MDM-X4

SERVICE MANUAL

US Model
Canadian Model
AEP Model
UK Model

U.S. and foreign patents licensed from Dolby Laboratories Licensing Corporation.

Model Name Using Similar Mechanism	MDS-503
MD Mechanism Type	MDM-2CR2
Base Unit Type	MBU-2B2
Optical Pick-up Type	KMS-210A/J-N

SPECIFICATIONS

Mixer Section

System (10 channel input mixer)

Internal bus
Group x 4, Stereo x 2, Monitor x 2, AUX x 2

Channel 1~4
Trim, Input Select, EQ (High/Mid/Low), AUX Out, Bus Assign Select, Panpot, Channel Fader

Channel 5~6
EQ (High/Low), Bus Assign Select, Balance

Master
Master Fader

Return 1~2
Return Level, Bus Assign Select

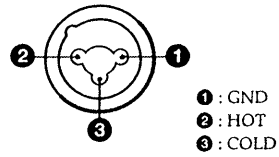
Aux 1~2 Send
Master Level

Monitor
Monitor Select, Monitor Level, Track 1~4 Level

INPUTS

CH1/2
Type : XLR-3-31/Phone (Balanced)
Input impedance : greater than 20 kohm
Standard input level : –50 ~ –10 dBs (Max: + 10dBs)

XLR type (Balanced)



Phone type (Balanced)
Sleeve : GND
Tip : HOT
Ring : COLD

CH3/4
Type : Phone (Unbalanced)
Input impedance : greater than 20 kohm
Standard input level : –50 ~ –10 dBs (Max: + 10dBs)

CH5/6
Type : Phone (Unbalanced)
Input impedance : greater than 20 kohm
Standard input level : –10 dBs (Max: + 10dBs)

RETURN 1~2 (L/R)
Type : Phone (Unbalanced)
Input impedance : greater than 20 kohm
Standard input level : –10 dBs (Max: + 10dBs)

— Continued on next page —

MD MULTI TRACK RECORDER

使用時は添付資料も参照のこと
Refer to the additional documents

SONY

OUTPUTS

STEREO OUT (L/R)
Type : Phono (Unbalanced)
Load impedance : greater than 20 kohm
Standard output level : -10 dBs

MONITOR OUT (L/R)
Type : Phono (Unbalanced)
Load impedance : greater than 20 kohm
Standard output level : -10 dBs

TRACK OUT (1~4)
Type : Phone (Unbalanced)
Load impedance : greater than 20 kohm
Standard output level : -10 dBs

AUX OUT (1~4)
Type : Phone (Unbalanced)
Load impedance : greater than 20 kohm
Standard output level : -10 dBs

CHANNEL EQUALIZER

CH 1~4
Low : ±15 dB (at 50 Hz)
Mid : ±12 dB (at 2.5 kHz)
High : ±15 dB (at 15 kHz)

CH 5~6
Low : ±15 dB (at 50 Hz)
High : ±15 dB (at 15 kHz)

* 0dBs = 0.775 Vrms

Recorder Section

Controls
Rec Select : 1~4
Locate Control : Mark, In, Out, Shift, A, B, C, D
Function : Edit, System, Repeat, Rehearsal, Auto Punch, Undo, Exit, Enter, Top, Rec, AMS (x 2), Play, Stop, Jog/Shuttle, Eject

System
MD-DATA system, Mini Disc digital audio system

Disc
MD Data disc, MD audio disc

Sampling Frequency
44.1 kHz

Maximum Recording Length
Max. 37 minutes (4 tracks / using MD Data disc)
Max. 74 minutes (2 tracks)
Max. 148 minutes (monaural)

Number of tracks that can be recorded simultaneously
Max 4 tracks (using MD Data disc)
Max 2 tracks (using MD audio disc)

Frequency response
5 ~ 20,000 Hz ±1.0 dB

Signal to noise ratio
More than 92 dB during playback

Maximum song number
255

Pitch control
±8.0%

Control jacks
Assignable switch x 2

Wow and flutter
Below measurable limit

Recording method
Magnetic field variation overwrite

Reading method
Non-contact Optical pickup (using Semiconductor laser)

Laser
Semiconductor laser (λ= 780mn)

Revolutions
Approx. 400~900 rpm (CLV)

Error correction
Advanced Cross Interleave Reed Solomon Code (ACIRC)

Coding
Adaptive TRansform Acoustic Coding (ATRAC)

Modulation
EFM (Eight-to-Fourteen Modulation)

General

Power Source
AC 120 V, 60 Hz
AC 230 V, 50/60 Hz

Power Consumption
25 W (120 V)
27 W (230 V)

Dimensions
423 x 119 x 385 mm (W x H x D including projections)

Mass
Approx. 5.1 kg

Supplied Accessories
MD Data disc (1)
Operating instructions (1)

Design and specifications subject to change without notice.

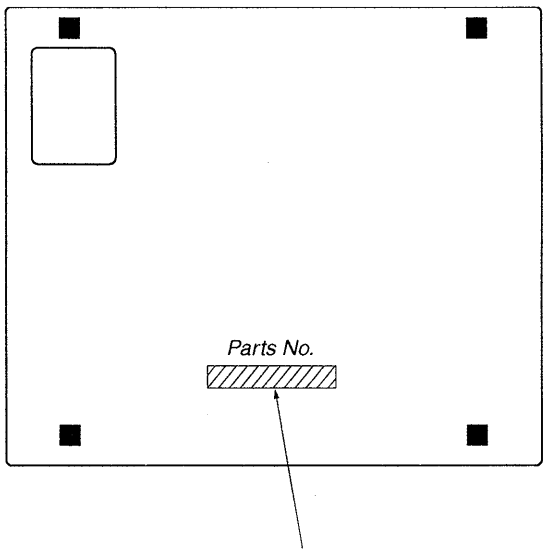
SAFETY-RELATED COMPONENT WARNING !!

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

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!!

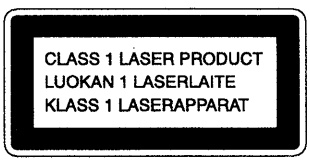
LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

MODEL IDENTIFICATION
— LOWER CASE —

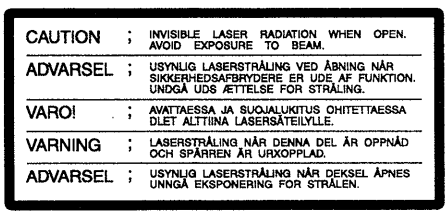


4-983-629-1□ : US, Canadian model
4-983-629-2□ : AEP, UK model

Laser component in this product is capable of emitting radiation exceeding the limit for Class 1.



This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.



This caution label is located inside the unit.

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

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the equipment manufacturer.
Discard used batteries according to manufacture's instructions.

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

ADVARSEL

Eksplosjonsfare ved feilakting skifte av batteri.
Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten.
Brukte batterier katterier kasseres i henhold til fabrikantens

VARNIG

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en likvärdig typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt gällande föreakrifter.

VAROITUS

Parist voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.
Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

- Keep the temperature of soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:
Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE

The AC leakage from any exposed metal part to earth Ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

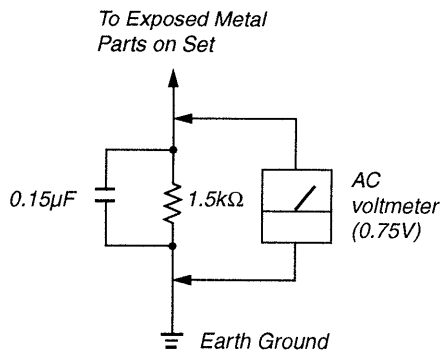


Fig. A. Using an AC voltmeter to check AC leakage.

TABLE OF CONTENTS

SECTION 1
SERVICING NOTE

FL Display Tube, LEDs All Lit and Key Check Mode

Turn ON the power while pressing the [REC], [■STOP], [UNDO] buttons.

↓

All FL display tube, LEDs light up

↓

Press the [REC SELECT 1] button.

↓

All FL display tube, LEDs go off.
(Only the UNDO LED changes from red to green.)

↓

Press the [REC SELECT 2] button.

↓

"Test Mode" blinks on the FL display tube, and the LEDs light up one by one.

↓

Press the [REC SELECT 3] button.

↓

"Key Test" blinks on the FL display tube.

↓ Note 1

[Press any button (including JOG). Note 2]

↓

The FL display tube level meter scale lights up each time the button is pressed.

↓ Note 1

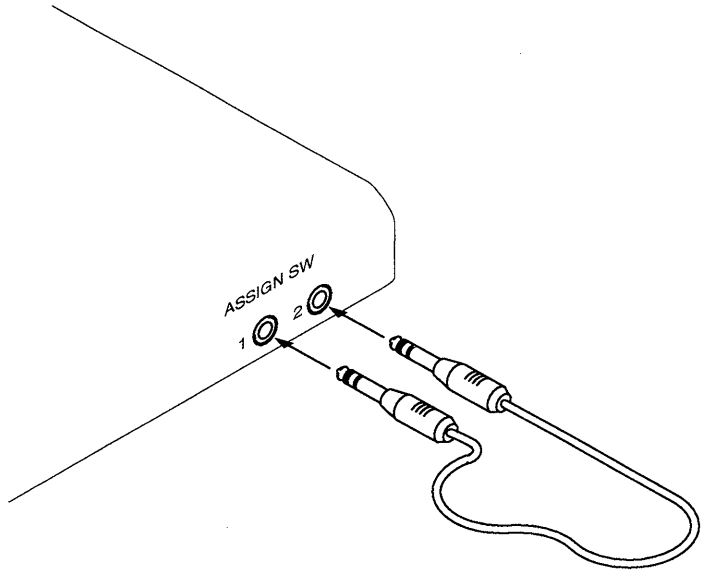
After pressing all the buttons, "Passed" is displayed on the FL display tube, indicating that key check has completed.

↓

Turn OFF the power to exit the test mode.

Note 1: [⏏EJECT] button can not be used.

Note 2: Insert a large plug between the ASSIGN SW1, and 2 jacks as shown in the figure, and detect the key inputs. (For foot switch)



To rest this unit to the original factory settings

1. Turn off the power to this unit.
2. Hold down SYSTEM while turning the power back on.
   The power comes on and "Initialized" appears in the display. The system settings are reset to the original factory settings.

- Abbreviation
  FL : Fluorescent indicator.

Standard Recording Procedures

The MDM-X4 is an integrated multichannel recorder/mixer that can record up to 4 tracks using MD-DATA discs. In addition to 4 track recording and playback, this unit can also perform a variety of editing operations.

1 Connect instruments, microphones, effectors, (etc.) and prepare for recording.

See "Connections and Signal Flow" (page 13) for details.

↓

2 Record the first track.

Example : Record the drums to track 1.
See "Initial Recording" (page 19) for details.

	Track
Drums →	1
	2
	3
	4

↓

3 Record another instrument on a different track while listening to the previously recorded track.

Example: Record the bass to track 2, the guitar to track 3 and the vocals on track 4.
See "Overdub Recording" (page 20) for details.

	Track	
	1	Drums
Bass →	2	
Guitar →	3	
Vocal →	4	

↓

4 You want to add a harmony chorus, but there's no more tracks left!

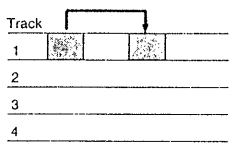
No problem! If you've already used all 4 tracks, you can record on top of a previously recorded track.
See "Mix Write Recording" (page 27) for details.

Track	
1	Drums
2	Bass
3	Guitar
4	Vocal ← Chorus

↓

5 You realize that a certain drum fill would sound better in a different place.

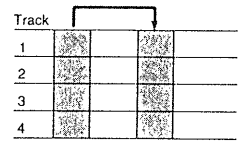
You can move, copy, or delete part of the song. For example, if the first and second chorus were reversed, they can easily be switched.
See "Editing Part of a Song (Track Edit)" (page 31) for details.



↓

6 You decide you want to change the structure of the song.

The edit functions let you add (or remove) an extra chorus or repeat the introduction in the middle of the song (etc.) without having to rerecord.
See "Changing the Construction of a Song (Section Edit)" (page 38) for details.



↓

7 Dub the tracks onto an external MD or DAT deck while using the mixer to adjust the balance.

See "Mixdown" (page 57) for details.

↓

Done !

Other convenient functions

- Equipped with an easy to use Jog/Shuttle dial.
- The Auto Punch-In/Out function lets you rerecord part of a song by enabling the record mode automatically only during the part which you have specified.
  See "Auto Punch-In/Out Recording" (page 22) for details.
- The Undo function lets you revert to the previous state when an edit operation doesn't produce the desired effect.
- Synchronization with other MIDI equipment is also possible. In addition to the ability to synchronize this unit with an external sequencer at start-up, you can also remote control this unit from the sequencer (with MMC compatible equipment only).
  The synchronization functions also let you make recordings by using a computer or sequencer to mediate sounds from acoustic instruments, like vocals or guitar, recorded on this unit with sounds from other MIDI equipment and sound modules (etc.).
  See "Synchronization with MIDI equipment" (page 52) for details.
- The Pitch Control function enables precise speed control.
  See the "SYSTEM key" explanation in "Names and Functions of Parts" (page 9) for details.
- A 10 INPUT/4 BUS analog mixer with exceptional sound quality.

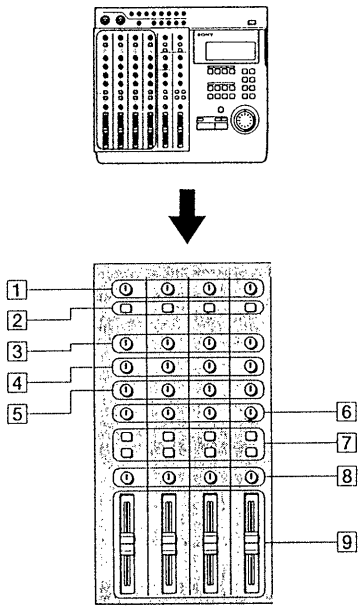
Names and Functions of Parts

The Mixer

Also refer to the "Block Diagram" on page 65.

The Channel 1~4 Section

The functions described are the same for each channel (1~4).



[1] TRIM knobs
Allow you to adjust the level of the signals input into the INPUT CH1~CH4 jacks approximately 40 dB. Turn to the right to increase the input level.
Normally, if you connect an instrument, turn to LINE; if you connect a microphone, turn to MIC.

For the best sound characteristics, adjust the TRIM knob so that the proper level is obtained when the fader is set between 7 and 8.

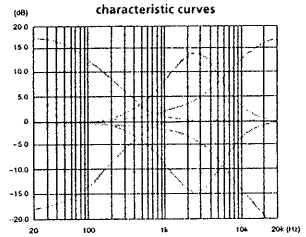
[2] INPUT selector keys
Allow you to select either LINE/MIC (sound from the INPUT CH jacks) or TRACK 1~4 (sound from the recorder) for input to mixer channels 1~4.
LINE/MIC : Use to input external sounds from an instrument or microphone (etc.).
TRACK 1~4 : Use to input sounds played back from the recorder.

[3] HIGH knobs
Adjust the treble of the respective channel. Provide a shelving type equalization.

[4] MID knobs
Adjust the middle frequencies of the respective channel. Provide a peak type equalization.

[5] LOW knobs
Adjust the bass of the respective channel. Provide a shelving type equalization.

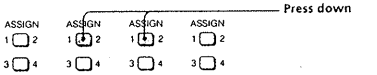
HIGH/MID/LOW equalizer characteristic curves



[6] AUX knobs
Adjust the level of the sound sent to the AUX bus (1~2) from the respective channel. Turn to "1" to output the sound from the respective channel to AUX bus 1. Turn to "2" to output the sound from the respective channel to AUX bus 2.
When set to the center position, no sound is output from either AUX bus.

[7] ASSIGN keys
Determine which group bus the channels will be assigned to (which track on the recorder they will be recorded to).
The channel signal is always connected to the stereo bus

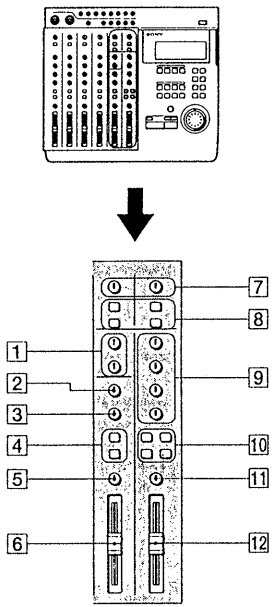
Example: To assign the sounds from channels 2 and 3 to group bus 1. (To record them to track 1 of the recorder).



[8] PAN knobs
Adjust the sound balance of the stereo or group bus. Turn towards "L" to move the sounds toward group bus 1 or 3 and the "L" side of the stereo bus. Turn towards "R" to move the sounds toward group bus 2 or 4 and the "R" side of the stereo bus.

[9] Faders 1~4
Adjust the volume of each channel.

Channel 5,6 and MASTER



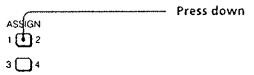
[1] MASTER AUX 1~2 knobs
Adjust the master level of the AUX bus sound output from the AUX OUTPUT 1~2 jacks.

[2] HIGH knob
Adjusts the treble of the sound input to the INPUT 5/6 jacks at the top of the unit. Provides a shelving type equalization.

[3] LOW knob
Adjusts the bass of the sound input to the INPUT 5/6 jacks at the top of the unit. Provides a shelving type equalization.

[4] ASSIGN keys
Determines which group bus the sound input to the INPUT 5/6 jacks at the top of the unit will be assigned to (which track on the recorder they will be recorded to).
Channel 5 can only be assigned to group bus 1 or 3.
Channel 6 can only be assigned to group bus 2 or 4.

EXAMPLE: To assign the sounds from channels 5 and 6 to group bus 1 and 2 respectively. (To record them to track 1 and 2 of the recorder).



[5] BALANCE knob
Adjusts the relative balance of channels 5 and 6.
Rotate toward "L" to increase the volume of channel 5.
Rotate toward "R" to increase the volume of channel 6.

[6] Fader 5/6
Simultaneously adjusts the volume of both channels 5 and 6.

[7] RETURN knobs (1 and 2)
Adjust the volume of the sound input into the RETURN 1 and 2 jacks at the top of the unit. (Return sound is generally used for adding external effects.)

[8] ASSIGN keys
Determine which group bus (1~4) the return sound will be assigned to (which track on the recorder they will be recorded to).

Example: To assign the sounds from return 1 and 2 to group bus 1 and 2. (To record them to tracks 1 and 2 on the recorder).

(continued)

[9] TRACK 1~4 knobs
Use to adjust the overall sound balance when monitoring playback from the recorder (CUE monitor) by turning the knob for each track as desired. When using the CUE monitor function, be sure to press down the monitor track setting CUE key ([10] below).

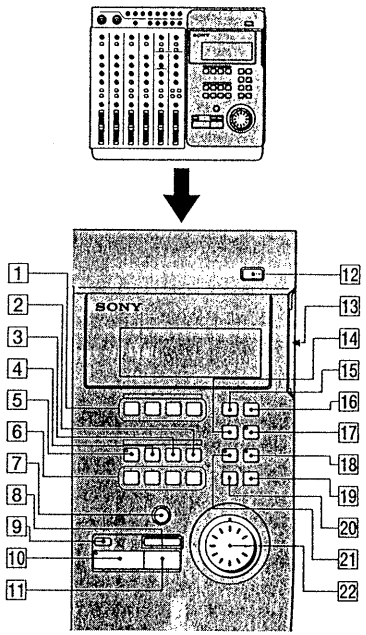
[10] Monitor Track Setting keys
Select the sound to be monitored.
1–2 : Press down to monitor the sound from group bus 1 and 2.
3–4 : Press down to monitor the sound from group bus 3 and 4.
CUE : Press down to monitor playback from the recorder. Use the TRACK 1~4 knobs to adjust volume of the individual tracks.
STEREO : Press down to monitor the sound from the stereo bus.

[11] MONITOR knob
Adjusts the volume of the sound output from the MONITOR OUT jacks (on the rear panel) and the HEADPHONES jack (on the front panel).

[12] MASTER fader
Adjusts the volume of the stereo bus sound output from the STEREO OUT jacks on the rear panel.

The Recorder

Control Panel



[1] REC SELECT 1~4 keys
Press to light the corresponding track indicator(s) and select the track(s) to be recorded. These keys also function as in/out keys during manual punch-in/out recording.

[2] SHIFT key
Holding down this key when you press another key lets you carry out the function written below the respective key.

EXAMPLE: The REPEAT key

- When pressed alone, it functions as the REPEAT key
- When pressed while holding down SHIFT, it functions as the DISPLAY key.

[3] OUT key
Sets the out point (edit end point).

[4] IN/DEST key
Sets the in point (edit start point).
Press while holding down SHIFT to set the destination point (edit destination point).

[5] MARK key
Press to set a mark point (and the key starts blinking).
Press IN, OUT, DEST, or A~H while the MARK key is blinking to set the mark point to the respective key.
This unit lets you assign up to 11 mark points using IN, OUT, DEST, and A~H.

[6] Locate point keys
Press to recall mark points. To specify points E~H, press the respective key while holding down SHIFT.

[7] REC key
Press to enter record mode. The key blinks, to indicate record pause mode. The key lights steadily when recording.

[8] ⏮ / ⏭ keys
Press to locate the beginning of the previous or next song. When adjusting a mark point, they can also be used with the rehearsal function to switch between a volume increase or decrease after the mark point.

[9] TOP key
Press once to locate the beginning of the first song on the disc. Press again during stop mode to locate the beginning of the unrecorded (blank) part of the disc.

[10] ▶ PLAY key
Starts playback. Lights during playback.

[11] ■ STOP key
Stops recording or playback.
Hold down this key and press the ▶ PLAY key to activate the IN-OUT playback mode and play back the section between the IN and OUT points repeatedly.
Pressing this key during stop mode to write the TOC data* to the disc.

[12] ⏏ EJECT key
Press to remove the disc.
If the TOC data* has not been written to the disc, it will be written automatically before the disc is ejected.
* You must write the TOC data to disc after a SECTION edit, SONG edit, or DISC edit. See pages 38 and 44 for details.

[13] Disc insertion slot
Insert the disc into this slot.

[14] REPEAT/DISPLAY key
Press to activate the repeat playback mode. The repeat mode changes as follows each time you press the key:
- REPEAT : repeats all the songs on the disc.
- REPEAT 1 : repeats the current song.
- (no indicator) : off.

Press while holding down SHIFT to change the display mode as follows:
- Time Mode : Shows the counter display in time.
- Bar Mode : Shows the counter display in bars.
- Remaining Mode : Shows the amount time which can be recorded remaining on the disc.

Note
Numbers will not be displayed in bar mode, if no tempo information is input.

[15] EDIT key
Press to enter Edit mode. Edit mode can only be entered when the disc is in stop mode.

[16] SYSTEM key
This key has two functions.
- System setting
  Press when making system settings to enter the system settings. See "Changing the Settings" (page 18) for details.
- Pitch Control
  Press while holding down SHIFT to turn the recording/playback pitch control "on". Press again while holding down SHIFT to turn the recording/playback pitch control "off".
  Pitch control "on" : Recording or playback is conducted in the preset pitch. ("Vari Pitch" is displayed.)
  Pitch control "off" : Recording or playback is conducted in the normal pitch. ("Fixed Pitch" is displayed.)
  See "System Settings" (page 17) for details on the pitch setting.

(continued)

17 RHSL (Rehearsal) key
This key has two functions:
- **Record rehearsal (rehearsal function)**
  Press during record pause mode to cause the indicator to blink and set this unit to operate as if it were recording, without actually recording. This is called rehearsal mode. (Rehearsal mode can also be activated by pressing RHSL when the AUTO PUNCH key is lit.)
  During record rehearsal, all other operations will function as if the unit was recording. This provides a convenient way to practice without actually recording.
  Press ■ STOP to cancel the rehearsal mode.
  Rehearsal mode, however, is not activated when recording a new song.
- **Locate point adjustment (locate adjust function)**
  Press to light the indicator and repeat the section just before and after the current locate point. The repeat time is specified in the roll time setting. Turning the JOG dial during rehearsal lets you adjust the position of the locate point.
  Press ■ STOP to cancel the locate adjust mode.
  See "Changing the position of a locate point" (page 32) for details.

Note
During locate adjust mode the counter value does not change to reflect the position of the playback sound.
Use JOG or SHUTTLE to adjust the counter value/position of the respective locate point. However, if you do not register the new value as a mark point it will be erased after the adjustment.

18 UNDO key
Erases the previous edit or auto punch-in/out operation and returns the data to its original status.
See "Using the Undo Function" (pages 24, 31, 38, 43) for details.

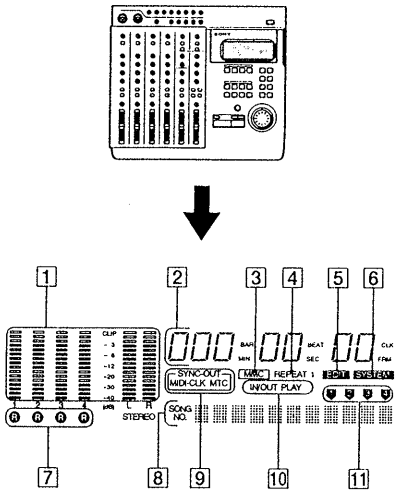
19 ENTER key
Press to carry out the selected operation (etc.).

20 EXIT key
Press to cancel the selected operation or to exit the edit mode.

21 AUTO PUNCH key
Use to select the auto punch-in/out function.

22 Jog dial (Jog/Shuttle dial)
Use to search (find a specific point within a song), select items from menus, set parameters, and adjust locate point positions (etc.).

The Display



1 Level meters
- 1–4
  During playback : Display the output levels of each track on the disc.
  During recording : Display the input levels of the track(s) being recorded.
  During stop mode or when no disc is inserted : Displays the volume of group bus 1–4.
- L, R
  Displays the volume of the stereo bus.

2 Counter display
Displays the time (minute/second/frame) or bar (bar/beat/clock).

3 MMC indicator
Lights when the unit can receive MMC (MIDI Machine Control) signals.

4 REPEAT indicator
Light during repeat playback.
"REPEAT" lights when repeating all the songs on the disc, "REPEAT1" lights when repeating one song.

5 EDIT indicator
Lights during edit operations (track, section, song, disc).

6 SYSTEM indicator
Lights during system setting operations.

7 Ⓡ indicators
Lights to indicate that the respective track was selected for recording using the REC SELECT keys. The track number corresponds to the group bus number.

8 Title display area
Displays the song or disc title, as well as edit menu information.

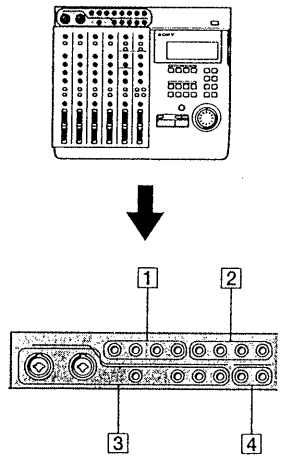
9 SYNC-OUT indicator
Displays the currently selected output synchronization. See pages 17 and 52–56 for details.
MIDI–CLK : Lights when the MIDI clock is being output.
MTC : Lights when the MIDI time code is being output.

10 IN/OUT PLAY indicator
Lights during IN/OUT playback.

11 Track display indicator
Displays the source track during editing.

Input and Output jacks

Top panel



1 TRACK 1–4 output jacks
Output the sound from tracks 1–4 of the recorder.
The TRACK 1–4 jacks output the signals for each track as they were recorded onto the disc.
Previously recorded signals are played back and output, even when the recorder is recording.

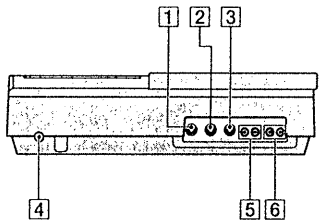
2 RETURN 1 / 2 (L (MONO) /R) input jacks
Use to input signals from external sources.
For example, when sending a sound modified by an external effect back to the mixer.
Use the L (MONO) jack when inputting monaural signals.

3 CH 1–6 input jacks
Use to input sounds to channels 1–6. The CH 1–4 jacks are for signals from microphones or line level sources. The CH 5 and 6 jacks are for line level signals only.
Channel 1 and 2 allow direct connection of XLR type plugs. (Channels 1 and 2 are balanced inputs for both XLR and standard plugs.)

(continued)

[4] OUTPUT AUX 1/2 jacks
Output sound for use as the send output. After adding an outboard effect to the sound output from these jacks, use the RETURN 1/2 (L/R) jacks to input it back to this unit.

Rear Panel



[1] MIDI THRU jack
Outputs the same signal input to the MIDI IN jack.

[2] MIDI OUT jack
Outputs the MIDI signal. Connect to the MIDI IN jack of another piece of MIDI equipment.

[3] MIDI IN jack
Inputs the signals output from the MIDI OUT jack of another piece of MIDI equipment.

[4] Power switch
Use to turn the power of this unit on and off.

[5] MONITOR OUT jack
Outputs the sound of the monitor bus. Connect to a pair of monitor speakers or an amplifier.
See "Connections for Recording" (page 13) for details.

[6] STEREO OUT jack
Outputs the sound of the stereo bus. Connect to a DAT deck (etc.) during mixdown.
See "Connections for Recording" (page 13) for details.

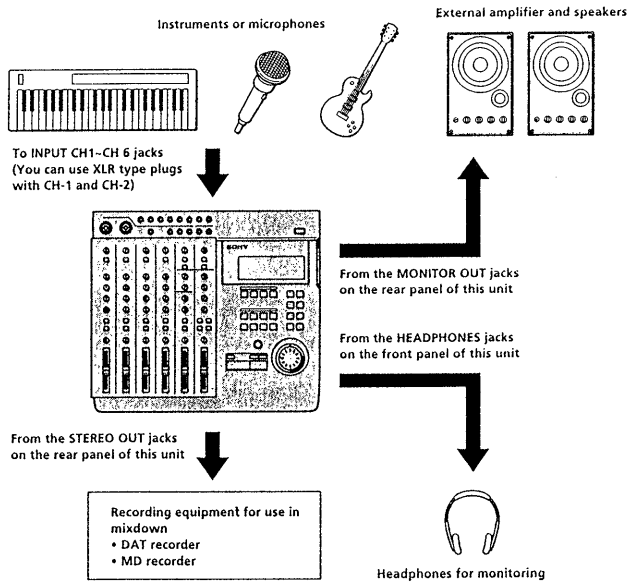
Front Panel

[1] HEADPHONES jack
Connect a pair of headphones with a standard type plug.

[2] ASSIGN SW 1,2 jack
For connecting external switches, such as a foot switch (etc.).
See "System Settings" (page 17) for details regarding the functions which can be controlled.
You can use either ⌐ or ⌐ type foot switches. When the power is turned on, this unit registers the current position of the connected pedal as "OFF".

Connections for Recording

Connect instruments, microphones, and amp and headphones for monitoring as shown below.



When inputting sound from a sound module into this unit
You can mix the sound with sounds previously recorded on tracks 1–4 by using the INPUT CH-5 or INPUT CH-6 jacks.

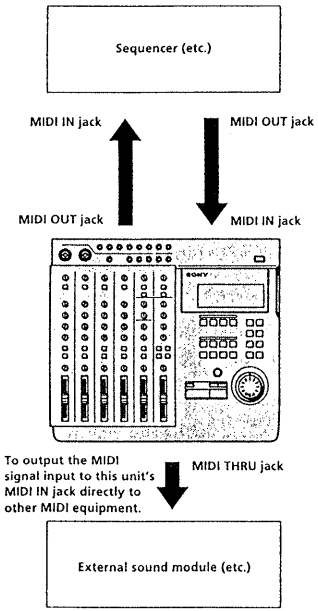
Do the following when connecting an external effector to input the return sound.
To output sound to the effector : Use the AUX 1 or AUX 2 jacks on the top panel of this unit.
To input sound from the effector (return sound) : Use the RETURN 1 or RETURN 2 jacks on the top panel of this unit.

Turning on the Power

After you have completed all connections, connect the power cord from this unit to a wall outlet.

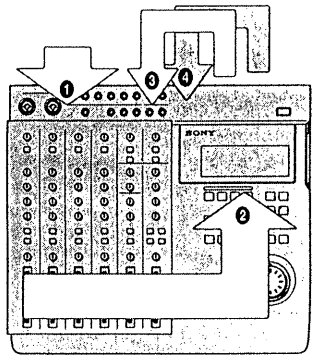
Connecting MIDI equipment

Connect MIDI equipment as shown in the following diagram.
For details regarding connections for synchronized operation with a sequencer (etc.). See "Synchronization with MIDI equipment" (pages 52~56) for details.



MDM-X4 Signal Flow Diagram

The following diagram shows the internal signal flow of this unit.



❶ Input external sounds.
❷ The input sound is recorded after being mixed and assigned to the respective group bus (1~4).
❸ The playback sound from the recorder is input back into the mixer (mix write recording, bounce recording).
❹ The playback sound from the recorder is output to an external component, that adds an effect, before being input back into the mixer (mix write recording, bounce recording).

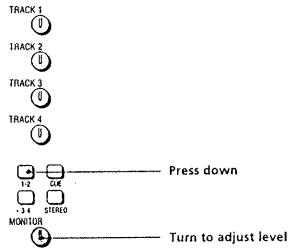
This unit's 6 channel inputs and 2 stereo return inputs are connected to group bus 1~4 and stereo bus L/R. (For group bus 1~4 use the ASSIGN keys to assign the input sound to a group bus. The channel signals are always connected to the stereo bus. In cases where you do not want to mix the signals to the stereo bus, lower the faders for the respective channels to "0".)
When monitoring, you can select group bus 1-2, group bus 3-4, stereo bus, or TRACK 1~4 OUTPUT (CUE bus).
For details on how to monitor, see "Monitoring Example" (page 15).

Monitoring Preparations

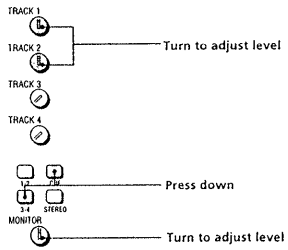
This unit enables you to monitor the following 4 types of signals as necessary.
① **Group 1, 2 :** Select to monitor mixer group bus 1 and 2. The sound from group bus 1 is localized in the L (left) channel and the sound from group bus 2 is localized in the R (right) channel. When recording, select to monitor the sound being recorded.
② **Group 3, 4 :** Select to monitor mixer group bus 3 and 4. The sound from group bus 3 is localized in the L (left) channel and the sound from group bus 4 is localized in the R (right) channel. When recording, select to monitor the sound being recorded.
③ **CUE :** Select to listen to all the sound recorded on the disc. You can adjust the volume level of the individual tracks using the TRACK 1~4 knobs located above the MONITOR keys. (All tracks are heard in mono.) When recording, the track being recorded is muted.
④ **STEREO :** Select to listen to the sound of the mixer's stereo bus. For use during mixdown (etc.).

Monitoring Example

EXAMPLE 1: Monitoring the sound from group bus 1 and 2 (during recording, etc.)

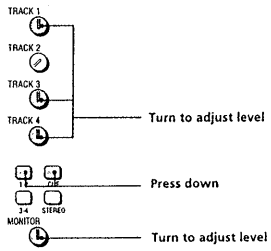


EXAMPLE 2: Monitoring the sound being recorded to tracks 3 and 4 while monitoring the sound of tracks 1 and 2 (during overdubbing, etc.)

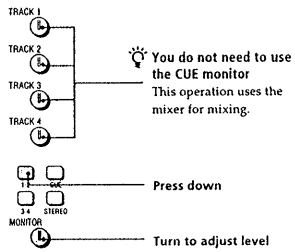


(continued)

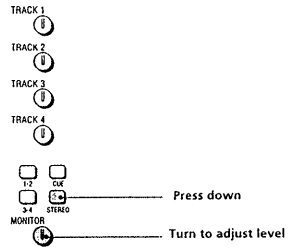
EXAMPLE 3: Rerecording part of track 1 while monitoring the sound of tracks 3 and 4 (during punch-in/out recording, etc.)



EXAMPLE 4: Mixing tracks 1~4 for recording onto tracks 1 and 2 (during mix write recording, etc.)



EXAMPLE 5: Monitoring the sound of the stereo bus (for mixdown, etc.)



System Settings

You customize the operating environment by turning the MIDI synchronization and UNDO (undo last operation) functions (etc.) on or off.

Pitch setting (Pitch)
You can set the pitch in 0.25% increments within a range of ±8%. When you turn the pitch control on after setting the pitch , recording/playback is conducted at the selected pitch.
See the "System key" in "Names and Functions of Parts" (page 9) for details on turning the pitch control on/off.

MMC setting (MMC)
This sets the MMC (MIDI Machine Control) reception. See page 55 for details about MMC.
off : No reception. Use this setting when using this unit by itself.
on : The unit operates according to the received MMC signals.

Device ID setting (Dev ID)
Sets the MMC ID number. It can be set to any number between 0 and 126. When this unit receives ID = 127 signals, they are registered as a valid signals regardless of this unit's ID setting.

Synchronized output source setting (Sync)
Sets the Synchronized output source. See pages 52 and 53 for details about synchronization.
off : Does not output a synchronization signal
MTC (MIDI Time Code) : When using the MTC for synchronization.
MCLK (MIDI Clock) : When using the MIDI clock for synchronization.

MTC frame number setting (Frame)
Sets the MTC frame number (per second). You can select either 25 or 30 non-drop frames.

Assignable switch 1, 2 setting (Sw-1, Sw-2)
Allows you to assign one of the following commands for control by the external switch connected to the ASSIGN SW1 or SW2 jack on the front panel.
Play : Same function as this unit's ► PLAY key.
RecIO : Press once for the same function as the REC key (punch-in). Press again for the same function as the ► PLAY key (punch-out). This setting allows you to conduct punch in-out recording from an external switch.
Stop : Stops the disc operation.
IOply (In-Out Play) : Starts IN-OUT playback
PlayS (Play-Stop) : Press one to start playback, press again to stop playback.
Rec S (Rec-Stop) : Press once to start recording, press again to stop recording.

Pre-roll/Post-roll setting (Roll)
Allows you to set the pre-roll/post-roll time used during rehearsal and auto punch-in/out operations in 1 second increments. It is adjustable from 1 to 10 seconds.

Undo function on/off setting (Undo)
This determines whether the undo function will be on or off when you use auto punch-in/out. During edit mode, however, the undo function is always on. Changing this setting also changes the redo function (that allows you to undo the undo) setting is also changed at the same time.
off : Turns off the undo function
on : Turns on the undo function
The indicator on the UNDO key has the following meanings:
GREEN : You can use the undo function.
RED (blinking) : Preparing to carry out the undo function.
RED : Undo (or Redo) has been carried out.
(off) : You cannot use the undo function (such as when the previous operation cannot be undone (etc.)).
See page 24 for details about using the undo function with the auto punch-in/out function.

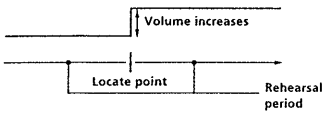
Note
Do to the limitations of this system, if the blank space on the disc becomes too small it may not be possible to use the undo function even if it is set to "on". In this case, the indicator on the UNDO key will be off. Be sure to check whether this indicator is on or off before performing an edit operations.

Recordable track number setting (Rec)
This sets the number of tracks to be used on the disc. The number of tracks selected is effective the next time a song is recorded. During playback, the number of tracks is selected automatically according to the source disc.
The selectable tracks also differ depending on the type of disc you use (MD DATA or music MD).

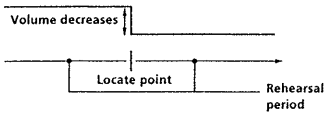
Rec Mode	Usable tracks	Recording time	Usable Discs
4	1~4	37 min.	MD DATA
2	1, 2	74 min.	MD DATA, Music MD
1	1	148 min.	MD DATA, Music MD

(continued)

Rehearsal mode setting (RHSL)
This setting lets you determine whether the volume will increase or decrease after the locate point when adjusting the position of a locate point with the rehearsal function. See page 32 for details about locate point adjustment.
↑: the volume increases past the locate point.



↓: the volume decreases past the locate point.

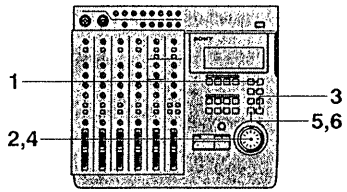


During rehearsal mode, press the I◄◄ or ►►I key to switch between increased or decreased volume after the locate point.

Display brightness setting (Dimmer)
Adjusts the display brightness. You can choose from 8 levels (1–8). Larger numbers provide a brighter display.

Changing a Setting

Use the following operations to change the system settings



1 Press SYSTEM.
SYSTEM appears in the display.

2 Turn the jog dial to display the item you want to adjust.
The item blinks in the display.

3 Press ENTER.
The blinking moves to the right of the item.

4 Turn the jog dial to display the setting you desire.

5 Press EXIT.
the item starts blinking again.

6 Press EXIT again.
SYSTEM disappears from the display.

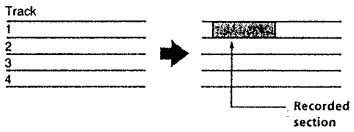
To reset this unit to the original factory settings

1 Turn off the power to this unit.

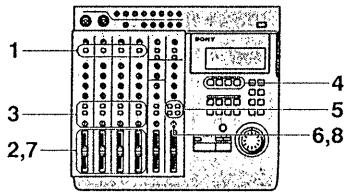
2 Hold down SYSTEM while turning the power back on.
The power comes on and "Initialized" appears in the display. The system settings are reset to the original factory settings.

Initial Recording

This shows you how to record the very first track onto a blank disc.



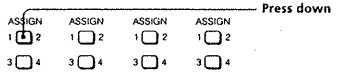
Preparations



1 Set the INPUT switch for the channel to which you will input the instrument or microphone sound to LINE/MIC (up position).

2 Set the fader for the channel to which you will input the sound to about 7 or 8.

3 Use the ASSIGN switch and PAN knobs to direct the sound to the group path you want to record.
EXAMPLE: To assign channel 1 to group path 1



4 Press the REC SELECT key corresponding to the group path number you selected in step 3 to specify the track to be recorded.

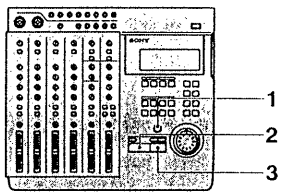
5 Press the monitor track set key corresponding to the group path number you selected in step 3.

6 Turn the MONITOR knob to adjust the sound to a level which can be monitored.

7 Use the fader to adjust the recording level.
Play a relatively loud phrase and make adjustments by watching the level meter for the track you want to record.
If necessary, you can use the TRIM knob to adjust the recording level and equalizer.
Adjust the recording level so that the CLIP indicator does not light.
Adjust the TRIM knob so that the proper level is obtained when the fader is set between 7 and 8 to achieve good frequency characteristics.

