Press the AMS button while playing a MiniDisc.

To listen to the current track again from the beginning →

If the button is kept pressed, the beginnings of the previous tracks will be located.

To listen to the next track from the beginning →

If the button is kept pressed, the beginnings of the succeeding tracks will be located.

### Searching for a Desired Part of a Track

#### — Manual Search

Keep the DISC button pressed while playing a MiniDisc.

To fast reverse →

To fast forward →

The elapsed playing time of the track will be displayed on the display window during the manual search.

#### Note

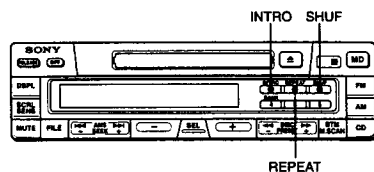
When you keep pressing the AMS button and come to either the beginning or end of a MiniDisc, you will not be able to go any further.

#### Note

If the DISC button is kept pressed and the end of the MiniDisc has been reached, "FM" will appear on the display window. Likewise if the beginning of the MiniDisc has been reached, "LL LL" will appear on the display window.

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## Playing in Other Modes



### Playing the Tracks Randomly

#### — Shuffle Play Function

Press the button to get the "SHUF 1" indication while playing the MiniDisc. Every track on the MiniDisc will be played randomly once. To cancel the mode, press the button again.

### Playing a MiniDisc Repeatedly

#### — Repeat Play Function

Press the button to get the "REP 1" indication while playing the MiniDisc. When the currently played track is over, that track will be played again from the beginning. To cancel the mode, press the button again.

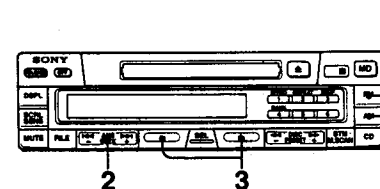
### Searching for a Desired Track by Listening to the First 10 seconds of Each Track — Intro Scan Function\*

Press the button to get the "INTRO" indication while playing the MiniDisc. The first 10 seconds of every track on that MiniDisc will be played in order. To cancel the mode, press the button again.

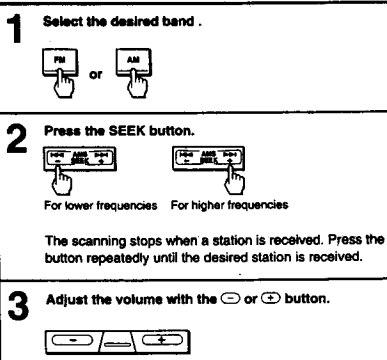
\* If the INTRO button is pressed while the unit is in the shuffle play mode, the first 10 seconds of every track will be played randomly.

## Searching for the Stations Automatically

### — Automatic Tuning



If you do not know the frequency of the station you wish to tune in, it is useful to use the Automatic Tuning function.

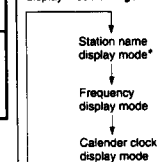


While receiving FM broadcasting

FM1 87.9

The "ST" indication will appear when an FM stereo program with sufficient signal strength is tuned in. The program will be received in stereo.

Getting the calendar clock indication while listening to the radio. Press the DSPL button. Each time you press the button, the display mode changes as follows:



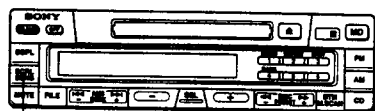
\* Refer to page 26 for the station name display mode.

16

17



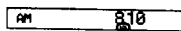
## Searching for the Stations Automatically



SENS

### Avoiding the Automatic Tuning from Stopping on Stations Too Frequently — Local Seek Mode

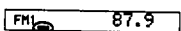
Press the **SENS** button lightly to get the "LCL" indication.



The mode changes to the local seek mode where only the stations with relatively strong signals are tuned in. It functions only when the Automatic Tuning is in operation.

### If FM Stereo Broadcasting is Difficult to Receive — Monaural Mode

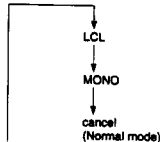
Press the **SCN** button lightly to get the "MONO" indication.



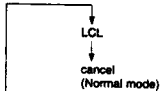
The sound will improve, but it will become monaural.

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

While receiving FM broadcasting

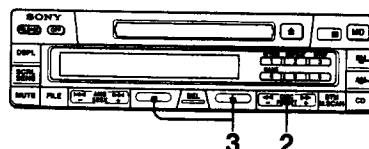


While receiving AM broadcasting



## Tuning in by Adjusting the Frequency

— Manual Tuning



Use the Manual Tuning if you know the frequency of the desired station.

- Select the desired band.**
- Press the PRESET button for more than 0.5 second.**  

For lower frequencies      For higher frequencies

To change the frequency rapidly, keep the button pressed.
- Adjust the volume with the or button.**

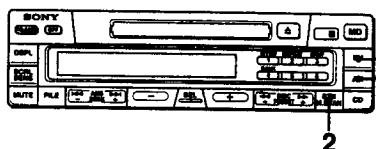
**Note**  
You cannot use the Manual Tuning with the remote commander.

**PREVENTING ACCIDENTS!**  
While you are driving, the use of the Automatic Tuning and the BTM function is recommended in favor of the Manual Tuning.

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## Memorizing the Stations Automatically

— BTM (Best Tuning Memory) Function



2

Clearer receiving stations are automatically searched and memorized on each band (FM1, FM2, FM3 and AM). Up to 6 stations on each band can be stored on the preset number buttons 1 to 6 in order of frequency.

- Select the desired band.**
- Keep the BTM button pressed for more than two seconds.**

The receivable frequencies of FM1, FM2 and FM3 are the same. Therefore, 18 stations can be memorized on FM.

### The BTM function — how this function operates

This function starts by searching stations from the lowest frequency of the currently tuned in band. When a station is located, 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 FM1 band was selected, it will continue until the preset number button 6 on the FM3 band is occupied. When all the preset number buttons are occupied with the memories before the highest receivable frequency is searched, the unit will start searching for 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 a 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 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 order of frequency.

**Notes**

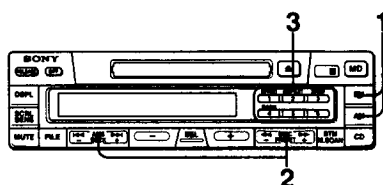
- There may be cases where there are not enough receivable stations due to the lack of stations in the vicinity or weak broadcasting signals. In such cases, the BTM operation may stop without all the buttons being occupied with memories.
- If you start the BTM operation from the FM1 band, it will continue to store stations in the memory on the FM3 band. Care must be taken if you wish to keep the stored stations on the FM3 band.
- If you start the BTM operation from the FM3 band, it will stop when all the memories on the FM3 band are occupied. It will not continue to the FM1 band.

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## Memorizing Only the Desired Stations



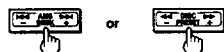
Up to 6 stations on each band (FM1, FM2, FM3 and AM) can be stored in the memory in order of your choice.

For example, store a station on the preset number button 1.

### 1 Select the desired band.



### 2 Tune in to the station which you wish to store on the preset number button (page 17 or 19).



### 3 Keep the preset number button pressed for about two seconds until the "MEM" indication comes on the display window.

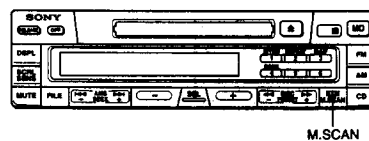


FM1 87.9

The number of the preset number button of which you are pressing now comes on the display window. When the "MEM" indication comes on, the station is stored in the memory and the operation is now completed. The "MEM" indication goes off after a while.

Repeat the same procedure to store other stations.

Only one station per band (FM1, FM2, FM3 and AM) can be stored in the memory on each preset number button. If you try to store another station on the same preset number button, the previously stored station will be erased.



M.SCAN

## Checking All the Memorized Stations in Order — Memory scan

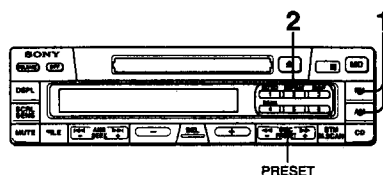


Press lightly.

The tuner will receive in order, all the stations stored in the memory for five seconds each.

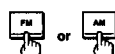
22

## Receiving Stations Stored in the Memory

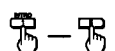


PRESET

### 1 Select the desired band.



### 2 Press the preset number button lightly on which the desired station is to be stored.



## Receiving in Order the Stations Stored in the Memory — Preset Search Function



(Press lightly.)

The number will advance in the following order:

1 → 2 → 3 → 4 → 5 → 6 → 1 → ...  
(number of the preset number buttons)



(Press lightly.)

The number will reverse in the following order:

1 → 6 → 5 → 4 → 3 → 2 → 1 → ...

### Notes

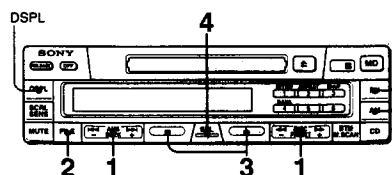
- There may be cases where even the stations which are stored in the memory cannot be received due to weak signals in the vicinity of your car.
- If you keep the preset number button pressed for more than two seconds, the currently received station will be memorized. To receive the previously memorized station, make sure that the preset number button is pressed lightly.

### Note

Make sure that you press the PRESET button lightly. If you keep it pressed for more than 0.5 second, the unit will enter the Manual Tuning mode.

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## Displaying the Name of Each Station — Station Memo Function



You can store the names of radio stations in the memory of tuner. The name of station can be displayed on the display window while it is tuned in.

## Storing the Station Names in the Memory of the Tuner

### 1 Tune in to a station whose name you wish to register.

### 2 Press the FILE button for more than two seconds to enter the name edit mode.



FM1

### 3 Press either the ◀ or ▶ button to select the desired characters.

FM1

Each time you press the ◀ or ▶ button, characters will come on in the following order:

→ A → B → C → ... → X → Y → Z → 0 → 1 → 2 → 3 → ...

→ \_ → . → { → } → / → - → + → \* → # → ...

### 4 Press the SEL button after locating the desired character.



FM1

The flashing part will move to the next space on the right. Repeat steps 3 and 4 to enter the entire name. Up to eight characters only can be used per name.