8 Turn the MONITOR knob as in step 6 to adjust monitor level.

Recording



1 Press REC.
The unit switches to record pause mode.

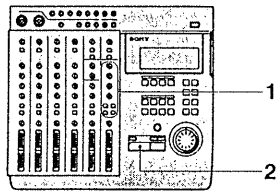
2 Press ► PLAY.
Recording begins

3 When you've finished playing, press ■ STOP.
This unit automatically goes to the beginning of the recorded song.
It takes a few seconds for the unit to process the information after pressing ■ STOP.
Please note that the length of the song is fixed at the point where the initial recording ends.

Note
Do not turn off the power during recording. Not only may you loose the data for the current song, you may loose all of the data on the disc.

(continued)

Checking the Recording



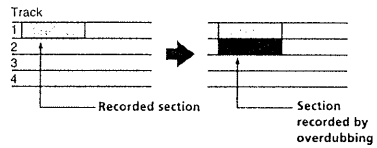
1 Press CUE to prepare for monitoring.
Adjust the monitor volume using the respective TRACK knobs and the MONITOR knob.

2 Press ► PLAY.
Playback begins.
Make sure the CLIP indicator on the level meter does not light.
If necessary, you can use the jog dial to locate a specific point.

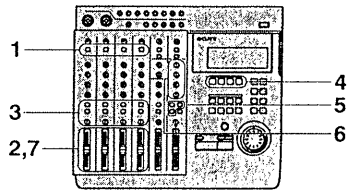
To rerecord
Follow the "Recording" procedure on the previous page.

Overdub Recording

You can record other sound on a different track while listening to the playback from a previously recorded track. This kind of recording is called overdubbing.



Preparations



1 Set the INPUT switch for the channel to which you will input the instrument or microphone sound to LINE/MIC (up position).

2 Set the fader for the channel to which you will input the sound to about 7 or 8.

3 Use the ASSIGN switch and PAN knobs to direct the sound to the group path you want to record.

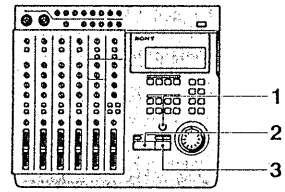
4 Press the REC SELECT key corresponding to the group path number you selected in step 3 to specify the track to be recorded.

5 Press the monitor track set key corresponding to the group path number you selected in step 3.

6 Press CUE, then turn the TRACK knob corresponding to the track containing the recorded sound you want to hear while recording to adjust the sound to a level at which it can be monitored.
Use the MONITOR knob to adjust the monitor level.

7 Use the fader to adjust the recording level.
Play a relatively loud phrase and make adjustments by watching the level meter for the track you want to record.
If necessary, you can use the TRIM knob to adjust the recording level and equalizer.
Adjust the recording level so that the CLIP indicator does not light.
Adjust the TRIM knob so that the proper level is obtained when the fader is set between 7 and 8 to achieve good frequency characteristics.

Recording



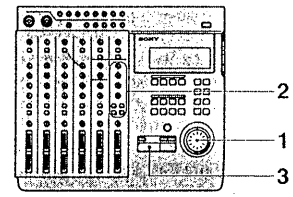
1 Press REC.
The unit switches to record pause mode.

2 Press ► PLAY.
Recording begins.
Play together with the previously recorded performance.

3 When you've finished playing, press ■ STOP.
If you press ■ STOP in the middle of the song, recording stops at that counter position.
If you do not press ■ STOP in the middle of the song, recording stops automatically at the end of the song and the beginning of the song is recalled automatically.

Note
Do not turn off the power during recording. Not only may you loose the data for the current song, you may loose all of the data on the disc.

Checking the Recording



1 Turn the jog dial to set the counter to the point you want to hear.

If you set it as a locate point, it can be located immediately with the LOCATE keys.

2 Press CUE to prepare for monitoring.
Adjust the monitor volume using the respective TRACK knobs and the MONITOR knob.

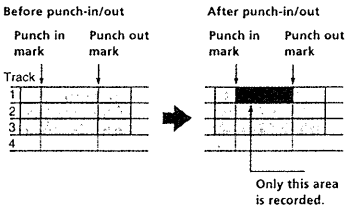
3 Press ► PLAY.
Playback begins.
Make sure the CLIP indicator on the level meter does not light.

To rerecord
Follow the "Recording" procedure to the left.

Auto Punch-In/Out Recording

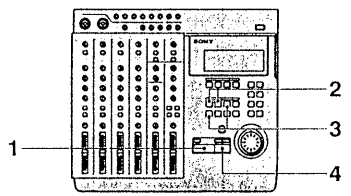
You can rerecord a certain portion of a previously recorded track. This is called punch-in/out recording. With this unit allows for 2 kinds of punch-in/out recording; auto punch-in/out, where you specify the section you desire and the unit punches in/out automatically, and manual punch-in/out, where you time the performance and punch-in/out manually at the positions you desire.
With auto punch-in/out recording, only the space between the in and out points is recordable. Therefore, you can play normally over the track but only the specified phrase will be rerecorded. The other parts of the track remain untouched.

EXAMPLE: Using punch-in/out on track 1.



Setting the section to be punched in/out

Before auto punch-in/out recording you must set the record start (punch in) and record stop (punch out) positions. The punch-in/out positions must be set within the same song. Also, be sure to set the out point at a higher number than the in point.



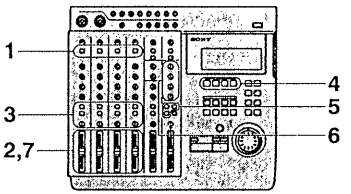
1 Press ► PLAY.
Playback begins.

2 At the point you want to start recording, press MARK then press IN.
This sets the punch in position.

3 At the point you want to stop recording, press MARK then press OUT.
This sets the punch out position.

4 Press ■ STOP.
Playback stops.

Preparations



1 Set the INPUT switch for the channel to which you will input the instrument or microphone sound to LINE/MIC (up position).

2 Set the fader for the channel to which you will input the sound to about 7 or 8.

3 Use the ASSIGN switch and PAN knobs to direct the sound to the group path you want to record.

4 Press the REC SELECT key corresponding to the group path number you selected in step 3 to specify the track to be recorded.

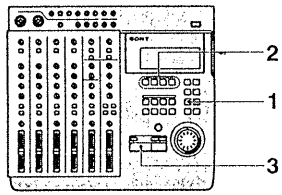
5 Press the monitor track set key corresponding to the group path number you selected in step 3.

6 Turn the MONITOR knob and the TRACK knob corresponding to the track containing the recorded sound you want to hear while recording to adjust the sound to a level which can be monitored.

7 Use the fader to adjust the recording level.
Play a relatively loud phrase and make adjustments by watching the level meter for the track you want to record.
If necessary, you can use the TRIM knob to adjust the recording level and equalizer.
Adjust the recording level so that the CLIP indicator does not light.
Adjust the TRIM knob so that the proper level is obtained when the fader is set between 7 and 8 to achieve good frequency characteristics.

Rehearsing the punch-in/out

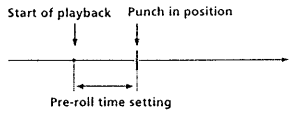
You can check to make sure the record start (punch in) and record stop (punch out) positions are correct before starting punch-in/out recording. (rehearsal function)
When the rehearsal function is operative, the specified section is muted through the CUE monitor (the actual sound has not been erased). If the settings are incorrect re-specify the in and out points until the correct section has been specified. See "Correcting the locate point position" (page 32) for details.
The following procedure shows how to carry out the rehearsal.



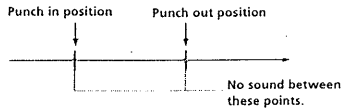
1 Press AUTO PUNCH when the disc is in stop mode.
The indicator on AUTO PUNCH lights up.
REC and the indicator on RHSL start blinking, and the unit enters record pause mode.
When "Undo Function On/Off" in the system settings is set to "on", the indicator on the UNDO key changes accordingly.

2 Press the REC SELECT key for the track to be recorded.

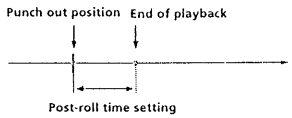
3 Press ► PLAY.
Playback starts pre-rolling from a point slightly before the punch-in position in accordance with the "Pre-roll/Post-roll" system setting.



When using CUE monitor, the sound between the punch-in and punch-out positions of the track to be recorded (the track whose REC SELECT key was pressed) cannot be heard.



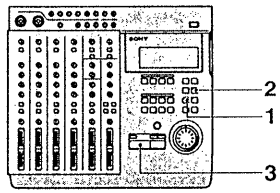
Rehearsal post-rolls to a point slightly after the punch out position in accordance with the "Pre-roll/Post-roll" system setting and then stops.
Once rehearsal has stopped, the disc automatically returns to the original point where the AUTO PUNCH key was pressed.



To stop in the middle of rehearsal
Press ■ STOP.

(continued)

Recording

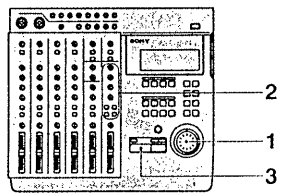


1 Press AUTO PUNCH when the disc is stopped.
The indicator on AUTO PUNCH lights.
REC and the indicator on RHSL start blinking, and the unit enters record pause mode.
When "Undo Function On/Off" in the system settings is set to "on", the indicator on the UNDO key changes accordingly.

2 Press RHSL to cancel rehearsal mode.
When "Undo Function On/Off" in the system settings is set to "on", and undo is possible, the unit proceeds to back up the data.

3 Press ► PLAY.
Playback begins. Play together with the previously recorded performance.
When the recorder arrives at the preset punch-in position, record mode is activated automatically and the input sound is recorded on the specified track up to the punch-out point. When the recorder reaches the punch-out point, recording stops automatically, but playback continues until the post-roll point is reached.
When playback is stopped the player automatically returns to the original point.

Checking the Recording



1 Turn the jog dial to set the counter to the point you want to hear.

Pressing the IN key automatically locates the punch-in point.

2 Press CUE to prepare for monitoring.
Adjust the monitor volume using the respective TRACK knobs and the MONITOR knob.

3 Press ► PLAY.
Playback begins.
Make sure the CLIP indicator on the level meter does not light.

To rerecord
Follow the "Recording" procedure to the left.

Using the UNDO function with auto punch-in/out recording

You can undo the punch-in/out immediately after execution if the system UNDO setting is set to "on" and the undo indicator is lit green.
To carry out the undo function, press UNDO.
Pressing undo again lets you redo the undone section (redo function).

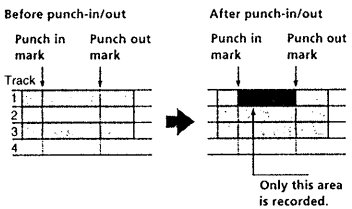
Note
Carrying out another edit operation, starting a recording, or removing the disc after carrying out the undo or redo functions will make it impossible to undo the previous edit operation.

Notes about the color of the indicator on the UNDO key.
The color which the indicator on the UNDO key lights shows the current status. (Sometimes the indicator is off).
GREEN : undo is possible. (Redo has been carried out.)
RED : undo has been carried out
RED (blinking) : in the process of carrying out the undo (or redo) function.
(off) : undo is not possible. (In cases where the previous operation cannot be undone (etc.).)

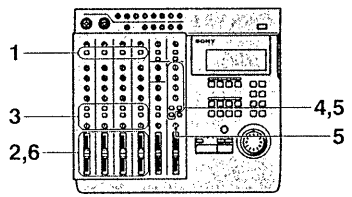
Manual Punch-In/Out Recording

Manual punch-in/out recording is when you start and stop recording manually with the appropriate timing instead of presetting the section to be recorded.

EXAMPLE: To punch-in/out a section on track 1.



Preparations



1 Set the INPUT switch for the channel to which you will input the instrument or microphone sound to LINE/MIC (up position).

2 Set the fader for the channel to which you will input the sound to about 7 or 8.

3 Use the ASSIGN switch and PAN knobs to direct the sound to the group path you want to record.

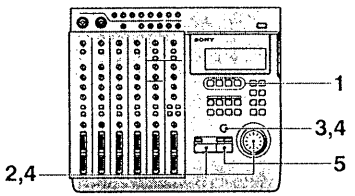
4 Press the monitor track set key corresponding to the group path number you selected in step 3.

5 Press CUE, then turn the TRACK knob corresponding to the track containing the recorded sound you want to hear while recording to adjust the sound to a level which can be monitored.
Use the MONITOR knob to adjust the monitor level.

6 Use the fader to adjust the recording level.
Play a relatively loud phrase and make adjustments by watching the level meter for the track you want to record.
If necessary, you can use the TRIM knob to adjust the recording level and equalizer.
Adjust the recording level so that the CLIP indicator does not light.
Adjust the TRIM knob so that the proper level is obtained when the fader is set between 7 and 8 to achieve good frequency characteristics.

Recording

(1) Using the REC key to punch-in/out.



1 Press the REC SELECT key corresponding to the group path you want to record to specify the track to be recorded.

2 Turn the jog dial to set the counter to a position before the point where you want to start recording, then press ► PLAY.
Playback begins.

3 When you reach the point where you want to start recording (the punch in point), press REC.
The REC key lights up and recording begins.

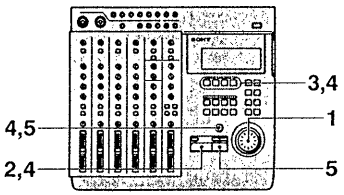
(continued)

4 Press ► PLAY when you reach the point where you want to stop recording (the punch out point).
The REC key goes out and the unit stops recording and switches to playback mode.

5 Press ■ STOP.
Playback ends.

Setting the ASSIGN SW on the front of the unit to "REC IO" lets you use a foot switch (etc.) to activate punch-in/out recording. See "System Settings" (page 17) for details.

(2) Using the REC SELECT key to punch-in/out



1 Turn the jog dial to set the counter to a position before the point where you want to start recording, then press REC.
The REC key start blinking and the unit switches to record pause mode.

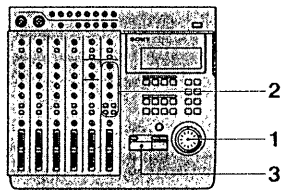
2 Press ► PLAY.
Playback starts, while the REC key continues blinking.

3 When you reach the point where you want to start recording (the punch in point), press the REC SELECT key for the track you want to record.
The REC key lights steadily and recording begins on the specified track.

4 When you reach the point where you want to stop recording (the punch out point), press REC SELECT key for the track being recorded or press the ► PLAY key.
The REC key starts blinking, or goes out, and the unit stops recording and switches to playback mode.

5 Press ■ STOP.
Playback ends.

Checking the Recording



1 Turn the jog dial to set the counter to the point you want to hear.

2 Press CUE to prepare for monitoring.
Adjust the monitor volume using the respective TRACK knobs and the MONITOR knob.

3 Press ► PLAY.
Playback begins.
Make sure the CLIP indicator on the level meter does not light.

To rerecord
Follow the "Recording" procedure on the previous page.

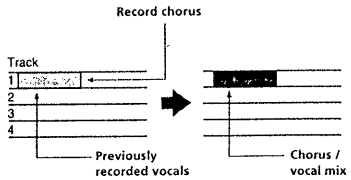
Mix Write Recording (Basics)

You can record other sounds on top of a previously recorded track.
The following is an explanation of the mix write concept.

EXAMPLE: Recording a chorus on top of the vocals recorded on track 1.

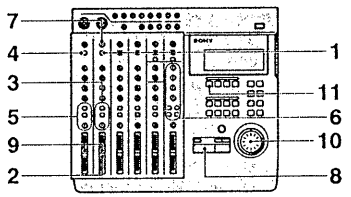
Since the vocals recorded on track 1 are all assigned to channel 1, connect the microphone to another channel's input jack.

During recording, the chorus vocals are mixed with the original vocals and recorded to track 1.



Preparations for recording

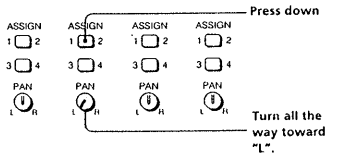
EXAMPLE: Recording a chorus on top of the vocals recorded on track 1. (For this example we will input the chorus to the INPUT CH2 jack.)



1 Set the channel 2 INPUT switch to LINE/MIC (up position).
(Set channel 2 to receive the input sound).

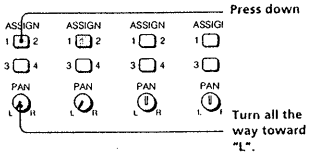
2 Set the fader for channel 2 to about 7 or 8.

3 Set the channel 2 ASSIGN switch and PAN knobs to direct the sound to track 1.
(Set the chorus vocals input from channel 2 to be recorded on track 1.)



4 Press down the channel 1 INPUT switch.
(Input the playback sound from the recorder (TRACK 1) to channel 1.)

5 Set the channel 1 ASSIGN switch and PAN knobs to direct the playback sound from the recorder to track 1.
(Set the playback sound from the recorder to be recorded on track 1.)



6 Prepare the monitor.
- Press the monitor track key corresponding to the group path selected in steps 3 and 5 (in this case, press down the 1-2 button).
- If you want to monitor the sound of tracks 2 and 3 press the CUE key.
- Turn the MONITOR knob and the TRACK knob(s) to adjust the sound to a level that can be monitored.

7 Input a loud phrase and use the channel 2 TRIM knob to adjust the recording level.

8 Press ► PLAY.
Playback begins.

(continued)

9 Use the channel 1 and 2 faders to adjust the balance between the vocals and chorus to be recorded on track 1.
You may also need to adjust the monitor balance at this time.
Press the ■ STOP key after making the necessary adjustments.

10 Turn the jog dial to locate the point on the counter where the recording will begin.

11 Press the REC SELECT key for track 1.
This makes it possible to record on track 1.

Recording

1 Press REC.
The unit switches to record pause mode.

2 Press ► PLAY.
Recording begins.
Play together with the previously recorded performance.

3 When you've finished playing, press STOP.

Checking the Recording

1 Turn the jog dial to set the counter to the point you want to hear.

2 Press CUE to prepare for monitoring.
Adjust the monitor volume using the respective TRACK knobs and the MONITOR knob.

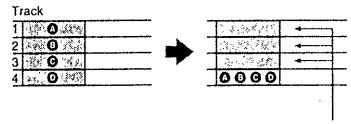
3 Press ► PLAY.
Playback begins.
Make sure the CLIP indicator on the level meter does not light.

Mix Write Recording (Applied Operations)

Mix write also comes in handy in a variety of other situations not mentioned on the previous pages. In this section we will provide 2 additional examples of mix write recording.

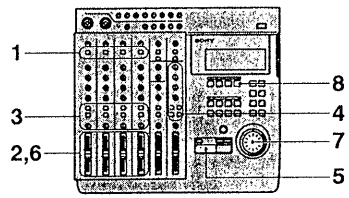
EXAMPLE 1: Recording the sound from tracks 1~4 to track 4 (Ping Pong Recording)

Recording the previously recorded sound from tracks 1~4 onto track 4.
This allows you to use tracks 1~3 as blank tracks for recording other parts.



The previously recorded contents of tracks 1~3 remain, but the contents of tracks 1~4 have been recorded together on track 4.

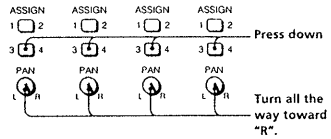
Preparations



1 Press down the INPUT switches on channels 1~4.
(Set channels 1~4 to receive the (TRACK) sound played back from the recorder.)

2 Set the faders for channels 1~4 to about 7 or 8.

3 Set the ASSIGN switches and PAN knobs for channels 1~4 to direct the sound to track 4.
(Set the playback sounds input from the recorder to channels 1~4 to be recorded on track 4.)



4 Prepare the monitor.
- Press the monitor track key corresponding to the group path selected in step 3 (in this case, press 3-4).
- Turn the MONITOR knob and the TRACK knob(s) to adjust the sound to a level that can be monitored.

5 Press ► PLAY.
Playback begins.

6 Use the faders for channels 1~4 to adjust the record balance of the sound to be recorded on track 4.
You may also need to adjust the monitor balance at this time.
Press the ■ STOP key after making the necessary adjustments.

7 Turn the jog dial to locate the point on the counter where the recording will begin.

8 Press the REC SELECT key for track 4.
This makes it possible to record on track 4.

Recording

1 Press REC.
The unit switches to record pause mode.

2 Press ► PLAY.
Recording begins.
Play together with the previously recorded performance.

3 When you've finished playing, press STOP.

Checking the Recording

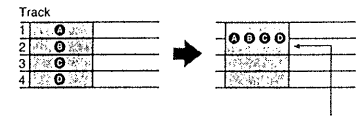
1 Turn the jog dial to set the counter to the point you want to hear.

2 Press CUE to prepare for monitoring.
Adjust the monitor volume using the respective TRACK knobs and the MONITOR knob.

3 Press ► PLAY.
Playback begins.
Make sure the CLIP indicator on the level meter does not light.

EXAMPLE 2: Recording the sound from tracks 1~4 to tracks 1 and 2 (Bounce Recording)

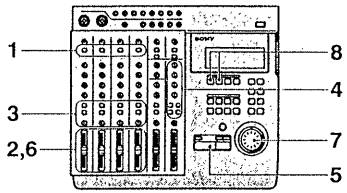
Recording the previously recorded sound from tracks 1~4 in a stereo mix to tracks 1 and 2.
This allows you to use tracks 3 and 4 as blank tracks for recording other parts.



The previously recorded contents of tracks 3 and 4 remain, but the contents of tracks 1~4 have been recorded together in a stereo mix on tracks 1 and 2.

(continued)

Preparations



1 Press down the INPUT switches on channels 1~4. (Set channels 1~4 to receive the (TRACK) sound played back from the recorder.)

2 Set the faders for channels 1~4 to about 7 or 8.

3 Set the ASSIGN switches and PAN knobs for channels 1~4 to direct the sound to tracks 1 and 2. (Set the playback sounds input from the recorder to channels 1~4 to be recorded on tracks 1 and 2.)

4 Prepare the monitor.
- Press the monitor track key corresponding to the group path selected in step 3 (In this case, press 1-2).
- Turn the MONITOR knob and the TRACK knob(s) to adjust the sound to a level that can be monitored.

5 Press ► PLAY.
Playback begins.

6 Use the faders for channels 1~4 to adjust the record balance of the sound to be recorded on tracks 1 and 2.
You may also need to adjust the monitor balance at this time.
Press the ■ STOP key after making the necessary adjustments.

7 Turn the jog dial to locate the point on the counter where the recording will begin.

8 Press the REC SELECT key for tracks 1 and 2.
This makes it possible to record on tracks 1 and 2.

Recording

1 Press REC.
The unit switches to record pause mode.

2 Press ► PLAY.
Recording begins.
Play together with the previously recorded performance.

3 When you've finished playing, press STOP.

Checking the Recording

1 Turn the jog dial to set the counter to the point you want to hear.

2 Press CUE to prepare for monitoring.
Adjust the monitor volume using the respective TRACK knobs and the MONITOR knob.

3 Press ► PLAY.
Playback begins.
Make sure the CLIP indicator on the level meter does not light.

Track Edit Overview

The track editing operations let you specify a part (an arbitrary section of an arbitrary track) and copy it over another part, move it to another position, or remove the sound from it. You can also switch the positions of two parts.
Additionally, you can edit between different songs as well as within the same song.

The track editing functions consist of the following:
- Track Copy (duplicating a part) → page 33
- Track Move (moving a part) → page 34
- Track Exchange (switching the positions of 2 parts) → page 35
- Track Erase (erasing a part) → page 36

Using the Undo Function with track editing operations

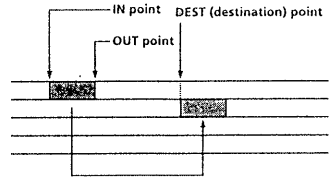
You can undo an edit immediately after execution if the undo indicator is lit green.
To carry out the undo function, press UNDO.
Pressing undo again lets you redo the undone edit operation (redo function).

Note
Carrying out another edit operation, starting a recording, or removing the disc after carrying out the undo or redo functions will make it impossible to undo the previous edit operation.

Notes about the color of the indicator on the UNDO key.
The color which the indicator on the UNDO key lights shows the current status. (Sometimes the indicator is off).
GREEN : undo is possible. (Redo has been carried out.)
RED : undo has been carried out
RED (blinking) : in the process of carrying out the undo (or redo) function.
(off) : undo is not possible. (In cases where the previous operation cannot be undone (etc.).)

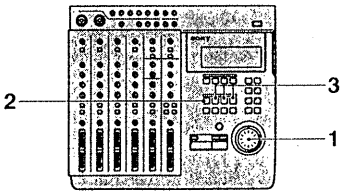
Specifying the Locate Points

Before editing, it is necessary to specify the locate points (edit points). There are the following three types of locate points:
- IN (edit start) point
  Represents the beginning of the part to be edited.
- OUT (edit end) point
  Represents the end of the part to be edited.
- DEST (edit destination) point
  Represents the place where the part will be copied to during the copy operation (etc.).



Setting edit points by specifying the time/bar

Use the following procedure when you know the time/bar of the locate points for the desired part.



1 Turn the jog dial during stop mode to display the time/bar you desire.
Holding down the SHIFT key and pressing the DISPLAY key lets you switch the display between time and bars.
To select the desired song, use the |◄◄ and ►►| keys.

2 Press MARK.
The indicator on the MARK key starts blinking.

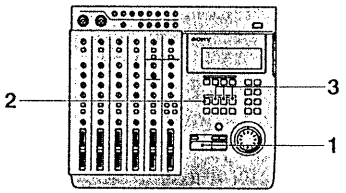
(continued)

3 Press the key for the locate point you desire.
- IN point : Press IN.
- OUT point : Press OUT.
- DEST (destination) point : Hold down the SHIFT key and press IN.

The time/bar in the display is set as the respective locate point.

Setting edit points while listening to the sound being played back

Use the following procedure to set locate points while listening to the sound being played back.



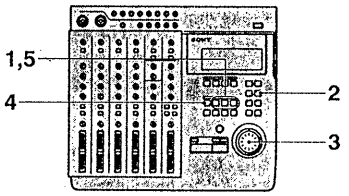
1 Press ► PLAY.
Playback begins.

2 Press MARK when you reach the place where you want to set the locate point.
The indicator on the MARK key starts blinking.

3 Press the key for the locate point you desire.
- IN point : Press IN.
- OUT point : Press OUT.
- DEST (destination) point : Hold down the SHIFT key and press IN.

The locate point is set at the place where you pressed the MARK key.

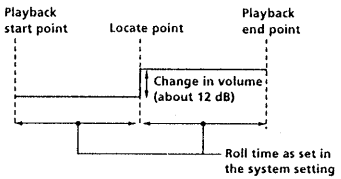
Correcting the position of the locate point



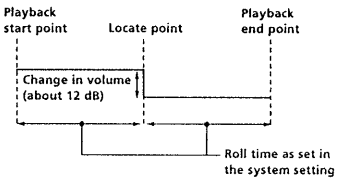
1 Press the key for the point you wish to correct.
- IN point : Press IN.
- OUT point : Press OUT.
- DEST (destination) point : Hold down the SHIFT key and press IN.

The time/bar for the respective locate point appears in the display.

2 Press RHSL.
The indicator on the RHSL key starts to blink and playback repeats around the locate point.
- When the rehearsal mode (page 17) setting is ↑: the volume increases when the locate point is passed.



- When the rehearsal mode (page 17) setting is ↓: the volume decreases when the locate point is passed.



💡 During rehearsal mode, press the ⏮ or ⏭ key to switch between increased or decreased volume after the locate point.

3 Turn the jog dial to adjust the position of the locate point.
The locate point moves in proportion to the rotation of the jog dial each time the section is repeated.

4 Press MARK.
The indicator on the MARK key starts blinking.

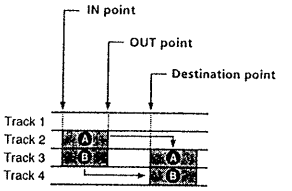
5 Press the key for the locate point you desire.
Playback stops and the locate point is set to the new position.

To stop before completing the correction
Press ■ STOP to stop playback.

Notes
- Be sure to set the out point at a higher number than the in point.
- Be sure to set the punch-in/out positions within the same song.

Copying a Part (Track Copy)

You can copy part of a track and place it in another location. If the location points are in the same position, you can copy parts from more than one track at the same time.



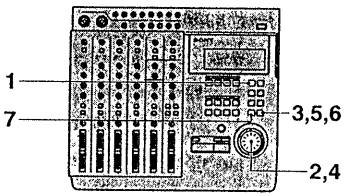
The original sound recorded after the destination point is erased and rewritten by the part between the in and out points.

Preparations

Set the following locate points before carrying out the edit operation.
- IN point : the beginning of the part to be copied.
- OUT point : the end of the part to be copied.
- DEST (destination) point : the beginning of the part to be rewritten.

See "Specifying the Location Points" (page 31) for details on how to set the location points.

Editing Operation



1 Press EDIT.
EDIT appears in the display.

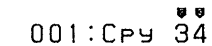
(continued)

2 Turn the jog dial so that "Trak Copy" appears in the display.
The name of the edit function starts blinking in the display.

3 Press ENTER.
The edit setting items appear in the display.

4 Turn the jog dial to display the setting you desire.
This determines which tracks the part will be copied from and which tracks the part will be copied to.
Use the jog dial to specify the copy destination track numbers in the space underneath the track indicator(s) (▼ mark) for the part to be copied.

Example display:



To set other tracks press ENTER and proceed to the next step.
Press EXIT to return to the original settings.
If you do not want to specify any tracks, leave the destination track number display empty.

5 Press ENTER.
Once all the track settings have been displayed, "OK?" appears in the display.

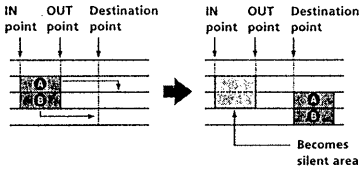
6 Press ENTER again.
The selected part is copied.
If you do not wish to carry out the edit operation, press EXIT.
When the edit operation has finished, the edit select screen reappears.

7 Press EXIT.
This completes the edit operation.

Note
It is not possible to set the destination point between the in and out points when copying to the same track.

Moving a Part (Track Move)

You can move part of a track to a different position in a different track.



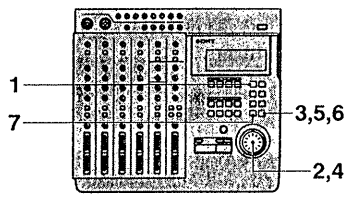
The space between the original in and out points becomes a silent area.

Preparations.

Set the following locate points before carrying out the edit operation.
- IN point : the beginning of the part to be copied.
- OUT point : the end of the part to be copied.
- DEST (destination) point : the beginning of the part to be rewritten.

See "Specifying the Location Points" (page 31) for details on how to set the location points.

Editing Operation



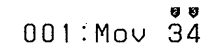
1 Press EDIT.
[EDIT] appears in the display.

2 Turn the jog dial so that "Trak Move" appears in the display.
The name of the edit function starts blinking in the display.

3 Press ENTER.
The edit setting items appear in the display.

4 Turn the jog dial to display the setting you desire.
This determines which tracks the part will be moved to.
Use the jog dial to display the move destination track numbers in the space below the move origin track number indicator(s) (▼ mark).

Example display:



To set other tracks press ENTER and proceed to the next step.
Press EXIT to return to the original settings.
If you do not want to specify any tracks, leave the destination track number display empty.

5 Press ENTER.
Once all the track settings have been displayed, "OK?" appears in the display.

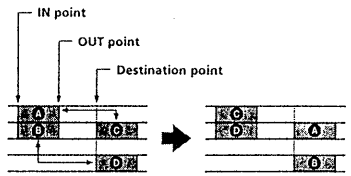
6 Press ENTER again.
The selected part is copied.
If you do not wish to carry out the edit operation, press EXIT.
When the edit operation has finished, the edit select screen reappears.

7 Press EXIT.
This completes the edit operation.

Note
It is not possible to set the destination point between the in and out points when moving within the same track.

Switching the Locations of 2 Parts (Track Exchange)

You can switch the location one part of a track with another part of any other track.

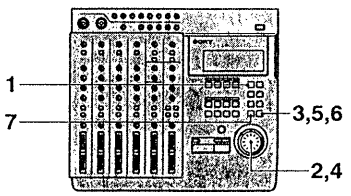


Preparations

Set the following locate points before carrying out the edit operation.
- IN point : the beginning of the part to be copied.
- OUT point : the end of the part to be copied.
- DEST (destination) point : the beginning of the part to be rewritten.

See "Specifying the Location Points" (page 31) for details on how to set the location points.

Editing Operation



1 Press EDIT.
[EDIT] appears in the display.

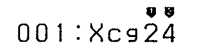
2 Turn the jog dial so that "Trak Xchnge" appears in the display.
The name of the edit function starts blinking in the display.

(continued)

3 Press ENTER.
The edit setting items appear in the display.

4 Turn the jog dial to display the setting you desire.
This determines which tracks the parts will be exchanged to.
Use the jog dial to display the exchange destination track number(s) below the exchange origin track number indicator(s) (▼ mark).

Example display:



To set other tracks press ENTER and proceed to the next step.
Press EXIT to return to the original settings.
If you do not want to specify any tracks, leave the destination track number display empty.

5 Press ENTER.
Once all the track settings have been displayed, "OK?" appears in the display.

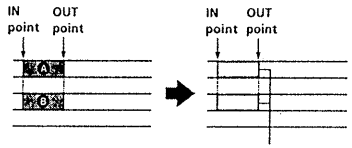
6 Press ENTER again.
The selected part is copied.
If you do not wish to carry out the edit operation, press EXIT.
When the edit operation has finished, the edit select screen reappears.

7 Press EXIT.
This completes the edit operation.

Note
It is not possible to set the edit points to exchange overlapping parts.

Erasing a Part (Track Erase)

You can erase part of a track. The part which was erased becomes a part with no sound.

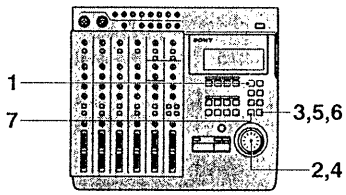


Preparations

Set the following locate points before carrying out the edit operation.
- IN point : the beginning of the part to be copied.
- OUT point : the end of the part to be copied.
- DEST (destination) point : the beginning of the part to be rewritten.

See "Specifying the Location Points" (page 31) for details on how to set the location points.

Editing Operation



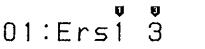
1 Press EDIT.
[EDIT] appears in the display.

2 Turn the jog dial so that "Trak Erase" appears in the display.
The name of the edit function starts blinking in the display.

3 Press ENTER.
The edit setting items appear in the display.

4 Turn the jog dial to display the setting you desire.
This determines which tracks the part will be erased from.
Use the jog dial to display the track number(s) containing the part(s) to be erased below the respective track number indicator(s) (▼ mark).

Example display:



To set other tracks press ENTER and proceed to the next step.
Press EXIT to return to the original settings.
If you do not want to specify a track, leave an empty space below the respective track number indicator.

5 Press ENTER.
"OK?" appears in the display.

6 Press ENTER again.
The selected part is copied.
If you do not wish to carry out the edit operation, press EXIT.
When the edit operation has finished, the edit select screen reappears.

7 Press EXIT.
This completes the edit operation.

Changing the Construction of a Song (Section Edit)

Section Edit Overview

The section editing operations let you specify sections common to all 4 tracks and move them to other positions in the song, duplicate them, or remove them. You can also switch the positions of two sections.

The section editing functions consist of the following:
- Section Move (moving a section) → page 39
- Section Exchange (switching 2 sections) → page 40
- Section Insert (duplicating and inserting a section) → page 41
- Section Delete (for deleting a section) → page 42

Notes
- It is not possible to perform recording operations, such as punch-in/out recording on a song that has been modified with section editing.
  In order to perform punch-in/out recording operations after a song has been edited, you must copy the entire song, then record or edit the copied version of the song.
  ":" blinks next to the song number of songs which have been modified with the section edit function.
  See "Copying a Song (Song Copy)" on page 43 for details on how to copy a song.
- Short sections* cannot be edited. This is due to the nature of the MD system, and is not a malfunction.
  * With 4 tracks = less than approximately 4 seconds.
  With 2 tracks = less than approximately 8 seconds.
  With 1 track = less than approximately 16 seconds.
- Section editing is only complete once the TOC data has been updated. You can update the TOC data by pressing STOP during stop mode. The TOC data is also updated automatically when the disc is ejected. **Therefore, always eject the disc before turning off the power. Not only is there a danger of loosing the song being edited, there is also a possibility of loosing the contents of the entire disc.**

Using the Undo Function with section editing operations

You can undo an edit immediately after execution if the undo indicator is lit green.
To carry out the undo function, press UNDO.
Pressing undo again lets you redo the undone edit operation (redo function).

Note
Carrying out another edit operation, starting a recording, or removing the disc after carrying out the undo or redo functions will make it impossible to undo the previous edit operation.

Notes about the color of the indicator on the UNDO key.
The color which the indicator on the UNDO key lights shows the current status. (Sometimes the indicator is off).
GREEN : undo is possible. (Redo has been carried out.)
RED : undo has been carried out
RED (blinking) : in the process of carrying out the undo (or redo) function.
(off) : undo is not possible. (In cases where the previous operation cannot be undone (etc.).)

Specifying the Locate Points

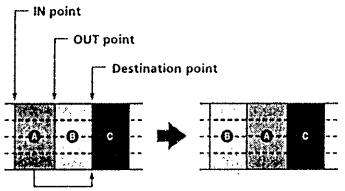
Before editing, it is necessary to specify the locate points (edit points). There are the following three types of locate points:
- IN (edit start) point :
  Represents the beginning of the section to be edited.
- OUT (edit end) point :
  Represents the end of the section to be edited.
- DEST (edit destination) point :
  Represents the edit destination for move, exchange, and insert operations.

See "Specifying the Location Points" on page 31 for details on how to set the location points.

Notes
- Be sure to set the out point at a higher number than the in point.
- Be sure to set the punch-in/out positions within the same song.

Moving a Section (Section Move)

You can move a section to a different place in the song. The section to be moved is inserted at the point specified by the destination point.



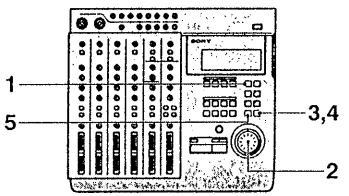
The selected section is moved.
A disappears and is moved to the destination point.

Preparations

Set the following locate points before carrying out the edit operation.
- IN point : the beginning of the part to be copied.
- OUT point : the end of the part to be copied.
- DEST (destination) point : the beginning of the part to be rewritten.

See "Specifying the Location Points" (page 31) for details on how to set the location points.

Editing Operation



1 Press EDIT.
EDIT appears in the display.

2 Turn the jog dial so that "Sect Move" appears in the display.
The name of the edit function starts blinking in the display.

3 Press ENTER.
"OK?" appears in the display.

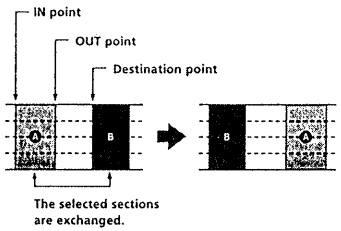
001 : Mov , OK?

4 Press ENTER again.
The selected edit operation is carried out.
To start over again from the beginning, or quit the edit operation, press EXIT instead of ENTER.
When the edit operation has finished, the edit select screen reappears.
To carry out another edit operation in succession use the jog dial to specify the operation you desire.

5 Press EXIT.
This completes the edit operation.

Switching the Locations of 2 Sections (Section Exchange)

You can switch the location of two sections.



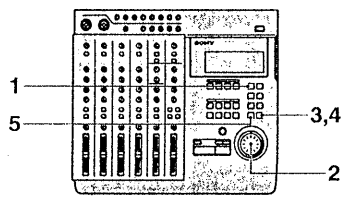
Preparations

Set the following locate points before carrying out the edit operation.

- IN point : the beginning of the part to be copied.
- OUT point : the end of the part to be copied.
- DEST (destination) point : the beginning of the part to be rewritten.

See "Specifying the Location Points" (page 31) for details on how to set the location points.

Editing Operation



1 Press EDIT.
EDIT appears in the display.

2 Turn the jog dial so that "Sect Xchnge" appears in the display.
The name of the edit function starts blinking in the display.

3 Press ENTER.
"OK?" appears in the display.

```
001:Xcg,OK?
```

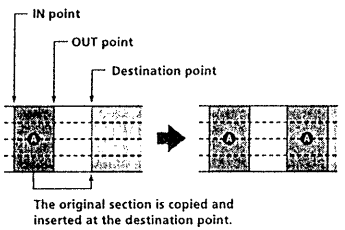
4 Press ENTER again.
The selected edit operation is carried out.
To start over again from the beginning, or quit the edit operation, press EXIT instead of ENTER.
When the edit operation has finished, the edit select screen reappears.
To carry out another edit operation in succession use the jog dial to specify the operation you desire.

5 Press EXIT.
This completes the edit operation.

Note
It is not possible to set the destination point between the in and out points.

Inserting Another Section (Section Insert)

This function lets you copy a section and insert it at another place in the song.



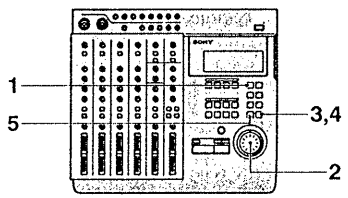
Preparations

Set the following locate points before carrying out the edit operation.

- IN point : the beginning of the part to be copied.
- OUT point : the end of the part to be copied.
- DEST (destination) point : the beginning of the part to be rewritten.

See "Specifying the Location Points" (page 31) for details on how to set the location points.

Editing Operation



1 Press EDIT.
EDIT appears in the display.

2 Turn the jog dial so that "Sect Insert" appears in the display.
The name of the edit function starts blinking in the display.

3 Press ENTER.
"OK?" appears in the display.

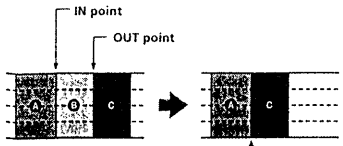
```
001:Ins,OK?
```

4 Press ENTER again.
The selected edit operation is carried out.
To start over again from the beginning, or quit the edit operation, press EXIT instead of ENTER.
When the edit operation has finished, the edit select screen reappears.
To carry out another edit operation in succession use the jog dial to specify the operation you desire.

5 Press EXIT.
This completes the edit operation.

Deleting a Section (Section Delete)

This function lets you delete a section of the song.



The specified section is deleted and the in and out points are joined together.

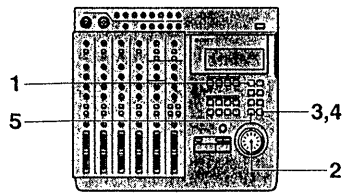
Preparations

Set the following locate points before carrying out the edit operation.

- IN point : the beginning of the part to be copied.
- OUT point : the end of the part to be copied.
- DEST (destination) point : the beginning of the part to be rewritten.

See "Specifying the Location Points" (page 31) for details on how to set the location points.

Editing Operation



1 Press EDIT.
EDIT appears in the display.

2 Turn the jog dial so that "Sect Delete" appears in the display.
The name of the edit function starts blinking in the display.

3 Press ENTER.
"OK?" appears in the display.

```
001:Del.OK?
```

4 Press ENTER again.
The selected edit operation is carried out.
To start over again from the beginning, or quit the edit operation, press EXIT instead of ENTER.
When the edit operation has finished, the edit select screen reappears.
To carry out another edit operation in succession use the jog dial to specify the operation you desire.

5 Press EXIT.
This completes the edit operation.

Song Edit Overview

The following sections show you how to divide a completed song and connect 2 adjacent songs (etc.) so you can easily locate the positions you desire on the recorded disc.

The following is a list of song editing functions :

- Song Copy (copying a song) → page 43
- Song Move (moving a song) → page 44
- Song Exchange (switching the positions of 2 songs) → page 45
- Song Divide (dividing 1 song into 2 different songs) → page 46
- Song Combine (combining 2 songs) → page 47
- Song Delete (deleting a song) → page 48
- Song Name (naming a song) → page 49
- Song Tempo (creating a tempo map) → page 53

Note

Song editing is only complete once the TOC data has been updated. You can update the TOC data by pressing STOP during stop mode. The TOC data is also updated automatically when the disc is ejected. Therefore, always eject the disc before turning off the power. Not only is there a danger of loosing the song being edited, there is also a possibility of loosing the contents of the entire disc.

Using the Undo Function with section editing operations

You can undo an edit immediately after execution if the undo indicator is lit green.
To carry out the undo function, press UNDO.
Pressing undo again lets you redo the undone edit operation (redo function).

Note

Carrying out another edit operation, starting a recording, or removing the disc after carrying out the undo or redo functions will make it impossible to undo the previous edit operation.

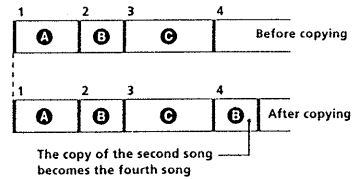
Notes about the color of the indicator on the UNDO key.

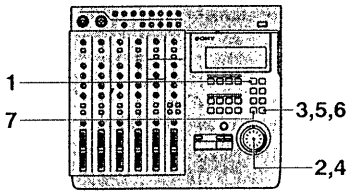
The color which the indicator on the UNDO key lights shows the current status. (Sometimes the indicator is off).
GREEN : Undo is possible. (Or Redo has been carried out.)
RED : Undo has been carried out
RED (blinking) : In the process of carrying out the undo (or redo) function.
(off) : Undo is not possible. (In cases where the previous operation cannot be undone (etc.).)

Copying a Song (Song Copy)

This function lets you duplicate a song. Newly created copy is treated as a new recording and becomes the last song on the disc. This is a convenient way to backup songs before editing.

Copying the second song.





1 Press EDIT.
EDIT appears in the display.

2 Turn the jog dial so that "Song Copy" appears in the display.
The name of the edit function starts blinking in the display.

3 Press ENTER.
The edit setting items appear in the display.

4 Turn the jog dial to display the number song you want to copy.

```
Cpy 002
```

5 Press ENTER
"OK?" appears in the display.

(continued)

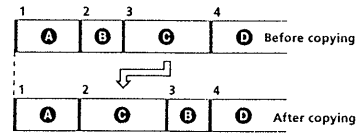
6 Press ENTER again.
The selected song is copied.
To start over again from the beginning, or quit the edit operation, press EXIT instead of ENTER.
When the edit operation has finished, the edit select screen reappears.
To carry out another edit operation in succession use the jog dial to specify the operation you desire.

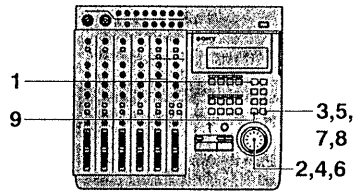
7 Press EXIT.
This completes the edit operation.

Moving a Song (Song Move)

This function lets you change the order of the songs by moving the song you select to a different position.

Moving the second song to the third song.





1 Press EDIT.
[EDIT] appears in the display.

2 Turn the jog dial so that "Song Move" appears in the display.
The name of the edit function starts blinking in the display.

3 Press ENTER.
The edit setting items appear in the display.

```
Mov 002>003
```

4 Turn the jog dial to display the song number you want to move.

5 Press ENTER.

6 Turn the jog dial to display the number you want to move the selected song to.

7 Press ENTER
"OK?" appears in the display.

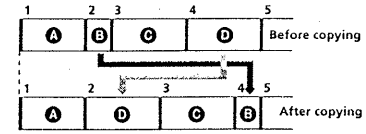
8 Press ENTER again.
The selected song is moved.
To start over again from the beginning, or quit the edit operation, press EXIT instead of ENTER.
When the edit operation has finished, the edit select screen reappears.
To carry out another edit operation in succession use the jog dial to specify the operation you desire.

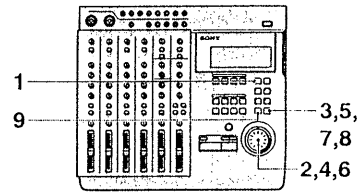
9 Press EXIT.
This completes the edit operation.

Changing the Song Order (Song Exchange)

This function lets you switch the position of 2 songs of your choice. New consecutive song numbers are assigned automatically.

Switching songs 2 and 4.





1 Press EDIT.
[EDIT] appears in the display.

2 Turn the jog dial so that "Song Xchnge" appears in the display.
The name of the edit function starts blinking in the display.

3 Press ENTER.
The edit setting items appear in the display.

```
Xcg 002-004
```

4 Turn the jog dial to display the first song number you want to exchange.

5 Press ENTER.

(continued)

6 Turn the jog dial to display the song number you want to exchange the first song with.

7 Press ENTER
"OK?" appears in the display.

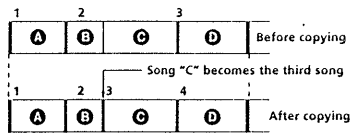
8 Press ENTER again.
The selected songs are exchanged.
To start over again from the beginning, or quit the edit operation, press EXIT instead of ENTER.
When the edit operation has finished, the edit select screen reappears.
To carry out another edit operation in succession use the jog dial to specify the operation you desire.

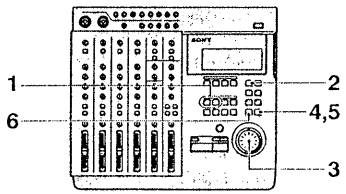
9 Press EXIT.
This completes the edit operation.

Dividing a Song (Song Divide)

This function lets you divide a song into different songs. New consecutive song numbers are assigned automatically.

Dividing the second song into sections (B) and (C).





1 Set a locate point (in point) at the position where you want to divide the song.

2 Press EDIT.
[EDIT] appears in the display.

3 Turn the jog dial so that "Song Divide" appears in the display.
The name of the edit function starts blinking in the display.

4 Press ENTER.
"OK?" appears in the display.

002:Div,OK?

5 Press ENTER again.
The song is divided at the specified point.
To start over again from the beginning, or quit the edit operation, press EXIT instead of ENTER.
When the edit operation has finished, the edit select screen reappears.
To carry out another edit operation in succession use the jog dial to specify the operation you desire.

6 Press EXIT.
This completes the edit operation.

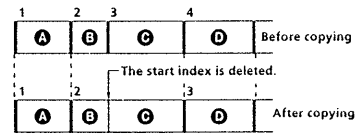
Connecting 2 Songs (Song Combine)

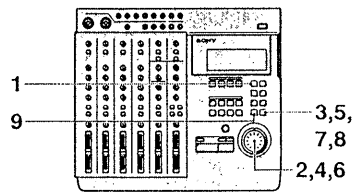
This function lets you combine two songs into one. You can use this function to connect songs for continuous playback, or combine a series of separate recordings into a single song (etc.).

Note

It is not possible to perform recording operations, such as punch-in/out recording on songs created from combinations of other songs using the song combine edit function.
In order to perform punch-in/out recording operations after a song combine, you must copy the entire song (Song Copy), then record or edit the copied version of the song.
":" blinks next to the song number of songs created using the song combine edit function.
If ":" is blinking next to one of the two song numbers to be combined, that song cannot be combined due limitations of the MD recording system. In such a case, copy the song (Song Copy) with the blinking ":" before performing the song combine edit function.
See "Copying a Song (Song Copy)" on page 43 for details on how to copy a song.

Creating one song by combining songs 2 and 3.





1 Press EDIT.
[EDIT] appears in the display.

2 Turn the jog dial so that "Song Combin" appears in the display.
The name of the edit function starts blinking in the display.

(continued)

3 Press ENTER.
The edit setting items appear in the display.

Cmb 002+003

4 Turn the jog dial to display the song number you want to combine as the first half of the new song.

5 Press ENTER.

6 Turn the jog dial to display the song number you want to combine as the second half of the new song.

7 Press ENTER
"OK?" appears in the display.

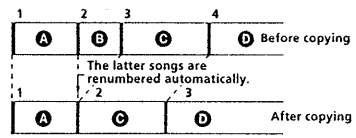
8 Press ENTER again.
The selected songs are combined.
To start over again from the beginning, or quit the edit operation, press EXIT instead of ENTER.
When the edit operation has finished, the edit select screen reappears.
To carry out another edit operation in succession use the jog dial to specify the operation you desire.

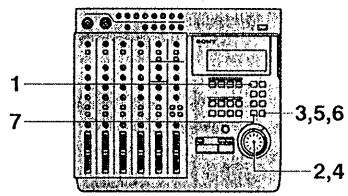
9 Press EXIT.
This completes the edit operation.

Deleting a Song (Song Delete)

This function allows you to easily delete a recorded song by specifying its song number. To delete all of the songs on the disc, see "Erasing the Disc Contents (Disc Erase)" on page 50.
New consecutive song numbers are automatically assigned to the songs following the deleted song. For example, if you delete song number 1, song number 2 becomes the song number 1.
This feature is convenient because there is no need to record "over" old material, as with cassette tapes.

Deleting the second song.





1 Press EDIT.
EDIT appears in the display.

2 Turn the jog dial so that "Song Delete" appears in the display.
The name of the edit function starts blinking in the display.

3 Press ENTER.
The edit setting items appear in the display.

Del 002

4 Turn the jog dial to display the song number you want to delete.

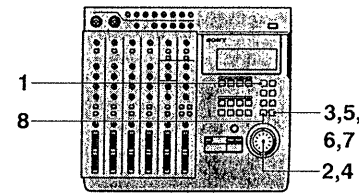
5 Press ENTER
"OK?" appears in the display.

6 Press ENTER again.
The selected songs are exchanged.
To start over again from the beginning, or quit the edit operation, press EXIT instead of ENTER.
When the edit operation has finished, the edit select screen reappears.
To carry out another edit operation in succession use the jog dial to specify the operation you desire.

7 Press EXIT.
This completes the edit operation.

Naming a Song (Song Name)

This function lets you assign names to songs using upper and lower case letters of the alphabet, numbers, and symbols.



1 Press EDIT.
EDIT appears in the display.

2 Turn the jog dial so that "Song Name" appears in the display.
The name of the edit function starts blinking in the display.

3 Press ENTER.
The edit setting items appear in the display.

4 Turn the jog dial to display the character you desire.
The selected character blinks. In addition to the letters of the alphabet, you can also use numbers and symbols. The symbols which can be displayed are as follows:
! " # $ % & ' ( ) * + , - . / : ; < = > ? @ ^ _ ` (blank)

5 Press ENTER.
The character selected in step 4 lights steadily and the cursor starts blinking in the next position.
To go back to the previous position, press EXIT.

6 Repeat steps 4 and 5 until to complete the title.

7 Press EXIT when the cursor is in the leftmost position or
press ENTER when the cursor is in the rightmost position to enter the final name.
To carry out another edit operation in succession use the jog dial to specify the operation you desire.

8 Press EXIT.
This completes the edit operation.

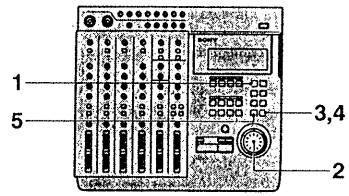
Overview

This chapter shows you how to erase all the information on the disc and how to assign a disc name.

The following is a list of disc editing functions :
- Disc Erase (for erasing a disc) → page 50
- Disc Name (for naming a disc) → page 51

Erasing the disc Contents (Disc Erase)

This function erases the entire disc. Both the recorded audio data and the disc name will be erased.



1 Press EDIT.
[EDIT] appears in the display.

2 Turn the jog dial so that "Disc Erase" appears in the display.
The name of the edit function starts blinking in the display.

3 Press ENTER.
"OK?" appears in the display.

```
Dsc Ers.OK?
```

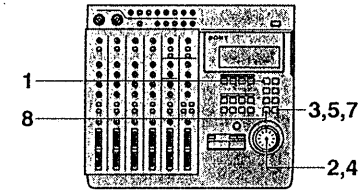
4 Press ENTER again.
The contents of the disc are erased.

5 Press EXIT.
This completes the edit operation.

Note
Since this operation cannot be undone, be sure to check the contents of the disc beforehand.

Naming the Disc (Disc Name)

This function lets you assign names to the disc using upper and lower case letters of the alphabet, numbers, and symbols. You can use up to 11 characters.



1 Press EDIT.
[EDIT] appears in the display.

2 Turn the jog dial so that "Disc Name" appears in the display.
The name of the edit function starts blinking in the display.

3 Press ENTER.
The edit setting items appear in the display.

4 Turn the jog dial to display the character you desire.
The selected character blinks. In addition to the letters of the alphabet, you can also use numbers and symbols. The symbols which can be displayed are as follows:
! " # $ % & ' ( ) * + , - . / : ; < = > ? @ ^ _ ` (blank)

5 Press ENTER.
The character selected in step 4 lights steadily and the cursor starts blinking in the next position.
To go back to the previous position, press EXIT.

6 Repeat steps 4 and 5 until to complete the title.

7 Press EXIT when the cursor is in the leftmost position or
press ENTER when the cursor is in the rightmost position to enter the final name.
To carry out another edit operation in succession use the jog dial to specify the operation you desire.

8 Press EXIT.
This completes the edit operation.

Synchronization with MIDI equipment

Advantages of Using MIDI

Connecting this unit to an external MIDI system (Computer, Sequencer, Sound Module, etc.) allows you to create even higher quality recordings.
For example, if you record the vocal and guitar tracks on this unit, you can synchronize them with sounds from a sound module played back through a sequencer (etc.) during mixdown. This method of mixing allows you to make recordings without using unnecessary tracks.
The MTC (MIDI Time Code), MIDI clock, or MMC (MIDI Machine Control) features allow you to coordinate this unit with external MIDI components.
This chapter explains how to use MIDI messages (information) in order to realize the following functions:

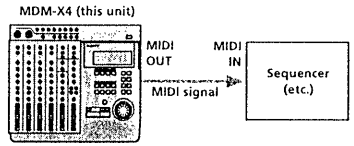
- Synchronization with a MIDI sequencer (etc.).
- Remote control PLAY and STOP (etc.) from MIDI components.

MIDI Synchronization Using MTC

The following explains how to achieve synchronization with a MTC (MIDI Time Control) compatible sequencer (etc.).

Connections

Use a MIDI cable to connect this unit to a MIDI compatible sequencer (etc.).



Setup

1 Set this unit's "SYNC" system setting to MTC.
See "Changing a Setting" (page 18) for details.

2 Set the sequencer to accept external MTC synchronization.
This enables playback of MIDI song data.
Refer to the operating instructions supplied with your sequencer as well.

3 Start playback from this unit.
The sequencer starts playing in synchronization with this unit.

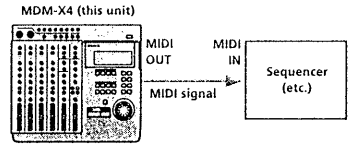
MIDI Synchronization Using the MIDI Clock

You can use the MIDI clock to synchronize this unit with sequencers (etc.) that are not MTC (MIDI Time Code) compatible. A tempo map must be created in order to use the MIDI clock.

Note
When using the MIDI clock for synchronization, be sure to create the tempo map before you start recording (see "Creating a tempo map" to the right for details). Also, be sure to listen to the MIDI sound source coming from the sequencer before you start recording.
It is extremely difficult to create a perfect match between a recorded song and the timing of the tempo map. Therefore, if you create a tempo map after recording, the synchronization will be incorrect.
Tempo information will not be stored on the disc if you create a tempo map but do not make an actual recording.

Connections

Use a MIDI cable to connect this unit to a MIDI compatible sequencer (etc.).



Setup

1 Set this unit's "SYNC" system setting to MCLK.
See "Changing a Setting" (page 18) for details.

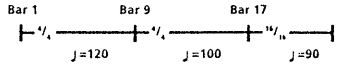
2 Set the sequencer to accept external MIDI clock synchronization.
This enables playback of MIDI song data.
Refer to the operating instructions supplied with your sequencer as well.

3 Start playback from this unit.
The sequencer starts playing in sync with this unit.

Creating a tempo map

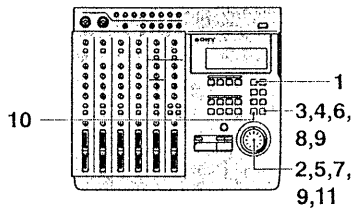
Setting up tempo information creates the standard signal for synchronization and allows you to use the MIDI clock for synchronization with an external sequencers (etc.).
You can assign up to 50 tempo maps to each song.

EXAMPLE: Suppose we create the following tempo maps.



In this case, the tempo will change as shown below

Bar 1~8	4/4 time	♩=120
Bar 9~16	4/4 time	♩=100
Bar 17~	16/16 time	♩=90



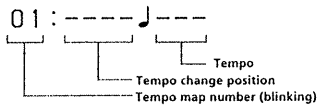
The following step show you how to make the tempo map shown in the previous example.

1 Press EDIT.
EDIT appears in the display.

2 Turn the jog dial so that "Song Tempo" appears in the display.
The name of the edit function starts blinking in the display.

(continued)

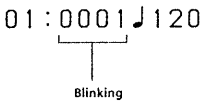
3 Press ENTER.
The tempo map setting display appears.



Note
If you do not want to change the tempo information, leave the tempo information numbers blank.

4 Press ENTER again.
The indication for the tempo change position starts blinking.
Tempo map 1 can only be set to the first bar.

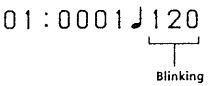
5 Turn the jog dial to display 0001.
The units in the display represent bars.
If you hold down SHIFT while turning the jog dial you can specify the tempo change position in 16th note units within the respective bar.



Note
If you do not want to change the tempo information, leave the tempo information numbers blank.

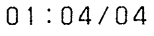
6 Press ENTER.
The indication for the tempo starts to blink.

7 Turn the jog dial to display 120.



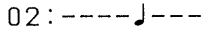
8 Press ENTER.
The time setting display appears.

9 Use the jog dial and ENTER to display 04/04.



10 Press ENTER again when finished.
The tempo map number blinks.

11 Turn the jog dial to display 02.



12 Repeat steps 3~9 to create the new tempo map.
When the tempo map is complete, the settings are displayed in order automatically starting from the first tempo change position.

To complete construction of the tempo map
Press EXIT repeatedly until the EDIT display disappears from the display.

Notes
- The time setting is only possible at the beginning of each bar.
- You can assign up to 50 tempo maps to each song. The tempo information can be stored on the disc, but since there is a limited amount of memory on each disc it may not be possible to store 50 tempo maps for each song if there are several songs on a disc. In this case "Tempo Full" will appear in the display when you select the tempo map number.
- Although tempo information can be entered when a standard music MD is loaded in the MD transport, due to the nature of the MD system, the tempo information cannot be stored on standard music MD discs.

Deleting a tempo map

Use the following operations to delete tempo maps which are no longer necessary. The tempo map numbers located after the tempo map which was deleted are brought forward automatically.

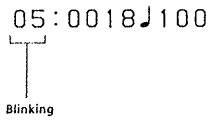
EXAMPLE: Erasing tempo map 5.

1 Press EDIT.
[EDIT] appears in the display.

2 Turn the jog dial so that "Song Tempo" appears in the display.
The name of the edit function starts blinking in the display.

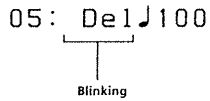
3 Press ENTER.
The tempo map setting display appears.

4 Turn the jog dial to display tempo map 05.



5 Press ENTER.
The indication for the tempo change position starts blinking.
Tempo map 1 can only be set to the first bar.

6 Turn the jog dial to the right to display Del.



7 Press ENTER.
"Deleted" appears in the display and tempo map 5 is deleted.

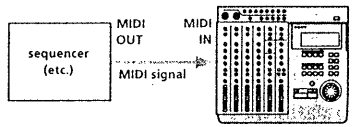
The previous operations can also be used to delete tempo map 1. However, tempo map 1 should only be deleted after deleting all the other tempo maps from 2 up.

Controlling This Unit from other MIDI Components Using MMC

You can control this unit from MMC (MIDI Machine Control) compatible external MIDI equipment, such as a sequencer (etc.).

Connections

Use a MIDI cable to connect this unit to a MIDI compatible sequencer (etc.).



Setup

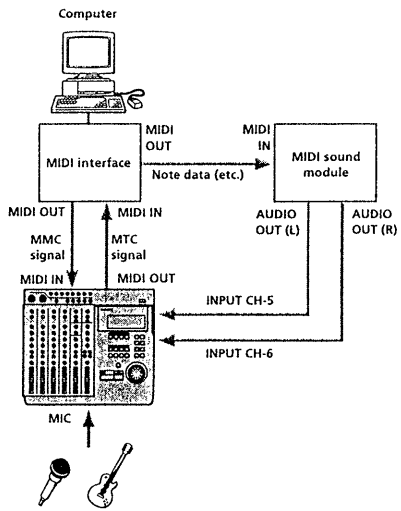
Set this unit's "MMC" system setting to "on".
See "Changing a Setting" (page 18) for details.

This unit accepts the following MMC command/responses:
- **Stop (Command 01) :** Stops the disc. Reception of this command during recording (or rehearsal) will cause recording (rehearsal) to stop.
- **Play (Command 02,03) :** Starts playback. Reception of this command during recording (or rehearsal) will not cause recording (rehearsal) to start.
- **Fast Forward (FF) (Command 04) :** Fast forward. Reception of this command during recording (or rehearsal) will cause recording (rehearsal) to stop.
- **Rewind (REW) (Command 05) :** Rewind. Reception of this command during recording (or rehearsal) will cause recording (rehearsal) to stop.
- **Record Strobe (Command 06) :** During playback, it starts recording on the recordable track (the track selected with the REC SELECT key). During stop mode, it starts recording (or rehearsal) on the recordable track. Reception of this command during modes not listed above (pause mode, etc.) has no effect on the unit.
- **Record Exit (Command 07) :** Stops recording on all tracks.
- **MMC Reset (Command 0D) :** Resets MMC related information to the state it was in at power on.
- **Write (Command 40,41) :** Writes or changes data in the specified information field (for Track Record Ready only).
- **Locate (Command 44) :** Locates the specified time code.
- **Group (Command 52) :** Checks the device ID list to see whether or not the unit belongs to the current group. If it belongs to the group, that group ID is used to receive MMC data.
  This unit can store up to 16 IDs.
- **Track record ready (Response 4F) :** Turns REC SELECT on/off.

Example of a MIDI System

The following explains the construction of a synchronized MIDI system using both MMC and MTC and a MIDI sound module.

Connections



Features available from this type of system

- You can record live vocal and guitar tracks (acoustic sounds) on this unit and then use MIDI sound control to play them in sync with other sounds played back through a sequencer (etc.).
- You can use MTC to synchronize a sequencer (etc.) with this unit.
- You can use MMC to control this unit from a sequencer (etc.).

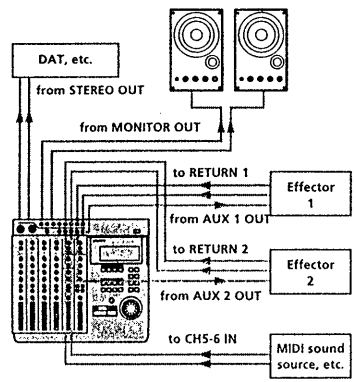
Mixdown (Basics)

The following explains how to dub the song to a master recorder (such as a DAT or MD recorder) while adjusting the volume balance and localization of each track once you have completed all necessary recording and editing.
This process, of completing a song composed in 4 tracks by converting it to normal stereo (2 tracks), is called "mixdown".
This process is generally considered the most important part of music production.

Preparations

- Connect the master recorder to this unit's STEREO OUT jacks. If necessary, you can connect an effector between this unit and the master recorder.
- If you are planning to simultaneously mixdown sound from a MIDI sound source by synchronizing with external MIDI equipment, be sure to make all necessary connections and settings beforehand.

See "Synchronization with MIDI equipment" (pages 52 ~ 56) for details.



Carrying out the mixdown

1 Press down the INPUT switches on channels 1~4. (Set channels 1~4 to receive the (TRACK) sound played back from the recorder.)

2 Press the monitor tracks STEREO key.

3 Use the I◄◄ or ►►I keys or the jog dial to locate the beginning of the desired song.

4 Press ► PLAY.
Playback begins.

5 Playback the track as many times as necessary to make the following adjustments.
Volume balance : Adjust using the faders on channels 1~4 and the MASTER fader. If an external MIDI sound source is being input to channel 5/6, adjust using the channel 5/6 fader as well.
Localization : Adjust using the PAN knobs on channels 1~4.
Effect volume : When an effector is connected, use the AUX or RETURN knobs to adjust the proportion of the effect.

6 After completing the adjustments, make the recording on the master recorder.
Be sure to check the recording level on the master recorder and make any necessary adjustments.
When the recording has finished, mixdown is complete.

Mixdown (Applied Operations)

How to use the TRACK jacks

The TRACK 1–4 jacks on the top panel of this unit provide a direct output of the signals from each track recorded on the disc. This allows you to take full advantage of a limited number of external effectors.
EXAMPLE: After recording a vocal on track 1 and a keyboard on track 2.
- You want to add delay to the vocals.
- You want to add flanging to the keyboard.
- But you only have 1 effector.

This kind of situation is where you can use the TRACK jacks.

For this example, we will explain how to record the vocal recorded on track 1 back to track 1 while adding delay.

1 Connect this unit's TRACK 1 OUTPUT jack to the input jack on the effector, and connect the output jack on the effector to this unit's INPUT CH 1 jack.

2 Set the INPUT switch for channel 1 to LINE/MIC (pressed down).

3 Play the track and adjust the effector volume.
During the actual recording, the direct sound will be rerecorded after it passes through the effector.

4 After completing the adjustments, record to track 1.
This operation can be performed for any track by using the respective input jack.

- By connecting the TRACK OUT jack to the effector and then inputting that sound to one of this unit's other INPUT CH jacks, you can mix the source and mix sounds with different equalizations .
- By using all four of the TRACK OUTPUT jacks, you can dub all 4 tracks independently to another multichannel recorder.

How to save up to 8 tracks of data independently

You can record sound parts numbering greater than the number of tracks available on this unit (4) by using the bounce recording function (page 29).
However, some of the features available during the normal bounce operation, such as rerecording the sound from the track being mixed to, and changing the mix balance, are not possible during this operation.
But, you can rely on the wide variety of editing functions available with this unit.
Since this unit can edit individual tracks (as well as songs), you can store more than 4 tracks worth of data individually and reedit them whenever necessary.
The following is an explanation of the example.

1 Recording the drums in stereo to tracks 1 and 2, then overdub the bass and guitar. (Song 1)

Song 1

1	Dr (L)
2	Dr (R)
3	B
4	G

2 Use the Song Copy edit function to back up the part recorded in step 1.
The backup becomes Song 2.

	Song 1	Song 2
1	Dr (L)	Dr (L)
2	Dr (R)	Dr (R)
3	B	B
4	G	G
	Original data	Backup data

3 Use mix write recording to mixdown tracks 1 and 2 of Song 1 to track 4 of Song 1.

	Song 1	Song 2
1	Dr (L) +B+G	Dr (L)
2	Dr (R)	Dr (R)
3		B
4		G

* Since this is a digital copy, there is no deterioration of the data when the copy is made.

4 Overdub the keyboard in stereo to tracks 3 and 4 while listening to the playback from tracks 1 and 2. (Song 1)

	Song 1	Song 2
1	Dr (L) +B+G	Dr (L)
2	Dr (R)	Dr (R)
3	K (L)	B
4	K (R)	G

5 Use the Song Copy edit function to back up the keyboard part.
The backup becomes Song 3.

	Song 1	Song 2	Song 3
1	Dr (L) +B+G	Dr (L)	Dr (L) +B+G
2	Dr (R)	Dr (R)	Dr (R)
3	K (L)	B	K (L)
4	K (R)	G	K (R)

6 Use bounce recording to mixdown all four parts to tracks 1 and 2. (Song 1)

	Song 1	Song 2	Song 3
1	Dr+K(L) +B+G	Dr (L)	Dr (L) +B+G
2	Dr+K(R)	Dr (R)	Dr (R)
3		B	K (L)
4		G	K (R)

7 Overdub the vocals to tracks 3 and 4 while listening to the playback from tracks 1 and 2. (Song 1)

	Song 1	Song 2	Song 3
1	Dr+K(L) +B+G	Dr (L)	Dr (L) +B+G
2	Dr+K(R)	Dr (R)	Dr (R)
3	Vo 1	B	K (L)
4	Vo 2	G	K (R)

8 Use the Song Copy edit function to back up the vocals, then copy tracks 3 and 4 to tracks 1 and 2. This process allows you mixdown while to preserving the sound of all the original parts.

	Song 1	Song 2	Song 3
1	Dr+K(L) +B+G	Dr (L)	Vo 1
2	Dr+K(R)	Dr (R)	Vo 2
3	Vo 1	B	K (L)
4	Vo 2	G	K (R)
	Completed mix		Backup of individual parts

- For future reference, we recommend naming each song in a way that helps you remember the content of the individual tracks. (Use the Song Name edit operation).
- Later, you can use the backed up songs to create remixes. With the method described in the previous example, you can use [Song Copy] to create a new copy of the tracks in songs 2 and 3 as song 4. This allows you to create new mixes later.

Glossary

TOC (Table of Contents)
The area in which nonmusical data, such as disc and track information is stored. Writing of TOC information marks the completion of record and edit operations.

ATRAC (Adaptive TRansform Acoustic Coding)
ATRAC is the sound compression technology that enables an MD to contain the same length of music as a CD, despite the smaller physical size of the MD. ATRAC cuts the sounds imperceptible by the human ear to compress the data to 1/5 the original size. Since the data is chosen for reduction is based on psycho acoustic principles there is no perceivable effect on the sound quality.

EQ
Abbreviation for equalizer. Adjusts certain bands of the sound. This unit has treble (HIGH), middle (MID), and bass (LOW) adjustments. See "Names and Function of Parts" (page 6) for details.

PAN
Abbreviation for pan pot. Adjusts the position of the sound. See "Names and Function of Parts" (page 7) for details.

MIDI (Musical Instrument Digital Interface)
A worldwide standard for data transmission between electronic instruments.

MMC (MIDI Machine Control), MTC (MIDI Time Code)
See "Synchronization with MIDI equipment" (pages 52-56).

Bus
Transports the input or recorded sounds to a specific section. The group bus (1-4) carries the sound to the respective tracks in the recorder, the stereo bus (L and R) carries the sound to the STEREO OUT jacks, and the CUE bus carries the sound recorded on the tracks to the MONITOR OUT jacks.

Blank Top
The first section of the unrecorded portion of the disc. It is necessary to locate the blank top when recording a new track on a disc that contains previously recorded material. For this unit, press the TOP key twice to locate the blank top. "New Song" appears in the display.

Ping Pong Recording
Normally, this term refers to the practice of dubbing the sound from tracks 1 through 3 onto track 4 in order to gain additional tracks. With this unit, you can dub the sound from tracks 1 through 4 to track 4. See "Mix Write Recording (Applied operations)" (page 28) for details.

Punch-In/Out Recording
Recording only part of a given track. Normally used to correct a performance mistake by rerecording the part which was mistaken, or to record only one phrase of a song. See "Auto Punch-In/Out Recording" (page 22) and "Manual Punch-In/Out Recording" (page 25) for details.

Overdub Recording
Listening to the sound from one previously recorded track while recording onto another track. See "Overdub Recording" (page 20) for details.

Bounce Recording
Recording the sounds previously recorded on tracks 1-4 in a stereo mix to tracks 1 and 2. See "Mix Write Recording (applied Operations)" (page 28) for details.

Mixdown
Dubbing the 4 track sound to two track equipment (such as a DAT) while adjusting the balance.

MD-DATA and Mini Disc
Mini Disc (MD) is a format developed specifically for music storage. The MD-DATA format was developed for data storage. This unit uses MD-DATA format (recordable) discs for 4 track recording and playback. For recording and playback of 2 tracks (or less) you can use either MD-DATA or Mini Disc formats. Please note that, however, that Mini Disc and MD-DATA are two different formats and are not interchangeable.

MD-DATA format discs bear the following logo:

Mini Disc format discs bear the following logo:

Note regarding usage of discs with different formats
If an MD-DATA disc containing data written in another format (such as Picture MD, etc.) is inserted into this unit, "Blank Disc" appears in the display and the disc will seem to be a blank disc (regardless of data present in other formats). If you use a variety of different formats, keep your discs well organized to prevent accidental erasure.

Sony Multi Track Recorder MDM-X4
MIDI Implementation Chart / Tableau de mise en application MIDI / MIDI-Implementationstabelle **SEP 21, 1996 Version: 1.0**

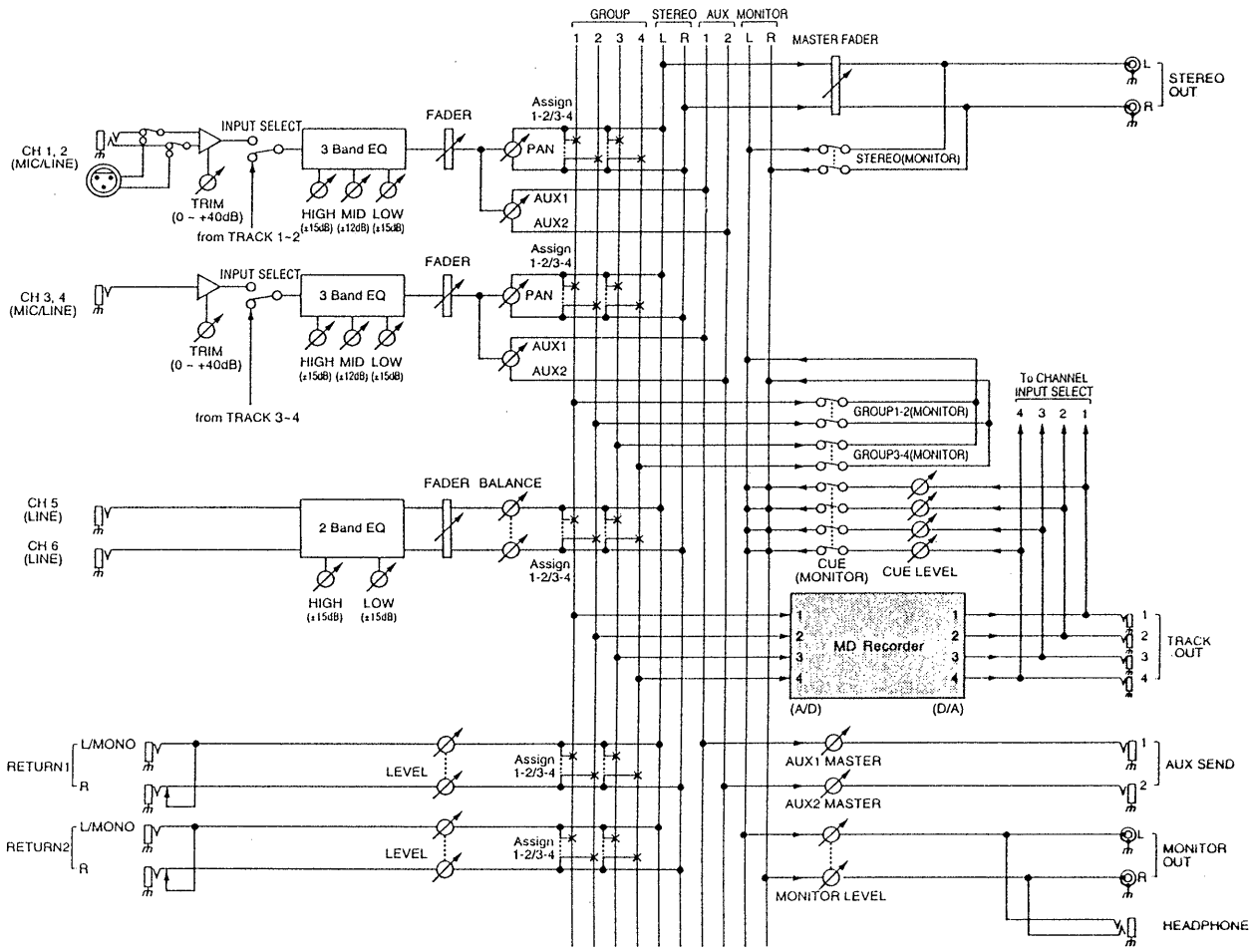
Function...		Transmitted	Recognized	Remarks
Basic	Default	X	X	
Channel	Changed	X	X	
Mode	Default	X	X	
	Messages	X	X	
	Altered	* * * * * * * * * * * * * *		
Note Number:		X	X	
	True Voice	* * * * * * * * * * * * * *	X	
Velocity	Note ON	X	X	
	Note OFF	X	X	
After Touch	Key's	X	X	
	Ch's	X	X	
Pitch Bend		X	X	
Control Change	0 – 31, 64 – 120	X	X	
Prog Change :	True#	X	X	
		* * * * * * * * * * * * * *	X	
System Exclusive		O *1	O *2	
Common	: Quarter Frame	O *1	X	
	: Song Pos	O *3	X	
	: Song Sel	O *3	X	
	: Tune	X	X	
System Real Time	: Clock	O *3	X	
	: Commands	O *3	X	
Aux Messages	: Local ON/OFF	X	X	
	: All Notes OFF	X	X	
	: Active Sense	X	X	
	: Reset	X	X	
Notes		*1 : Only when "Sync = MTC". *2 : Supported by MMC (MIDI Machine Control). *3 : Only when "Sync = MCLK".		

Mode 1 : OMNI ON, POLY MODE 2 : OMNI ON, MONO O : YES
Mode 3 : OMNI OFF, POLY MODE 4 : OMNI OFF, MONO X : NO

A1

Block Diagram

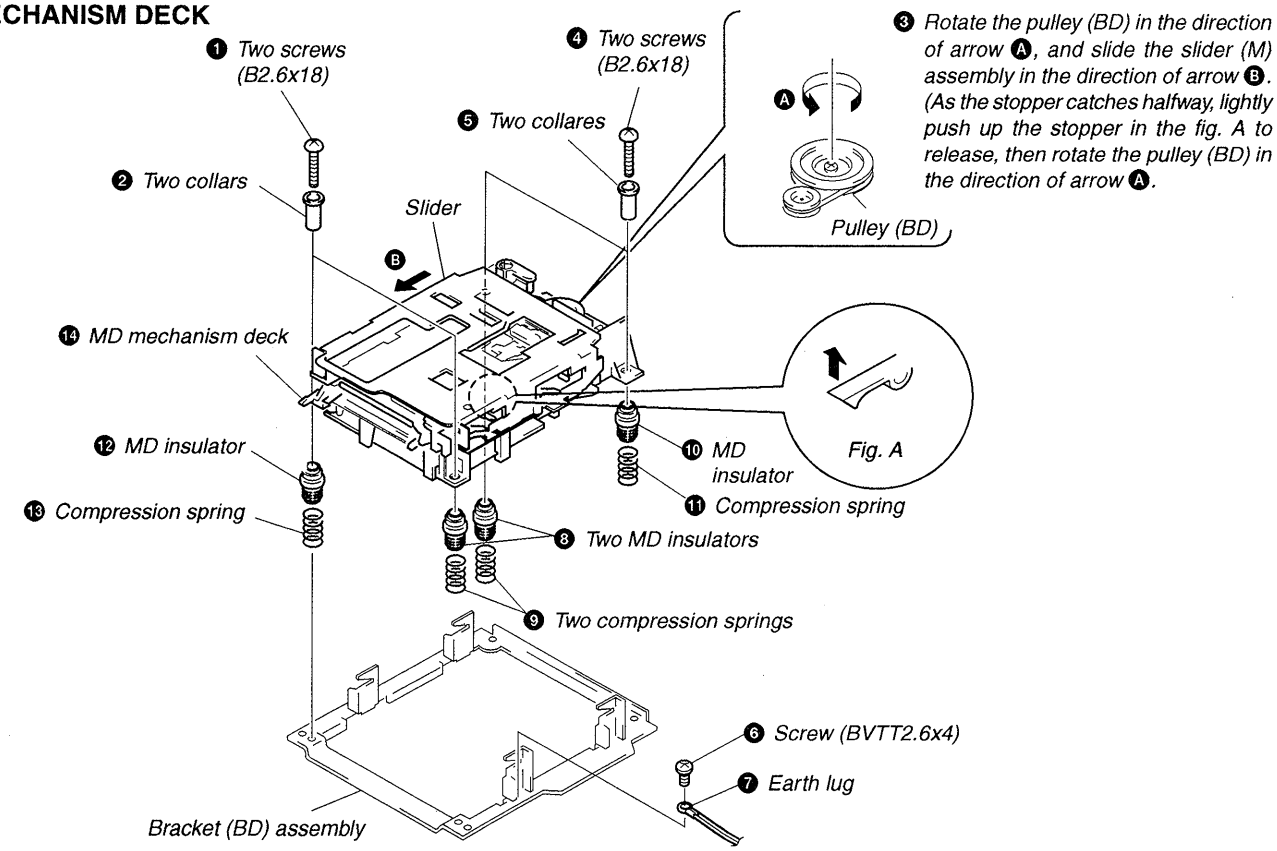
The block diagram for this unit is shown below.