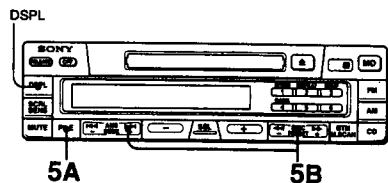
### Notes

- If you press the SEL button when the eighth character (farthest right character) is flashing, the flashing part goes back to the first character (farthest left character).
- If you wish to put a blank space after a character, select " " (under-bar).

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## Displaying the Name of Each Station



**5** To register the name, use one of the following two methods.

**A** Press the FILE button for more than two seconds.  
The unit will go back to the normal mode.

**B** Tune in to another station by pressing the SEEK or MANU button and repeat the procedures.  
You can also change the band and repeat the process.

### Notes

- If you turn off the tuner before you complete this procedure, the name you have just entered will not be registered.
- You can store up to 40 names, but if you try to enter more, the "MEMORY FULL" indication will come on the display window and you will not be able to register them. You can register more names after erasing some of the existing names.

## Displaying the Station Names

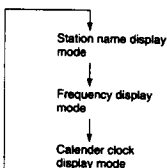
While listening to the radio, press the DSPL button to enter the name display mode.



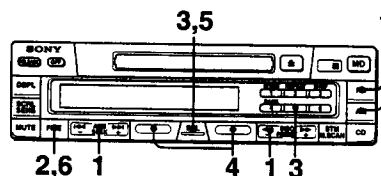
FM1 WRKISS

If the name of the station is not registered, "-----" will come on the display window.

Each time you press the DSPL button while listening to the radio, the display mode changes cyclically as follows:



## Editing the Registered Station Names



### Erasing the Station Names

**1** Turn the radio on and tune in to any station.

**2** Press the preset FILE button for more than two seconds to enter the name edit mode.



The currently received station will come on the display window.

**3** Press the preset number button 5 while pressing the SEL button.



**4** Press either the  $\square$  or  $\square$  button to search the names you wish to erase.

The station names stored in the memory of the tuner will come on the display window in the same order as they were registered.

**5** Press the SEL button for more than two seconds to erase the displayed name.



Repeat steps 4 and 5 to erase the other station names.

**6** Press the FILE button for more than two seconds.



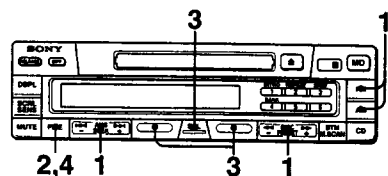
The unit will go back to the normal mode.

The alternative method to erase the name in the step 3 of "Changing the Station Names" (page 28), put the eight under-bars ("-----"), then press the FILE button for more than two seconds. The displayed station name will be erased.

• If you have erased some of the titles before, they will not come on in the same order as they were registered.

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## Editing the Registered Station Names



### Changing the Station Names

**1** Tune in to the station whose name you wish to change.

**2** Press the FILE button for more than two seconds to enter the name edit mode.



The currently received station will come on the display window.

**3** Press the SEL button to make the part you wish to edit flashing. Select the characters using the  $\square$  or  $\square$  button.



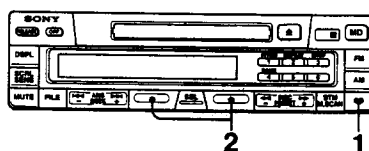
If you wish to change the names of other stations, repeat steps 1 to 3 on the stations after tuning in to them with the SEEK or MANU button.

**4** Press the FILE button for more than two seconds. The new station names are registered.



## Listening to the CD Play

— When Optional Sony CD Changers are Connected



**1** Press the CD button.



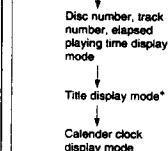
CD changer number    Track number  
CD play will start.    Disc number    Elapsed playing time

**2** Adjust the volume with the  $\square$  or  $\square$  button.



If it is set in the normal playing mode, after the end of a disc, the disc with the next number shown will be automatically played. If two or more CD changers are connected, after the end of the last disc, the first disc in the CD changer with the next number shown will be played. The order of the CD play can be rearranged by changing the playing modes. For details, see "Playing in Other Modes." (page 33)

Getting the calendar clock display while listening to a CD Press the DSPL button. Each time you press the button, the display mode will change cyclically as follows:



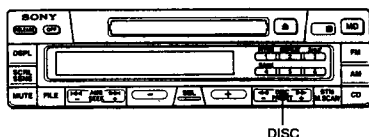
\* It is necessary to put titles onto the discs in advance. See pages 36 and 37 for details.

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29

## Locating a Desired Disc, Track or Part of a



DISC

You can use this function to quickly locate your desired disc, track or part of the track.

### Searching Your Desired Discs in Turn — Disc Search

Press the DISC button lightly during CD play.

To search previous disc numbers →



To search the disc numbers ahead →



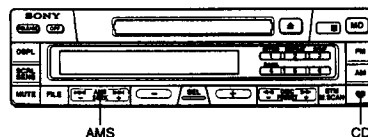
You can search a disc by displaying the titles of the discs registered with the Custom File Function. For details, see page 36.

#### Note

Make sure that you press the DISC button lightly. If you keep it pressed, the unit will enter the Manual Search mode.

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## Track



AMS

CD

### Listening to the Discs in Another CD Changer (when two or more CD changers are connected)

Press the CD button during CD play.



The CD changer number changes.

### Locating the Beginning of a Track — AMS Function

Press the AMS button during CD play.

To listen to the current track again from the beginning →



If the button is kept pressed, the beginnings of the previous tracks will be located.

To listen to the next track from the beginning →



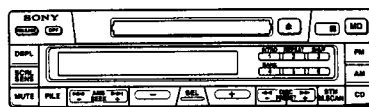
If the button is kept pressed, the beginnings of the succeeding tracks will be located.

#### Note

When you keep pressing the AMS button and come to either the beginning or end of a disc, you will not be able to go any further.

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## Locating a Desired Disc, Track or Part of a Track

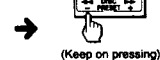


DISC

### Searching for a Desired Part of Track — Manual Search

Keep the DISC button pressed during CD play.

To go back →



(Keep on pressing)

To go ahead →



(Keep on pressing)

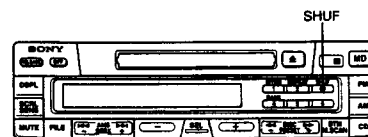
The elapsed playing time of the track will be displayed on the display window during the manual search.

#### Note

You cannot use the Manual Search with the remote commander.

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## Playing in Other Modes



SHUF

### Playing the Discs Randomly — Shuffle Play Functions

#### Playing the tracks on the currently selected disc randomly — Disc shuffle play

Press the button to get the "SHUF 1" indication during CD play.

When all the tracks on a disc have been played, it goes on to the next disc.

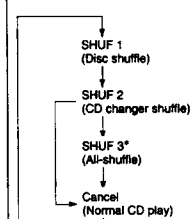
#### Playing every track on every disc in the currently selected CD changer randomly — CD changer shuffle play

Press the button to get the "SHUF 2" indication during CD play.

#### Playing every track on every disc in all CD changers connected randomly — All shuffle play (when two or more CD changers are connected)

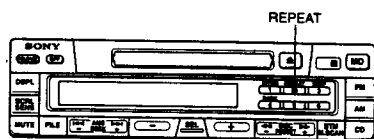
Press the button to get the "SHUF 3" indication during CD play.

The function of the SHUF button changes cyclically as follows:



\* All-shuffle play (SHUF 3) mode functions only when two or more changers are connected to the unit. When only one changer is connected, the "SHUF 3" indication will not be displayed. In this case, if you press the SHUF button again while the "SHUF 2" indication is being displayed, the shuffle play will be canceled.

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## Playing a Disc Repeatedly

### — Repeat Play Functions

#### Playing the currently selected track repeatedly — Track repeat

Press the **REPEAT** button to get the "REP 1" indication during CD play.

When the track is over, the CD play will be repeated from the beginning of that track.

#### Playing the currently selected disc repeatedly — Disc repeat

Press the **REPEAT** button to get the "REP 2" indication during CD play.

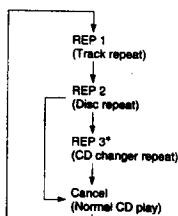
When the last track of the currently selected disc is over, the CD play will be repeated from the beginning of that disc.

#### Playing the discs in the currently selected CD changer repeatedly — CD changer repeat (when two or more CD changers are connected)

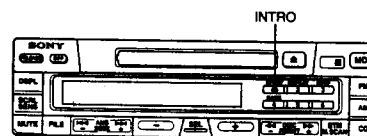
Press the **REPEAT** button to get the "REP 3" indication during CD play.

When the last disc of the currently selected CD changer is over, the CD play will be repeated from the first disc in the currently selected CD changer.

The function of the REPEAT button changes cyclically as follows:



\*CD changer repeat (REP 3) mode functions only when two or more changers are connected to the unit. When only one changer is connected, the "REP 3" indication will not be displayed. In this case, if you press the REPEAT button again while the "REP 2" indication is being displayed, the repeat play will be canceled.



## Searching for a Desired Track by Listening to the First 10 Seconds of Each Track

### — Intro Scan Function\*

Press the **INTRO** button during CD play.

The first 10 seconds of all the tracks on the currently selected disc will be played in order.

When the first 10 seconds of the last track on a disc is played, it will move on to the next disc.

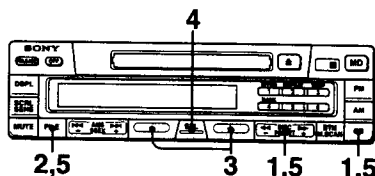
When the first 10 seconds of the last disc in the first CD changer has been played, the first disc in the next CD changer will be played (only when two or more CD changers are connected).

\*If the INTRO button is pressed while the unit is in the shuffle play mode, the first 10 seconds of every track will be played randomly.

When you find the desired track Press the INTRO button once more. The intro scan function will be canceled and you can continue to listen to the track.

## Displaying the Title of Each Disc

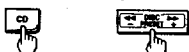
### — Disc Memo Function



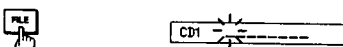
You can put a title of your own choice to a disc (one title per disc). The title can be displayed on the display window while the disc is being loaded and played.

## Putting Your Personalized Titles onto the Discs

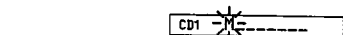
### 1 Play the disc that you wish to title.