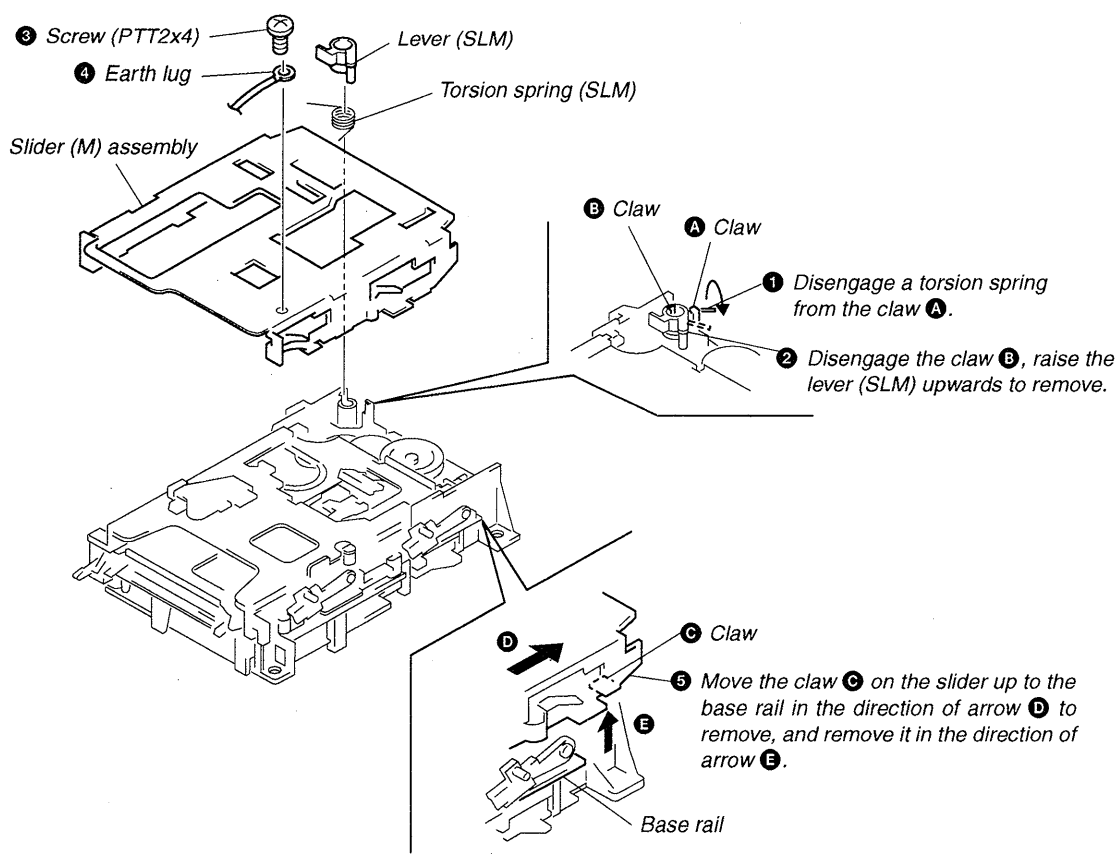
SECTION 3
DISASSEMBLY

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

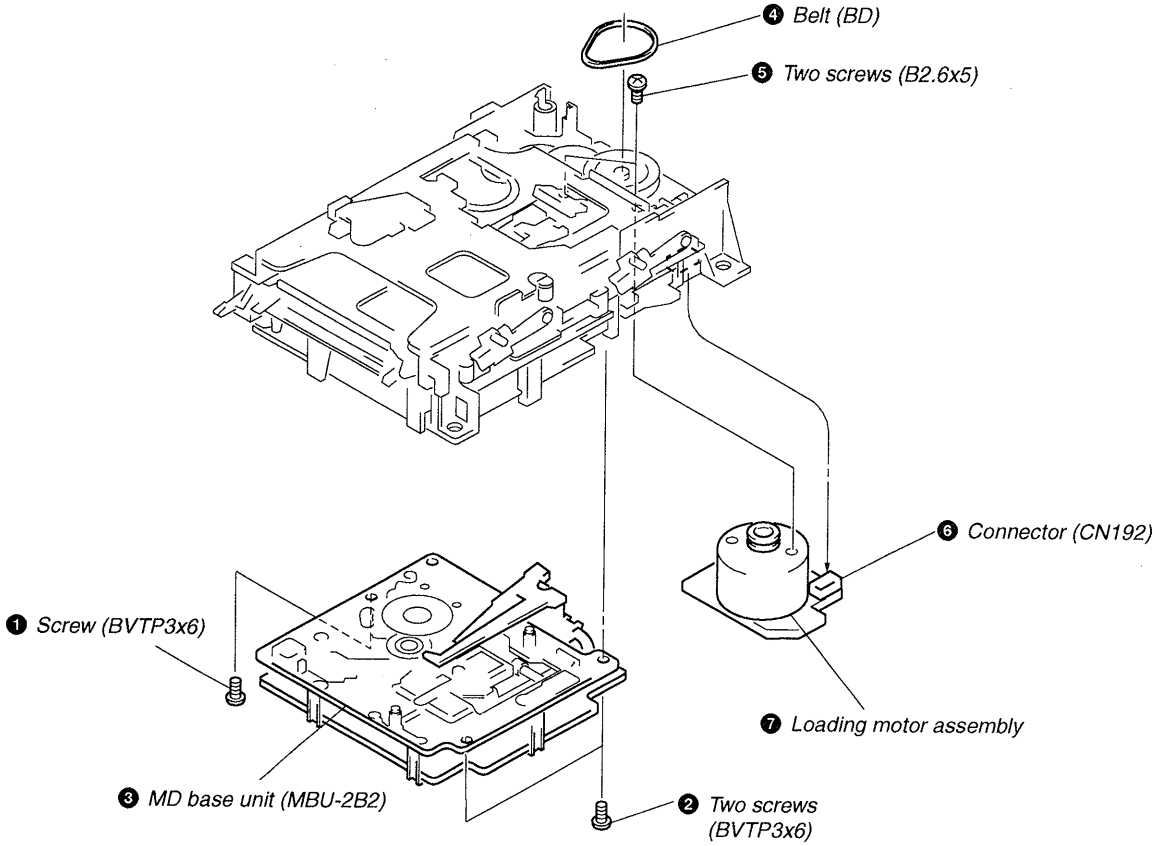
3-1. MECHANISM DECK



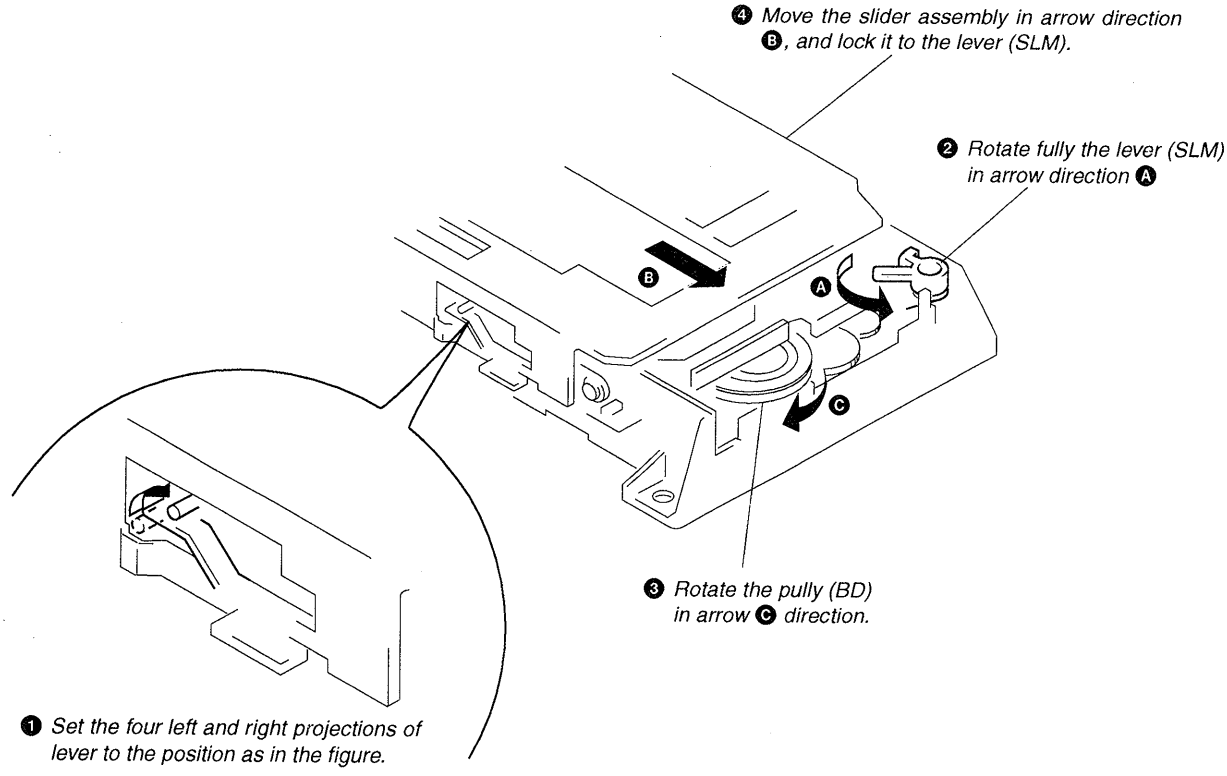
3-2. SLIDER



3-3. BASE UNIT (MBU-2B2), LOADING MOTOR ASSEMBLY

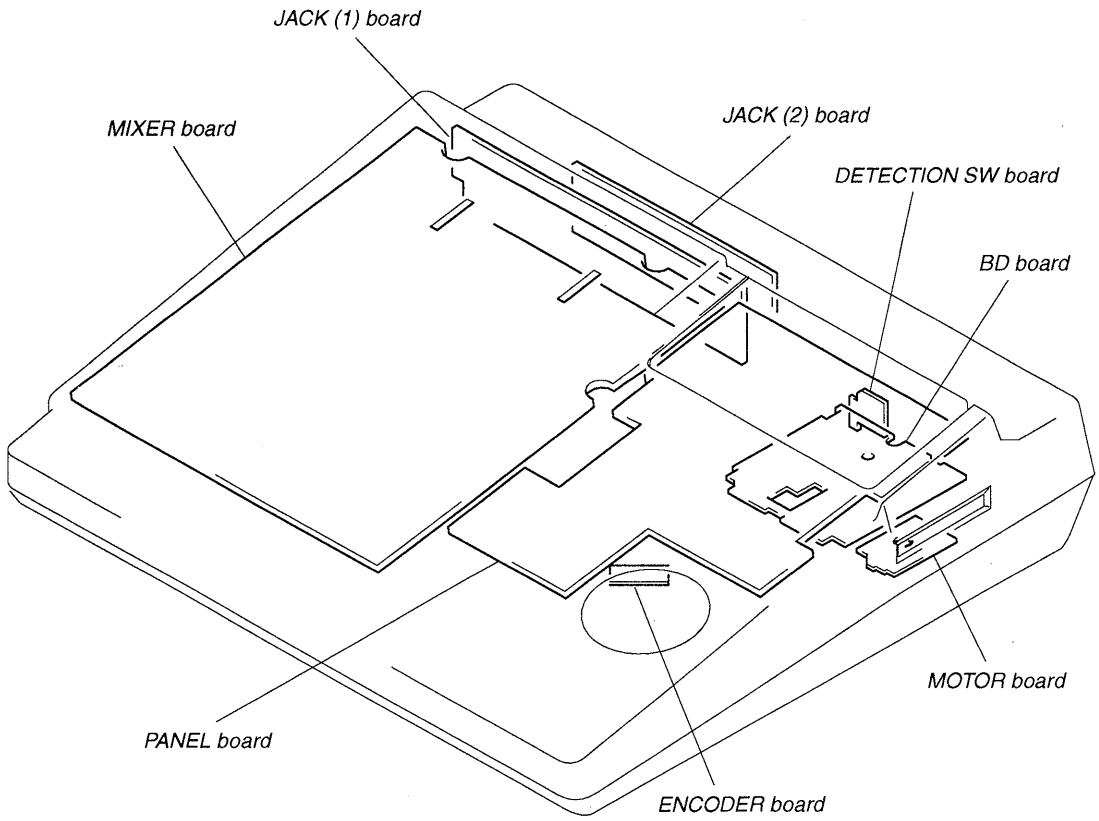


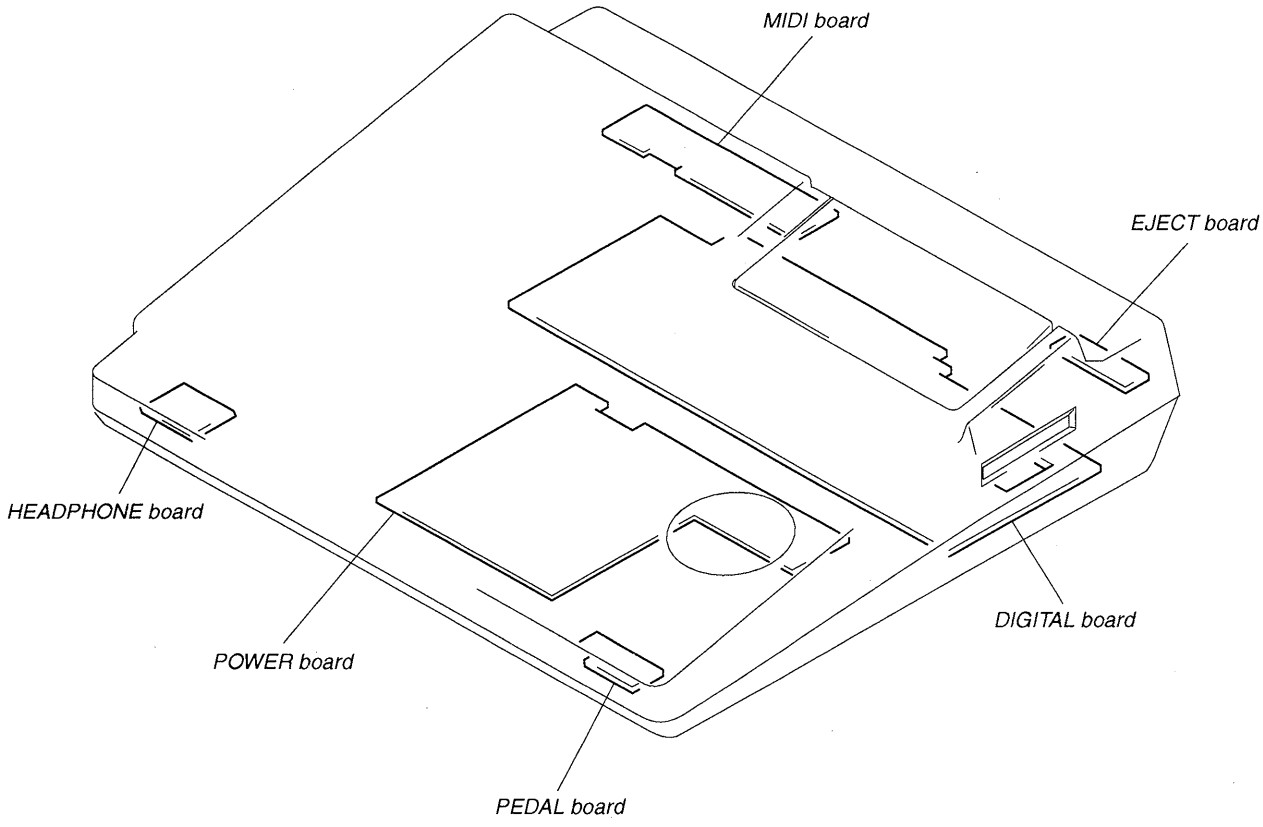
3-4. SLIDER ASSEMBLY MOUNTING



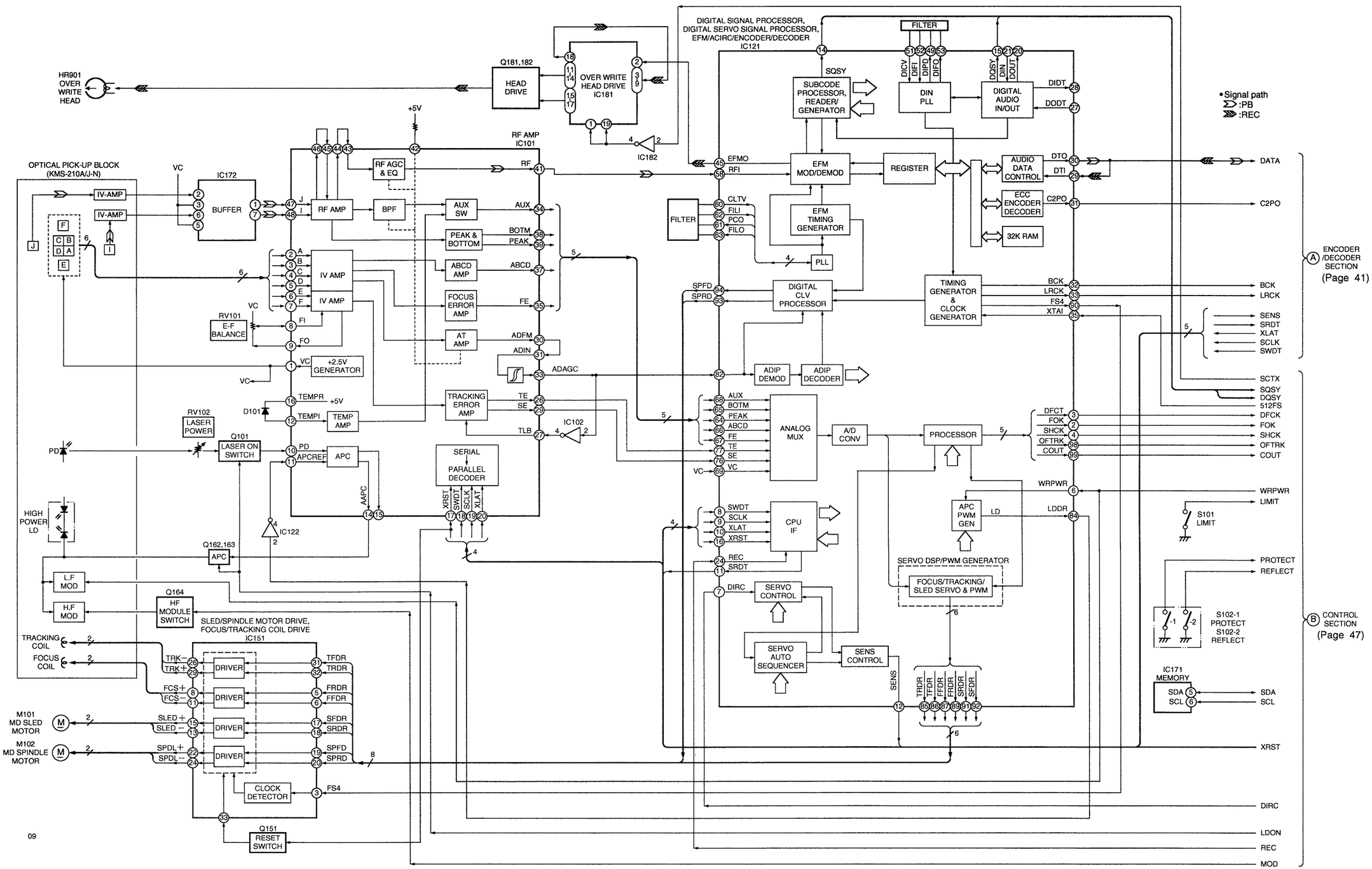
SECTION 4
DIAGRAMS

4-1. CIRCUIT BOARDS LOCATION

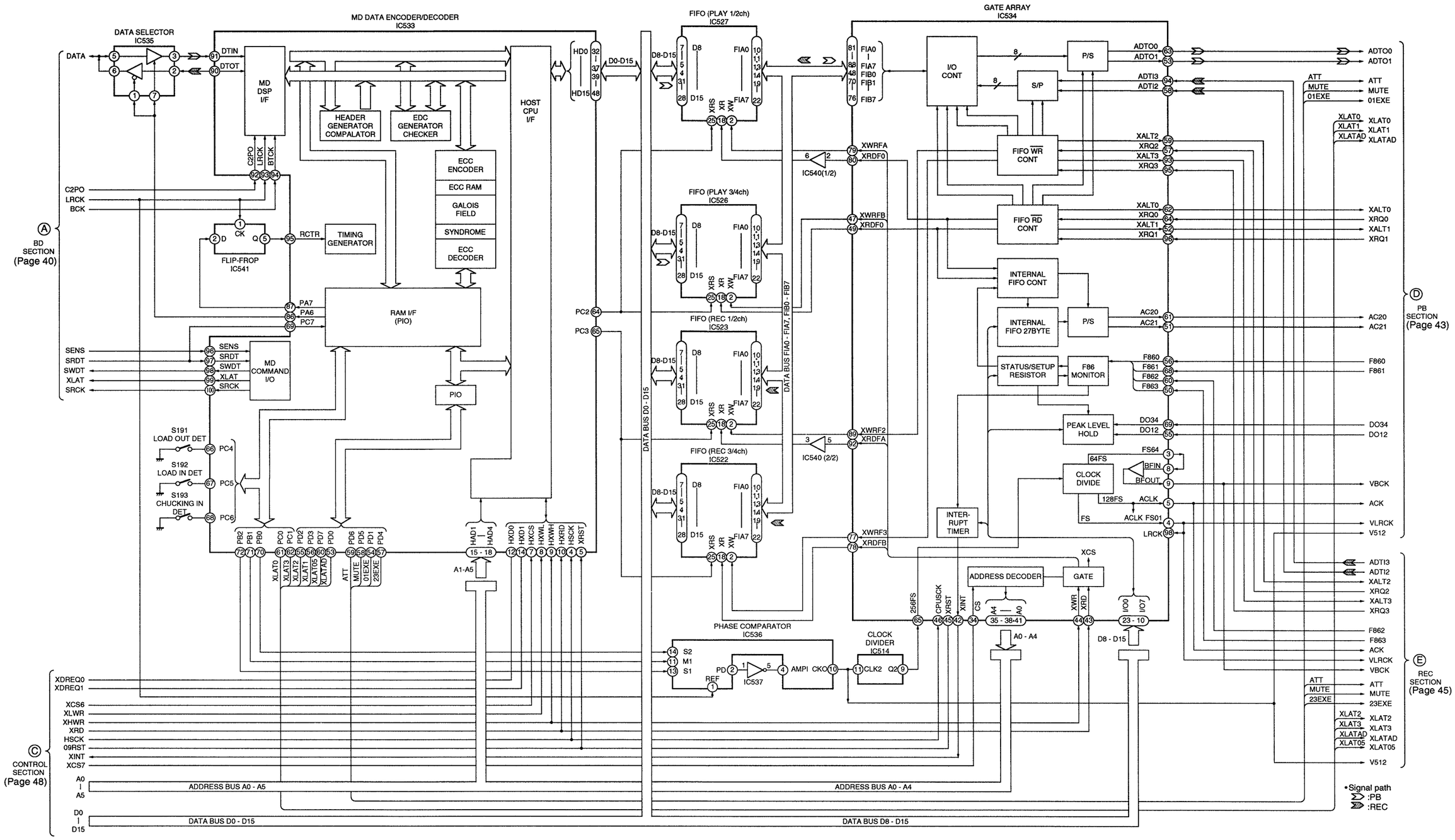




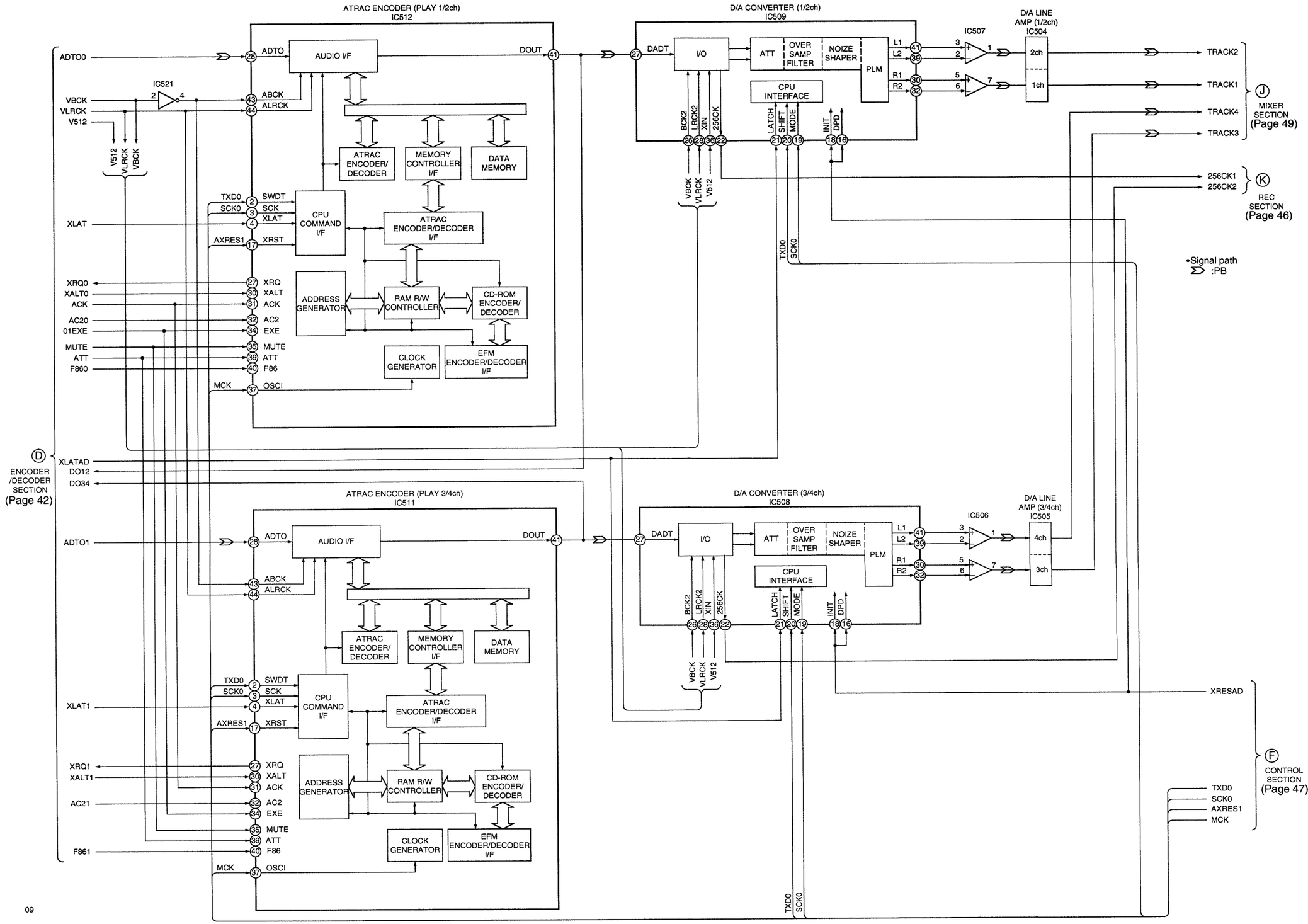
4-2. BLOCK DIAGRAMS
— BD SECTION —



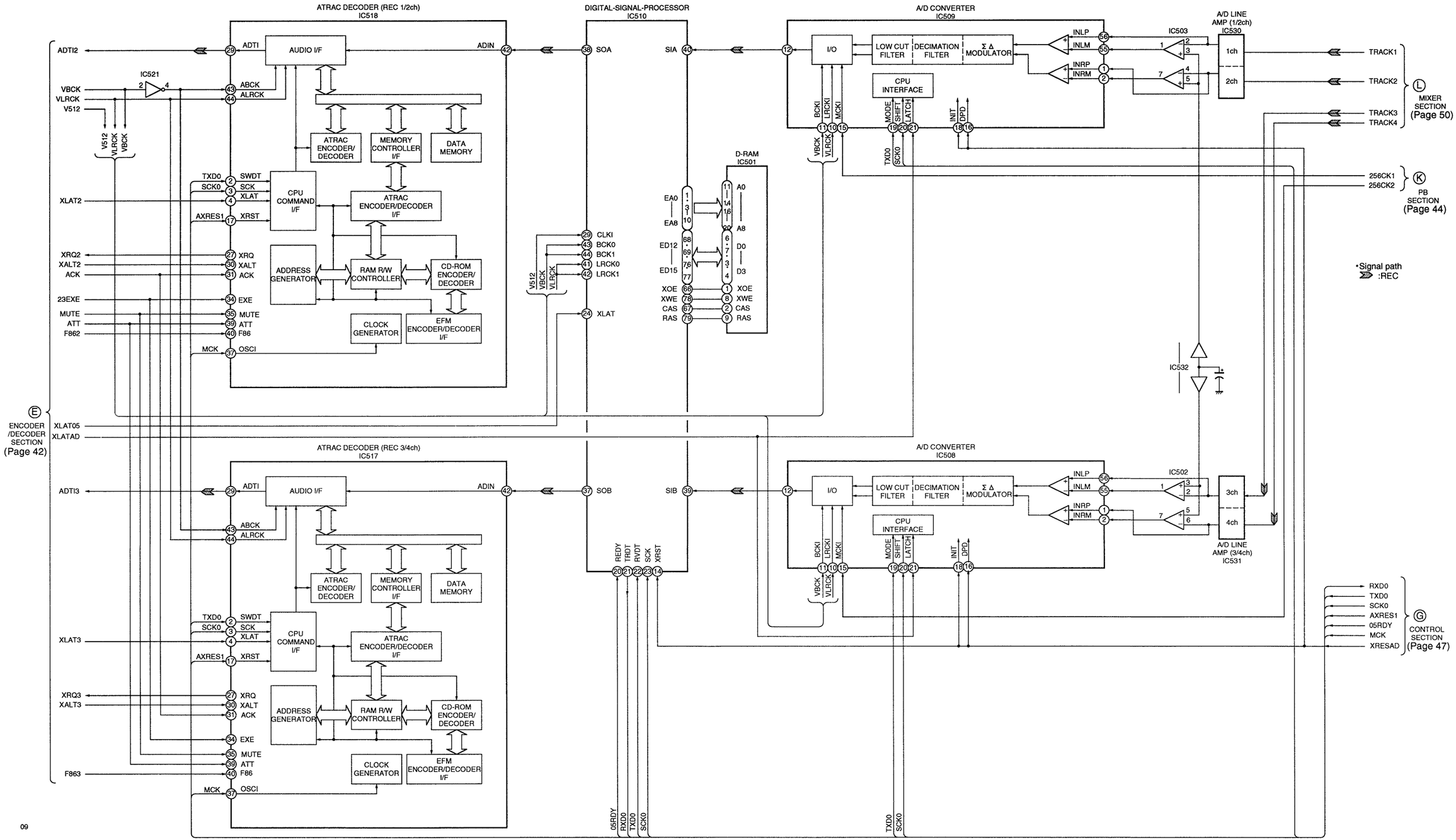
— ENCODER/DECODER SECTION —



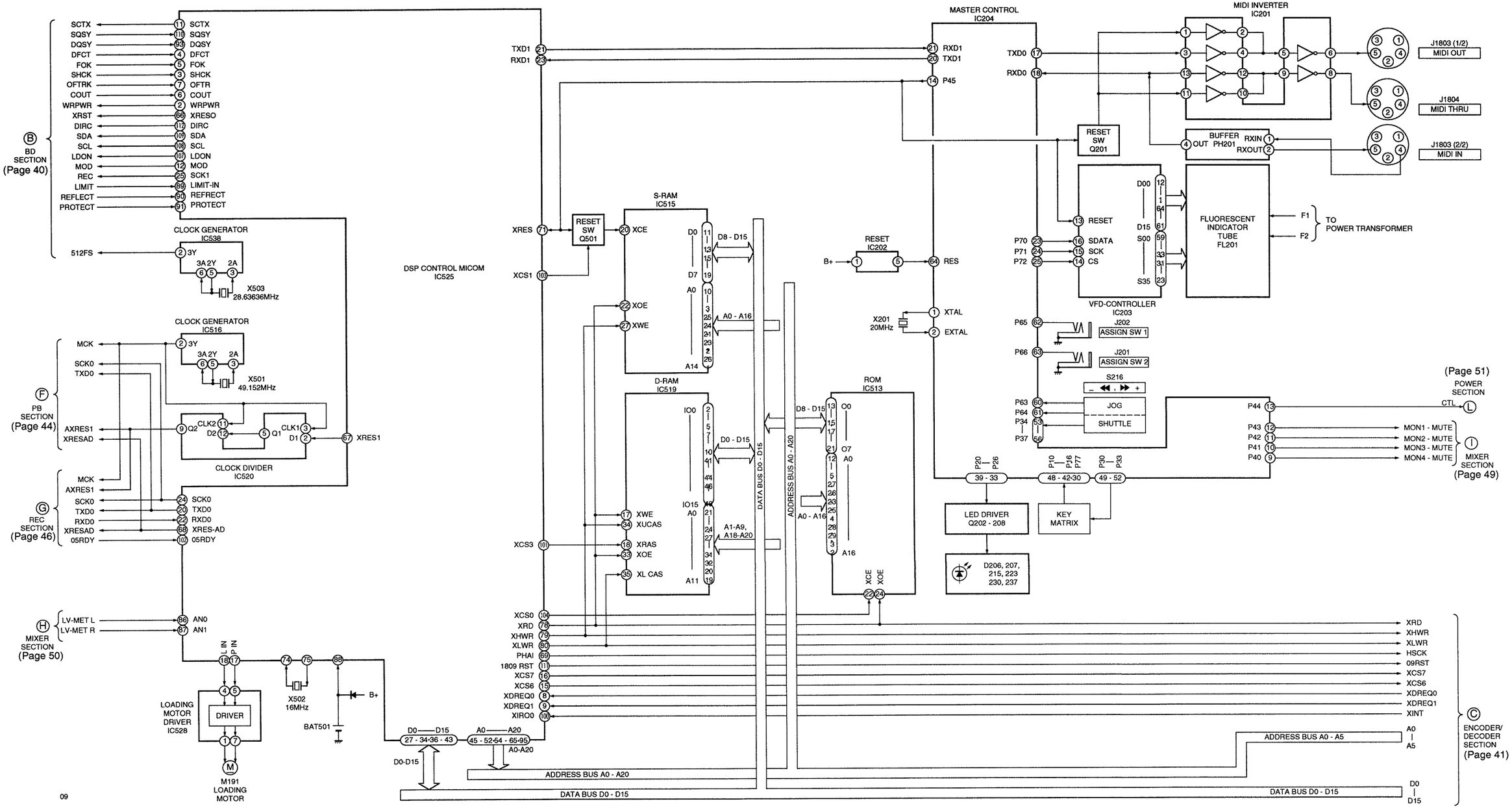
— PB SECTION —


ATRAC ENCODER (PLAY 1/2ch)
IC512
ADTO0
ADTO
AUDIO I/F
DOUT
VBCK
VLRCK
V512
ABCK
ALRCK
IC521
ATRAC ENCODER/ DECODER
MEMORY CONTROLLER I/F
DATA MEMORY
TXD0
SCK0
XLAT
AXRES1
SWDT
SCK
XLAT
XRST
CPU COMMAND I/F
ATRAC ENCODER/DECODER I/F
XRQ0
XALT0
ACK
AC20
01EXE
MUTE
ATT
F860
MCK
XRQ
XALT
ACK
AC2
EXE
MUTE
ATT
F86
OSCI
ADDRESS GENERATOR
RAM R/W CONTROLLER
CD-ROM ENCODER/ DECODER
CLOCK GENERATOR
EFM ENCODER/DECODER I/F
D/A CONVERTER (1/2ch)
IC509
DADT
I/O
ATT
OVER SAMP FILTER
NOIZE SHAPER
PLM
CPU INTERFACE
L1
L2
R1
R2
BCK2
LRCK2
XIN
256CK
LATCH
SHIFT
MODE
INIT
DPD
IC507
D/A LINE AMP (1/2ch)
IC504
2ch
1ch
TRACK2
TRACK1
TRACK4
TRACK3
MIXER SECTION (Page 49)
256CK1
256CK2
REC SECTION (Page 46)
•Signal path
:PB
D
ENCODER /DECODER SECTION (Page 42)
XLATAD
DO12
DO34
ATRAC ENCODER (PLAY 3/4ch)
IC511
ADTO1
XLAT1
XRQ1
XALT1
AC21
F861
D/A CONVERTER (3/4ch)
IC508
IC506
D/A LINE AMP (3/4ch)
IC505
4ch
3ch
XRESAD
F
CONTROL SECTION (Page 47)
TXD0
SCK0
AXRES1
MCK

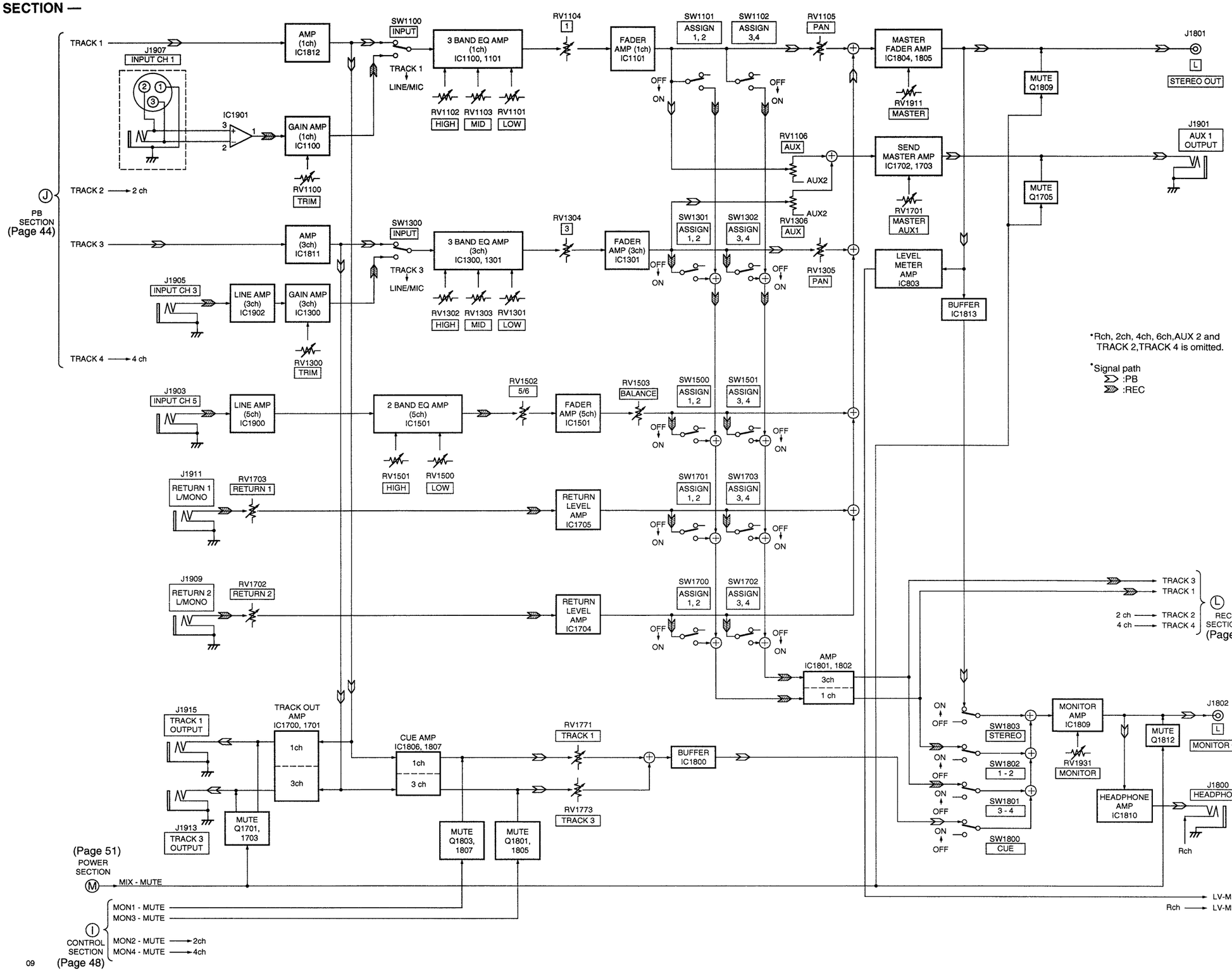
— REC SECTION —


ATRAC DECODER (REC 1/2ch)
IC518
DIGITAL-SIGNAL-PROCESSOR
IC510
A/D CONVERTER
IC509
A/D LINE
AMP (1/2ch)
IC530
IC503
ADTI2
ADTI
AUDIO I/F
ADIN
SOA
SIA
I/O
LOW CUT FILTER
DECIMATION FILTER
Σ Δ MODULATOR
INLP
INLM
INRP
INRM
CPU INTERFACE
1ch
2ch
TRACK1
TRACK2
TRACK3
TRACK4
L MIXER SECTION (Page 50)
IC521
VBCK
VLRCK
V512
ABCK
ALRCK
ATRAC ENCODER/ DECODER
MEMORY CONTROLLER I/F
DATA MEMORY
BCKI
LRCKI
MCKI
MODE
SHIFT
LATCH
INIT
DFD
TXD0
SCK0
D-RAM
IC501
256CK1
256CK2
K PB SECTION (Page 44)
TXD0
SWDT
SCK0
SCK
XLAT2
XLAT
AXRES1
XRST
CPU COMMAND I/F
ATRAC ENCODER/DECODER I/F
EA0
EA8
ED12
ED15
XOE
XWE
CAS
RAS
A0
A8
D0
D3
XRQ2
XALT2
ACK
XRQ
XALT
ACK
ADDRESS GENERATOR
RAM R/W CONTROLLER
CD-ROM ENCODER/ DECODER
CLKI
BCK0
BCK1
LRCK0
LRCK1
XLAT
23EXE
EXE
MUTE
ATT
F862
F86
CLOCK GENERATOR
EFM ENCODER/DECODER I/F
MCK
OSCI
*Signal path
:REC
IC532
E ENCODER /DECODER SECTION (Page 42)
XLAT05
XLATAD
ATRAC DECODER (REC 3/4ch)
IC517
A/D CONVERTER
IC508
IC502
ADTI3
SOB
SIB
REDY
TRDT
RVDT
SCK
XRST
3ch
4ch
A/D LINE
AMP (3/4ch)
IC531
XLAT3
XRQ3
XALT3
F863
05RDY
RXD0
RXESAD
G CONTROL SECTION (Page 47)

— CONTROL SECTION —



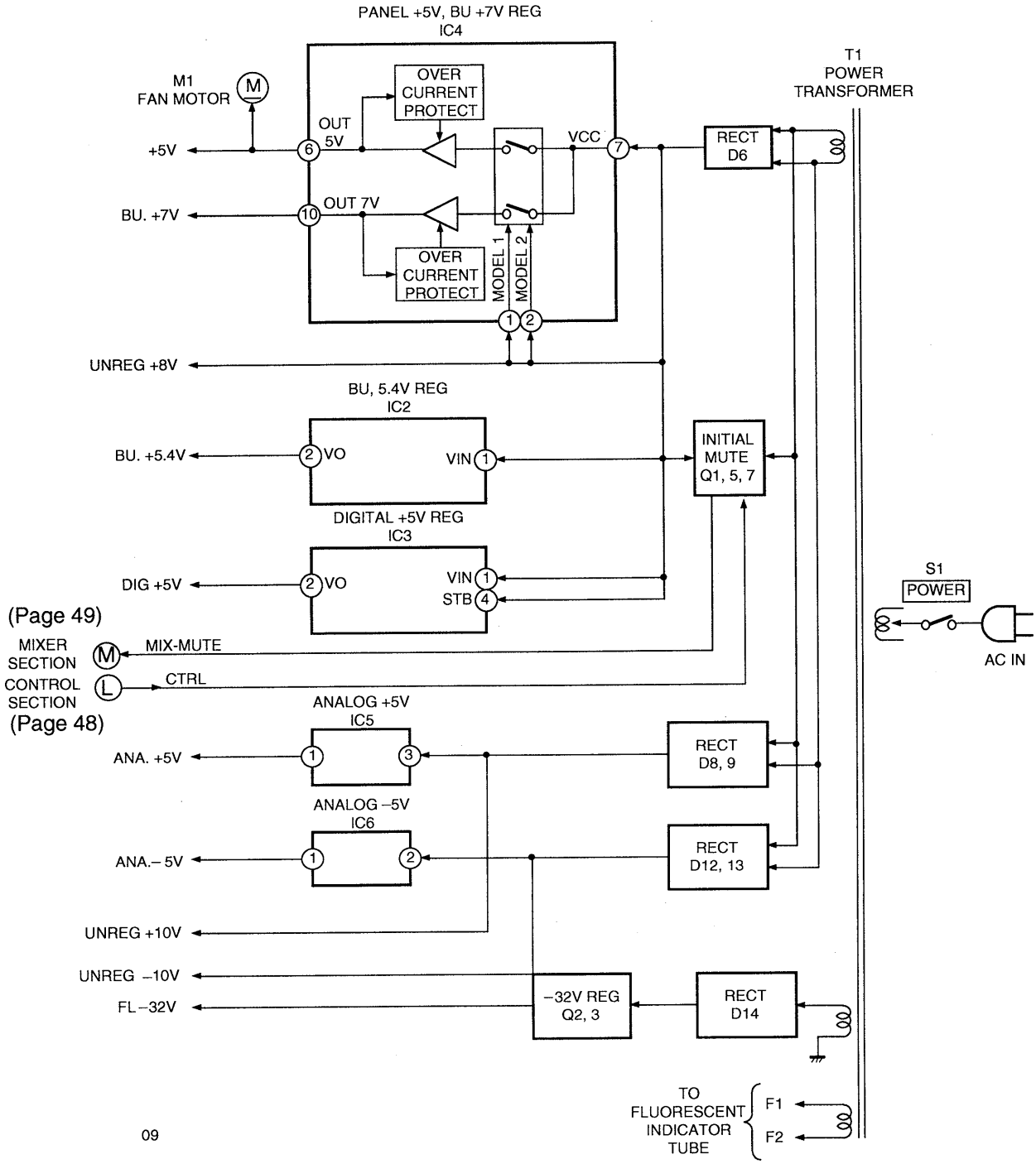
— MIXER SECTION —



•Rch, 2ch, 4ch, 6ch,AUX 2 and TRACK 2,TRACK 4 is omitted.

•Signal path
:PB
:REC

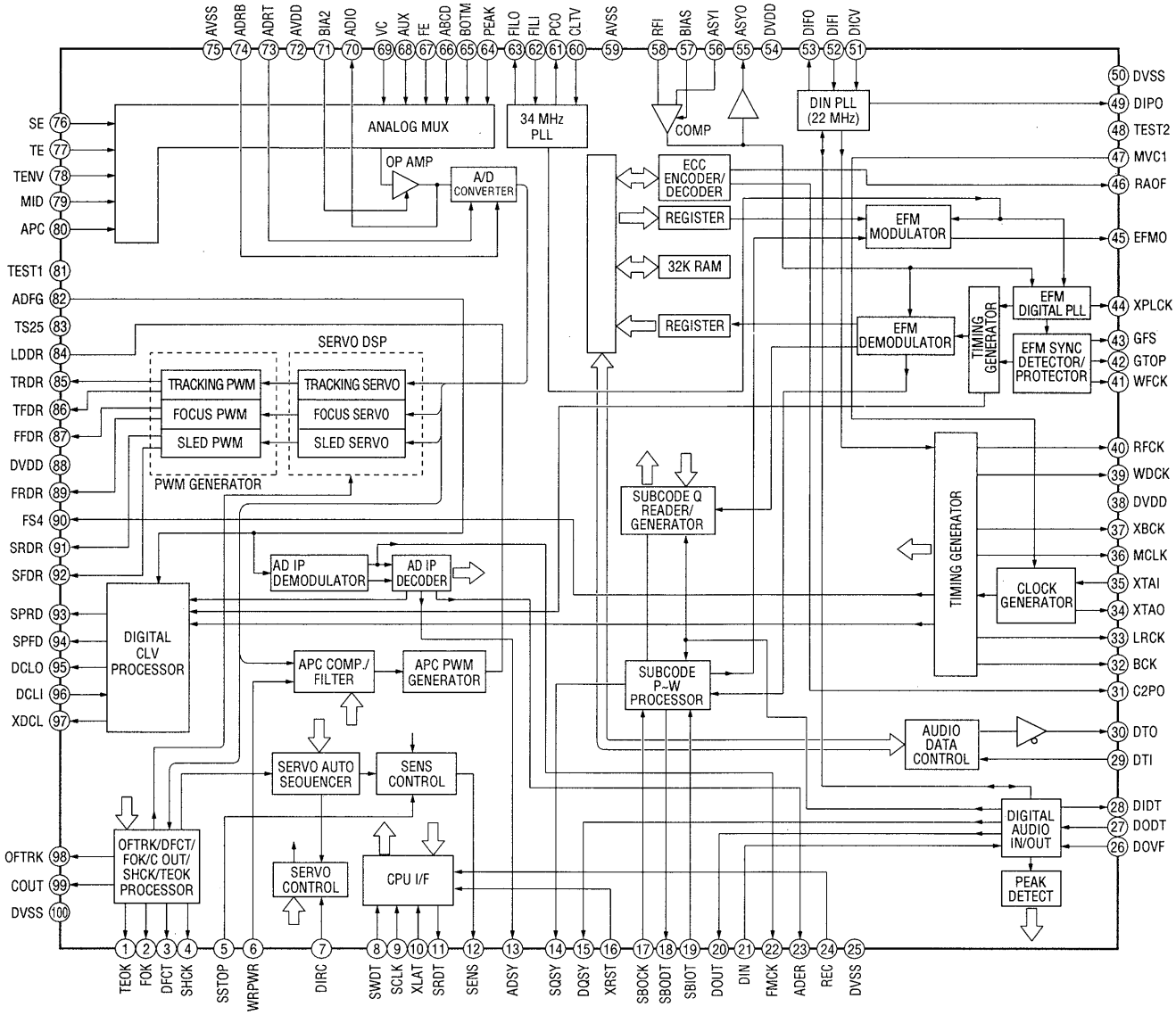
— POWER SECTION —



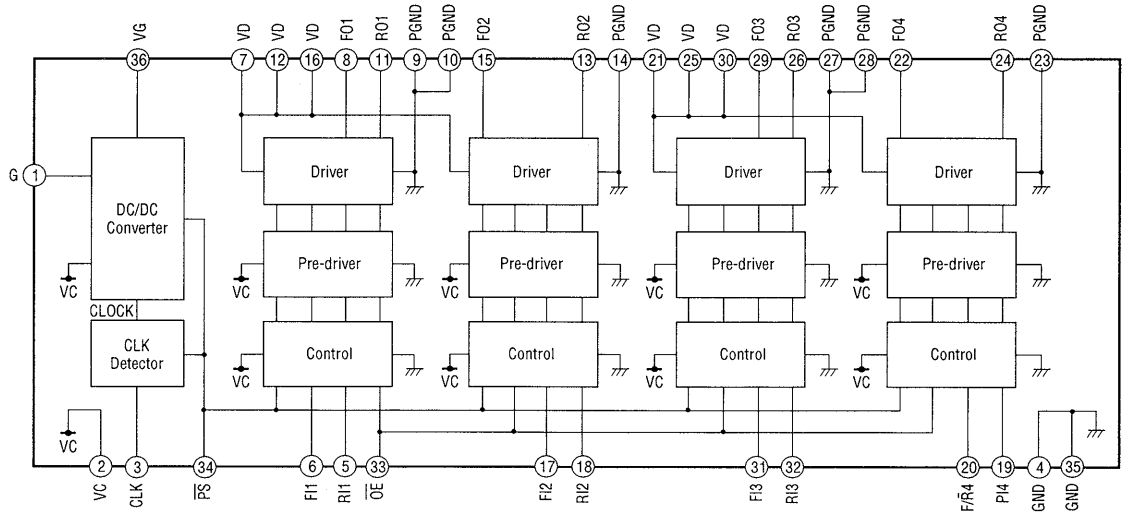
4-3. IC BLOCK DIAGRAMS

— BD SECTION —

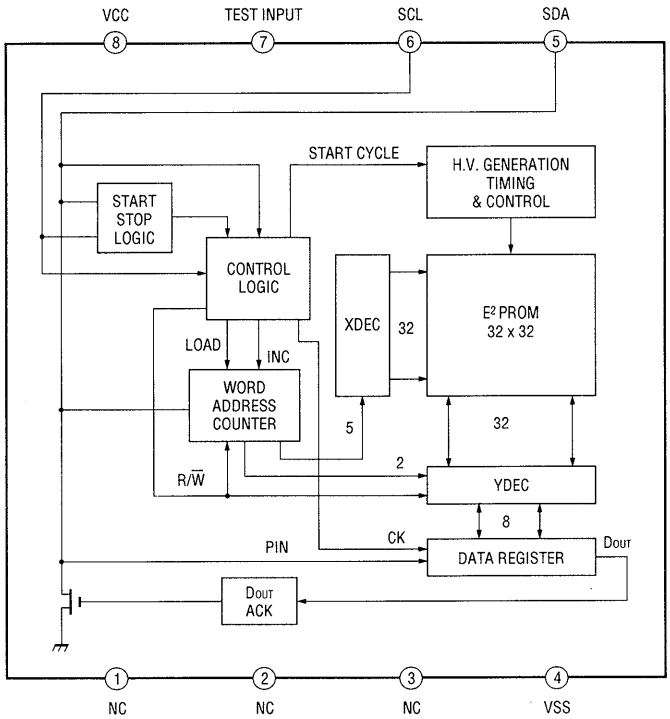
IC121 CXD2535BR



IC151 MPC17A38VMEL

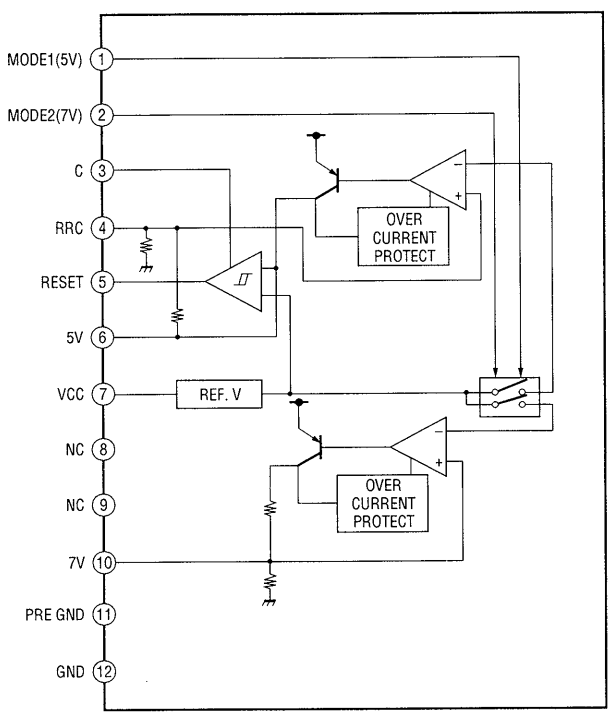


IC171 X24C01S



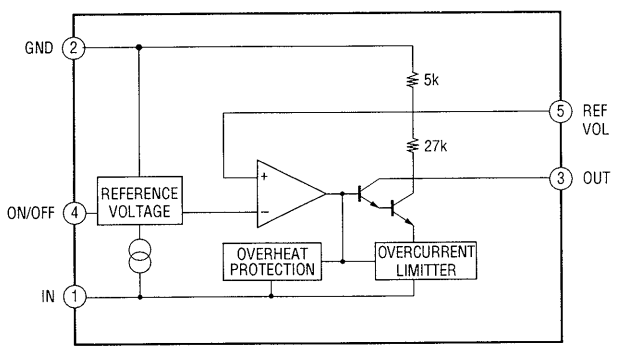
— POWER SECTION —

IC4 BA3963



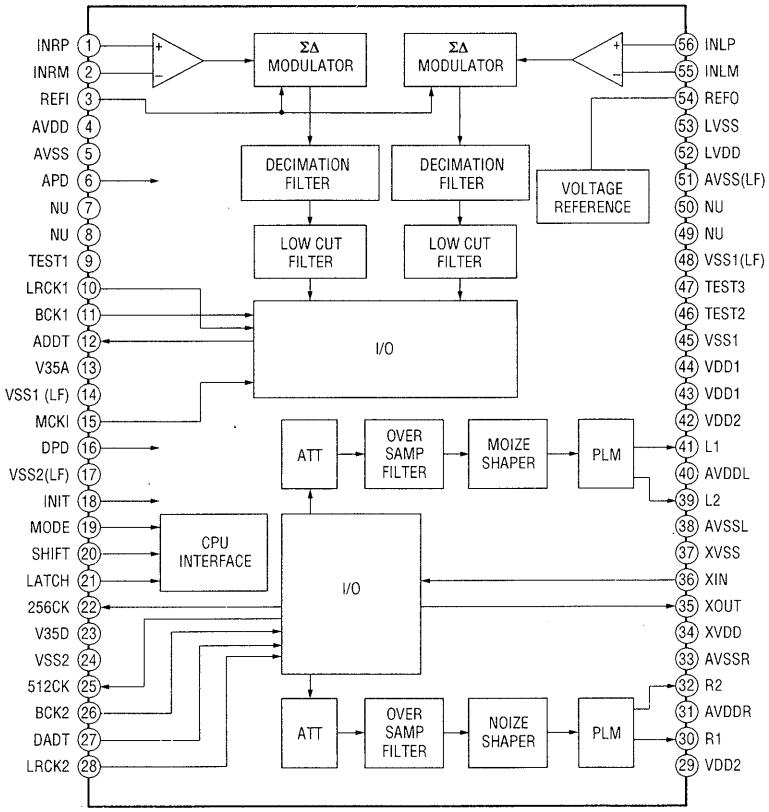
— PANEL SECTION —

IC202 M51953AL

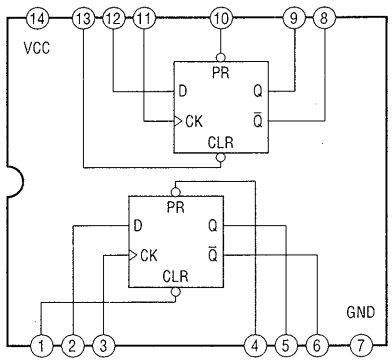


— DIGITAL SECTION —

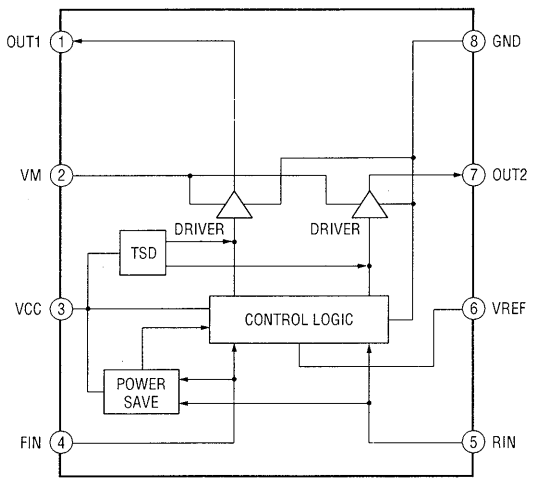
IC508, 509 CXD8607N



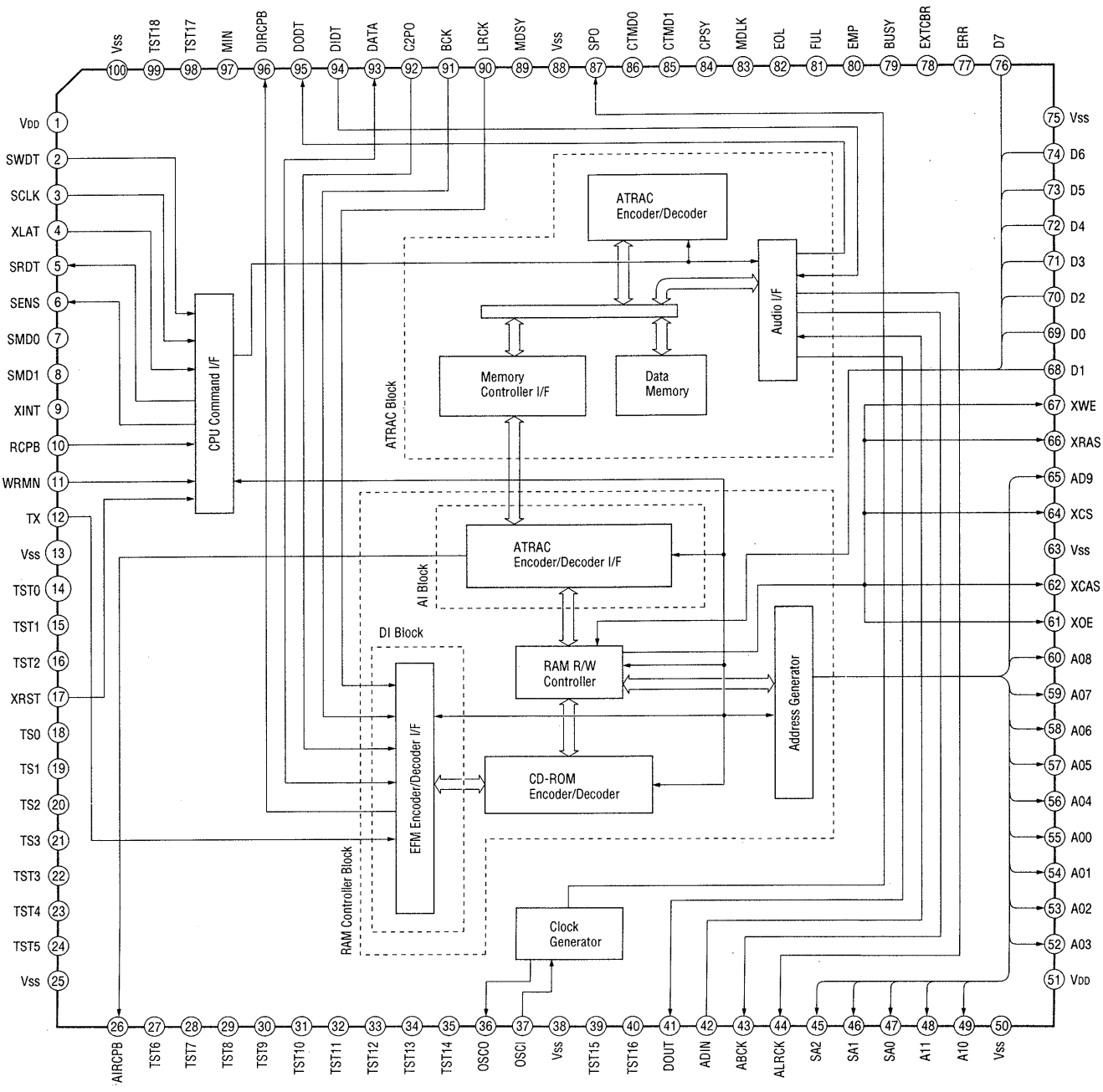
IC514 TC74HC74AF／
IC520 TC74VHC74F



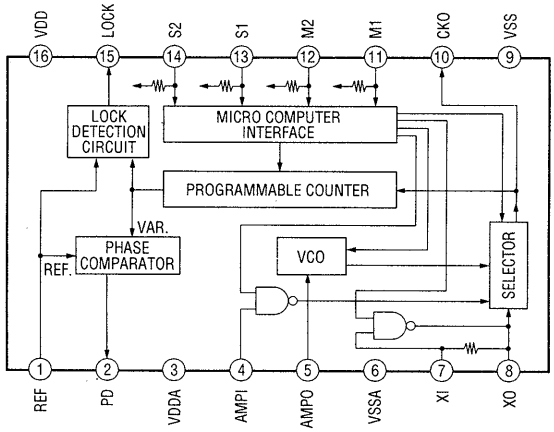
IC528 BA6287F



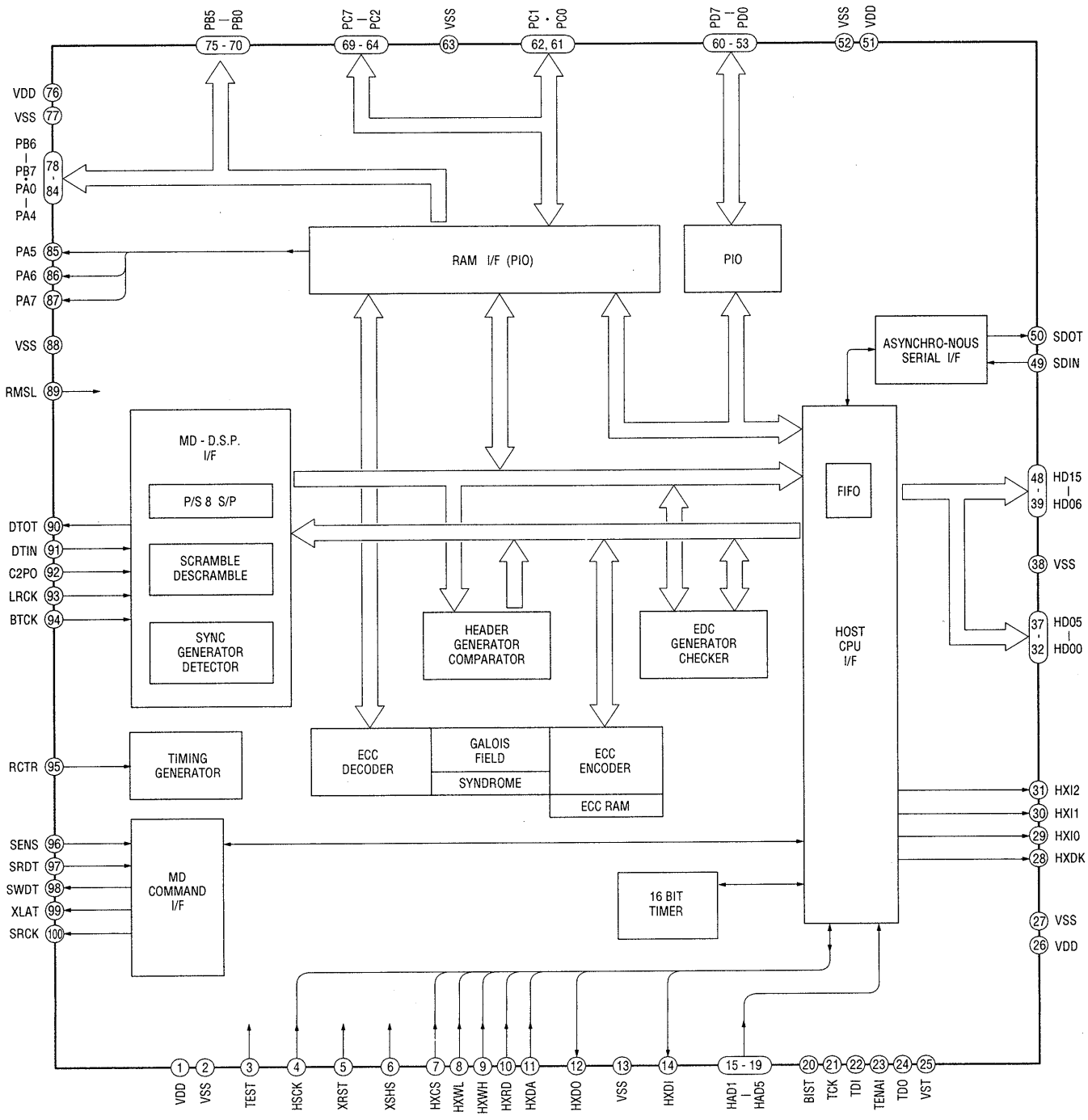
IC511, 512, 517, 518 CXD2536CR



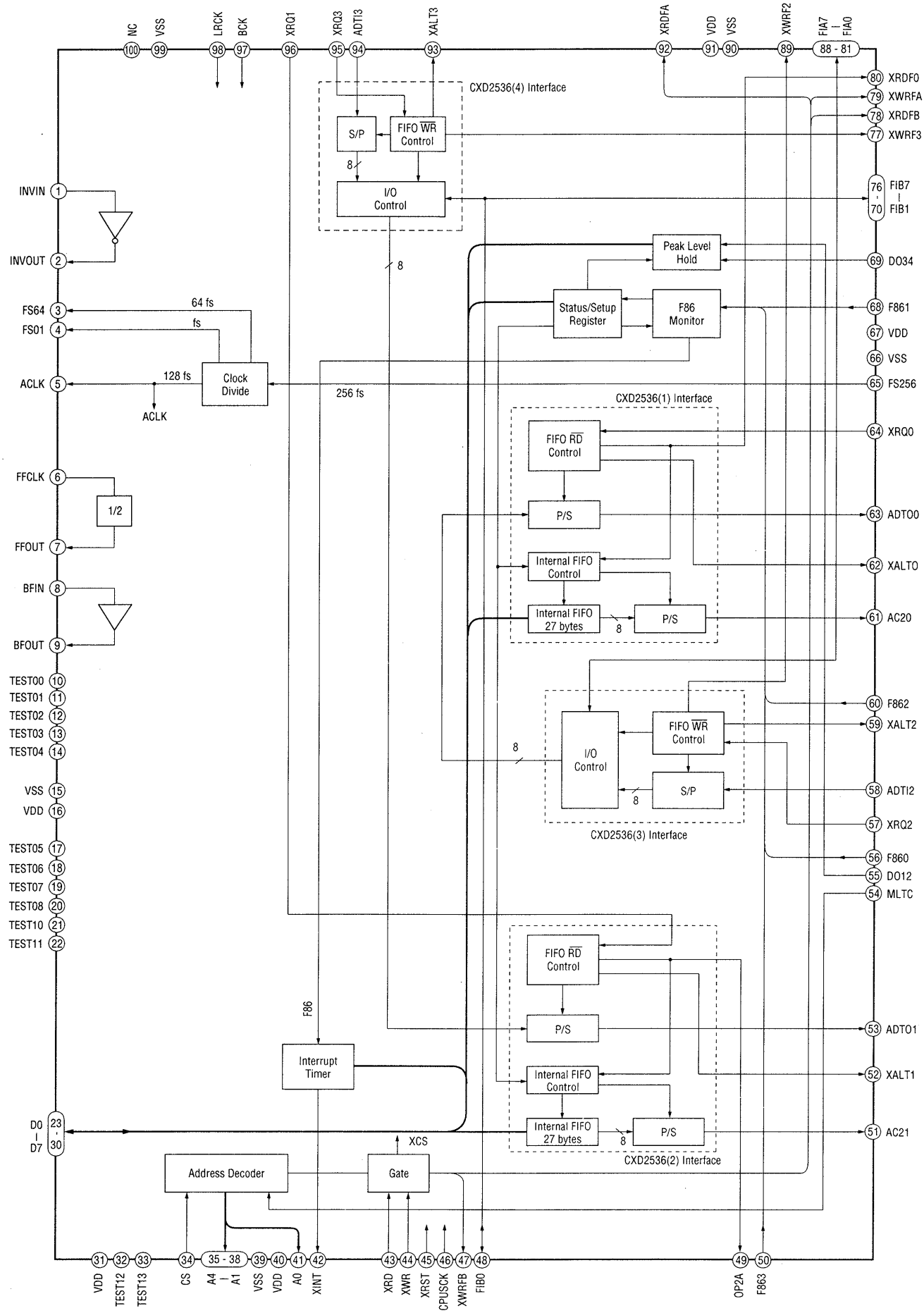
IC536 TC9246F



IC533 CXD1809R



IC534 CXD8655Q



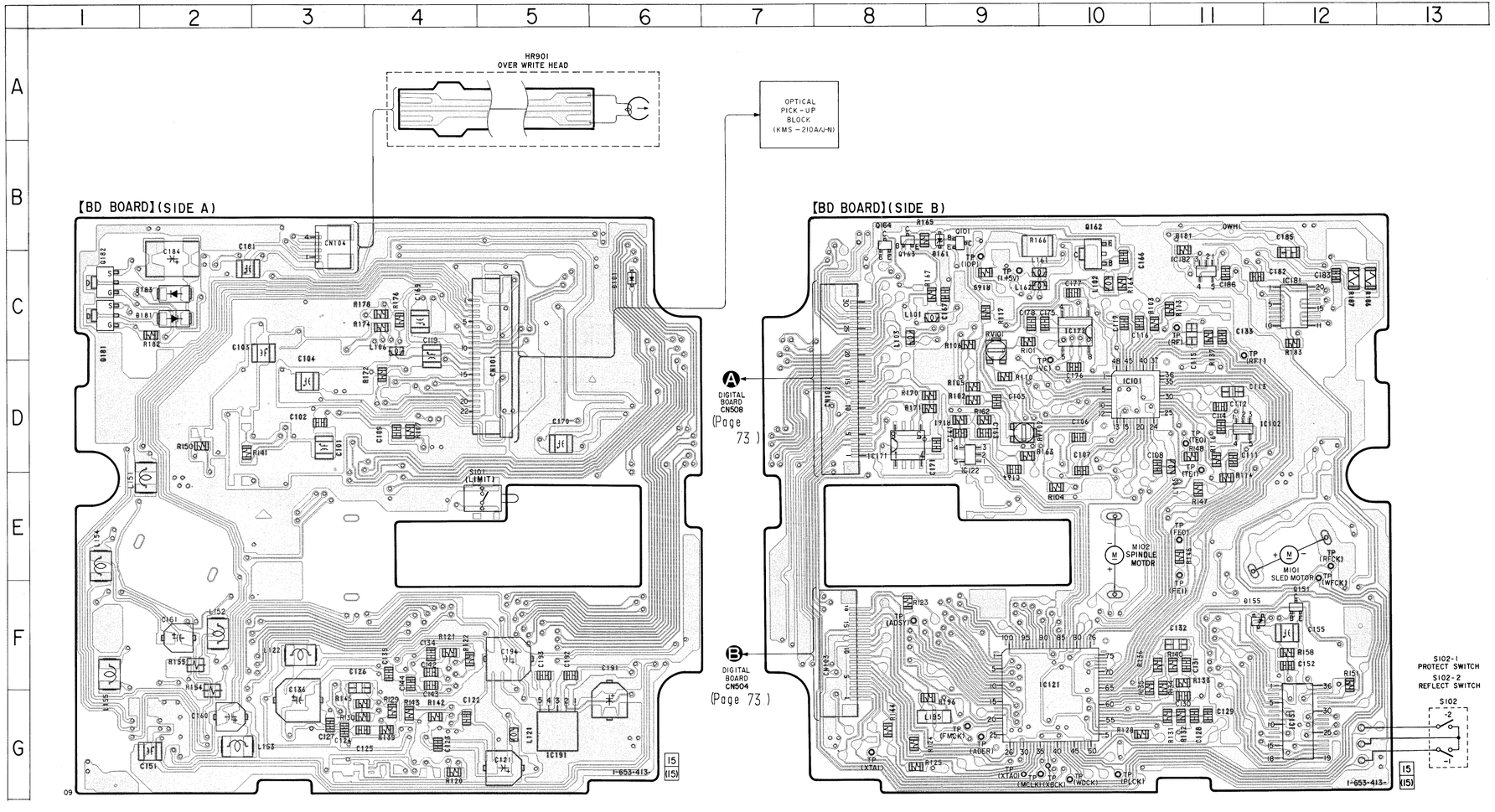
4-4. PRINTED WIRING BOARD — BD SECTION —

• See page 38 for Circuit Boards Location.

• **Semiconductor Location**

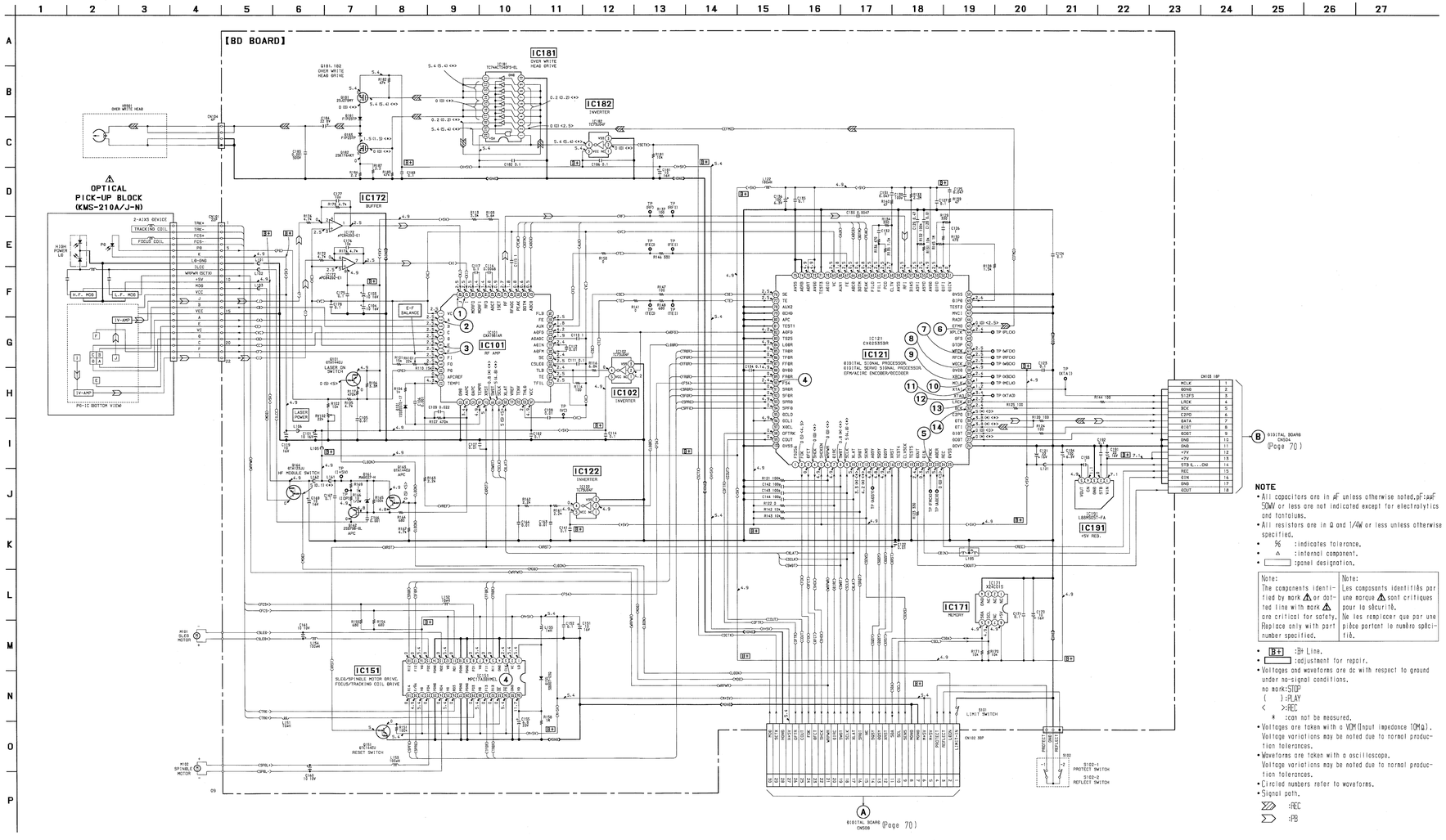
Ref. No.	Location
D101	C-6
D155	F-11
D161	B-8
D181	C-2
D183	C-2
IC101	D-10
IC102	D-11
IC121	F-9
IC122	D-9
IC151	G-12
IC171	D-8
IC172	C-10
IC181	C-12
IC182	C-11
IC191	G-5
Q101	B-9
Q151	F-11
Q162	B-10
Q163	B-8
Q164	B-8
Q181	C-1
Q182	C-1

Note:
- ○ : Through hole.
- ▭ : Pattern from the side which enable seeing. (The other layer's patterns are not indicated.)

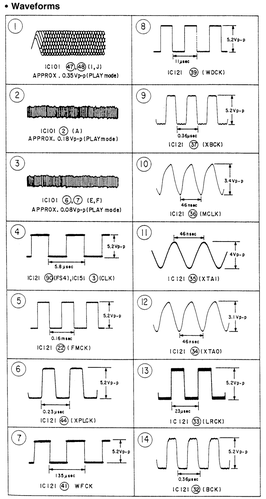


4-5. SCHEMATIC DIAGRAM — BD SECTION —

- See page 52 for IC Block Diagrams.
- See page 95 for IC Pin Functions. (IC101, 121)



• Waveforms



NOTE

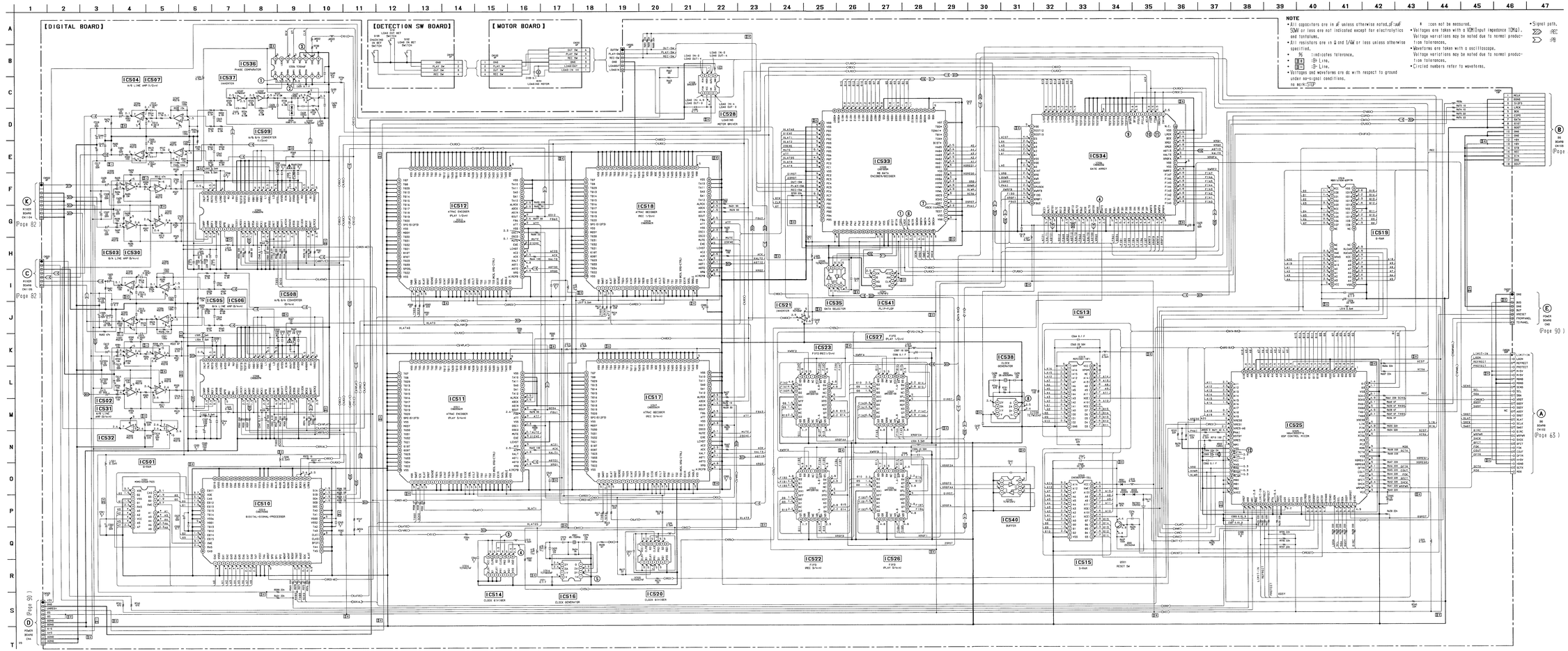
- All capacitors are in μF unless otherwise noted. pF: pμF
  50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- % : indicates tolerance.
- △ : internal component.
- ▭ : panel designation.

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

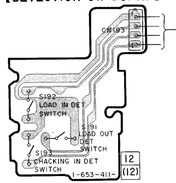
- B+ : B+ Line.
- ▭ : adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark : STOP
  ( ) : PLAY
  < > : REC
  * : can not be measured.
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⋙ : REC
  ⋙ : PB

4-6. SCHEMATIC DIAGRAM — DIGITAL SECTION —

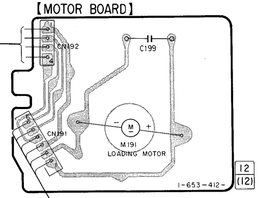
- See page 54 for IC Block Diagrams.
- See page 101 for IC Pin Functions.
  (IC508, 509, 510, 511, 512, 517, 518, 522, 523, 525, 526, 527, 533, 534)



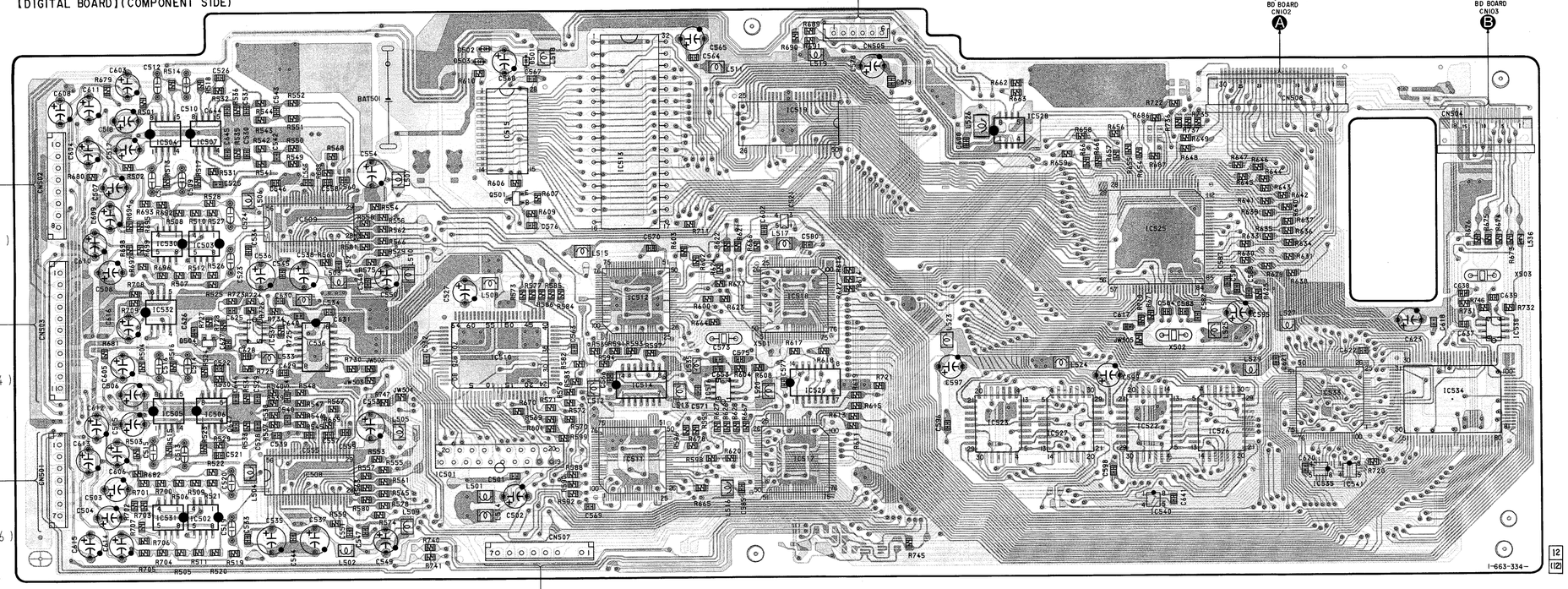
【DETECTION SW BOARD】



【MOTOR BOARD】



【DIGITAL BOARD】(COMPONENT SIDE)

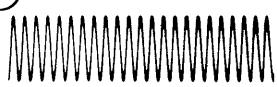
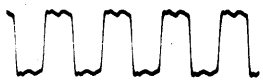


• Semiconductor Location

Ref. No.	Location
D501	C-7
D502	C-6
D503	C-6
D504	F-3
IC501	H-6
IC502	H-3
IC503	E-3
IC504	D-3
IC505	G-3
IC506	G-3
IC507	D-3
IC508	H-4
IC509	E-4
IC510	F-6
IC511	H-8
IC512	F-8
IC513	D-7
IC514	G-8
IC515	D-6
IC516	G-8
IC517	H-9
IC518	F-9
IC519	D-9
IC520	G-9
IC521	E-9
IC522	G-13
IC523	G-11
IC525	E-13
IC526	G-14
IC527	G-12
IC528	D-12
IC530	E-3
IC531	H-3
IC532	F-3
IC533	G-15
IC534	G-16
IC535	H-15
IC536	F-4
IC537	F-4
IC538	F-17
IC540	H-13
IC541	H-15
Q501	E-6

Note:
- ⟷ : parts extracted from the component side.
- ○ : Through hole.
- ▒ : Pattern from the side which enable seeing.
- ▫ : Pattern on the rear side.