### 2 Press the FILE button for more than two seconds to enter the name edit mode.



### 3 Press either the **←** or **→** button to select the desired characters.

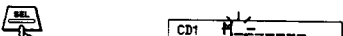


Each time you press the **←** or **→** button, characters will come on in the following order:

**→** \_ \_ \_ \_ \_ A \_ \_ \_ \_ \_ B \_ \_ \_ \_ \_ C \_ \_ \_ \_ \_ X \_ \_ \_ \_ \_ Y \_ \_ \_ \_ \_ Z \_ \_ \_ \_ \_ 0 \_ \_ \_ \_ \_ 1 \_ \_ \_ \_ \_ 2 \_ \_ \_ \_ \_ 3 \_ \_ \_ \_ \_

**←** \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ ( \_ ) \_ \_ \_ \_ \_ \ \_ \_ \_ \_ \_ / \_ \_ \_ \_ \_ \* \_ \_ \_ \_ \_ + \_ \_ \_ \_ \_ \$ \_ \_ \_ \_ \_

### 4 Press the SEL button after locating the desired character.



The flashing part will move to the next space on the right. Repeat steps 3 and 4 to enter the entire titles. Up to eight characters only can be used per disc.

#### Notes

- If you press the SEL button when the eighth character (farthest right character) is flashing, the flashing part goes back to the first character (farthest left character).
- If you wish to put a blank space after a character, select " " (under-bar).

### 5 To register the title, use one of the following methods ① through ④.

#### ① Press the FILE button for more than two seconds.



The unit will go back to the normal CD playing mode.

#### ② Press the FILE button lightly.



(Press lightly.)

The unit enters the PLAY/SKIP mode in which the play and skip modes can be set. (Continue to step 4 in "Setting the Play and Skip Modes on the Discs" of page 40.)

#### ③ Press the DISC button lightly.



(Press lightly.)

You can change the disc and continue to put the titles to the discs.

#### ④ Press the CD button. (only when two or more CD changers are connected)



You can go to the next CD changer and the unit will go back to the normal playing mode.

## Where are the contents of the custom file stored?

The information registered in the custom file will be stored in the memory of currently selected CD changer. You can play a custom-filed disc in another CD changer and use the custom file function as long as they are connected to the currently selected CD changer with the UNILINK system.

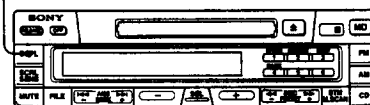
## You can register the maximum of 110 discs on one CD changer

If you try to register more than 110 discs, the unit will display "MEMORY FULL" on the display window and will not accept the command for custom-filing. In this case, you will have to erase the memory of the other discs before you enter the new ones. See page 44 for details on erasing the memory.

## When two or more CD changers are connected

The information registered in the custom file can be retrieved by other CD changers using the communication signals sent between the CD changers provided that they are connected by UNILINK cables.

DSPL



## Displaying the Title

While the disc is playing, press the DSPL button to enter the title display mode.



CD1 MADONNA

If the title of a disc is not registered, "-----" will come on the display window.

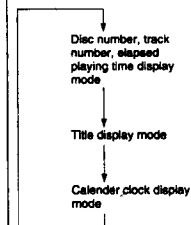
## While loading the discs

Whatever the display mode is, the indication automatically changes as follows:

Title of the disc (2 seconds) → Disc and track number (2 seconds) → Currently selected display mode

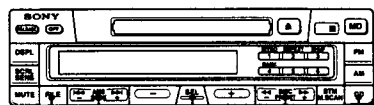
The registered titles of the discs may not come on the display window immediately during loading. This occurs because the unit displays the title after identifying the disc by reading the TOC\* (Table of Contents) information of the disc. Therefore, while the CD changer is loading the disc for the first time, the registered title of the disc cannot be displayed. Once the disc has been loaded and played, the TOC information would have been read and the title will be displayed even while the disc is being loaded.

Each time you press the DSPL button while the disc is playing. The indication on the display window will change cyclically as follows:



\* The TOC information of the disc contains the total length of playing time and the codes to search the beginning and end of each track, and so on.

## Playing Selected Tracks on a Disc — Bank Function



You can listen to only the desired tracks by using this function.

## Setting the Play and Skip Modes on the Discs

- 1 Play the disc to which you wish to set these modes.
- 2 Press the FILE button for more than two seconds and put the titles onto the discs.  
 See page 36 for details about putting on a title. If the title has already been registered, go to step 3.
- 3 Press the FILE button lightly to enter the PLAY/SKIP edit mode.  
 When the unit enters the PLAY/SKIP edit mode, the indication on the display window will look like the illustration below.
- 4 Press the AMS button to select the track number you wish to skip and press the SEL button.  
   
The indication changes from "PLAY" to "SKIP". If you wish to return to "PLAY", press the SEL button again.  
Repeat the operation in this step to set either the "PLAY" or "SKIP" mode on all the tracks.

## Notes

- When the title is not registered, you cannot enter the PLAY/SKIP edit mode even if you press the FILE button.
- You can only set the "SKIP" mode onto up to 24 tracks. If a disc has more than 24 tracks, you will not be able to set the SKIP mode on the tracks after the 24th track.
- You cannot set the SKIP mode onto all of the tracks on a disc.

## 5 To register the settings, use one of the following methods ① to ④.

- ① Press the FILE button for more than two seconds.



The unit will go back to the normal CD playing mode.

- ② Press the FILE button lightly.



The unit will re-enter the name edit mode. See page 36.

(Press lightly.)

- ③ Press the DISC button lightly.



You can change the disc and continue to put the titles to the discs.

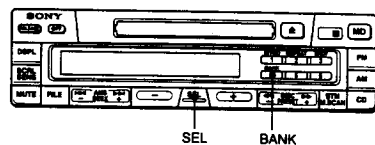
(Press lightly.)

- ④ Press the CD button (only when two or more CD changers are connected).



You can go to the next CD changer and the unit will go back to the normal playing mode.

## Playing Selected Tracks on a Disc

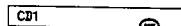


You can listen to only the desired tracks by using this function.

### Playing with the Bank Function

#### To play the tracks with "PLAY" settings

Press the BANK button during CD play.



The "BANK" indication will come on the display window. The unit will start playing the tracks with "PLAY" settings which have been set by the PLAY/SKIP mode.

#### To play the tracks with "SKIP" settings

Press the BANK button while pressing the SEL button.



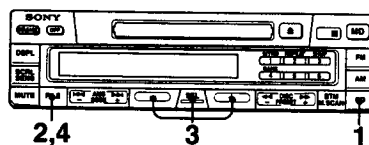
The "BANK" indication will come on the display window. The unit starts playing the tracks with "SKIP" settings which have been set by the PLAY/SKIP mode.

To go back to the normal playing mode  
Press the BANK button again.

To go back to the normal playing mode  
Press the BANK button while pressing the SEL button.

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## Editing a Custom File



When you change the title, the PLAY/SKIP settings of the Bank function will not be erased at the same time.

### Changing the Title and the PLAY/SKIP Settings

#### 1 Play the disc you wish to edit.

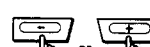


#### 2 Press the FILE button for more than two seconds to enter the name edit mode.



The title of the currently played disc will appear on the display window.

#### 3 Press the SEL button to make the part you wish to edit flashing. Select the characters using the ◀ or ▶ button.



If you wish to change the titles of other discs, repeat steps 1 to 3 on the discs after changing them with the DISC or CD button.

#### 4 Press the FILE button for more than two seconds.

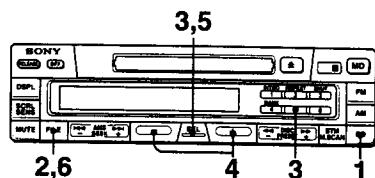


Now the new title is registered.

**Note**  
If you wish to change the PLAY/SKIP settings of the Bank function, press the FILE button lightly to enter the PLAY/SKIP mode while the unit is in the name edit mode in step 2. While checking the disc and track numbers on the display window, change the setting by the AMS and SEL buttons. Press the FILE button lightly again and the unit will enter the name edit mode again.

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## Editing a Custom File



If you erase the title, the PLAY/SKIP settings of the Bank function will be erased as well.

### Erasing a Title

#### 1 Select the CD changer and play any disc.

#### 2 Press the FILE button for more than two seconds to enter the name edit mode.



The title of the currently played disc will appear on the display window.

#### 3 Press the preset number button 5 while pressing the SEL button.



#### 4 Press the ◀ or ▶ button to search for the title you wish to erase.



The titles stored in the CD changer currently selected will appear on the display window in the same order as they were registered.

#### 5 Press the SEL button for more than two seconds after the title you wish to erase is displayed.



Repeat steps 4 and 5 on other titles, if necessary.

#### 6 Press the FILE button for more than two seconds.



Now the title and the PLAY/SKIP settings are erased. The unit goes back to the normal CD playing mode.

**The alternative method to erase a title**  
You can erase a title by selecting eight "—"s (under-bars) as described in step 3 of "Changing the Title and the PLAY/SKIP Settings". (page 43)

• If you have erased some of the titles before, they will not come on in the same order as they were registered.