• **Waveforms**

①  5Vp-p 55.9kHz IC533 (93) LRCK, IC536 (1) REF	⑦  5.4Vp-p 16MHz IC533 (4) HSCK
②  3.8Vp-p 22.6MHz IC536 (4) AMPI	⑧  3.6Vp-p 28.63MHz IC538 (2) 3Y
③  4.3Vp-p 22.6MHz IC514 (11) CLK2 , IC536 (10) CKO	⑨  4.6Vp-p 2.82MHz IC534 (9) BFOUT
④  6.6Vp-p 22.5MHz IC514 (9) Q2 , IC534 (65) 256FS	⑩  5.2Vp-p 44.1kHz IC534 (4) FSOI
⑤  0.4Vp-p 45.3 MHz IC516 (2) 3Y	⑪  5.2Vp-p 2.82MHz IC534 (3) FS64
⑥  5.3Vp-p 3.58MHz IC533 (94) BTCK	⑫  4Vp-p 16MHz IC525 (74) EXTAL

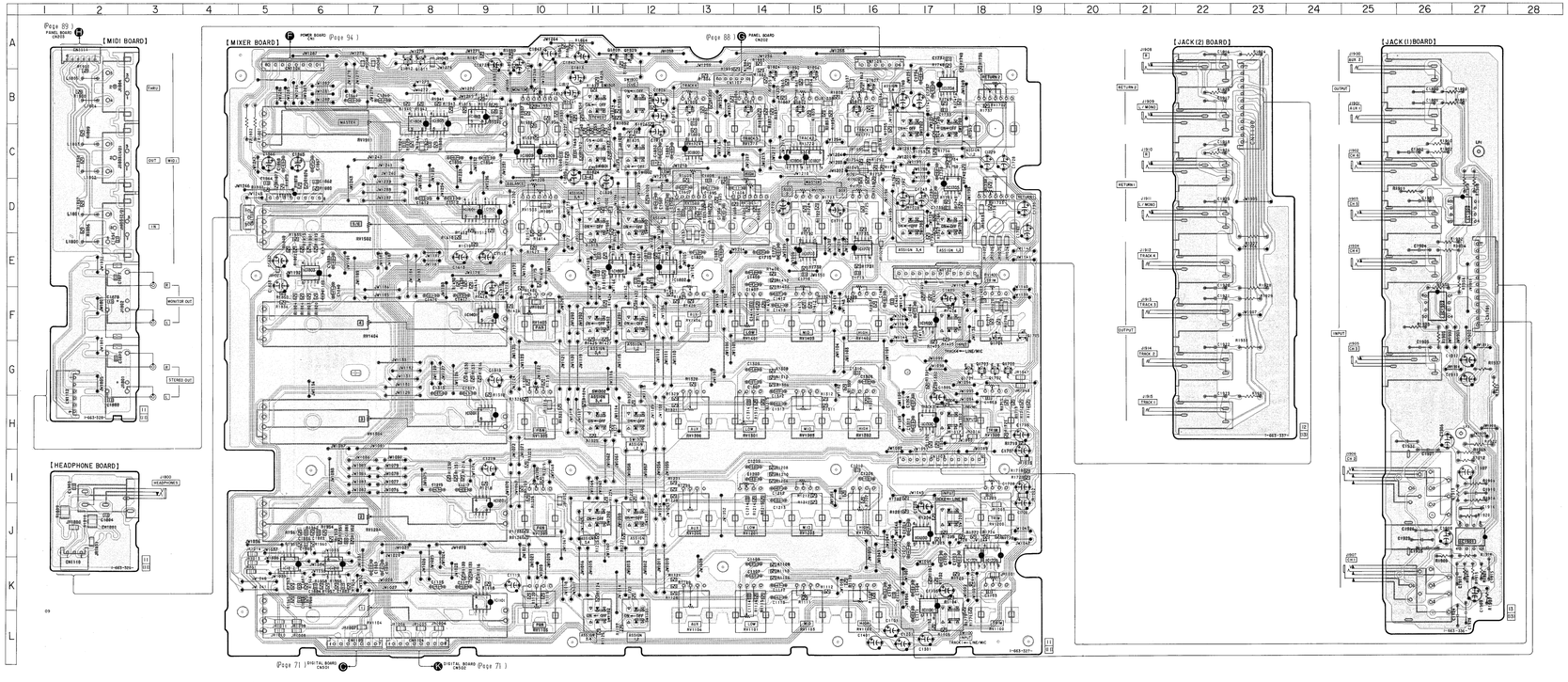
4-8. PRINTED WIRING BOARD — MIXER SECTION —

• See page 38 for Circuit Boards Location.

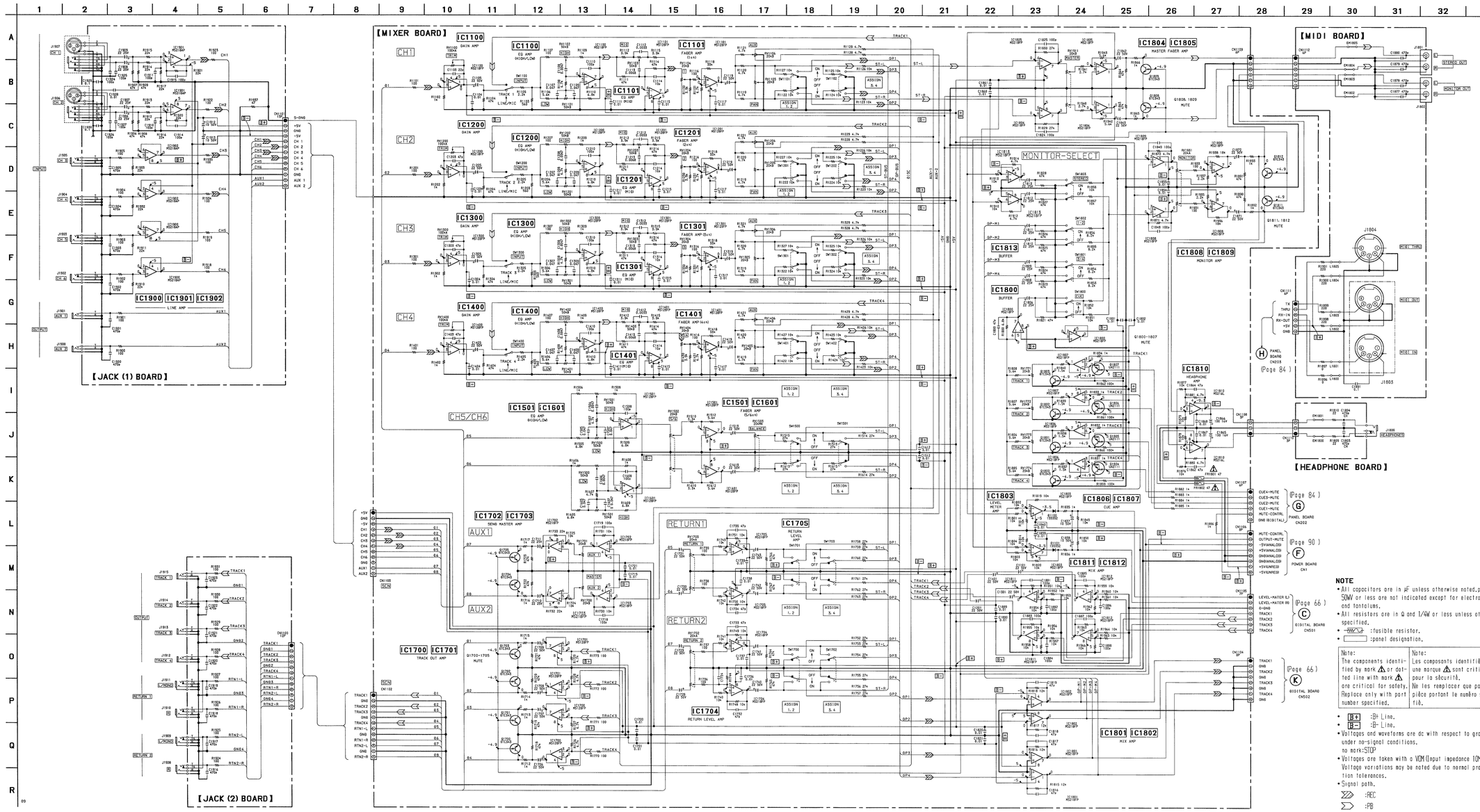
• **Semiconductor Location**

Ref. No.	Location
D1100	E-6
D1101	E-6
IC1100	K-17
IC1101	K-9
IC1200	J-17
IC1201	J-9
IC1300	H-17
IC1301	H-9
IC1400	F-17
IC1401	F-9
IC1501	D-9
IC1601	D-9
IC1700	K-18
IC1701	K-18
IC1702	E-16
IC1703	E-15
IC1704	B-17
IC1705	D-17
IC1800	C-13
IC1801	E-11
IC1802	E-13
IC1803	E-6
IC1804	B-8
IC1805	B-8
IC1806	C-15
IC1807	C-15
IC1808	C-10
IC1809	C-10
IC1810	D-5
IC1811	K-6
IC1812	K-5
IC1813	B-9
IC1900	D-27
IC1901	J-27
IC1902	F-27
Q1700	G-19
Q1701	G-18
Q1702	G-18
Q1703	G-18
Q1704	G-18
Q1705	F-19
Q1800	B-13
Q1801	B-14
Q1802	B-15
Q1803	B-16
Q1804	A-14
Q1805	A-15
Q1806	A-15
Q1807	B-16
Q1808	A-11
Q1809	A-12
Q1811	A-8
Q1812	A-8

Note:
- ⟷ : parts extracted from the component side.
- ▭ : Pattern from the side which enable seeing.

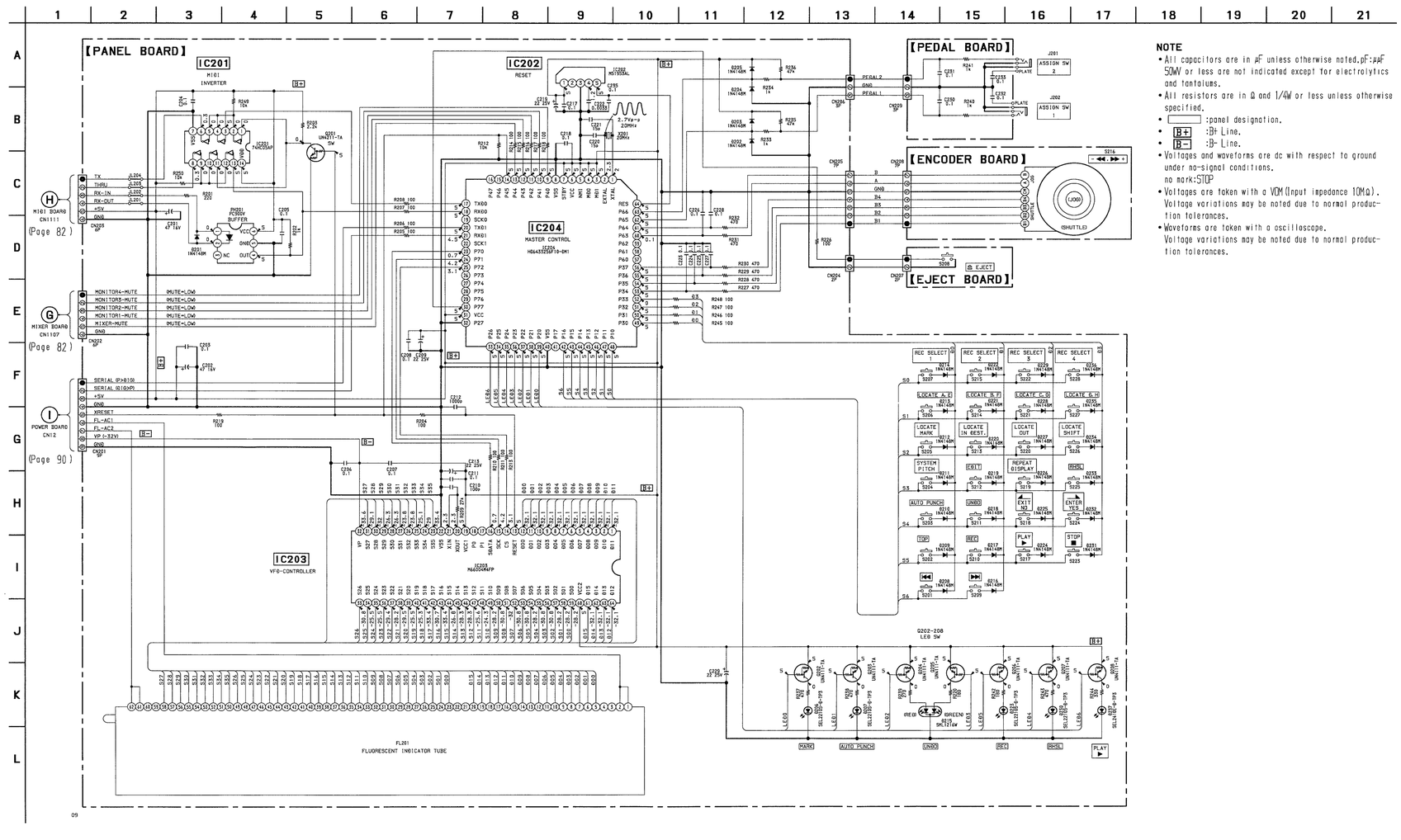


4-9. SCHEMATIC DIAGRAM — MIXER SECTION —



4-10. SCHEMATIC DIAGRAM — PANEL SECTION —

- See page 53 for IC Block Diagrams.
- See page 99 for IC Pin Functions. (IC204)

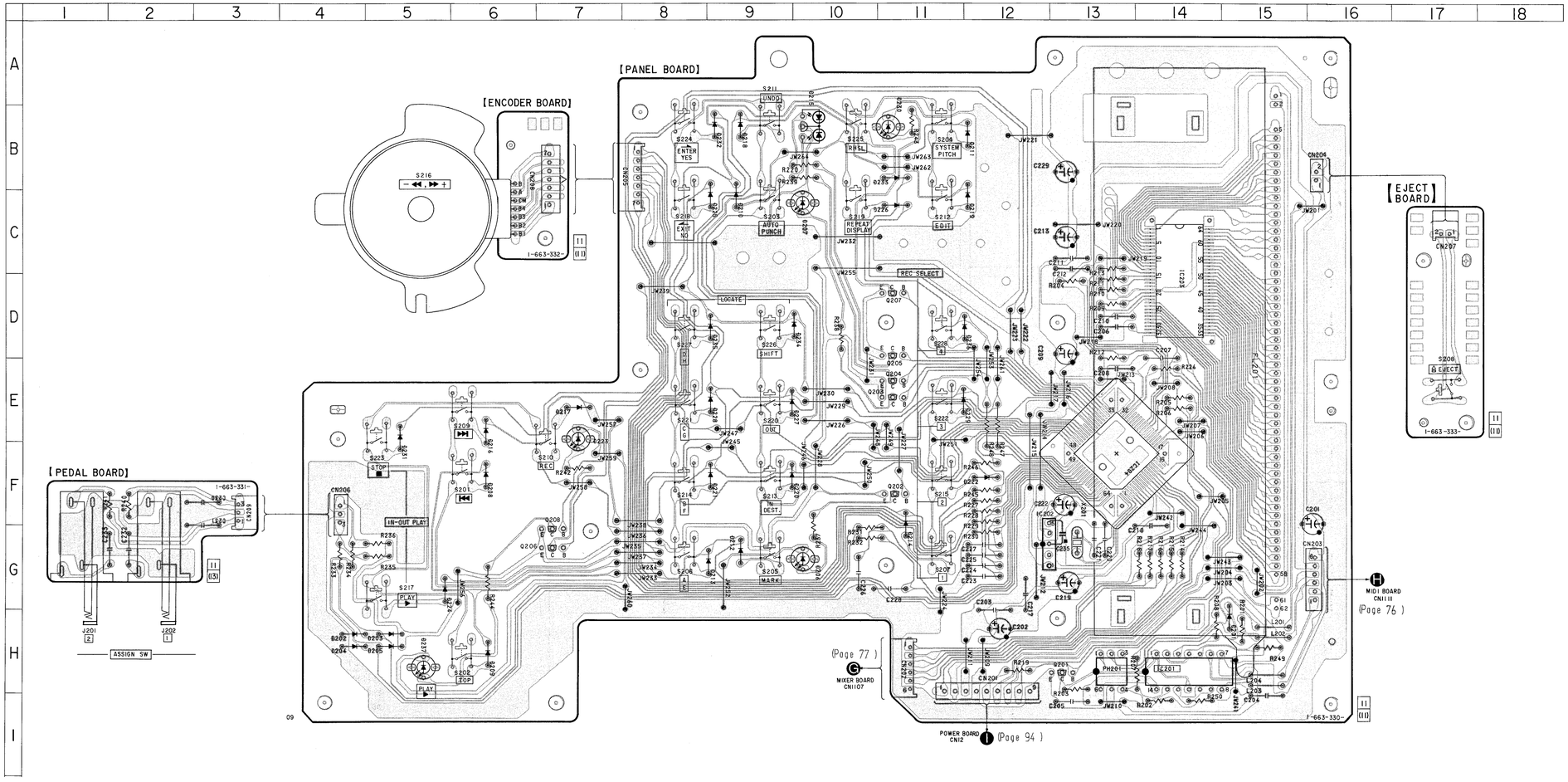


NOTE

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- ▭ : panel designation.
- B+ : B+ Line.
- B− : B− Line.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark: STOP
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.

4-11. PRINTED WIRING BOARD — PANEL SECTION —

• See page 38 for Circuit Boards Location.



• **Semiconductor Location**

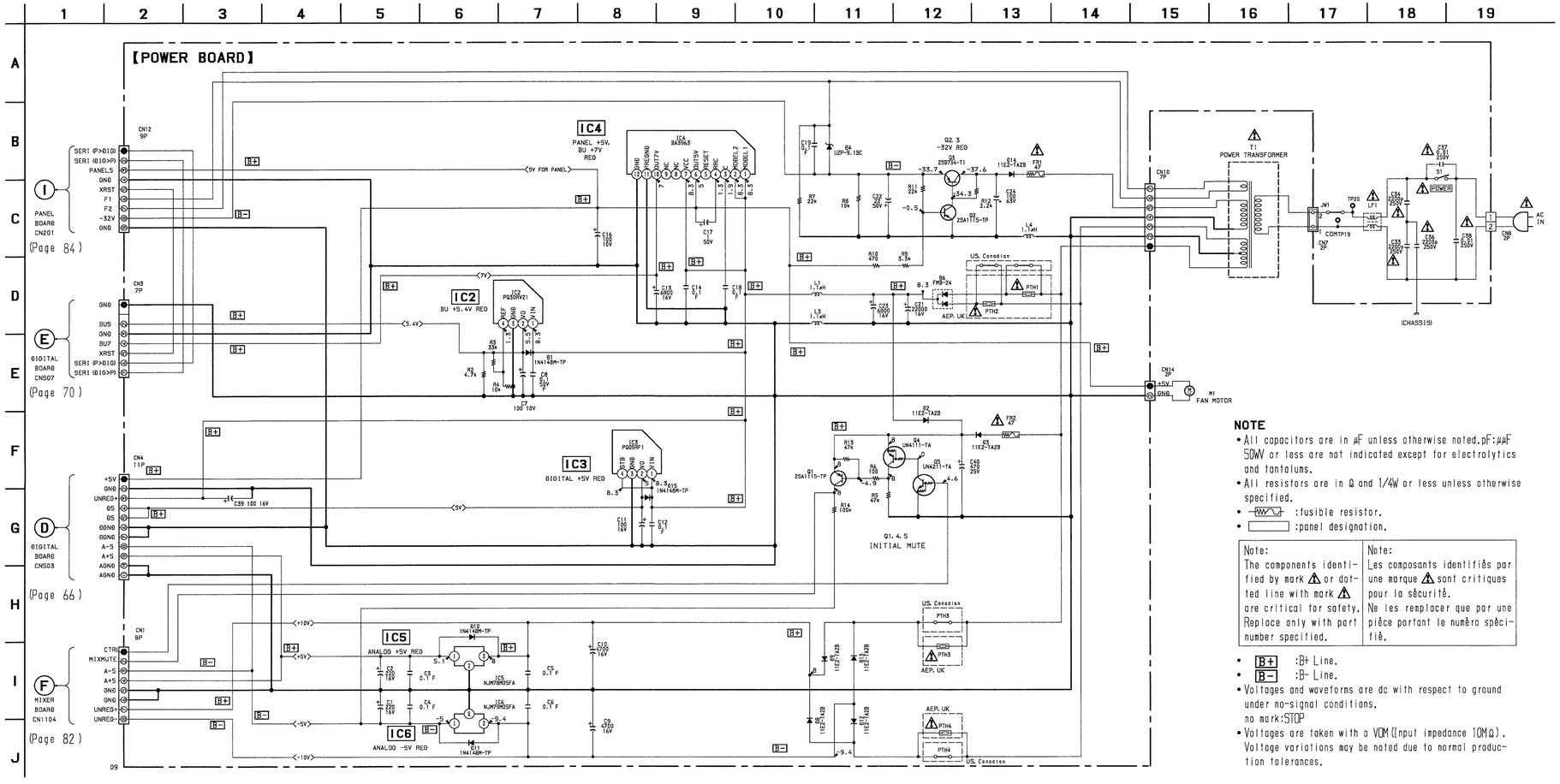
Ref. No.	Location
D201	H-15
D202	H-4
D203	H-5
D204	H-4
D205	H-5
D206	G-10
D207	C-10
D208	F-6
D209	H-6
D210	C-9
D211	B-12
D212	G-9
D213	G-9
D214	G-11
D215	A-10
D216	F-6
D217	E-7
D218	B-9
D219	C-12
D220	F-10
D221	F-9
D222	F-12
D223	F-7
D224	H-6
D225	C-9
D226	C-11
D227	E-10
D228	E-9
D229	E-12
D230	B-11
D231	F-5
D232	B-9
D233	B-11
D234	D-10
D235	D-9
D236	D-12
D237	H-5
IC201	H-14
IC202	G-12
IC203	D-14
IC204	F-13
PH201	H-13
Q201	H-13
Q202	F-11
Q203	E-11
Q204	E-10
Q205	E-11
Q206	G-7
Q207	D-11
Q208	G-7

Note:

- ⟷ : parts extracted from the component side.
- ■ : parts mounted on the conductor side.
- ▭ : Pattern from the side which enable seeing.

4-12. SCHEMATIC DIAGRAM — POWER SECTION —

• See page 53 for IC Block Diagrams.



NOTE

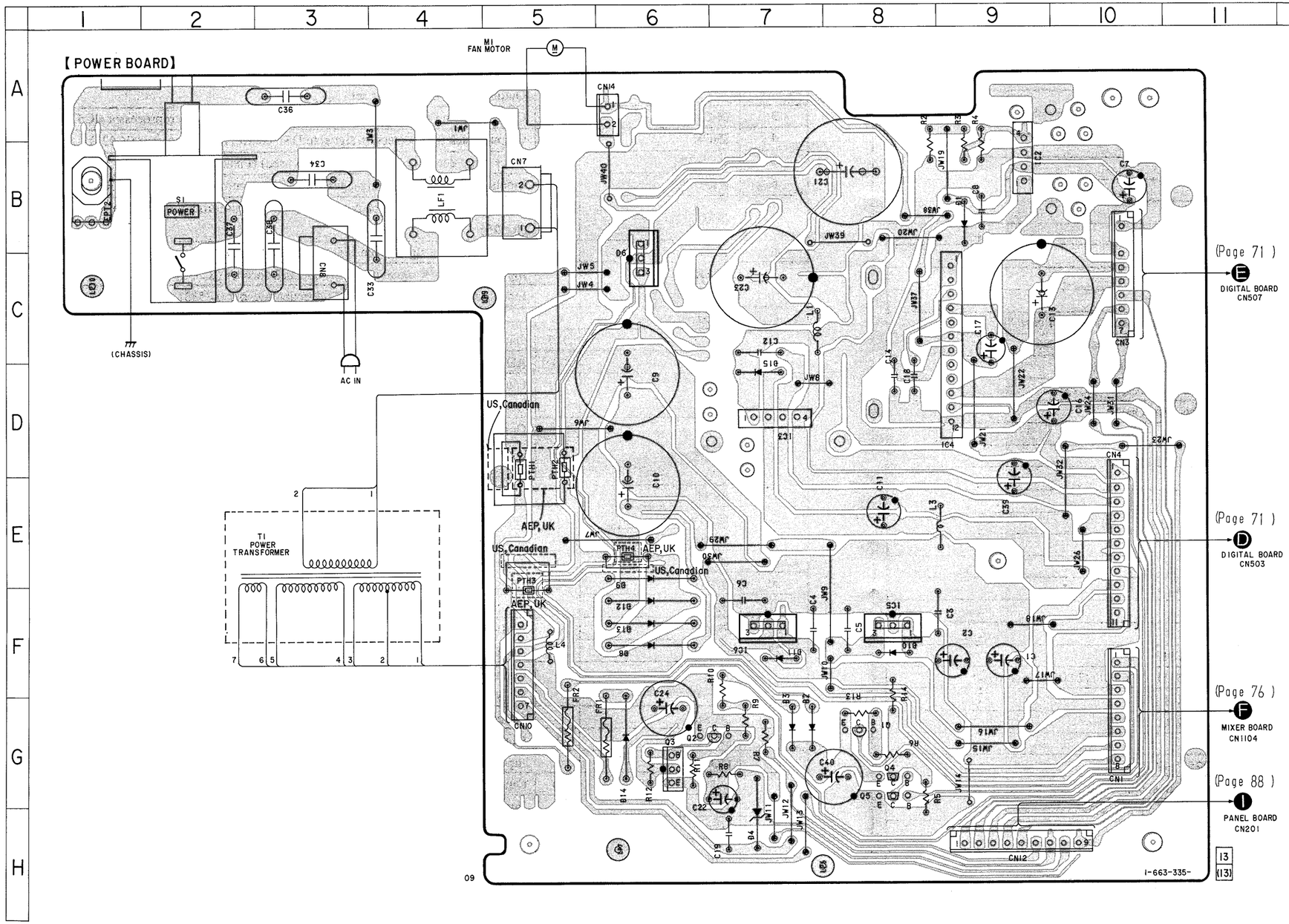
- All capacitors are in μF unless otherwise noted. pF: μμF
  50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- ⏦ : fusible resistor.
- ▭ : panel designation.

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- B+ : B+ Line.
- B− : B− Line.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark: STOP
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.

4-13. PRINTED WIRING BOARD — POWER SECTION —

• See page 38 for Circuit Boards Location.



• **Semiconductor Location**

Ref. No.	Location
D1	B-9
D2	F-7
D3	F-7
D4	H-7
D6	C-6
D8	F-6
D9	E-6
D10	F-8
D11	F-7
D12	F-6
D13	F-6
D14	G-6
D15	C-7
IC2	B-9
IC3	D-7
IC4	D-9
IC5	F-8
IC6	F-7
Q1	G-8
Q2	G-6
Q3	G-6
Q4	G-8
Q5	G-8

Note:

• ⟜ : parts extracted from the component side.
• ▭ : Pattern from the side which enable seeing.

4-14. IC PIN FUNCTIONS

• **IC101 RF Amplifier (CXA1981AR)/BD board**

Pin No.	Pin Name	I/O	Function
1	VC	O	Middle point voltage (2.5V) generation output pin
2 to 7	A to F	I	Input of signal from optical block detector
8	FI	I	F operation amplifier input
9	FO	O	F operation amplifier output
10	PD	I	Front monitor. Connected to photo diode
11	APCREF	I	Input pin for setting laser power
12	TEMPI	I	Temperature sensor connection pin
13	GND	–	Ground pin
14	AAPC	O	APC LD amplifier output pin
15	DAPC	O	Not used (Open)
16	TEMPR	O	Temperature sensor reference voltage output pin
17	XRST	I	Input of reset signal from DSP control microprocessor (IC525). Reset: "L"
18	SWDT	I	Input of write data signal from DSP control microprocessor (IC525)
19	SCLK	I	Input of clock signal from DSP control microprocessor (IC525)
20	XLAT	I	Input of latch signal from DSP control microprocessor (IC525)
21	VREF	O	Reference voltage output. Not used in this unit (Open)
22	TENV	O	Not used (Open)
23	THLD	I	Not used (Connected to VC)
24	VCC	–	Power supply pin (+5V)
25	TFIL	I	Not used (Open)
26	TE	O	Output of tracking error signal to CXD2535BR (IC121)
27	TLB	I	Input pin of add signal to tracking error
28	CSLED	I	Sled error LPF pin
29	SE	O	Output of sled error signal to CXD2535BR (IC121)
30	ADFM	O	ADIP FM signal output
31	ADIN	I	Inputs ADIP FM signal by AC coupling
32	ADAGC	I	Connection pin of external capacitor for ADIP AGC
33	ADFG	O	Output of ADIP dual FM signal to CXD2535BR (IC121) (22.05 kHz±1 kHz)
34	AUX	O	Output of auxiliary signal to CXD2535BR (IC121)
35	FE	O	Output of focus error signal to CXD2535BR (IC121)
36	FLB	I	Not used (Open)
37	ABCD	O	Output of light amount signal to CXD2535BR (IC121)
38	BOTM	O	Output of bottom hold signal of light amount signal to CXD2535BR (IC121)
39	PEAK	O	Output of peak hold signal of light amount signal to CXD2535BR (IC121)
40	RFAGC	I	Connection pin of RF AGC circuit external capacitor
41	RF	O	Output of playback EFM RF signal to CXD2535BR (IC121)
42	ISET	I	Internal circuit constant setting pin. 22 kHz BPF center frequency
43	AGCT	I	Inputs RF signal by AC coupling
44	RFO	O	Output pin of RF signal
45	MORFI	I	Inputs MO RF signal by AC coupling
46	MORFO	O	Output pin of MO RF signal
47, 48	I, J	I	Input of signal from optical block detector

• **IC121 Digital signal processor, digital servo processor, EFM/ACIRC encoder/decoder (CXD2535BR)/BD board**

Pin No.	Pin Name	I/O	Function
1	FS256	O	11.2896 MHz clock output (MCLK). (Not used) (Open)
2	FOK	O	Output of FOK signal to DSP control microprocessor (IC525) Outputs "H" when focus is set
3	DFCT	O	Outputs defect ON/OFF switching signal to DSP control microprocessor (IC525)
4	SHCK	O	Outputs track jump detection signal to DSP control microprocessor (IC525)
5	SHCKEN	I	Track jump detection enable input. (Not used) (Fixed at "H")
6	WRPWR	I	Inputs laser power switching signal from DSP control microprocessor (IC525)
7	DIRC	I	Disc drive recording/playback switching signal input from the DSP control microprocessor (IC525)
8	SWDT	I	Inputs write data signal from MD encoder/decoder (IC533)
9	SCLK	I	Inputs serial clock signal from MD encoder/decoder (IC533)
10	XLAT	I	Inputs serial latch signal from MD encoder/decoder (IC533)
11	SRDT	O	Outputs write data signal to MD encoder/decoder (IC533)
12	SENS	O (3)	Outputs internal status (SENSE) to MD encoder/decoder (IC533)
13	ADSY	O	ADIP sync signal output. (Not used) (Open)
14	SQSY	O	Output subcode Q sync (SCOR) to DSP control microprocessor (IC525) Outputs "L" every 13.3 msec. Outputs "H" at all most mostly
15	DQSY	O	Outputs digital-in U-bit CD format subcode Q sync (SCOR) to DSP control microprocessor (IC525). Outputs "L" every 13.3 msec Outputs "H" at all most mostly
16	XRST	I	Inputs reset signal from DSP control microprocessor (IC525). Reset: "L"
17	TEST4	I	Test input (Fixed at "L")
18	CLVSCK	O	Not used (Open)
19	TEST5	I	Test input (Fixed at "L")
20	DOUT	O	Digital audio signal output pin (For optical output) (Not used)
21	DIN	I	Digital audio signal input pin (For optical input)
22	FMCK	O	ADIP FM demodulation clock signal output
23	ADER	O	ADIP CRC flag output. "H":Error
24	REC	I	Input of recording/playback switching signal from DSP control microprocessor (IC525) Recording: "H". Playback: "L"
25	DVSS	–	Ground pin (Digital)
26	DOVF	I	Digital audio output validity flag input pin. (Fixed at "L")
27	DODT	I	Input pin of 16bit data for digital audio output (Not used)
28	DIDT	O	Output pin of 16bit data for digital audio input (Not used)
29	DTI	I	Input pin of recording audio data signal from MD encoder/decoder (IC533)
30	DTO	O (3)	Output pin of playback audio data signal to MD encoder/decoder (IC533)
31	C2PO	O	Outputs C2PO signal to MD encoder/decoder (IC533). (Output indicating data error status) Playback: C2PO ("H"). Digital recording: D.In-Vflag. Analog recording: "L"
32	BCK	O	Outputs bit clock signal (2.8224 MHz) to MD encoder/decoder (IC533) (MCLK)
33	LRCK	O	Outputs L/R clock signal (44.1 kHz) to MD encoder/decoder (IC533) (MCLK)
34	XTAO	O	System clock (512 fs=22.5792 MHz) signal output. (Not used) (Open)
35	XTAI	I	Input of system clock (512fs=22.5792 MHz) signal input
36	MCLK	O	MCLK clock (22.5792 MHz) signal output
37	XBCK	O	Pin 32 (BCK) inversion output
38	DVDD	–	Power supply pin (+5V) (Digital)

Pin No.	Pin Name	I/O	Function
39	WDCK	O	WDCK clock (88.2 kHz) signal output (MCL)
40	RFCK	O	RFCK clock (7.35 kHz) signal output (MCLK)
41	WFCK	O	WFCK clock (7.35 kHz) signal output (Playback: EFM decoder PLL. Recording: EFM encoder PLL)
42	GTOP	O	"H": Opens playback EFM frame sync protection window
43	GFS	O	"H": Playback EFM sync and interpolation protection timing match
44	XPLCK	O	EFM decoder PLL clock output (98 fs=4.3218 MHz) Falling edge and EFM signal edge match
45	EFMO	O	EFM signal output (Recording)
46	RAOF	O	Internal RAM overflow detection signal output (decoder monitor output) Outputs "H" when the disc rotation exceeds ±4F jitter margin during playback
47	MVCI	I	Digital-in PLL oscillation input. (Not used) (Fixed at "L")
48	TEST2	I	Test pin (Fixed at "L")
49	DIPD	O (3)	Digital-in PLL phase comparison output Internal VCO: (Frequency: Low→"H"). External VCO: (Frequency: Low→"L")
50	DVSS	–	Ground pin (Digital)
51	DICV	I (A)	Digital-in PLL internal VCO control voltage input
52	DIFI	I (A)	Filter input when digital-in PLL internal VCO is used
53	DIFO	O (A)	Filter output when digital-in PLL internal VCO is used
54	AVDD	–	Power supply pin (+5V) (Analog)
55	ASYO	O	Playback EFM full-swing output (L=VSS, H=VDD)
56	ASYI	I (A)	Playback EFM asymmetry comparate voltage input
57	BIAS	I (A)	Playback EFM asymmetry circuit constant current input
58	RFI	I (A)	Inputs playback EFM RF signal from CXA1981AR (IC101)
59	AVSS	–	Ground pin (Analog)
60	CLTV	I (A)	Decoder PLL master clock PLL VCO control voltage input
61	PCO	O (3)	Decoder PLL master clock PLL phase comparison output
62	FILI	I (A)	Decoder PLL master clock PLL filter input
63	FILO	O (3)	Decoder PLL master clock PLL filter output
64	PEAK	I (A)	Inputs peak hold signal for light amount signal from CXA1981AR (IC101)
65	BOTM	I (A)	Inputs bottom hold signal for light amount signal from CXA1981AR (IC101)
66	ABCD	I (A)	Light amount signal from CXA1981AR (IC101)
67	FE	I (A)	Input of focus error signal from CXA1981AR (IC101)
68	AUX1	I (A)	Input of auxiliary signal from CXA1981AR (IC101)
69	VC	I (A)	Input of middle point voltage (+2.5V) from CXA1981AR (IC101)
70	ADIO	O (A)	A/D converter input signal monitor output
71	TEST3	I (A)	Test input (Fixed at "L")
72	AVDD	–	Power supply pin (+5V) (Analog)
73	ADRT	I (A)	A/D converter operation range upper limit voltage input (Fixed at "H")
74	ADRB	I (A)	A/D converter operation range lower limit voltage input (Fixed at "L")
75	AVSS	–	Ground pin (Analog)
76	SE	I (A)	Input of sled error signal from CXA1981AR (IC101)
77	TE	I (A)	Input of tracking error signal from CXD1981AR (IC101)
78	AUX2	I (A)	Auxiliary input pin 2. (Not used). (Fixed at "L")

Pin No.	Pin Name	I/O	Function
79	DCHG	I (A)	Connected to ground
80	APC	I (A)	Laser APC input. (Not used) (Fixed at "L")
81	TEST1	I	Test pin (Fixed at "L")
82	ADFG	I	Input of ADIP dual FM signal from CXA1981AR (IC101) (22.05 kHz ±1 kHz) (TTL Schmidt input)
83	TS25	I	Test pin (Fixed at "L")
84	LDDR	O	Laser APC signal output
85	TRDR	O	Tracking servo drive signal output (–)
86	TFDR	O	Tracking servo drive signal output (+)
87	FFDR	O	Focus servo drive signal output (+)
88	DVDD	–	Power supply pin (+5V) (Digital)
89	FRDR	O	Focus servo drive signal output (–)
90	FS4	O	176.4 kHz clock signal output (MCLK)
91	SRDR	O	Sled servo drive signal output (–)
92	SFDR	O	Sled servo drive signal output (+)
93	SPRD	O	Spindle servo drive signal output (–)
94	SPFD	O	Spindle servo drive signal output (+)
95	DCLO	O	Not used normally (Open)
96	DCLI	I	Not used normally (Fixed at "H")
97	XDCL	O	Not used normally (Open)
98	OFTRK	O	Off track signal output
99	COUT	O	Traverse count signal output
100	DVSS	–	Ground pin (Digital)

* (3) of I/O is 3-state output, (A) is analog output.

• **IC204 Master Control (HD6433256F10-DM1)/Panel board**

Pin No.	Pin Name	I/O	Function
1	XTAL	I	Crystal oscillation circuit (20 MHz)
2	EXTAL	O	
3	MD1	I	Not used. (Connected to power supply)
4	MD0	I	
5	NMI	I	
6	VCC	–	Power supply (+5V)
7	STBY	I	Not used. (Connected to power supply)
8	VSS	–	Ground
9	P40	O	Monitor mute control output
10	P41	O	
11	P42	O	
12	P43	O	
13	P44	O	Mixer mute control output
14	P45	O	System reset output
15	P46	I	Not used.
16	P47	I	
17	TXD0	O	Write data transmission timing output to MIDI
18	RXD0	I	Read data transmission timing output to MIDI
19	SCK0	O	Not used.
20	TXD1	O	Write data signal output to the DSP control microprocessor (IC525)
21	RXD1	I	Read data signal input from the DSP control microprocessor (IC525)
22	SCK1	O	Not used.
23	P70	O	Serial chip select signal output to the VFD controller (IC203)
24	P71	O	Serial clock signal output to the VFD controller (IC203)
25	P72	O	Serial data signal output to the VFD controller (IC203)
26	P73	I	Not used.
27	P74	I	
28	P75	I	
29	P76	I	
30	P77	I	Eject switch (S208) detection
31	VCC	–	Power supply (+5V)
32	P27	I	Not used. (Connected to ground)
33	LED6	O	PLAY LED (D237) drive output
34	LED5	O	REC LED (D223) drive output
35	LED4	O	RHSL LED (D230) drive output
36	LED3	O	UNDO (Green) LED (D215) drive output
37	LED2	O	UNDO (Red) LED (D215) drive output
38	LED1	O	AUTO PUNCH LED (D207) drive output
39	LED0	O	MARK LED (D206) drive output
40	VSS	–	Ground

Pin No.	Pin Name	I/O	Function
41	P17	I	Not used.
42	S6	I	Key input (A/D)
43	S5	I	
44	S4	I	
45	S3	I	
46	S2	I	
47	S1	I	
48	S0	I	
49	P30	O	Key output (LINE)
50	P31	O	
51	P32	O	
52	P33	O	
53	P34	I	Pulse input from the shuttle (S216)
54	P35	I	
55	P36	I	
56	P37	I	
57	P60	I	Not used.
58	P61	I	
59	P62	I	
60	P63	I	Pulse input from the jog (S216)
61	P64	I	
62	P65	I	ASSIGN (Footswitch) detection input
63	P66	I	
64	RES	I	Power ON reset input

• **IC508, 509 A/D, D/A Converter (CXD8607N)/Digital board**

Pin No.	Pin Name	I/O	Function
1	INRP	I	Rch analog (+) input
2	INRM	I	Rch analog (–) input
3	REFI	I	A/D reference voltage input (+3.2V)
4	AVDD	–	+5V power supply (A/D, analog)
5	AVSS	–	Ground (A/D, analog)
6	APD	I	A/D analog block power down. "L": Power down
7	NU	–	Not used
8	NU	–	
9	TEST1	I	Test pin (Fixed at "L")
10	LRCK1	I	A/D LRCK input
11	BCK1	I	A/D BCK input
12	ADDT	O	A/D data output
13	V35A	–	+3.3V power supply
14	VSS1 (LF)	–	Ground (A/D, digital)
15	MCKI	I	A/D master clock input (256 fs)
16	DPD	I	A/D digital block power down. "L": Power down/reset
17	VSS2 (LF)	–	Ground (D/A, digital)
18	INIT	I	D/A initialize. "L": Initialize
19	MODE	I	Mode flag input
20	SHIFT	I	Shift clock input
21	LATCH	I	Latch clock input
22	256CK	O	256 fs clock output
23	V35D	–	+3.3V power supply
24	VSS2	–	Ground (D/A, digital)
25	512CK	O	Not used
26	BCK2	I	D/A BCK input
27	DADT	I	D/A data input
28	LRCK2	I	D/A LRCK input
29	VDD2	–	+5V power supply (D/A, digital)
30	R1	O	Rch PLM output 1
31	AVDDR	–	+5V power supply (D/A, Rch, analog)
32	R2	O	Rch PLM output 2
33	AVSSR	–	Ground (D/A, Rch, analog)
34	XVDD	–	+5V power supply (X'tal)
35	XOUT	O	X'tal oscillation output (22 MHz)
36	XIN	I	X'tal oscillation input (512 fs) (22 MHz)
37	XVSS	–	Ground (X'tal)
38	AVSSL	–	Ground (D/A, Lch, analog)
39	L2	O	Lch PLM output 2
40	AVDDL	–	+5V power supply (D/A, Lch, analog)

Pin No.	Pin Name	I/O	Function
41	L1	O	Lch PLM output 1
42	VDD2	–	+5V power supply (D/A, digital)
43	VDD1	–	+5V power supply (A/D, digital)
44	VDD1	–	
45	VSS1	–	Ground (A/D, digital)
46	TEST2	I	Test pin (Fixed at "L")
47	TEST3	I	
48	VSS1 (LF)	–	Ground (A/D, digital)
49	NU	–	Not used
50	NU	–	
51	AVSS (LF)	–	Ground (A/D, analog)
52	LVDD	–	+5V power supply (A/D, buffer)
53	LVSS	–	Ground (A/D, buffer)
54	REFO	O	A/D reference voltage output (+3.2V)
55	INLM	I	Lch analog (–) input
56	INLP	I	Lch analog (+) input

• **IC510 Digital Signal Processor (CXD2705AQ)/Digital board**

Pin No.	Pin Name	I/O	Function
1	EAO	O	Address signal output to D-RAM (IC501)
2	VSS0	–	Ground
3	EA1	O	Address signal output to D-RAM (IC501)
4	EA2	O	
5	EA3	O	
6	EA4	O	
7	EA5	O	
8	EA6	O	
9	EA7	O	
10	EA8	O	
11	TA7	I	Test pin (Connected to ground)
12	VSS1	–	Ground
13	TA6	I	Test pin (Connected to ground)
14	XRST	I	Reset input. "L": Reset.
15	SP0	O	Not used.
16	SP1	O	
17	SP2	O	
18	MOVF	O	
19	AOVF	O	
20	REDY	O	Ready signal output to the DSP control microprocessor (IC525)
21	TRDT	O	Data output to the DSP control microprocessor (IC525)
22	RVDT	I	Data input from the DSP control microprocessor (IC525)
23	SCK	I	Shift clock input from the DSP control microprocessor (IC525)
24	XLAT	I	Mode separation signal input from the MD encoder/decoder (IC533)
25	TA5	I	Test pin (Connected to ground)
26	TA4	I	
27	BFOT	O	Not used.
28	CLKO	O	
29	CLKI	I	Clock input (51.035 MHz)
30	TA3	I	Test pin (Connected to ground)
31	TA2	I	
32	VSS2	–	Ground
33	VDD0	–	+5V power supply
34	TA1	I	Test pin (Connected to ground)
35	TA0	I	
36	SOC	O	Not used.
37	SOB	O	Serial data output (3ch/4ch output)
38	SOA	O	Serial data output (1ch/2ch output)
39	SIB	I	Serial data input
40	SIA	I	

Pin No.	Pin Name	I/O	Function
41	LRCK0	I	LR clock input
42	LRCK1	I	
43	BCK0	I	Bit clock input
44	BCK1	I	
45	VSS3	–	Ground
46	D2BK	O	Not used.
47	D2LR	O	
48	D4BK	O	
49	D4LR	O	
50	ED0	I/O	
51	TST1	I	Test pin (Connected to ground)
52	VSS4	–	Ground
53	TST0	I	Test pin (Connected to ground)
54	ED1	I/O	Not used.
55	ED2	I/O	
56	ED3	I/O	
57	ED4	I/O	
58	ED5	I/O	
59	ED6	I/O	
60	ED7	I/O	
61	ED8	I/O	
62	ED9	I/O	
63	VSS5	–	Ground
64	ED10	I/O	Not used.
65	ED11	I/O	
66	XOE	O	Output enable output to D-RAM (IC501). "L": Valid.
67	CAS	O	Column address strobe output to D-RAM (IC501)
68	ED12	I/O	Data input/output with D-RAM (IC501)
69	ED13	I/O	
70	TD15	I	Test pin (Connected to ground)
71	TD14	I	
72	VSS6	–	Ground
73	VDD1	–	+5V power supply
74	TD13	I	Test pin (Connected to ground)
75	TD12	I	
76	ED14	I/O	Data input/output with D-RAM (IC501)
77	ED15	I/O	
78	XWE	O	Write enable output to D-RAM (IC501). "L": Valid.
79	RAS	O	Row address strobe output to D-RAM (IC501)
80	EA9	O	Not used.

• **IC511, 512 ATRAC Decoder (CXD2536CR)/Digital board**

Pin No.	Pin Name	I/O	Function
1	VDD	–	Power supply (+5V)
2	SWDT	I	Data input of the microprocessor serial interface
3	SCLK	I	Shift clock input of the microprocessor serial interface
4	XLAT	I	Latch input of the microprocessor serial interface. Latched at the falling edge.
5	SRDT	O	Not used.
6	SENS	O	
7	TD24	I	Not used. (Connected to ground)
8	TD25	I	
9	XINT	O	Not used.
10	TD26	I	Not used. (Connected to ground)
11	TD27	I	
12	TD28	I	
13	VSS	–	Ground
14	SICK	I	Test pin (Connected to power supply)
15	IDSL	I	
16	XILT	I	
17	XRST	I	Reset input. Reset when "L".
18	TS0	I	Test pin (Connected to ground)
19	TS1	I	
20	TS2	I	
21	TS3	I	
22	EXIR	I	Not used. (Connected to ground)
23	SASL	I	
24	SNGLE	I	Not used. (Connected to power supply)
25	VSS	–	Ground
26	AIRCPB	O	ATRAC block recording/playback mode output. When "L", playback mode.
27	XRQ	O	Data request signal output to the gate array (IC534)
28	ADTO	I	Decode data signal input from the gate array (IC534)
29	ADTI	I	Not used.
30	XALT	I	Data ready or latch signal input from the gate array (IC534)
31	ACK	I	128fs clock signal input
32	AC2	I	Output data C2 pointer information input from the gate array (IC534)
33	LCHST	I	Not used. (Connected to ground)
34	EXE	I	EXE signal input from the MD encoder/decoder (IC533)
35	MUTE	I	Mute signal input from the MD encoder/decoder (IC533)
36	OSCO	O	Not used.
37	OSCI	I	Crystal oscillation circuit input (1024Fs = 45.1584 MHz)
38	VSS	–	Ground
39	ATT	I	ATT signal input from the MD encoder/decoder (IC533)
40	F86	O	F86 (Monitor) output to the gate array (IC534)

EXE : Execution
ATT : Attenuation

Pin No.	Pin Name	I/O	Function
41	DOUT	O	Not used.
42	ADIN	I	Not used. (Connected to ground)
43	ABCK	I	XBCK (64Fs) input from the external audio block
44	ALRCK	I	LRCK (Fs) input from the external audio block
45	TA12	I/O	Not used. (Connected to ground)
46	SA1	I/O	Not used.
47	SA0	I/O	
48	TA11	I/O	Not used. (Connected to ground)
49	TA10	I/O	
50	VSS	–	Ground
51	VDD	–	Power supply (+5V)
52	TA03	I/O	Not used. (Connected to ground)
53	TA02	I/O	
54	TA01	I/O	
55	TA00	I/O	
56	TA04	I/O	
57	TA05	I/O	
58	TA06	I/O	
59	TA07	I/O	
60	TA08	I/O	
61	XOE	O	Not used.
62	TD9	I/O	Not used. (Connected to ground)
63	VSS	–	Ground
64	TD10	I/O	Not used. (Connected to ground)
65	TA09	I/O	
66	TD11	I/O	
67	TD12	I/O	
68	TD1	I/O	
69	TD0	I/O	
70	TD2	I/O	
71	TD3	I/O	
72	TD4	I/O	
73	TD5	I/O	
74	TD6	I/O	
75	VSS	–	Ground
76	TD7	I/O	Not used. (Connected to ground)
77	TD8	I/O	
78	TD29	I	
79	TD13	I/O	
80	TD14	I/O	

Pin No.	Pin Name	I/O	Function
81	TD15	I/O	Not used. (Connected to ground)
82	TD16	I/O	
83	TD17	I/O	
84	TD18	I/O	
85	TD19	I/O	
86	TD20	I/O	
87	SPO	O	Not used.
88	VSS	–	Ground
89	MDSY	O	Not used.
90	TD30	I	Not used. (Connected to ground)
91	TD31	I	
92	TD32	I	
93	TD21	I/O	
94	DIDT	I	
95	DODT	O	Not used.
96	TD23	I/O	Not used. (Connected to ground)
97	TD33	I	
98	TD34	I	
99	TD22	I/O	
100	VSS	–	Ground

• **IC517, 518 ATRAC Encoder (CXD2536CR)/Digital board**

Pin No.	Pin Name	I/O	Function
1	VDD	–	Power supply (+5V)
2	SWDT	I	Data input of the microprocessor serial interface
3	SCLK	I	Shift clock input of the microprocessor serial interface
4	XLAT	I	Latch input of the microprocessor serial interface. Latched at the falling edge.
5	SRDT	O	Not used.
6	SENS	O	
7	TD24	I	Not used. (Connected to ground)
8	TD25	I	
9	XINT	O	Not used.
10	TD26	I	Not used. (Connected to ground)
11	TD27	I	
12	TD28	I	
13	VSS	–	Ground
14	SICK	I	Test pin (Connected to power supply)
15	IDSL	I	
16	XILT	I	
17	XRST	I	Reset input. Reset when "L".
18	TS0	I	Test pin (Connected to ground)
19	TS1	I	
20	TS2	I	
21	TS3	I	
22	EXIR	I	Not used. (Connected to ground)
23	SASL	I	
24	SNGLE	I	Not used. (Connected to power supply)
25	VSS	–	Ground
26	AIRCPB	O	ATRAC block recording/playback mode output. When "H", recording mode.
27	XRQ	O	Data request signal output to the gate array (IC534)
28	ADTO	I	Not used. (Connected to ground)
29	ADTI	O	Data signal output to the gate array (IC534)
30	XALT	I	Data ready or latch signal input from the gate array (IC534)
31	ACK	I	128fs clock signal input
32	AC2	I	Not used. (Connected to ground)
33	LCHST	I	
34	EXE	I	EXE signal input from the MD encoder/decoder (IC533)
35	MUTE	I	Mute signal input from the MD encoder/decoder (IC533)
36	OSCO	O	Not used.
37	OSCI	I	Crystal oscillation circuit input (1024Fs=45.1584 MHz)
38	VSS	–	Ground
39	ATT	I	ATT signal input from the MD encoder/decoder (IC533)
40	F86	O	F86 (Monitor) output to the gate array (IC534)

EXE : Execution
ATT : Attenuation

Pin No.	Pin Name	I/O	Function
41	DOUT	O	Not used.
42	ADIN	I	Analog recording input
43	ABCK	I	XBCK (64Fs) input from the external audio block
44	ALRCK	I	LRCK (Fs) input from the external audio block
45	TA12	I/O	Not used. (Connected to ground)
46	SA1	I/O	Not used.
47	SA0	I/O	
48	TA11	I/O	Not used. (Connected to ground)
49	TA10	I/O	
50	VSS	–	Ground
51	VDD	–	Power supply (+5V)
52	TA03	I/O	Not used. (Connected to ground)
53	TA02	I/O	
54	TA01	I/O	
55	TA00	I/O	
56	TA04	I/O	
57	TA05	I/O	
58	TA06	I/O	
59	TA07	I/O	
60	TA08	I/O	
61	XOE	O	Not used.
62	TD9	I/O	Not used. (Connected to ground)
63	VSS	–	Ground
64	TD10	I/O	Not used. (Connected to ground)
65	TA09	I/O	
66	TD11	I/O	
67	TD12	I/O	
68	TD1	I/O	
69	TD0	I/O	
70	TD2	I/O	
71	TD3	I/O	
72	TD4	I/O	
73	TD5	I/O	
74	TD6	I/O	
75	VSS	–	Ground
76	TD7	I/O	Not used. (Connected to ground)
77	TD8	I/O	
78	TD29	I	
79	TD13	I/O	
80	TD14	I/O	

Pin No.	Pin Name	I/O	Function
81	TD15	I/O	Not used. (Connected to ground)
82	TD16	I/O	
83	TD17	I/O	
84	TD18	I/O	
85	TD19	I/O	
86	TD20	I/O	
87	SPO	O	Not used.
88	VSS	–	Ground
89	MDSY	O	Not used.
90	TD30	I	Not used. (Connected to ground)
91	TD31	I	
92	TD32	I	
93	TD21	I/O	
94	DIDT	I	
95	DODT	O	Not used.
96	TD23	I/O	Not used. (Connected to ground)
97	TD33	I	
98	TD34	I	
99	TD22	I/O	
100	VSS	–	Ground

• **IC522, 523 FIFO (Record) AM7200-50/Digital board**

Pin No.	Pin Name	I/O	Function
1	NC	–	Not used.
2	XW	I	WR signal input from the gate array (IC534)
3	D8	–	Connected to power supply.
4 to 7	D3 to D0	O	Data signal output from the MD encoder/decoder (IC533)
8	XXI	–	Connected to ground.
9	XFF	–	Not used.
10, 11	Q0, Q1	I	Data signal input to the gate array (IC534)
12	NC	–	Not used.
13, 14	Q2, Q3	I	Data signal input to the gate array (IC534)
15	Q8	–	Not used.
16	GND	–	Ground
17	NC	–	Not used.
18	XR	I	RD signal input from the gate array (IC534)
19 to 22	Q4 to Q7	I	Data signal input to the gate array (IC534)
23	XO	–	Not used.
24	XEF	–	
25	XRS	I	Reset signal input from the MD encoder/decoder (IC533)
26	XFL	–	Connected to power supply.
27	NC	–	Not used.
28 to 31	D7 to D4	O	Data signal output from the MD encoder/decoder (IC533)
32	VCC	–	Power supply (+5V)

RD: Data read request

WR: Data write request

• **IC525 DSP Control Microprocessor (HD6413003TF16)/Digital board**

Pin No.	Pin Name	I/O	Function
1	VCC	–	Power supply (+5V)
2	WRPWR	O	Laser power switching signal output to the optical pick-up and the CXD2535BR (IC121)
3	SHCK	I	Track jump detection signal input from the CXD2535BR (IC121)
4	DFCT	I	Defect ON/OFF switching signal input from the CXD2535BR (IC121)
5	FOK	I	FOK signal input from the CXD2535BR (IC121)
6	COUT	I	Traverse count signal input from the CXD2535BR (IC121)
7	OFTR	I	Off-track signal input from the CXD2535BR (IC121)
8	XDREQ0	I	DMA reset input from the MD encoder/decoder (IC533)
9	XDREQ1	I	
10	VSS	–	Ground
11	SCTX	O	Write data transmission timing output to the CXD2535BR (IC121)
12	MOD	O	Laser modulation switching signal output
13	PC2	O	Not used.
14	PC3	O	
15	XCS6	O	Chip select signal output to the MD encoder/decoder (IC533)
16	XCS7	O	Chip select signal output to the gate array (IC534)
17	LDOUT	O	Loading motor (M191) control
18	LDIN	I	
19	XRESO	O	Not used.
20	TXD0	O	Write data signal output to the serial bus
21	TXD1	O	Write data signal output to the master control (IC204)
22	RXD0	I	Read data signal input from the serial bus
23	RXD1	I	Read data signal input from the master control (IC204)
24	SCK0	O	Shift clock signal output to the serial bus
25	REC	O	Recording/playback switching signal output to the CXD2535BR (IC121)
26	VSS	–	Ground
27 to 34	D0 to D7	I/O	Data bus input/output
35	VSS	–	Ground
36 to 43	D8 to D15	I/O	Data bus input/output
44	VCC	–	Power supply (+5V)
45 to 52	A0 to A7	O	Address bus output
53	VSS	–	Ground
54 to 65	A8 to A19	O	Address bus output
66	XRES0	O	Reset output to the CXD2535BR (IC121)
67	XRES1	O	Reset output to the ATRAC encoder/decoder (IC511, 512, 517, 518)
68	XRES-AD	O	Reset output to the DSP (IC510), A/D, D/A converter (IC508, 509)
69	PHAI	O	Master clock (16 MHz) output
70	XSTBY	I	Not used.
71	XRES	I	Reset input from the Master control (IC204)
72	NMI	I	VCC level detection input
73	VSS	–	Ground

Pin No.	Pin Name	I/O	Function
74	EXTAL	O	Crystal oscillation circuit (16 MHz)
75	XTAL	I	
76	VCC	–	Power supply (+5V)
77	XAS	O	Not used.
78	XRD	O	Data read request signal output
79	XHRW	O	Lower byte write strobe signal output
80	XLWR	O	Higher byte write strobe signal output
81	MD0	I	Not used. (Connected to power supply)
82	MD1	I	
83	MD2	I	Not used. (Connected to ground)
84	VCC	–	Power supply (+5V)
85	VREF	I	Reference voltage input
86	AN0	I	Stereo level detection (Lch)
87	AM1	I	Stereo level detection (Rch)
88	AN2	I	Battery detection
89	LIMIT IN	I	Detection input from the limit switch (S101)
90	REFLECT	I	Disc reflectance detection input from the reflect detection switch (S102-2)
91	PROTECT	I	Rec-proof claw detection input from the protect detection switch (S102-1)
92	P76	I	Not used.
93	DQSY	I	"L" is input each time (13.3 msec intervals) the sub code Q sync (SCOR) of the digital-in U-bit CD-format is input from the CXD2535BR (IC121). Almost "H" is input.
94	AVSS	–	Ground
95	A20	O	Address bus output
96	A21	O	Not used.
97	A22	O	
98	A23	O	
99	VSS	–	Ground
100	XIRQ	I	Interrupt signal input from the gate array (IC534)
101	XCS3	O	Row address strobe signal output to the DRAM (IC519)
102	05RDY	I	Ready signal input from the DSP (IC510)
103	XCS1	O	Chip enable signal output to the S-RAM (IC515)
104	XCS0	O	Chip enable signal output to the ROM (IC513)
105	TEND0	O	Not used.
106	TEND1	O	
107	LDON	O	Laser ON/OFF control signal output
108	SCL	O	Clock signal output to the backup memory (IC171)
109	SDA	I/O	Data signal input/output with the backup memory (IC171)
110	SQSY	I	"L" is input each time (13.3 msec intervals) the ATP address sync or sub code Q sync (SCOR) is input from the CXD2535BR (IC121). Almost "H" is input.
111	1809RST	O	Reset signal output to the MD encoder/decoder (IC533), gate array (IC534)
112	DIRC	O	Disc drive recording/playback switching signal input to the CXD2535BR (IC121)

• **IC526, 527 FIFO (Playback) AM7200-50/Digital board**

Pin No.	Pin Name	I/O	Function
1	NC	–	Not used.
2	XW	I	WR signal input from the gate array (IC534)
3	D8	–	Connected to power supply.
4 to 7	D3 to D0	I	Data signal input from the MD encoder/decoder (IC533)
8	XXI	–	Connected to ground.
9	XFF	–	Not used.
10, 11	Q0, Q1	O	Data signal output to the gate array (IC534)
12	NC	–	Not used.
13, 14	Q2, Q3	O	Data signal output to the gate array (IC534)
15	Q8	–	Not used.
16	GND	–	Ground
17	NC	–	Not used.
18	XR	I	RD signal input from the gate array (IC534)
19 to 22	Q4 to Q7	O	Data signal output to the gate array (IC534)
23	XO	–	Not used.
24	XEF	–	
25	XRS	I	Reset signal input from the MD encoder/decoder (IC533)
26	XFL	–	Connected to power supply.
27	NC	–	Not used.
28 to 31	D7 to D4	I	Data signal input from the MD encoder/decoder (IC533)
32	VCC	–	Power supply (+5V)

RD: Data read request

WR: Data write request

• **IC533 MD Encoder/Decoder (CXD1809R)/Digital board**

Pin No.	Pin Name	I/O	Function
1	VDD	–	Power supply (+5V)
2	VSS	–	Ground
3	TEST	I	Test pin. Fixed at "L".
4	HSCK	I	System clock input from the DSP control microprocessor (IC525)
5	XRST	I	Reset input from the DSP control microprocessor (IC525)
6	XSHS	I	Not used (Connected to ground).
7	HXCS	I	Chip select signal input from the DSP control microprocessor (IC525)
8	HXWL	I	Lower byte write strobe signal input from the DSP control microprocessor (IC525)
9	HXWH	I	Higher byte write strobe signal input from the DSP control microprocessor (IC525)
10	HXRD	I	Read strobe signal input from the DSP control microprocessor (IC525)
11	HXDA	I	Not used (Connected to power supply).
12	HXD0	O	Main data DMA request signal output to the DSP control microprocessor (IC525)
13	VSS	–	Ground
14	HXD1	O	C2PO data DMA request signal output to the DSP control microprocessor (IC525)
15 to 19	HAD1 to HAD5	I	Address signal input from the DSP control microprocessor (IC525)
20	BIST	–	Not used.
21	TCK	–	
22	TD1	–	
23	TENA1	–	
24	TD0	–	
25	VST	I	Test pin. Fixed at "L".
26	VDD	–	Power supply (+5V)
27	VSS	–	Ground
28	HXDK	O	Not used.
29	HXI0	O	
30	HXI1	O	
31	HXI2	O	
32 to 37	HD00 to HD05	I/O	Data signal input/output with the DSP control microprocessor (IC525) data bus
38	VSS	–	Ground
39 to 48	HD06 to HD15	I/O	Data signal input/output with the DSP control microprocessor (IC525) data bus
49	SDIN	I	Not used.
50	SDOT	O	
51	VDD	–	Power supply (+5V)
52	VSS	–	Ground
53	PD0	O	Latch signal output to the A/D, D/A converter (IC508, 509)
54	PD1	O	EXE signal output to the ATRAC decoder (IC511, 512)
55	PD2	O	Latch signal output to the ATRAC decoder (IC511)
56	PD3	O	Latch signal output to the ATRAC encoder (IC518)
57	PD4	O	EXE signal output to the ATRAC encoder (IC517, 518)
58	PD5	O	Mute signal output to the ATRAC encoder/decoder (IC511, 512, 517, 518)
59	PD6	O	Attenuate signal output to the ATRAC encoder/decoder (IC511, 512, 517, 518)

EXE : Execution

Pin No.	Pin Name	I/O	Function
60	PD7	O	Latch signal output to DSP (IC510)
61	PC0	O	Latch signal output to the ATRAC decoder (IC512)
62	PC1	O	Latch signal output to the ATRAC encoder (IC517)
63	VSS	–	Ground
64	PC2	O	Reset output to FIFO (IC526, 527)
65	PC3	O	Reset output to FIFO (IC522, 523)
66	PC4	I	Detection input from MD loading-in (S191)
67	PC5	I	Detection input from MD chucking switch (S193)
68	PC6	I	Detection input from MD loading-out (S192)
69	PC7	I	Serial bus data input from the CXD2535BR (IC121) (Pulled-up internally)
70	PB0	O	Shift clock signal output to the phase comparator (IC536)
71	PB1	O	Clear signal output to the phase comparator (IC536)
72	PB2	O	Data signal output to the phase comparator (IC536)
73	PB3	O	Not used.
74	PB4	O	
75	PB5	O	
76	VDD	–	Power supply (+5V)
77	VSS	–	Ground
78	PB6	O	Not used.
79	PB7	O	
80	PA0	O	
81	PA1	O	
82	PA2	O	
83	PA3	O	
84	PA4	O	
85	PA5	O	
86	PA6	O	Data switching control output
87	PA7	O	RCTR control output
88	VSS	–	Ground
89	RMSL	I	Not used. (Connected to ground)
90	DTOT	O	Data output to the CXD2535BR (IC121)
91	DTIN	I	Data input from the CXD2535BR (IC121) (Pulled-up internally)
92	C2PO	I	C2PO input from the CXD2535BR (IC121)
93	LRCK	I	LR clock input from the CXD2535BR (IC121)
94	BTCK	I	Bit clock input from the CXD2535BR (IC121)
95	RCTR	I	Start trigger input when REC. When operated, "H".
96	SENS	I	Sense input from the CXD2535BR (IC121) (Pulled-down internally)
97	SRDT	I	Serial bus data input from the CXD2535BR (IC121) (Pulled-up internally)
98	SWDT	O	Serial bus data output to the CXD2535BR (IC121)
99	XLAT	O	Serial bus latch output to the CXD2535BR (IC121)
100	SRCK	O	Serial bus clock output to the CXD2535BR (IC121)

• **IC534 Gate Array (CXD8655Q)/Digital board**

Pin No.	Pin Name	I/O	Function
1	INVIN	I	Clock inverter input
2	INVOUT	O	Not used.
3	FS64	O	1/4 divided frequency output of FS256 input
4	FS01	O	1/256 divided frequency output of FS256 input
5	ACLK	O	128fs output
6	FFCLK	I	Not used. (Connected to ground)
7	FFOUT	O	Not used.
8	BFIN	I	Clock buffer input
9	BFOUT	O	Clock buffer output
10 to 14	TEST01 to TEST04	I	Test pin (Connected to ground)
15	VSS	–	Ground
16	VDD	–	Power supply (+5V)
17 to 20	TEST05 to TEST08	I	Test pin (Connected to ground)
21, 22	TEST10, TEST11	O	Not used.
23 to 30	I/O0 to I/O7	I/O	Data bus signal input/output with the DSP control microprocessor (IC525)
31	VDD	–	Power supply (+5V)
32, 33	TEST12, TEST13	O	Not used.
34	CS	I	Chip select input from the DSP control microprocessor (IC525)
35 to 38	A4 to A1	I	Address bus input from the DSP control microprocessor (IC525)
39	VSS	–	Ground
40	VDD	–	Power supply (+5V)
41	A0	I	Address bus input from the DSP control microprocessor (IC525)
42	XINT	O	Interrupt signal output to the DSP control microprocessor (IC525)
43	XRD	I	Data read request signal input from the DSP control microprocessor (IC525)
44	XWR	I	Data write request signal input from the DSP control microprocessor (IC525)
45	XRST	I	Reset input
46	CPUSCK	I	System reset input from the MD encoder/decoder (IC533)
47	XWRFB	O	Data write request signal output to the FIFO (IC526)
48	FIB0	I/O	Data input/output with the FIFO (IC522, 526)
49	XRDF1	O	Data read request signal output to the FIFO (IC526)
50	F863	I	F86 (Monitor) input from the ATRAC encoder (IC517)
51	AC21	O	Output data C2 pointer information to the ATRAC encoder (IC511)
52	XALT1	O	Data ready or latch output to the ATRAC encoder (IC511)
53	ADTO1	O	Data output to the ATRAC encoder (IC511)
54	MLTC	I	Not used. (Connected to ground)
55	DO12	I	1ch/2ch output data input from the ATRAC encoder (IC512)
56	F860	I	F86 (Monitor) input from the ATRAC encoder (IC512)
57	XRQ2	I	Data request signal input from the ATRAC encoder (IC518)
58	ADTI2	I	Data input from the ATRAC encoder (IC518)
59	XALT2	O	Data ready or latch output to the ATRAC encoder (IC518)

Pin No.	Pin Name	I/O	Function
60	F862	I	F86 (Monitor) input from the ATRAC encoder (IC518)
61	AC20	O	Output data C2 pointer information to the ATRAC encoder (IC512)
62	XALT0	O	Data ready or latch output to the ATRAC encoder (IC512)
63	ADTO0	O	Data output to the ATRAC encoder (IC512)
64	XRQ0	I	Data request signal input from the ATRAC encoder (IC512)
65	256FS	I	256fs clock input
66	VSS	–	Ground
67	VDD	–	Power supply (+5V)
68	F861	I	F86 (Monitor) input from the ATRAC encoder (IC511)
69	DO34	I	3ch/4ch output data input from the ATRAC encoder (IC511)
70 to 76	FIB1 to FIB7	I/O	Data input/output with the FIFO (IC522, 526)
77	XWRF3	O	Data write request signal output to the FIFO (IC522)
78	XRDFB	O	Data read request signal output to the FIFO (IC522)
79	XWRFA	O	Data write request signal output to the FIFO (IC527)
80	XRDF0	O	Data read request signal output to the FIFO (IC527)
81 to 88	FIA0 to FIA7	I/O	Data input/output with the FIFO (IC523, 527)
89	XWRF2	O	Data write request signal output to the FIFO (IC523)
90	VSS	–	Ground
91	VDD	–	Power supply (+5V)
92	XRDFA	O	Data read request signal output to the FIFO (IC523)
93	XALT3	O	Data ready or latch output to the ATRAC encoder (IC517)
94	ADTI3	I	Data input to the ATRAC encoder (IC517)
95	XRQ3	I	Data request signal input from the ATRAC encoder (IC517)
96	XR01	I	Data request signal input from the ATRAC encoder (IC511)
97	BCK	I	64fs bit clock input
98	LRCK	I	1fs, L/R clock input
99	VSS	–	Ground
100	NC	–	Not used.

SECTION 5
EXPLODED VIEWS

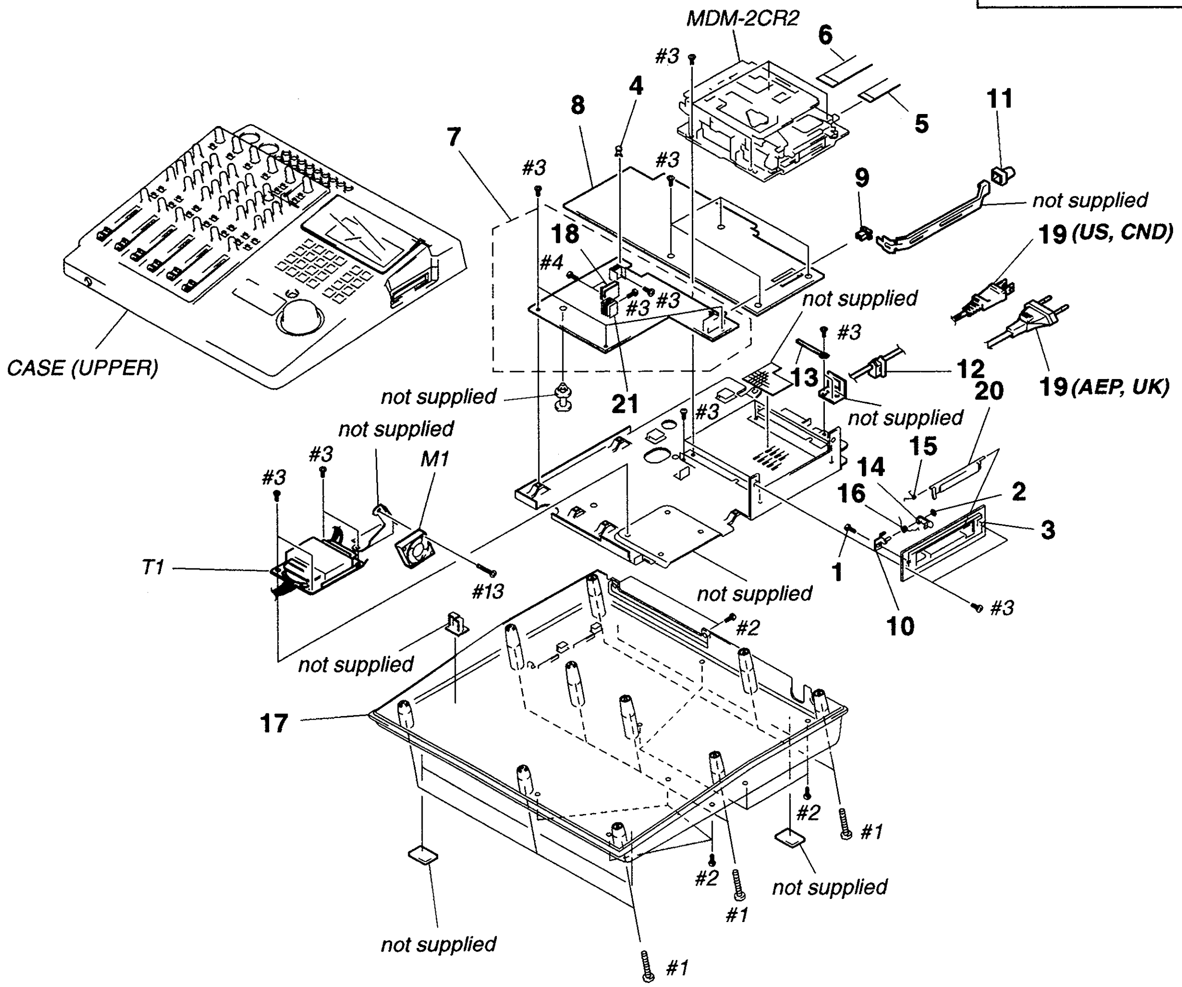
NOTE:
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

- Abbreviation
  CND: Canadian model

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

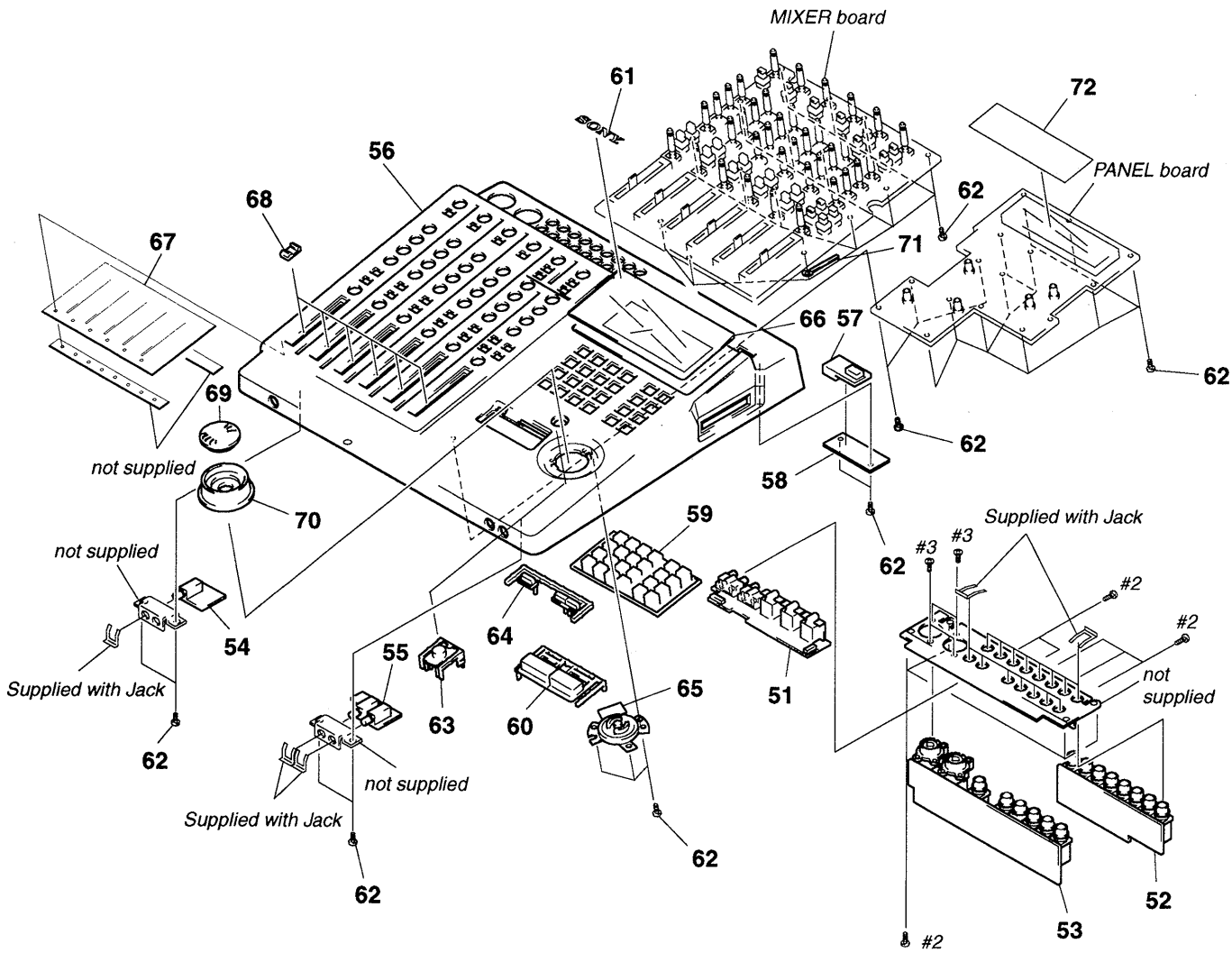
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

5-1. CASE (LOWER) SECTION



Ref. No.	Part No.	Description	Remark
1	4-951-620-01	SCREW (2.6X8), +BVTP	
2	3-681-678-00	WASHER, SLIT	
* 3	4-983-625-01	CASE (LID)	
* 4	2-279-715-31	RIVET, NYLON	
5	1-776-833-11	WIRE (FLAT TYPE) (18 CORE)	
6	1-776-834-11	WIRE (FLAT TYPE) (30 CORE)	
* 7	A-4699-250-A	POWER BOARD, COMPLETE (US,CND)	
* 7	A-4699-272-A	POWER BOARD, COMPLETE (AEP,UK)	
* 8	A-4699-264-A	DIGITAL BOARD, COMPLETE	
9	4-866-342-00	JOINT (B), KNOB	
10	X-4945-242-1	BRACKET (LEVER LID) ASSY	
11	4-983-617-01	BUTTON (POWER)	
* 12	3-703-244-00	BUSHING (2104), CORD	
* 13	3-703-150-11	CLAMP	
14	4-969-213-01	LEVER (LID)	
15	4-976-593-01	SPRING (LID), TORSION	
16	4-969-215-01	SPRING, TORSION	
* 17	4-983-629-11	CASE (LOWER)(US,CND)	
* 17	4-983-629-21	CASE (LOWER)(AEP,UK)	
* 18	4-363-146-21	HEAT SINK, V.OUT	
⚠19	1-575-651-21	CORD, POWER (AEP,UK)	
⚠19	1-590-836-11	CORD, POWER (US,CND)	
20	4-976-548-01	LID (CARTRIDGE)	
21	4-921-402-41	HEAT SINK	
M1	1-698-909-11	FAN, DC	
⚠T1	1-429-725-11	TRANSFORMER, POWER (AEP,UK)	
⚠T1	1-429-942-11	TRANSFORMER, POWER (US,CND)	

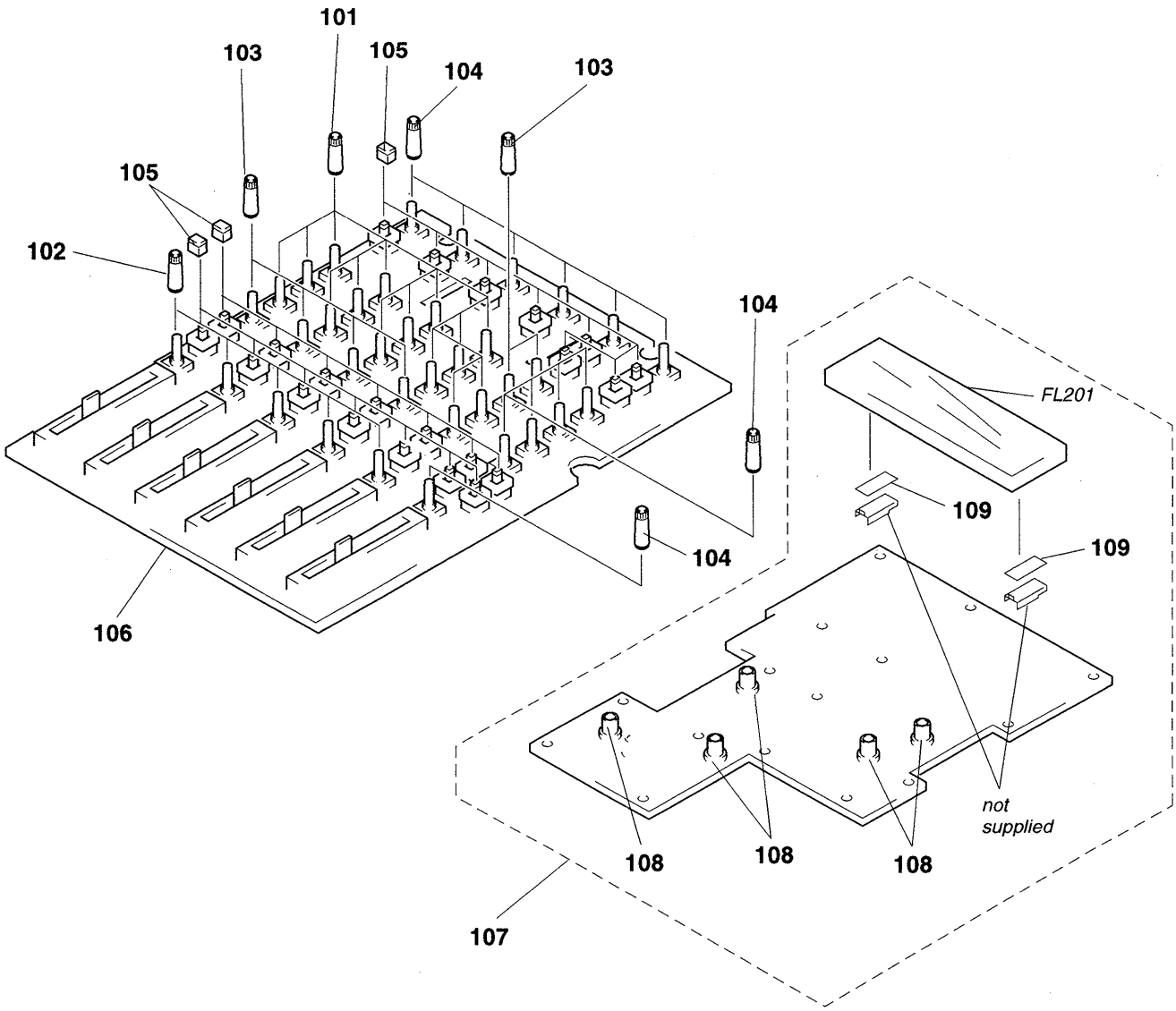
5-2. CASE (UPPER) SECTION



Ref. No.	Part No.	Description	Remark
* 51	1-663-328-11	MIDI BOARD	
* 52	A-4699-270-A	JACK (1) BOARD, COMPLETE	
* 53	A-4699-271-A	JACK (2) BOARD, COMPLETE	
* 54	1-663-329-11	HEADPHONE BOARD	
* 55	1-663-331-11	PEDAL BOARD	
56	X-4947-620-1	CASE (UPPER) ASSY	
57	4-983-618-01	BUTTON (EJECT)	
* 58	1-663-333-11	EJECT BOARD	
59	X-4947-621-2	BUTTON (MAIN) ASSY	
60	X-4947-680-1	BUTTON (PLAY) ASSY	
61	3-704-176-51	EMBLEM (NO.6), SONY	