44

## SECTION 2



### DIAGRAMS

#### 2-1. IC PORT FUNCTION DESCRIPTION

##### MD SERVO BOARD IC514 ( $\mu$ PD78138GF)


Pin No.	Port No.	Port Name	I/O	Description
1	P34	KYENB	O	TEST KEY (No. 42 to 49 buttons) enable or not designation out. High: ENABLE, Low: INHIBIT
2		SI	I	DATA of the communication between MASTER $\mu$ -COM and MECHA $\mu$ -COM in.
3		SO	O	DATA of the communication between MASTER $\mu$ -COM and MECHA $\mu$ -COM out.
4		SCK	I	CLOCK of the communication between MASTER $\mu$ -COM and MECHA $\mu$ -COM in.
5	NMI	WP	I	Control port for ACTIVE/SLEEP of MECHA $\mu$ -COM. High: ACTIVE, Low: SLEEP
6	INT0	DQSY	I	(Not used) Open.
7	INT1	SQSY	I	SUBQ SYNC interruption. Interrupted at  .
8	INT2	ATSY	I	ADIP SYNC interruption. Interrupted at  .
9		DEFECT		(Not used) Open.
10		DEFECT		(Not used) Open.
11	P26	CS	I	MASTER $\mu$ -COM transfer request on the communication between MASTER $\mu$ -COM and MECHA $\mu$ -COM. Request at  .
12	P27	CS	I	The same as pin ⑪.
13	P30	5VPOWER	O	Servo IC power control. High: POWER ON, Low: POWER OFF
14	P31	SRQ	O	MECHA $\mu$ -COM transfer request on the communication between MASTER $\mu$ -COM and MECHA $\mu$ -COM. Request at  .
15	P32	LOAD	O	LOADING/EJECT Output for motor
16	P33	EJECT	O	LOADING/EJECT Output for motor
17	PWM0	LDON	O	Laser on/off output High: LASER OFF, Low: LASER ON
18	PWM1	LDPOWER	O	Laser power control Low: On low reflecting rate disc (MO), High: On high reflecting rate disc (CD).
19	AVSS			Ground for A/D convertor input. (0 V)
20	AVREF			Reference voltage input for A/D convertor. (5 V)
21	AN0	SW1	ADI	Loading start switch, eject end switch. Loading starts on  , Eject is end on  .
22	AN1	SW2	ADI	Loading end switch Loading is end on  .
23	AN2	SW3	ADI	(Not used) Open.
24	AN3	SW4	ADI	Disc reflecting rate detection switch. Detects from holes on the cartridge. Low: On high reflecting rate disc (CD), High: On low reflecting rate disc (MO).
25	AN4	TEMP	ADI	Detects the mechanism deck is high temperature or not. High: NORMAL, Low: HIGH TEMP
26	AN5			(Not used) Open.
27	AN6			(Not used) Open.
28	AN7			(Not used) Open.
29	RESET			Reset for $\mu$ -COM
30	VDD			Power for $\mu$ -COM
31	X2			For the system clock
32	X1			For the system clock
33	Vss			Ground for $\mu$ -COM
34	P00	RFSW1	O	DISC MODE High: On pit, Low: On groove





Pin No.	Port No.	Port Name	I/O	Description
35	P01	RFSW0	O	DISC MODE High: On CD, Low: On MO
36	P02	ASYSW	O	On playing back CD disc pit: Fixed to high. On playing back MO disc groove: High=Normal, Low=On track jump operation.
37	P03	AGCSW	O	High: Focusing starts, Low: Focusing is end.
38	P04	MIRRSW	O	On playing back CD disc pit: Fixed to low. On playing back MO disc groove: High=Normal, Low=On track jump operation and on the time from CLV, tracking, sled servo go on to starting is OK.
39	P05	DFCTSW	O	High: Focusing starts. Low: All servo (Focus, CLV, Tracking, sled) is on.
40	P06	SLO MUTE	O	MOTOR DRIVER POWER CONTROL "H": ON, "L": OFF
41	P07	IFRES		(Not used) Open.
42	P60	KI0	I	KEY SCAN input 0
43	P61	KI1	I	KEY SCAN input 1
44	P62	KI2	I	KEY SCAN input 2
45	P63	KI3	I	KEY SCAN input 3
46	P64	KO0	O	KEY SCAN output 0
47	P65	KO1	O	KEY SCAN output 1
48	P66	KO2	O	KEY SCAN output 2
49	P67	KO3	O	KEY SCAN output 3
50	P57	FOK	I	FOCUS OK High: FOCUS OK, Low: FOCUS NG
51	P56	ATT	O	CXD2527 ATTENUATION ( - 12dB) High: ON, Low: OFF
52	P55	AEXEC	O	CXD2527 START High: START, Low: STOP
53	P54	CD/MO	I	Connected to CXA1381. CD/MO discrimination
54	P53	SENS	I	SENSE input from CXA1082 and CXD2525.
55	P52	LOCK	I	LOCK input from CXD2525. "H": CLV LOCK, "L": CLV UNLOCK
56	P51	GFS	I	GFS (Constant linear velocity) OK High: GFS OK, Low: GFS NG
57	P50	XINT	I	CXD2526 interruption. Detects  low level.
58	P47	MD2		Connected to MD2 terminal of CXD2525.
59	P46	DIRC	O	High: Detects TRACK JUMP TZC, Low: 1 TRACK JUMP end
60	P45	XRST	O	Reset the servo IC on  .
61	P44	SORS	O	Reset ENSCOR
62	P43	SBMN		Connected to CXD2526 SBMN. "H": SUB DATA CONTROL, "L": MAIN DATA CONTROL
63	P42	WRMN	O	High: DRAM WRITE START, Low: DRAM WRITE STOP
64	P41	RCPB	O	REC/PB selection High: REC, Low: PB
65	P40	SCTX	O	CD-DA MODE SCOR input
66				(Not used) Open.
67	Vss			Ground for $\mu$ -COM
68	EA			5 V
69	P10	SCK	I	Clock for serial communication to servo IC.

	KI0	KI1	KI2	KI3
KO0	EJECT	STOP	PLAY	PAUSE
KO1	REV	CUE	AMS -	AMS+
KO2	MODE			LASER
KO3	FOCUS	TRACK	SLED -	SLED+


On pin ① is low [Pins ④③, ④⑦, ④⑧  $\Rightarrow$  DRAM remains.]  
000=0M, 001= $\sim$ 0.5M, 010= $\sim$ 1.0M,  
011= $\sim$ 1.5M, 100= $\sim$ 2.0M, 101= $\sim$ 2.5M,  
110= $\sim$ 3.0M, 111=3.0M $\sim$

Pin No.	Port No.	Port Name	I/O	Description
70	P11	ARST	O	Reset output to CXD2527. Reset on 
71	P12	SWDT	O	Write data for serial communication to servo IC.
72	P13	SRDT	O	Read data for serial communication to servo IC.
73	P14	XLAT	O	Latch for serial communication to servo IC.
74	P15	MDT	O	For digital filter (Not used). Open.
75	P16	MCK	O	For digital filter (Not used). Open.
76	P17	MLEN	O	For digital filter (Not used). Open.
77	VDD			Power for $\mu$ -COM
78	P70	8VPOWER		8 V system power supply. High: ON, Low: OFF
79	P71	MUTE		High: MUTE ON, Low: MUTE OFF
80				(Not used) Open.

**MAIN BOARD IC504 ( $\mu$ PD75518GF)**

Pin No.	Port No.	Port Name	I/O	Key Contents																																		
1	AN0	KEY-IN0	ADI	Key input by A/D conversion no.0 <table><tr><th>VALUE (DENOMINATOR OFFH)</th><th>KEY CONTENTS</th></tr><tr><td>00H – 08H</td><td>FM(J)</td></tr><tr><td>09H – 1BH</td><td>AM(J)</td></tr><tr><td>1CH – 2AH</td><td>EJECT</td></tr><tr><td>2BH – 3AH</td><td>LEVEL+</td></tr><tr><td>3BH – 48H</td><td>SELECT</td></tr><tr><td>49H – 58H</td><td>SEEK+, AMS+</td></tr><tr><td>59H – 67H</td><td>SEEK –, AMS –</td></tr><tr><td>68H – 78H</td><td>PRESET+, DISC+</td></tr><tr><td>79H – 88H</td><td>PRESET –, DISC –</td></tr><tr><td>89H – 99H</td><td>MUTE</td></tr><tr><td>9AH – AAH</td><td>FILE</td></tr><tr><td>ABH – BAH</td><td>M.SCAN, BTM</td></tr><tr><td>BBH – CBH</td><td>SENS, SCROLL</td></tr><tr><td>CCH – DBH</td><td></td></tr><tr><td>DCH – EAH</td><td></td></tr><tr><td>EBH – F9H</td><td></td></tr></table>	VALUE (DENOMINATOR OFFH)	KEY CONTENTS	00H – 08H	FM(J)	09H – 1BH	AM(J)	1CH – 2AH	EJECT	2BH – 3AH	LEVEL+	3BH – 48H	SELECT	49H – 58H	SEEK+, AMS+	59H – 67H	SEEK –, AMS –	68H – 78H	PRESET+, DISC+	79H – 88H	PRESET –, DISC –	89H – 99H	MUTE	9AH – AAH	FILE	ABH – BAH	M.SCAN, BTM	BBH – CBH	SENS, SCROLL	CCH – DBH		DCH – EAH		EBH – F9H	
VALUE (DENOMINATOR OFFH)	KEY CONTENTS																																					
00H – 08H	FM(J)																																					
09H – 1BH	AM(J)																																					
1CH – 2AH	EJECT																																					
2BH – 3AH	LEVEL+																																					
3BH – 48H	SELECT																																					
49H – 58H	SEEK+, AMS+																																					
59H – 67H	SEEK –, AMS –																																					
68H – 78H	PRESET+, DISC+																																					
79H – 88H	PRESET –, DISC –																																					
89H – 99H	MUTE																																					
9AH – AAH	FILE																																					
ABH – BAH	M.SCAN, BTM																																					
BBH – CBH	SENS, SCROLL																																					
CCH – DBH																																						
DCH – EAH																																						
EBH – F9H																																						
2	AVREF			Reference voltage input for A/D convertor input (5 V).																																		
3	VDD			Power for $\mu$ -COM																																		
4	VDD			Power for $\mu$ -COM																																		
5	P113	KEY-ACTIVE	O	Power on/off switch for A/D buttons. High: POWER ON, Low: POWER OFF																																		
6	P112	P-ON	O	LED on/off switch for general keys on nose. High: LED on, Low: LED off.																																		
7	P111	ILL-ON	O	LED on/off switch for source keys on nose. High: LED on, Low: LED off.																																		
8	P110	COLOR	O	LED color select High: GREEN, Low: AMBER																																		
9	P103	MUTE	O	Head unit internal mute High: On source selection or during stop, Low: During playback.																																		
10	P102	AUX-MUTE	O	UNI-LINK slave unit mute High: During internal slave playback or stop. Low: During playback.																																		
11	P101		O	(Not used) Open.																																		
12	P100		O	(Not used) Open.																																		
13	P93	ANT. REM	O	Output for power antenna. It is high in tuner and TV modes. High: FM, AM, MW, LW, TV modes, Low: Other modes.																																		
14	P92	MD-P-ON	O	MD board power on (Not used). High: During MD playback or MD eject, Low: Other operation.																																		
15	P91	MD2-ON	O	Wake up/sleep control for MECHA $\mu$ -COM. High: MECHA $\mu$ -COM ACTIVE, Low: MECHA $\mu$ -COM SLEEP																																		
16	P90	$\overline{\text{MD-RESET}}$	O	Reset for MECHA $\mu$ -COM. Reset MECHA $\mu$ -COM at 																																		
17	S11	MD-DATA. IN	I	DATA of the communication between MASTER $\mu$ -COM and MECHA $\mu$ -COM in.																																		
18	SO1	MD-DATA. OUT	O	DATA of the communication between MASTER $\mu$ -COM and MECHA $\mu$ -COM out.																																		
19	$\overline{\text{SCK1}}$	$\overline{\text{MD-CLK}}$	O	CLOCK of the communication between MASTER $\mu$ -COM and MECHA $\mu$ -COM out.																																		
20	PPO	$\overline{\text{MD-CS}}$	O	MASTER $\mu$ -COM transfer request on the communication between MASTER $\mu$ -COM and MECHA $\mu$ -COM. Request at  .																																		
21	P73	VOL-CE	O	Chip enable to E-volume (LC7537)																																		
22	P72		O	(Not used) Open.																																		
23	P71	VOL-CLK	O	Clock to E-volume																																		
24	P70	VOL-DATA	O	Data to E-volume																																		

Pin No.	Port No.	Port Name	I/O	Description
25	P63	8901-CE	O	Chip enable to digital audio receiver
26	P62	DIGITALRESET	O	Reset to digital audio receiver and DAC
27	P61	8901-CLK	O	Clock to digital audio receiver
28	P60	8901-DATA	O	Data to digital audio receiver
29	P53	DIGITAL MUTE-IN	I	Connected to ERROR terminal of LC8901. Raise up high MUTE terminal by level high input.
30	P52		I	(Not used) GND
31	P51		I	(Not used) GND
32	P50		I	(Not used) GND
33	Vss			Ground for $\mu$ -COM
34	P43	HAS LOUDNESS/ NOT HAVE LOUDNESS	I	Loudness function having or not select input. High: Has loudness. Low: Not have loudness.
35	P42		I	(Not used) GND
36	P41		I	(Not used) GND
37	P40		I	(Not used) GND
38	P33		O	(Not used) Open.
39	P32		O	(Not used) Open.
40	P31	DISK-IN. LED GFS (TEST)	O	Indicates there is MD cartridge in the mechanism deck or not. High: There is a cartridge. Low: There is not.
41	P30	SYNC	O	Sync signal for UNI-LINK
42	P23	SYSTEM-RESET	O	Sync reset for UNI-LINK
43	P22	BUS ON	O	Controls UNI-LINK bus activation High: BUS SLEEP, Low: BUS ACTIVE
44	P21	CLK OUT	O	Clock out for UNI-LINK
45	P20	BEEP	O	Beep out. When requesting beep out, rectangular wave is out.
46	P13	ACC-CHECK	I	ACC SW in High: ACC OFF, Low: ACC ON
47	P12	KEY-ACK	I	Rises low to high by pushing KEY IN 0 or KEY IN 1 when KEY-ACTIVE is low. Usually high level is out when KEY-ACTIVE is high.
48	P11	C-SW	I	Mechanism deck cartridge in switch High: There is a cartridge, Low: There is not.
49	P10	SIRCS-IN	I	SIRCS input from remote controller
50	SI0	DATA IN	I	Data input from UNI-LINK
51	SO0	DATA OUT	O	Data output to UNI-LINK
52	SCK0	CLK IN	I	Clock output to UNI-LINK. Input from pin ④.
53	P00	B/U-CHECK	I	For back-up check High: BACK UP ON, Low: BACK UP OFF
54	Vss			Ground for $\mu$ -COM
55	XT1			SUB SYSTEM CLOCK
56	XT2			SUB SYSTEM CLOCK
57	IC			Connected to internally connected Vss.
58	X1			MAIN SYSTEM CLOCK
59	X2			MAIN SYSTEM CLOCK
60	RESET			Reset for $\mu$ -COM

Pin No.	Port No.	Port Name	I/O	Description
61	P143		O	(Not used) Open.
62	P142	LCD-CE	O	Chip enable to LCD driver
63	P141	LCD-CLK	O	Clock to LCD driver
64	P140	LCD-DATA	O	Data to LCD driver
65	P133		O	(Not used) Open.
66	P132	TEL-MUTE	I	Telephone mute input. Attenuate audio output – 20 dB by putting low level in.
67	P131	MD-SRQ	I	MECHA $\mu$ -COM transfer request on the communication between MASTER $\mu$ -COM and MECHA $\mu$ -COM. Request at  .
68	P130	N-SW	I	Input there is nose or not. High: There is a nose, Low: There is not.
69	P123		O	(Not used) Open.
70	P122	SEL-A/D	O	ANALOG AUDIO/DIGITAL AUDIO SOURCE select High: DIGITAL, Low: ANALOG
71	P121	SEL-1	O	AUDIO SOURCE select 1      0      1      0      1      SLAVE 

**MAIN BOARD IC601 (μPD75116GF-G00-3BE)**

Pin No.	Name	I/O	Description
1	—	—	Not used.
2	—	—	
3	—	—	
4	—	—	(Connected to ground).
5	—	—	
6	—	—	
7	RESET	—	Reset input
8	X2	—	Connected to ceramic oscillator (4.19 MHz).
9	X1	—	
10	PLL-DI	I	Data input for PLL IC
11	PLL-DO	O	Data output for PLL IC
12	PLL-CLK	O	Clock output for PLL IC
13	PLL-CE	O	Chip enable output for PLL IC
14	MS7	I	Mode select input
15	MS6	I	
16	MS5	I	
17	MS4	I	
18	MS3	I	
19	MS2	I	
20	MS1	I	
21	MS0	I	
22	RDS-D1	I	Not used.
23	RDS-D-Start	I	Not used.
24	RDS-ERR	I	Not used.
25	RDS-Receive	I	Not used.
26	Vss	—	GND
27	—	—	(Connected to ground).
28	—	—	(Connected to ground).
29	RDS – CLK	I	Not used.
30	BUS-ON	I	Bus on input Recognizes interruption request flag (IREQ 0) when bus on/off detection interrupting and on μ-COM operation mode. When μ-COM is stop, this interruption is used for releasing stop mode. when the stop command effects, set interrupting enable, interruption request flag, and INTO edge detection mode register (IMO).
31	—	—	Not used. (Connected to Vss or VDD).
32	ST IN	I	STEREO input Low: Stereo. Goes low during putting out force monaural. Usually transfers "0" to display data.
33	Vsm (FM)	I	FM S meter voltage detection. Used for A/D conversion function during BTM.
34	Vsm (AM)	I	AM S meter voltage detection.
35	—	—	Not used. (Connected to Vss or VDD).
36	—	—	

Pin No.	Name	I/O	Description
37	—	—	Not used.
38	RDS-RESET	O	Not used.
39	Request	O	Bus request output. For communication request. High: Requests.
40	LINK-OFF	O	Bus link off output High: Link off. Goes low during bus on. When setting link state in CLOCK STOP mode, output level continues low. When BACKUP is off, sets input state.
41	DATA. IN	I	Bus data input. Serial data input.
42	DATA. OUT	O	Bus data output. Serial data output.
43	CLK. IN	I	Bus clock out Serial clock input for bus communication. Clock goes out from IC504 during transferring on receiving clock sync. 8 bits.
44	B UP	I	BUCKUP detect input. Used for BACKUP detect or interruption. On $\mu$ -COM operation, recognizes BACKUP change by detecting rising edge and falling edge of interruption request flag (IRQ4). When the interruption doesn't effect, interruption enable flag (IE4) is inhibited. When $\mu$ -COM is stop, this interruption is used for releasing STOP mode.
45	—	—	Not used.
46	—	—	
47	—	—	
48	MONO	O	Force monaural output Selects stereo mode high level output or force monaural mode low level. When setting to AM band, MS4 (Mode select pin) "1" is only effective. During TA interrupting on alarming, force monaural mode low level goes out in spite of mode setting.
49	—	—	Not used.
50	—	—	
51	FM-FE-ON	O	
52	AE-FE-ON	O	FM power supply control output. Low: FM
53	MUTE	O	AM power supply control output. Low: AM
54	—	—	Mute output
55	—	—	
56	—	—	
57	VDD	—	Power supply
58	VDD	—	
59	SD	I/O	SD input Set the stop level of seek, auto-memory, and scan. Low: AM receiving (Mute off).
60	—	—	Not used.
61	ROM CLK	O	EEPROM clock output
62	ROM DATA	I/O	EEPROM data input/output
63	—	—	Not used.
64	—	—	

# **MAIN BOARD IC901 (LC8901)**

Pin No.	Name	I/O	Description
1	DIN5	I	Data input
2	DIN6	I	Data input
3	DOUT1	O	Input EIAJ data through output
4	DOUT2	O	Input EIAJ data through output
5	RC1	I	For RC oscillator making clock for misclock detection of PLL.
6	RC2	O	
7	LPF	I	High: LPF time constant change, Low: Fixed.
8	STOP	I	High: Stops VCO, Low: Normally.
9	TEST1	I	For test (normally low)
10	TEST2	I	For test (normally low)
11	DVDD		Digital power supply
12	AVDD		Analogue power supply
13	R	I	For adjusting VCO oscillating band width
14	AGND		Analogue ground
15	VIN	I	For adjusting VCO self-oscillating
16	VCO	O	For PLL LPF
17	DGND		Digital ground
18	CLK	I	Clock mode select High: 512 Fs, Low: 384 Fs
19	XSYS	I	Crystal mode set. High: Crystal mode.
20	XIN1	I	Crystal oscillator. When PLL sync. demodulating, stops oscillating.
21	XIN2	O	
22	DVDD		Digital power supply
23	LOCK	O	High: PLL locks, Low: PLL unlocks.
24	ERROR	O	Error mute signal output
25	FS256	O	256 Fs clock output
26	CLKOUT	O	VCO oscillation or Crystal oscillation output.
27	EMPHA	O	High: There is emphasis, Low: There is not.
28	DGND		Digital ground
29	BCLK	O	Bit clock output
30	DATAOUT	O	Audio data output
31	LRCK	O	L/R clock output
32	SUB1	O	Sampling frequency output
33	SUB2	O	Sampling frequency output
34	DO	O	$\mu$ -COM interface output
35	DI	I	$\mu$ -COM interface input
36	CE	I	$\mu$ -COM interface chip enable input
37	CL	I	$\mu$ -COM interface clock input
38	XMODE	I	Starts PLL operation after power on
39	DVDD		Digital power supply
40	DIN1	I	Amplifier built-in data input

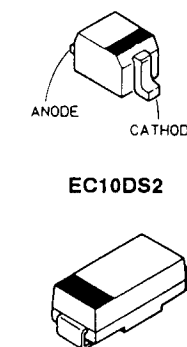
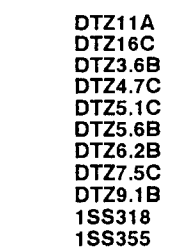
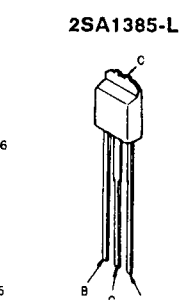
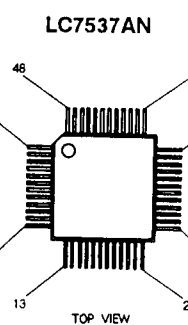
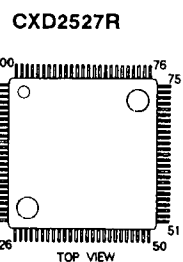


Pin No.	Name	I/O	Description
41	DIN2	I	Amplifier built-in data input
42	DIN3	I	Amplifier built-in data input
43	DIN4	I	Amplifier built-in data input
44	DGNC		Digital ground

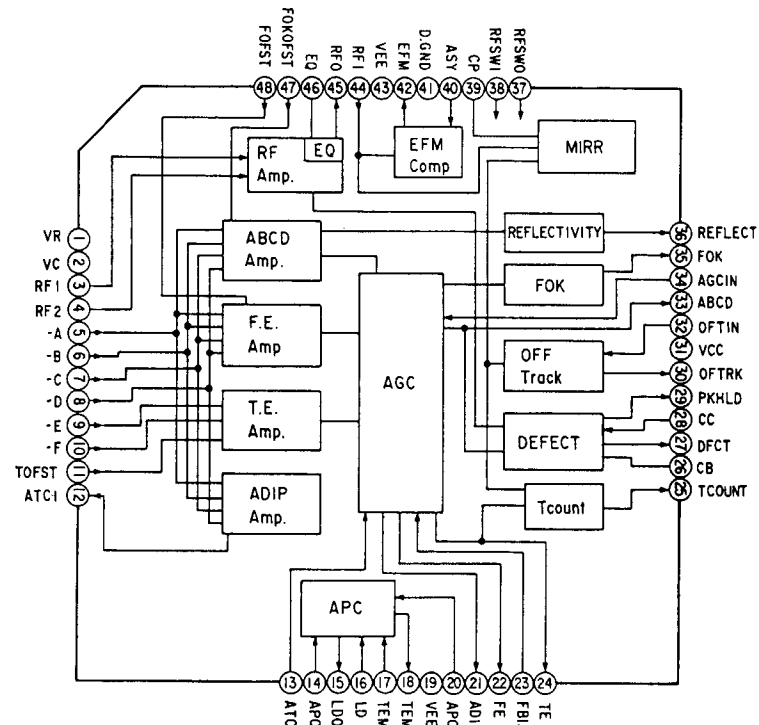
# **MAIN BOARD IC902 (AK4328)**

Pin No.	Name	I/O	Description
1	AGND1	—	Analogue ground
2	AOUTL	O	Lch analogue out, when putting in full scale, output is typ $\pm 2$ Vp-p.
3	VA+	—	Positive power supply, +5 V for analogue
4	AGND2	—	Analogue ground
5	VA —	—	Negative power supply, — 5 V for analogue
6	CMPO	O	Comparator output. Used for offset calibration. Connected to CMPI pin.
7	NC	—	Not connected. Open.
8	CMPI	I	Comparator input. Used for offset calibration. Connected to CMPO pin.
9	$\overline{\text{RST}}$	I	Reset/Calibration When making this low, filter and modulator are reset. After this, making high, offset calibration starts. 1024L/R clock is used for offset calibration, while this time, analogue output is connected to analogue ground internally.
10	TST	I	Test (Pull-down pin) Open or connect it to digital ground.
11	CKS	I	Clock select. Selects clock frequency feeding to XTI pin. “L”: CLK=256 fs (12.288 MHz @fs=48 kHz) “H”: CLK=284 fs (18.432 MHz @fs=48 kHz)
12	DIF1	I	Dital input format (Pull-down pin) Can select four kinds of input format.
13	DIF0		
14	XTI	I	Clock input Connect crystal oscillator between XTO pin and this pin or feed external CMOS clock into XTI pin. Clock frequency is selected by CKS pin.
15	XTO	O	Crystal oscillator output When using crystal oscillator, connect it to XTI pin. When using external clock, open this pin.
16	VD+	—	Positive power supply +5 V for digital
17	DGND	—	Dgital ground
18	SDATA	I	Serial data input Feed 16/18 bit serial data 2's complementally from MSB.
19	BICK	I	Serial bit clock Clock for latching serial data. Latching polarity is different in data input format.
20	LRCK	I	L/R clock Selects channels of feeding serial data.
21	CALO	O	Calibration output Used for offset calibration. Connected to CALI pin.
22	ACKO	O	Analogue clock output. 128fs clock out. Connected to ACKI pin.
23	NC	—	Not connected. Open.
24	ACKI	I	Analogue clock input Analogue section master clock input. Feed input word rate 128 times (128 fs) clock. Connected to ACKO pin.
25	AGND3	—	Analogue ground
26	AOUTR	O	Rch analogue out When putting in full scale, output is typ $\pm 2$ Vp-p.
27	CALI	I	Calibration input Used for offset calibration. Connected to CALO pin.
28	VREF —	O	Reference voltage output, — 3.68 V. Usually connect a 10 $\mu$ F or more electrolytic capacitor and a 0.1 $\mu$ F ceramic capacitor parallel to analogue ground.

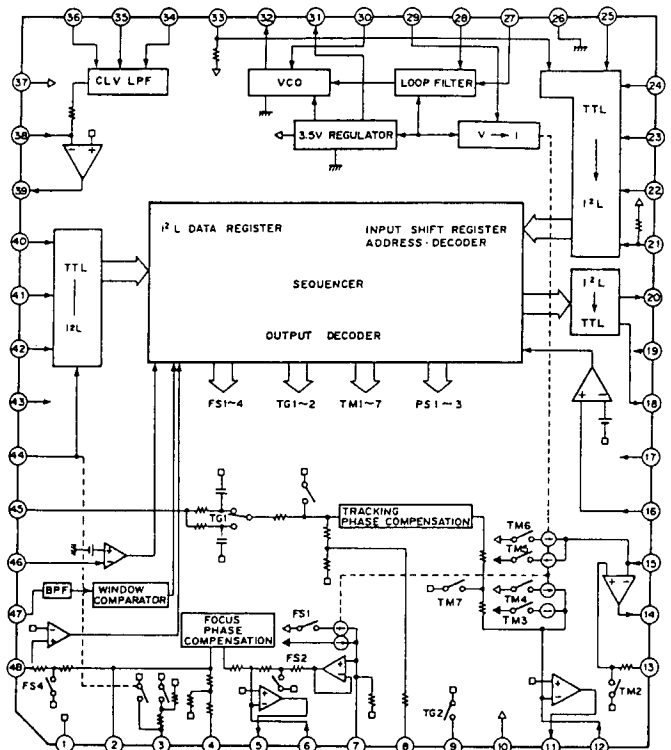
- **Semiconductor Lead Layouts**



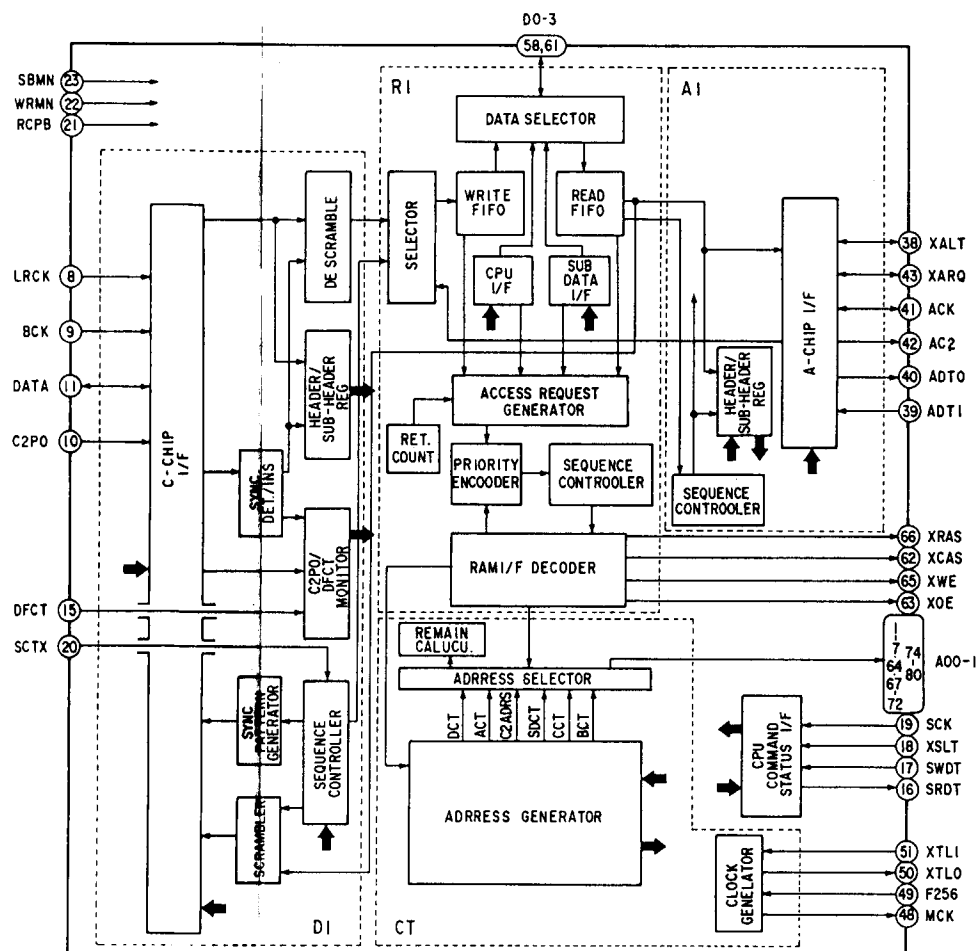
MD SERVO BOARD  
IC502 CXA1381R



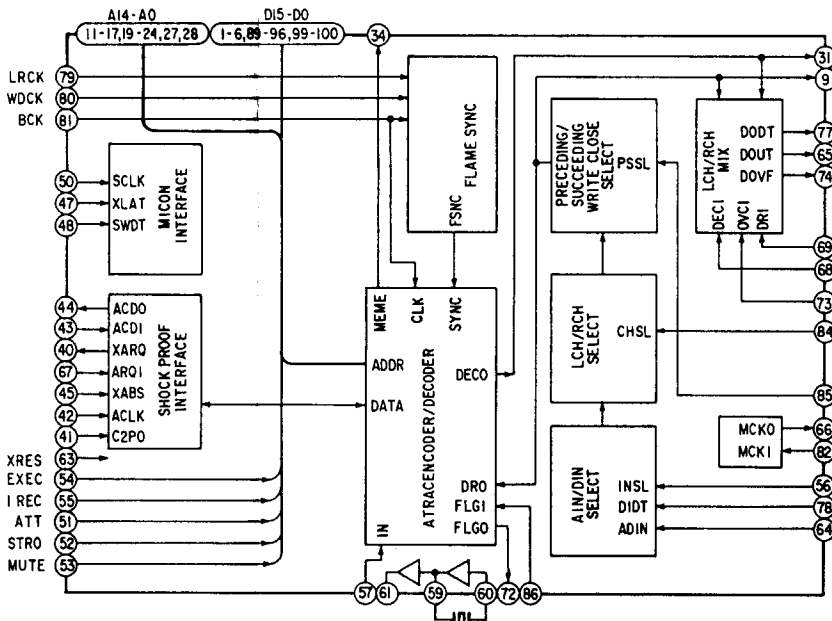
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IC503 CXA1082BQ



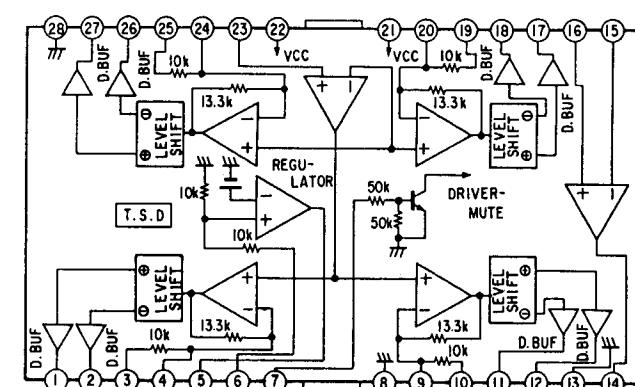
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**IC505 CXD2526Q**



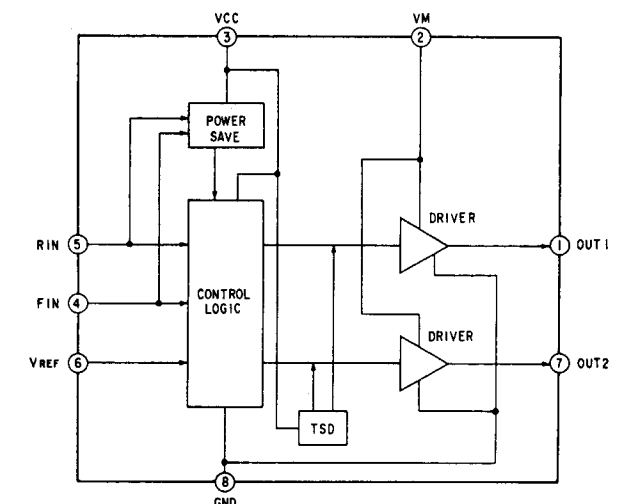
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**IC507, 510 CXD2527R**



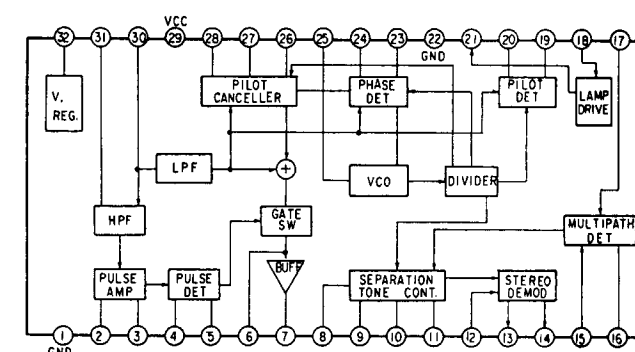
MD SERVO BOARD  
IC513 BA6298FP



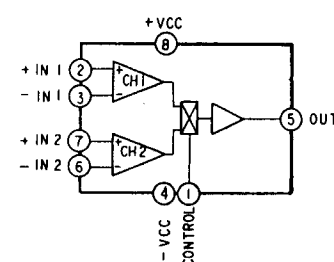
**MD SERVO BOARD**  
**IC519 BA6287F**



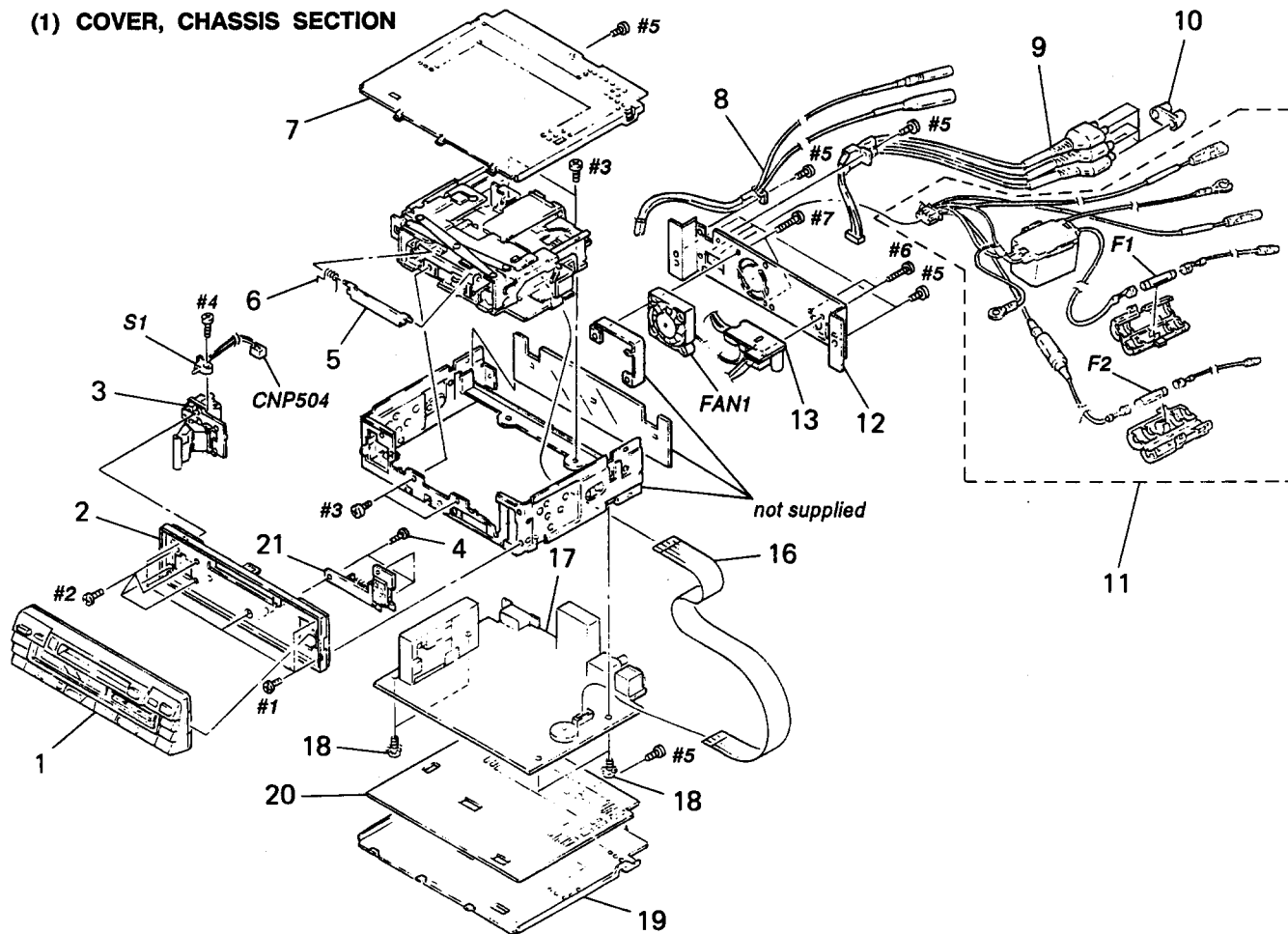
**MAIN BOARD**  
**IC40 AN7464S**



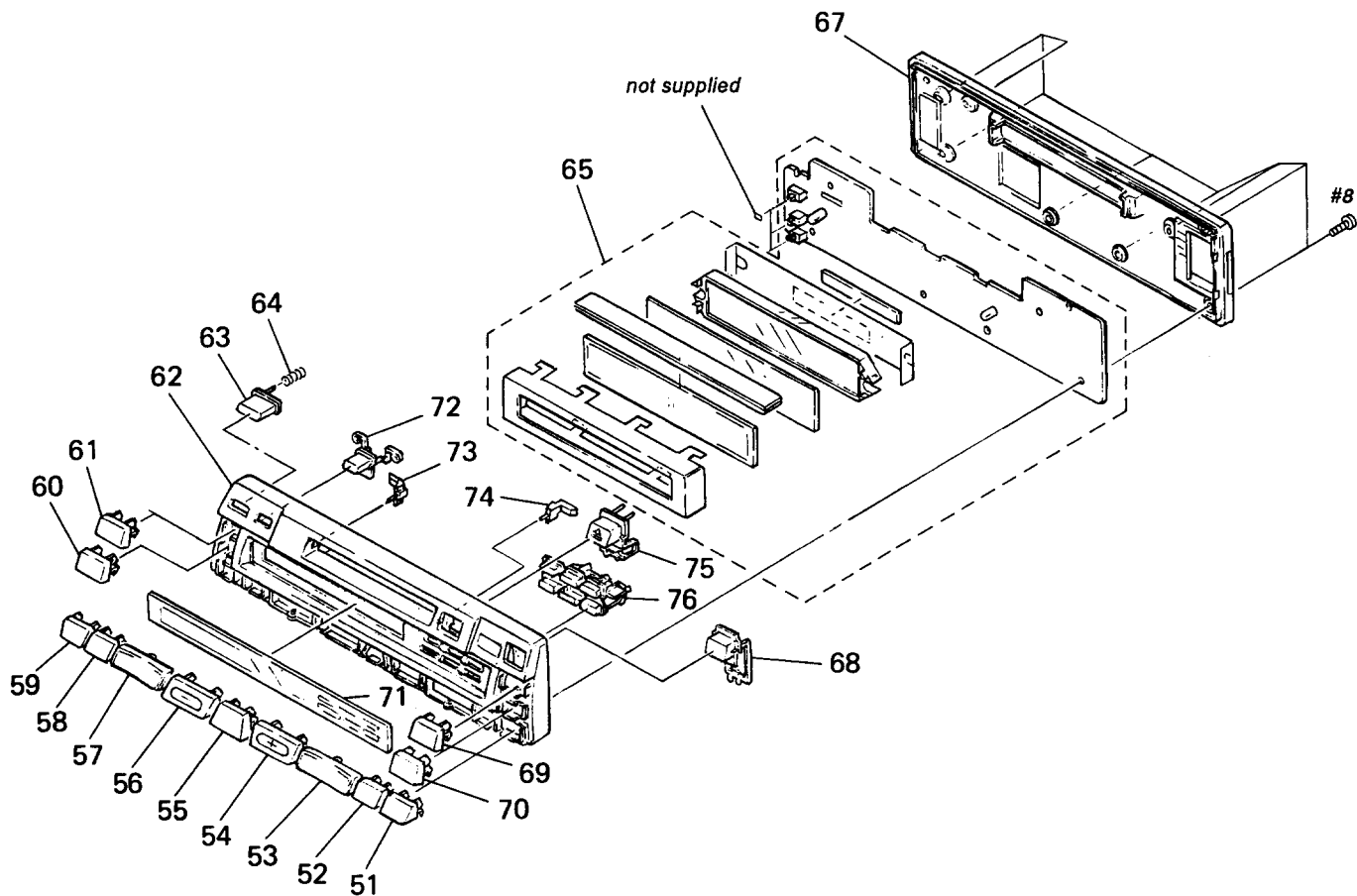
**MAIN BOARD**  
**IC104 M5203FP**



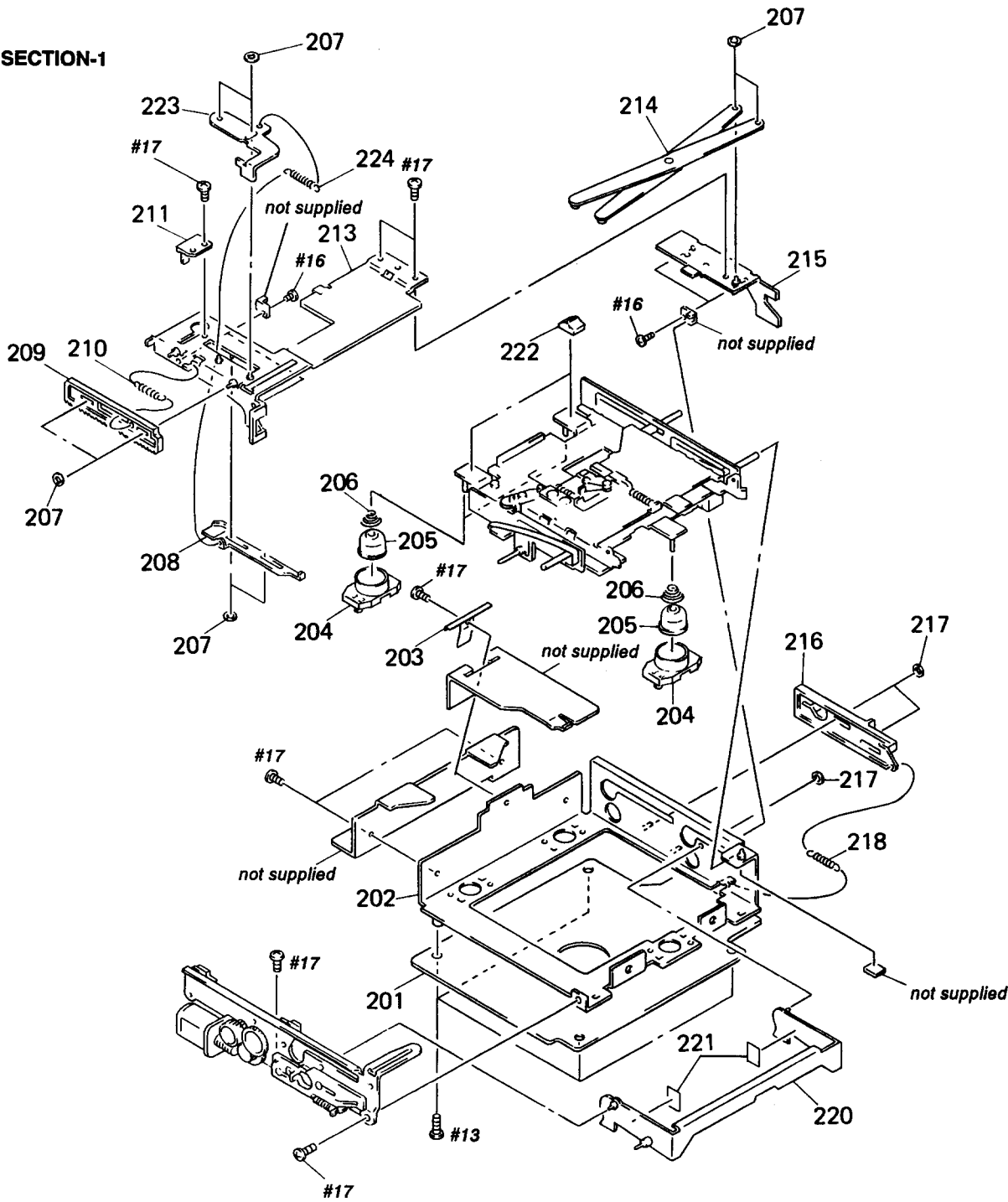
# (1) COVER, CHASSIS SECTION



## (2) FRONT PANEL SECTION



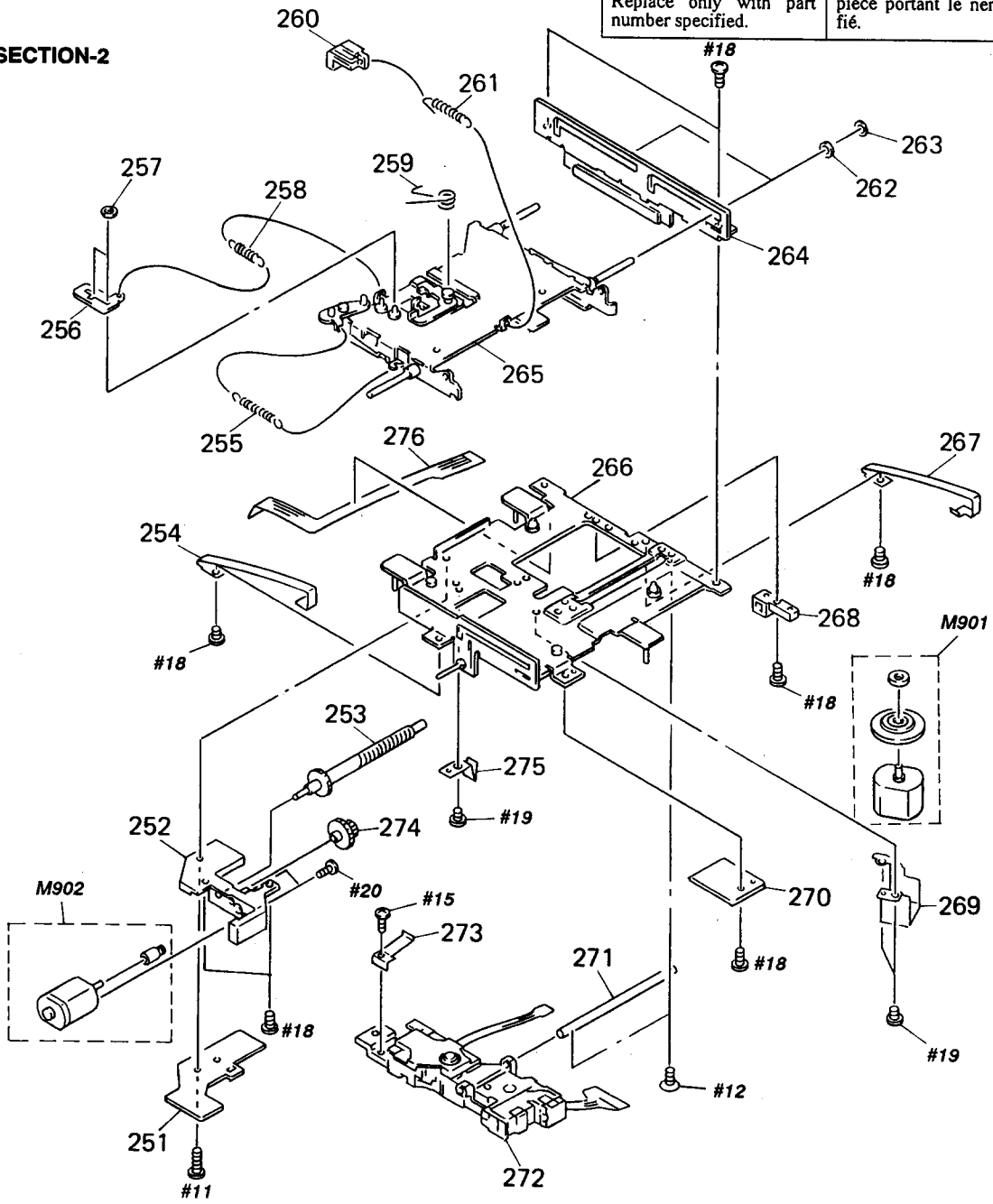
(3) MD SECTION-1



critical for safety.  
Replace only with part  
number specified.

Ne les remplacer que par une  
pièce portant le numéro spéci-  
fié.

(4) MD SECTION-2



(5) MD SECTION-3