Ref. No.	Part No.	Description	Remark
62	4-951-620-01	SCREW (2.6X8), +BVTP	
63	4-983-613-02	BUTTON (REC)	
64	4-983-615-01	BUTTON (AMS)	
* 65	1-663-332-11	ENCODER BOARD	
66	4-983-626-02	WINDOW, INDICATION	
67	4-985-757-01	COVER, DUST	
68	4-983-635-01	KNOB (FADER)	
69	4-983-620-01	DIAL, JOG	
70	4-983-619-01	RING, SHUTTLE	
* 71	3-703-150-11	CLAMP	
72	4-989-374-01	FILTER (FL)	

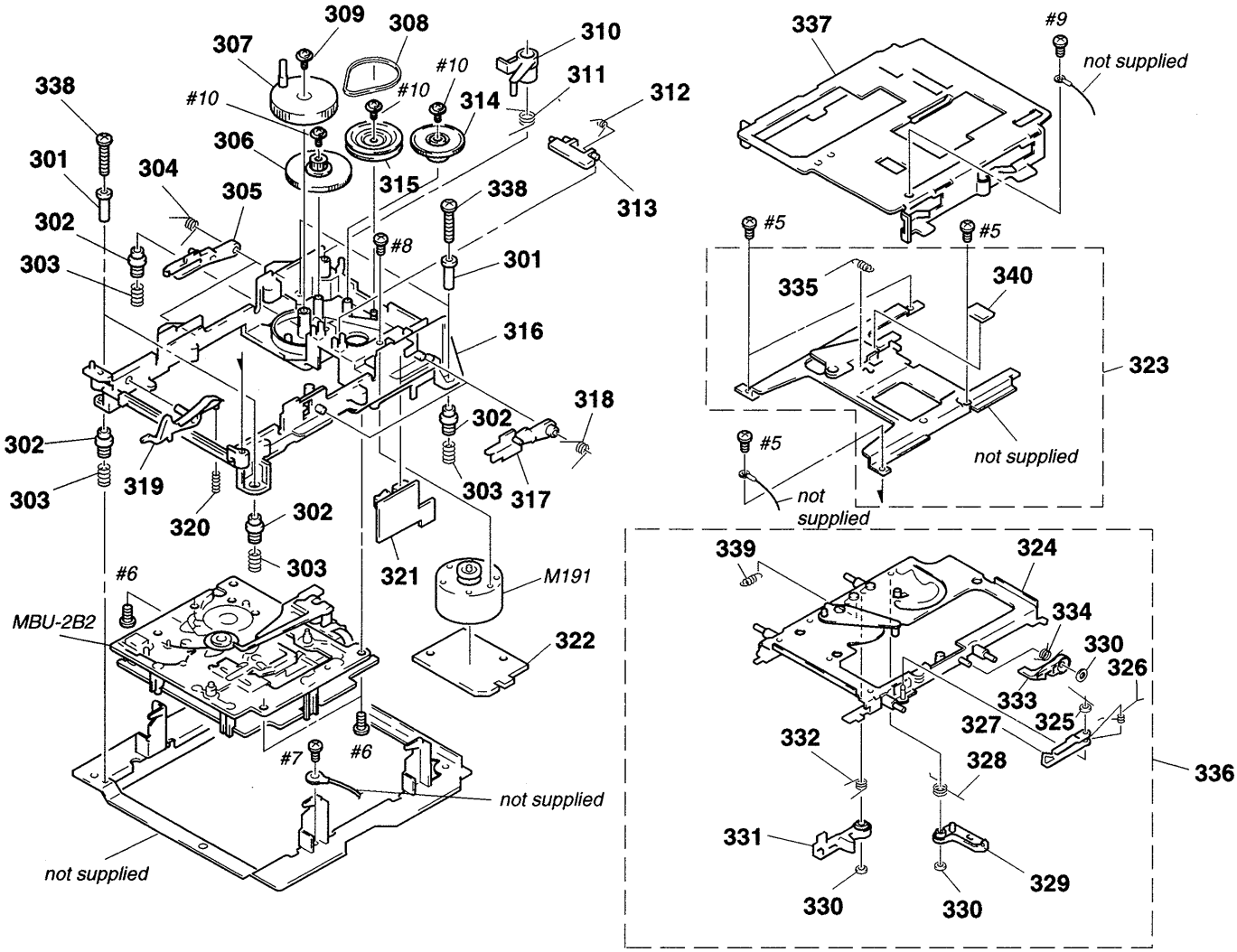
5-3. PANEL, MIXER BOARD SECTION



Ref. No.	Part No.	Description	Remark
101	4-983-633-01	KNOB (VOL)(YELLOW)	
102	4-983-633-11	KNOB (VOL)(ORANGE)	
103	4-983-633-21	KNOB (VOL)(BLUE)	
104	4-983-633-31	KNOB (VOL)(GRAY)	
105	4-983-634-01	KNOB (PUSH)	

Ref. No.	Part No.	Description	Remark
* 106	A-4699-261-A	MIXER BOARD, COMPLETE	
* 107	A-4699-265-A	PANEL BOARD, COMPLETE	
* 108	3-362-478-01	HOLDER (T), LED	
* 109	4-932-810-11	CUSHION (FL)	
FL201	1-517-584-11	INDICATOR TUBE, FLUORESCENT	

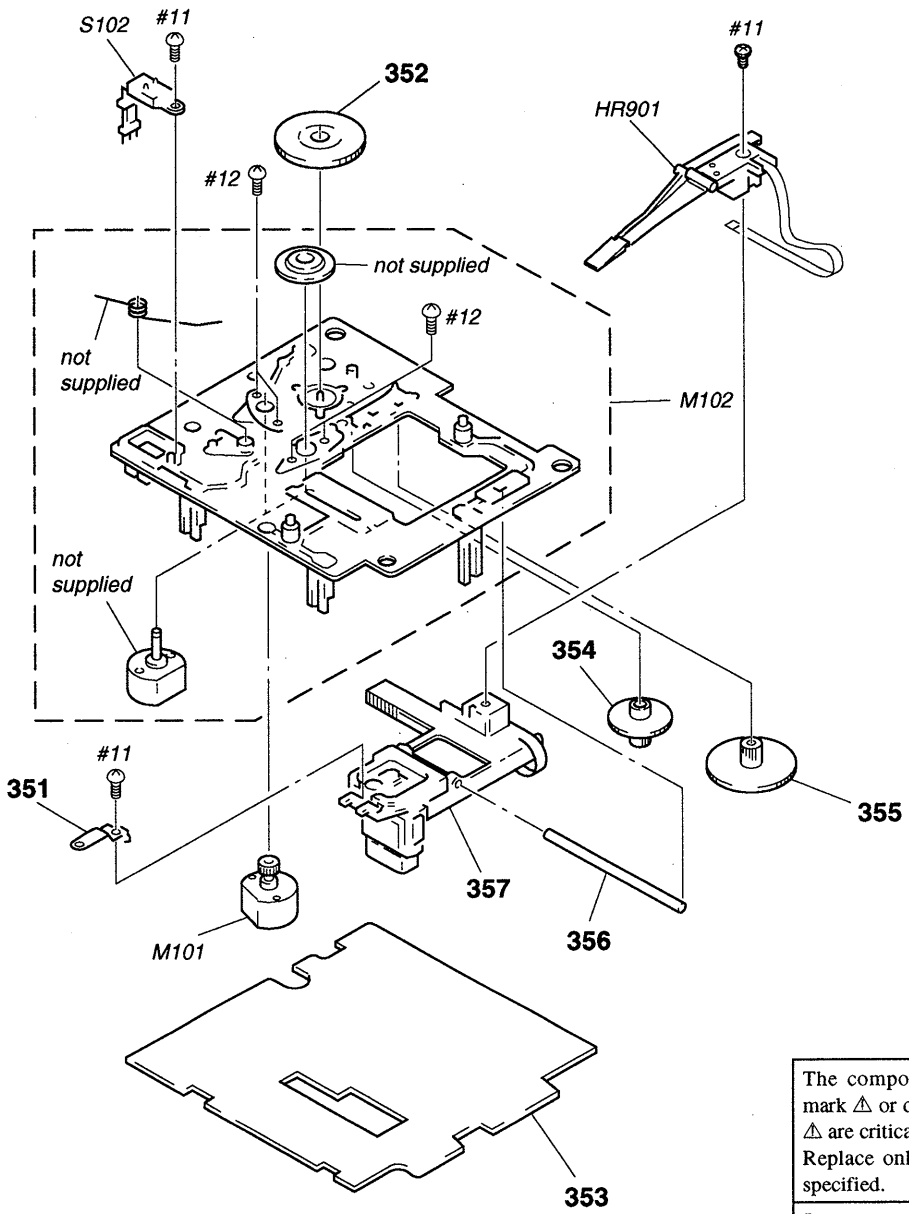
5-4. MD MECHANISM SECTION (MDM-2CR2)



Ref. No.	Part No.	Description	Remark
301	4-983-100-01	COLLAR (DAMPER)	
302	4-967-671-01	INSULATOR (MD)	
303	4-967-673-01	SPRING, COMPRESSION	
304	4-967-668-01	SPRING (UDL), TORSION	
305	4-967-667-01	LEVER (UDL)	
306	4-977-610-01	GEAR (BD-B)	
307	X-4945-069-1	CAM ASSY	
308	4-967-656-01	BELT (BD)	
309	4-933-134-01	SCREW (+PTPWH M2.6X6)	
310	4-967-637-01	LEVER (SLM)	
311	4-984-426-01	SPRING (SLM), TORSION	
312	4-968-273-01	SPRING (OWH), TORSION	
313	4-968-272-01	LEVER (OWH)	
314	4-977-609-01	GEAR (BD-A)	
315	4-977-608-01	PULLEY (BD)	
316	4-977-777-01	BASE (BD)	
317	4-967-669-01	LEVER (UDR)	
318	4-967-670-01	SPRING (UDR), TORSION	
319	4-979-400-01	LEVER (DOOR)	
320	4-970-710-01	SPRING, COMPRESSION	
* 321	1-653-411-11	DETECTION SW BOARD	

Ref. No.	Part No.	Description	Remark
* 322	1-653-412-11	MOTOR BOARD	
323	A-4672-087-A	BRACKET (LVO) ASSY	
324	X-4947-136-2	HOLDER ASSY	
325	4-968-919-11	WASHER, STOPPER	
326	4-967-646-01	SPRING (SHT), TORSION	
327	4-967-645-01	LEVER (SHT)	
328	4-983-106-02	SPRING (LM), TORSION	
329	4-967-639-01	LEVER (LM)	
330	4-968-919-01	WASHER, STOPPER	
331	4-967-641-01	LEVER (L)	
332	4-967-642-01	SPRING (L), TORSION	
333	4-982-040-01	LEVER (LOCK)	
334	4-982-099-01	SPRING (LOCK), TORSION	
335	4-967-664-05	SPRING, TENSION	
336	A-4672-071-B	HOLDER COMPLETE ASSY	
* 337	X-4946-349-1	SLIDER (M) ASSY	
338	4-972-910-01	SCREW (2.6X18), +B	
339	4-971-743-02	SPRING, TENSION	
340	4-983-110-01	CUSHION (LVO)	
M191	A-4660-646-A	MOTOR (LOADING) ASSY	

5-5. BASE UNIT SECTION (MBU-2B2)



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Replace only with part number specified.

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Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
351	4-967-679-01	SPRING (OP), LEAF	
352	4-967-675-01	GEAR (SL-A)	
* 353	A-4699-610-A	BD BOARD, COMPLETE	
354	4-967-676-01	GEAR (SL-B)	
355	4-967-677-01	GEAR (SL-C)	
356	4-967-678-01	SHAFT (OP)	

Ref. No.	Part No.	Description	Remark
⚠357	8-583-009-11	OPTICAL PICK UP KMS-210A/J-N	
HR901	1-500-304-21	HEAD, OVER WRITE	
M101	A-4660-651-A	MOTOR (SLED) ASSY	
M102	A-4660-650-A	CHASSIS ASSY, BU (SPINDLE)	
S102	1-762-148-11	SWITCH, PUSH (2 KEY)	

BD

SECTION 6
ELECTRICAL PARTS LIST

Note:

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

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

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

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: μ , for example:
  uA...: μ A..., uPA...: μ PA..., uPB...: μ PB..., uPC...: μ PC..., uPD...: μ PD...
- CAPACITORS
  uF : μ F
- COILS
  uH : μ H
- Abbreviation
  CND: Canadian model

Ref. No.	Part No.	Description			Remark
*	A-4699-610-A	BD BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C101	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C102	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C103	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C104	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C105	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C106	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C107	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C108	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C109	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C111	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C112	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C113	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C114	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C115	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C116	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C117	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C119	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C121	1-126-395-11	ELECT	22uF	20%	16V
C122	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C123	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C124	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C125	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C126	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C127	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C128	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C129	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C130	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C131	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C132	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C133	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C134	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C135	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C136	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C141	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C142	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C143	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C144	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C151	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C152	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C155	1-104-916-11	TANTAL. CHIP	6.8uF	20%	20V
C160	1-104-601-11	ELECT CHIP	10uF	20%	10V
C161	1-104-601-11	ELECT CHIP	10uF	20%	10V
C163	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C164	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C166	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C167	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C169	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C170	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C171	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C175	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C176	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C177	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C178	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C181	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C182	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C183	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C184	1-107-836-11	ELECT CHIP	22uF	20%	8V
C185	1-164-611-11	CERAMIC CHIP	0.001uF	10%	500V
C186	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C191	1-126-395-11	ELECT	22uF	20%	16V
C192	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C193	1-164-346-11	CERAMIC CHIP	1uF		16V
C194	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
		< CONNECTOR >			
CN101	1-766-508-11	CONNECTOR, FFC/FPC (ZIF) 22P			
CN102	1-766-510-21	CONNECTOR, FFC/FPC 30P			
CN103	1-766-509-21	CONNECTOR, FFC/FPC 18P			
CN104	1-766-898-21	HOUSING, CONNECTOR (PC BOARD) 4P			
		< DIODE >			
D101	8-719-988-62	DIODE 1SS355			
D155	8-719-031-17	DIODE 1SS322-TE85L			
D161	8-719-421-15	DIODE MA8027-L			
D181	8-719-033-60	DIODE F1P2STP			
D183	8-719-033-60	DIODE F1P2STP			
		< IC >			
IC101	8-752-072-68	IC CXA1981AR			
IC102	8-759-243-19	IC TC7SU04F			

Ref. No.	Part No.	Description			Remark
IC121	8-752-375-36	IC CXD2535BR			
IC122	8-759-243-19	IC TC7SU04F			
IC151	8-759-179-60	IC MPC17A38VMEL			
IC171	8-759-504-12	IC X24C01S			
IC172	8-759-149-73	IC uPC842G2			
IC181	8-759-095-65	IC TC74ACT540FS			
IC182	8-759-243-19	IC TC7SU04F			
IC191	8-759-822-99	IC L88MS05T-FA			
		< COIL >			
L101	1-414-234-11	INDUCTOR, FERRITE BEAD			
L102	1-414-234-11	INDUCTOR, FERRITE BEAD			
L103	1-414-234-11	INDUCTOR, FERRITE BEAD			
L105	1-414-234-11	INDUCTOR, FERRITE BEAD			
L106	1-414-234-11	INDUCTOR, FERRITE BEAD			
L121	1-414-234-11	INDUCTOR, FERRITE BEAD			
L122	1-412-039-51	INDUCTOR CHIP 100uH			
L151	1-412-622-51	INDUCTOR 10uH			
L152	1-412-622-51	INDUCTOR 10uH			
L153	1-412-039-51	INDUCTOR CHIP 100uH			
L154	1-412-039-51	INDUCTOR CHIP 100uH			
L155	1-410-980-51	INDUCTOR CHIP 1mH			
L161	1-414-234-11	INDUCTOR, FERRITE BEAD			
L162	1-414-234-11	INDUCTOR, FERRITE BEAD			
L195	1-233-316-21	FILTER, CHIP EMI			
		< MOTOR >			
M101	A-4660-651-A	MOTOR (SLED) ASSY			
M102	A-4660-650-A	CHASSIS ASSY, BU (SPINDLE)			
		< TRANSISTOR >			
Q101	8-729-905-12	TRANSISTOR DTA144EU			
Q151	8-729-905-18	TRANSISTOR DTC144EU			
Q162	8-729-101-07	TRANSISTOR 2SB798-DL			
Q163	8-729-905-12	TRANSISTOR DTA144EU			
Q164	8-729-924-19	TRANSISTOR DTA123JU			
Q181	8-729-018-75	TRANSISTOR 2SJ278MY			
Q182	8-729-017-65	TRANSISTOR 2SK1764KY			
		< RESISTOR >			
R101	1-216-077-00	METAL CHIP	15K	5%	1/10W
R102	1-216-073-00	METAL CHIP	10K	5%	1/10W
R103	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R104	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R105	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R106	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R107	1-216-113-00	METAL CHIP	470K	5%	1/10W
R110	1-216-077-00	METAL CHIP	15K	5%	1/10W
R113	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R114	1-216-025-91	METAL GLAZE	100	5%	1/10W
R116	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R117	1-216-113-00	METAL CHIP	470K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R120	1-216-025-91	METAL GLAZE	100	5%	1/10W
R121	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R122	1-216-295-91	CONDUCTOR, CHIP (2012)			
R123	1-216-037-00	METAL CHIP	330	5%	1/10W
R124	1-216-025-91	METAL GLAZE	100	5%	1/10W
R125	1-216-025-91	METAL GLAZE	100	5%	1/10W
R128	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R129	1-216-037-00	METAL CHIP	330	5%	1/10W
R130	1-216-041-00	METAL CHIP	470	5%	1/10W
R131	1-216-073-00	METAL CHIP	10K	5%	1/10W
R132	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R133	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R134	1-216-037-00	METAL CHIP	330	5%	1/10W
R135	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R136	1-216-041-00	METAL CHIP	470	5%	1/10W
R137	1-216-025-91	METAL GLAZE	100	5%	1/10W
R139	1-216-017-91	METAL GLAZE	47	5%	1/10W
R140	1-216-017-91	METAL GLAZE	47	5%	1/10W
R141	1-216-295-91	CONDUCTOR, CHIP (2012)			
R142	1-216-073-00	METAL CHIP	10K	5%	1/10W
R143	1-216-073-00	METAL CHIP	10K	5%	1/10W
R144	1-216-025-91	METAL GLAZE	100	5%	1/10W
R145	1-216-121-91	METAL GLAZE	1M	5%	1/10W
R146	1-216-037-00	METAL CHIP	330	5%	1/10W
R147	1-216-025-91	METAL GLAZE	100	5%	1/10W
R148	1-216-045-00	METAL CHIP	680	5%	1/10W
R150	1-216-295-91	CONDUCTOR, CHIP (2012)			
R151	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R154	1-220-262-11	METAL GLAZE	680	5%	1/4W
R155	1-220-262-11	METAL GLAZE	680	5%	1/4W
R158	1-216-121-91	METAL GLAZE	1M	5%	1/10W
R161	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R162	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R163	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R164	1-216-045-00	METAL CHIP	680	5%	1/10W
R165	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R166	1-220-250-11	METAL GLAZE	10	5%	1/2W
R167	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R169	1-219-724-11	METAL CHIP	1	1%	1/4W
R170	1-216-073-00	METAL CHIP	10K	5%	1/10W
R171	1-216-073-00	METAL CHIP	10K	5%	1/10W
R172	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R174	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R176	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R178	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R181	1-216-073-00	METAL CHIP	10K	5%	1/10W
R182	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R183	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R186	1-216-134-00	METAL CHIP	2.2	5%	1/8W
R187	1-216-134-00	METAL CHIP	2.2	5%	1/8W

BD | DETECTION SW | DIGITAL

Ref. No.	Part No.	Description			Remark
		< VARIABLE RESISTOR >			
RV101	1-241-396-11	RES, ADJ, METAL GLAZE 22K			
RV102	1-241-396-11	RES, ADJ, METAL GLAZE 22K			
		< SWITCH >			
S101	1-572-467-61	SWITCH, PUSH (1 KEY)(LIMIT)			
**********					
*	1-653-411-11	DETECTION SW BOARD			
		**********			
		< CONNECTOR >			
CN193	1-770-010-21	CONNECTOR, BOARD TO BOARD 4P			
		< SWITCH >			
S191	1-762-149-11	SWITCH, PUSH (1 KEY)(LOAD OUT DET)			
S192	1-762-149-11	SWITCH, PUSH (1 KEY)(LOAD IN DET)			
S193	1-762-149-11	SWITCH, PUSH (1 KEY)(CHUCKING IN DET)			
**********					
*	A-4699-264-A	DIGITAL BOARD, COMPLETE			
		**********			
	1-540-107-11	SOCKET, IC 32P			
		< BATTERY >			
BA501	1-550-414-21	HOLDER, BATTERY			
		< CAPACITOR >			
C501	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C502	1-126-965-11	ELECT	22uF	20%	50V
C503	1-126-965-11	ELECT	22uF	20%	50V
C504	1-126-965-11	ELECT	22uF	20%	50V
C505	1-126-965-11	ELECT	22uF	20%	50V
C506	1-126-965-11	ELECT	22uF	20%	50V
C507	1-126-965-11	ELECT	22uF	20%	50V
C508	1-126-965-11	ELECT	22uF	20%	50V
C509	1-130-472-00	MYLAR	0.0012uF	5%	50V
C510	1-130-472-00	MYLAR	0.0012uF	5%	50V
C511	1-130-479-00	MYLAR	0.0047uF	5%	50V
C512	1-130-479-00	MYLAR	0.0047uF	5%	50V
C513	1-130-472-00	MYLAR	0.0012uF	5%	50V
C514	1-130-472-00	MYLAR	0.0012uF	5%	50V
C515	1-130-479-00	MYLAR	0.0047uF	5%	50V
C516	1-130-479-00	MYLAR	0.0047uF	5%	50V
C517	1-126-965-11	ELECT	22uF	20%	50V
C518	1-126-965-11	ELECT	22uF	20%	50V
C519	1-136-153-00	FILM	0.01uF	5%	50V
C520	1-136-153-00	FILM	0.01uF	5%	50V
C521	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C522	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C523	1-136-153-00	FILM	0.01uF	5%	50V
C524	1-136-153-00	FILM	0.01uF	5%	50V
C525	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C526	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C527	1-126-965-11	ELECT	22uF	20%	50V
C528	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C529	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C530	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C531	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C532	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C533	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C534	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C535	1-126-024-11	ELECT	220uF	20%	16V
C536	1-126-024-11	ELECT	220uF	20%	16V
C537	1-126-024-11	ELECT	220uF	20%	16V
C538	1-126-024-11	ELECT	220uF	20%	16V
C539	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C540	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C541	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C542	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C543	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C544	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C545	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C546	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C547	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C548	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C549	1-126-965-11	ELECT	22uF	20%	50V
C550	1-126-965-11	ELECT	22uF	20%	50V
C551	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C552	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C553	1-126-052-11	ELECT	100uF	20%	16V
C554	1-126-052-11	ELECT	100uF	20%	16V
C555	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C556	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C557	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C558	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C559	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C560	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C563	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C564	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C565	1-126-965-11	ELECT	22uF	20%	50V
C566	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C567	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C568	1-126-965-11	ELECT	22uF	20%	50V
C569	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C570	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C571	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C573	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C575	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C576	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C577	1-163-038-91	CERAMIC CHIP	0.1uF		25V

Ref. No.	Part No.	Description			Remark
C578	1-126-965-11	ELECT	22uF	20%	50V
C579	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C580	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C582	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C583	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C584	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C585	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C587	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C588	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C589	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C595	1-124-261-00	ELECT	10uF	20%	50V
C596	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C597	1-124-261-00	ELECT	10uF	20%	50V
C598	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C599	1-124-261-00	ELECT	10uF	20%	50V
C600	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C602	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C603	1-126-965-11	ELECT	22uF	20%	50V
C604	1-126-965-11	ELECT	22uF	20%	50V
C605	1-126-965-11	ELECT	22uF	20%	50V
C606	1-126-965-11	ELECT	22uF	20%	50V
C608	1-126-965-11	ELECT	22uF	20%	50V
C609	1-126-965-11	ELECT	22uF	20%	50V
C610	1-126-965-11	ELECT	22uF	20%	50V
C611	1-126-965-11	ELECT	22uF	20%	50V
C612	1-126-965-11	ELECT	22uF	20%	50V
C613	1-126-965-11	ELECT	22uF	20%	50V
C614	1-126-965-11	ELECT	22uF	20%	50V
C615	1-126-965-11	ELECT	22uF	20%	50V
C616	1-126-059-11	ELECT	10uF	20%	50V
C617	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C618	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C620	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C621	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C622	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C623	1-124-261-00	ELECT	10uF	20%	50V
C625	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C626	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C627	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C628	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C629	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C630	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C631	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C637	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C638	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C639	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C640	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C641	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C644	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C645	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C646	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C647	1-163-038-91	CERAMIC CHIP	0.1uF		25V

Ref. No.	Part No.	Description			Remark
C653	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
		< CONNECTOR >			
CN501	1-564-510-11	PLUG, CONNECTOR 7P			
CN502	1-564-511-11	PLUG, CONNECTOR 8P			
* CN503	1-564-514-11	PLUG, CONNECTOR 11P			
CN504	1-766-509-21	CONNECTOR, FFC/FPC 18P			
* CN505	1-568-955-11	PIN, CONNECTOR 6P			
CN507	1-691-769-11	PLUG (MICRO CONNECTOR) 7P			
CN508	1-766-510-21	CONNECTOR, FFC/FPC 30P			
		< DIODE >			
D501	8-719-988-62	DIODE 1SS355			
D502	8-719-988-62	DIODE 1SS355			
D503	8-719-988-62	DIODE 1SS355			
D504	8-719-974-98	DIODE HVM17-01			
		< IC >			
IC501	8-759-188-94	IC CAT514256B-70ZS			
IC502	8-759-636-55	IC M5218AFP			
IC503	8-759-636-55	IC M5218AFP			
IC504	8-759-636-55	IC M5218AFP			
IC505	8-759-636-55	IC M5218AFP			
IC506	8-759-636-55	IC M5218AFP			
IC507	8-759-636-55	IC M5218AFP			
IC508	8-759-426-99	IC CXD8607N-T6			
IC509	8-759-426-99	IC CXD8607N-T6			
IC510	8-752-352-30	IC CXD2705AQ			
IC511	8-752-371-17	IC CXD2536R			
IC512	8-752-371-17	IC CXD2536R			
IC513	8-759-445-80	IC M27C1001-10F1-MDM1			
IC514	8-759-032-23	IC MC74HC74AF			
IC515	8-752-364-95	IC CXK58257BM-10LL-T6			
IC516	8-759-242-70	IC TC7WU04F			
IC517	8-752-371-17	IC CXD2536R			
IC518	8-752-371-17	IC CXD2536R			
IC519	8-759-443-01	IC MB8116160A-70PFTN			
IC520	8-759-186-39	IC TC74VHC74F			
IC521	8-759-031-84	IC SC7S04F			
IC522	8-759-443-00	IC AM7200-50JC			
IC523	8-759-443-00	IC AM7200-50JC			
IC525	8-759-446-15	IC HD6413003TF16			
IC526	8-759-443-00	IC AM7200-50JC			
IC527	8-759-443-00	IC AM7200-50JC			
IC528	8-759-040-83	IC BA6287F			
IC530	8-759-636-55	IC M5218AFP			
IC531	8-759-636-55	IC M5218AFP			
IC532	8-759-636-55	IC M5218AFP			
IC533	8-752-375-14	IC CXD1809R-T6			
IC534	8-759-441-74	IC CXD8655Q			
IC535	8-759-362-52	IC TC7W241FU-TE12L			
IC536	8-759-158-96	IC TC9246F-TP1			

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Ref. No.	Part No.	Description			Remark
IC537	8-759-242-70	IC TC7WU04F			
IC538	8-759-242-70	IC TC7WU04F			
IC540	8-759-327-60	IC TC7W125FU-TE12R			
IC541	8-759-083-94	IC TC7W74FU			
		< JUMPER RESISTOR >			
JW502	1-216-295-91	CONDUCTOR, CHIP (2012)			
JW503	1-216-295-91	CONDUCTOR, CHIP (2012)			
JW504	1-216-295-91	CONDUCTOR, CHIP (2012)			
JW505	1-216-295-91	CONDUCTOR, CHIP (2012)			
		< COIL >			
L501	1-410-375-11	INDUCTOR CHIP	3.3uH		
L502	1-410-375-11	INDUCTOR CHIP	3.3uH		
L503	1-410-375-11	INDUCTOR CHIP	3.3uH		
L504	1-410-375-11	INDUCTOR CHIP	3.3uH		
L505	1-410-375-11	INDUCTOR CHIP	3.3uH		
L506	1-410-375-11	INDUCTOR CHIP	3.3uH		
L507	1-410-375-11	INDUCTOR CHIP	3.3uH		
L508	1-410-375-11	INDUCTOR CHIP	3.3uH		
L509	1-410-375-11	INDUCTOR CHIP	3.3uH		
L510	1-410-375-11	INDUCTOR CHIP	3.3uH		
L511	1-410-375-11	INDUCTOR CHIP	3.3uH		
L512	1-410-375-11	INDUCTOR CHIP	3.3uH		
L513	1-410-375-11	INDUCTOR CHIP	3.3uH		
L514	1-410-375-11	INDUCTOR CHIP	3.3uH		
L515	1-410-375-11	INDUCTOR CHIP	3.3uH		
L516	1-410-375-11	INDUCTOR CHIP	3.3uH		
L517	1-410-375-11	INDUCTOR CHIP	3.3uH		
L518	1-410-375-11	INDUCTOR CHIP	3.3uH		
L519	1-410-375-11	INDUCTOR CHIP	3.3uH		
L520	1-410-375-11	INDUCTOR CHIP	3.3uH		
L523	1-410-375-11	INDUCTOR CHIP	3.3uH		
L524	1-410-375-11	INDUCTOR CHIP	3.3uH		
L525	1-410-375-11	INDUCTOR CHIP	3.3uH		
L526	1-412-622-51	INDUCTOR	10uH		
L527	1-410-375-11	INDUCTOR CHIP	3.3uH		
L529	1-410-375-11	INDUCTOR CHIP	3.3uH		
L533	1-412-332-41	INDUCTOR	2.2uH		
L534	1-410-375-11	INDUCTOR CHIP	3.3uH		
L535	1-410-370-31	INDUCTOR CHIP	1.2uH		
L536	1-414-235-11	INDUCTOR, FERRITE BEAD			
		< TRANSISTOR >			
Q501	8-729-107-46	TRANSISTOR 2SC3624A-L15			
		< RESISTOR >			
R501	1-216-025-91	METAL GLAZE	100	5%	1/10W
R502	1-216-025-91	METAL GLAZE	100	5%	1/10W
R503	1-216-025-91	METAL GLAZE	100	5%	1/10W
R504	1-216-025-91	METAL GLAZE	100	5%	1/10W
R505	1-216-089-91	METAL GLAZE	47K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R506	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R507	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R508	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R509	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R510	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R511	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R512	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R513	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R514	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R515	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R516	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R517	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R518	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R519	1-216-017-91	METAL GLAZE	47	5%	1/10W
R520	1-216-017-91	METAL GLAZE	47	5%	1/10W
R521	1-216-017-91	METAL GLAZE	47	5%	1/10W
R522	1-216-017-91	METAL GLAZE	47	5%	1/10W
R523	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R524	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R525	1-216-017-91	METAL GLAZE	47	5%	1/10W
R526	1-216-017-91	METAL GLAZE	47	5%	1/10W
R527	1-216-017-91	METAL GLAZE	47	5%	1/10W
R528	1-216-017-91	METAL GLAZE	47	5%	1/10W
R529	1-216-077-00	METAL CHIP	15K	5%	1/10W
R530	1-216-077-00	METAL CHIP	15K	5%	1/10W
R531	1-216-077-00	METAL CHIP	15K	5%	1/10W
R532	1-216-077-00	METAL CHIP	15K	5%	1/10W
R533	1-216-077-00	METAL CHIP	15K	5%	1/10W
R534	1-216-077-00	METAL CHIP	15K	5%	1/10W
R535	1-216-077-00	METAL CHIP	15K	5%	1/10W
R536	1-216-077-00	METAL CHIP	15K	5%	1/10W
R537	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R538	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R539	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R540	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R541	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R542	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R543	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R544	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R545	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R546	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R547	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R548	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R549	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R550	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R551	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R552	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R553	1-216-033-00	METAL CHIP	220	5%	1/10W
R554	1-216-033-00	METAL CHIP	220	5%	1/10W
R555	1-216-001-00	METAL CHIP	10	5%	1/10W
R556	1-216-001-00	METAL CHIP	10	5%	1/10W
R557	1-216-013-00	METAL CHIP	33	5%	1/10W

Ref. No.	Part No.	Description			Remark
R558	1-216-013-00	METAL CHIP	33	5%	1/10W
R559	1-216-017-91	METAL GLAZE	47	5%	1/10W
R560	1-216-017-91	METAL GLAZE	47	5%	1/10W
R561	1-216-033-00	METAL CHIP	220	5%	1/10W
R562	1-216-033-00	METAL CHIP	220	5%	1/10W
R563	1-216-033-00	METAL CHIP	220	5%	1/10W
R564	1-216-033-00	METAL CHIP	220	5%	1/10W
R565	1-216-033-00	METAL CHIP	220	5%	1/10W
R566	1-216-033-00	METAL CHIP	220	5%	1/10W
R567	1-216-001-00	METAL CHIP	10	5%	1/10W
R568	1-216-001-00	METAL CHIP	10	5%	1/10W
R569	1-216-033-00	METAL CHIP	220	5%	1/10W
R570	1-216-017-91	METAL GLAZE	47	5%	1/10W
R571	1-216-017-91	METAL GLAZE	47	5%	1/10W
R572	1-216-017-91	METAL GLAZE	47	5%	1/10W
R573	1-216-001-00	METAL CHIP	10	5%	1/10W
R574	1-216-001-00	METAL CHIP	10	5%	1/10W
R575	1-216-001-00	METAL CHIP	10	5%	1/10W
R576	1-216-033-00	METAL CHIP	220	5%	1/10W
R577	1-216-017-91	METAL GLAZE	47	5%	1/10W
R578	1-216-013-00	METAL CHIP	33	5%	1/10W
R579	1-216-013-00	METAL CHIP	33	5%	1/10W
R580	1-216-017-91	METAL GLAZE	47	5%	1/10W
R581	1-216-017-91	METAL GLAZE	47	5%	1/10W
R582	1-216-001-00	METAL CHIP	10	5%	1/10W
R583	1-216-013-00	METAL CHIP	33	5%	1/10W
R584	1-216-013-00	METAL CHIP	33	5%	1/10W
R585	1-216-013-00	METAL CHIP	33	5%	1/10W
R586	1-216-013-00	METAL CHIP	33	5%	1/10W
R588	1-216-017-91	METAL GLAZE	47	5%	1/10W
R589	1-216-017-91	METAL GLAZE	47	5%	1/10W
R590	1-216-017-91	METAL GLAZE	47	5%	1/10W
R591	1-216-017-91	METAL GLAZE	47	5%	1/10W
R592	1-216-033-00	METAL CHIP	220	5%	1/10W
R593	1-216-033-00	METAL CHIP	220	5%	1/10W
R594	1-216-001-00	METAL CHIP	10	5%	1/10W
R595	1-216-013-00	METAL CHIP	33	5%	1/10W
R596	1-216-033-00	METAL CHIP	220	5%	1/10W
R597	1-216-025-91	METAL GLAZE	100	5%	1/10W
R598	1-216-009-00	METAL CHIP	22	5%	1/10W
R599	1-216-081-00	METAL CHIP	22K	5%	1/10W
R600	1-216-009-00	METAL CHIP	22	5%	1/10W
R601	1-216-081-00	METAL CHIP	22K	5%	1/10W
R602	1-216-013-00	METAL CHIP	33	5%	1/10W
R603	1-216-033-00	METAL CHIP	220	5%	1/10W
R604	1-216-121-91	METAL GLAZE	1M	5%	1/10W
R606	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R607	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R608	1-216-017-91	METAL GLAZE	47	5%	1/10W
R609	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R610	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R611	1-216-017-91	METAL GLAZE	47	5%	1/10W

Ref. No.	Part No.	Description			Remark
R612	1-216-017-91	METAL GLAZE	47	5%	1/10W
R613	1-216-017-91	METAL GLAZE	47	5%	1/10W
R614	1-216-017-91	METAL GLAZE	47	5%	1/10W
R615	1-216-033-00	METAL CHIP	220	5%	1/10W
R616	1-216-033-00	METAL CHIP	220	5%	1/10W
R617	1-216-009-00	METAL CHIP	22	5%	1/10W
R618	1-216-013-00	METAL CHIP	33	5%	1/10W
R619	1-216-013-00	METAL CHIP	33	5%	1/10W
R620	1-216-009-00	METAL CHIP	22	5%	1/10W
R621	1-216-013-00	METAL CHIP	33	5%	1/10W
R622	1-216-033-00	METAL CHIP	220	5%	1/10W
R623	1-216-009-00	METAL CHIP	22	5%	1/10W
R624	1-216-013-00	METAL CHIP	33	5%	1/10W
R625	1-216-121-91	METAL GLAZE	1M	5%	1/10W
R626	1-216-001-00	METAL CHIP	10	5%	1/10W
R627	1-216-017-91	METAL GLAZE	47	5%	1/10W
R628	1-216-013-00	METAL CHIP	33	5%	1/10W
R629	1-216-033-00	METAL CHIP	220	5%	1/10W
R630	1-216-033-00	METAL CHIP	220	5%	1/10W
R631	1-216-033-00	METAL CHIP	220	5%	1/10W
R633	1-216-033-00	METAL CHIP	220	5%	1/10W
R634	1-216-033-00	METAL CHIP	220	5%	1/10W
R635	1-216-033-00	METAL CHIP	220	5%	1/10W
R636	1-216-033-00	METAL CHIP	220	5%	1/10W
R637	1-216-033-00	METAL CHIP	220	5%	1/10W
R638	1-216-081-00	METAL CHIP	22K	5%	1/10W
R639	1-216-033-00	METAL CHIP	220	5%	1/10W
R640	1-216-033-00	METAL CHIP	220	5%	1/10W
R641	1-216-033-00	METAL CHIP	220	5%	1/10W
R642	1-216-033-00	METAL CHIP	220	5%	1/10W
R643	1-216-033-00	METAL CHIP	220	5%	1/10W
R644	1-216-033-00	METAL CHIP	220	5%	1/10W
R645	1-216-033-00	METAL CHIP	220	5%	1/10W
R646	1-216-033-00	METAL CHIP	220	5%	1/10W
R647	1-216-033-00	METAL CHIP	220	5%	1/10W
R648	1-216-033-00	METAL CHIP	220	5%	1/10W
R649	1-216-033-00	METAL CHIP	220	5%	1/10W
R654	1-216-033-00	METAL CHIP	220	5%	1/10W
R655	1-216-033-00	METAL CHIP	220	5%	1/10W
R656	1-216-017-91	METAL GLAZE	47	5%	1/10W
R657	1-216-017-91	METAL GLAZE	47	5%	1/10W
R658	1-216-017-91	METAL GLAZE	47	5%	1/10W
R659	1-216-017-91	METAL GLAZE	47	5%	1/10W
R660	1-216-017-91	METAL GLAZE	47	5%	1/10W
R661	1-216-033-00	METAL CHIP	220	5%	1/10W
R662	1-216-021-00	METAL CHIP	68	5%	1/10W
R663	1-216-021-00	METAL CHIP	68	5%	1/10W
R664	1-216-025-91	METAL GLAZE	100	5%	1/10W
R665	1-216-025-91	METAL GLAZE	100	5%	1/10W
R666	1-216-025-91	METAL GLAZE	100	5%	1/10W
R667	1-216-025-91	METAL GLAZE	100	5%	1/10W

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Ref. No.	Part No.	Description			Remark
⚠R668	1-219-212-11	FUSIBLE	15	5%	1/8W
⚠R669	1-219-212-11	FUSIBLE	15	5%	1/8W
R670	1-216-081-00	METAL CHIP	22K	5%	1/10W
R671	1-216-009-00	METAL CHIP	22	5%	1/10W
R673	1-216-001-00	METAL CHIP	10	5%	1/10W
R674	1-216-001-00	METAL CHIP	10	5%	1/10W
R675	1-216-009-00	METAL CHIP	22	5%	1/10W
R676	1-216-009-00	METAL CHIP	22	5%	1/10W
R677	1-216-013-00	METAL CHIP	33	5%	1/10W
R678	1-216-013-00	METAL CHIP	33	5%	1/10W
R679	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R680	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R681	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R682	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R686	1-216-081-00	METAL CHIP	22K	5%	1/10W
R687	1-216-081-00	METAL CHIP	22K	5%	1/10W
R689	1-216-081-00	METAL CHIP	22K	5%	1/10W
R690	1-216-081-00	METAL CHIP	22K	5%	1/10W
R691	1-216-081-00	METAL CHIP	22K	5%	1/10W
R692	1-216-073-00	METAL CHIP	10K	5%	1/10W
R693	1-216-073-00	METAL CHIP	10K	5%	1/10W
R694	1-216-073-00	METAL CHIP	10K	5%	1/10W
R695	1-216-073-00	METAL CHIP	10K	5%	1/10W
R696	1-216-073-00	METAL CHIP	10K	5%	1/10W
R697	1-216-073-00	METAL CHIP	10K	5%	1/10W
R698	1-216-073-00	METAL CHIP	10K	5%	1/10W
R699	1-216-073-00	METAL CHIP	10K	5%	1/10W
R700	1-216-073-00	METAL CHIP	10K	5%	1/10W
R701	1-216-073-00	METAL CHIP	10K	5%	1/10W
R702	1-216-073-00	METAL CHIP	10K	5%	1/10W
R703	1-216-073-00	METAL CHIP	10K	5%	1/10W
R704	1-216-073-00	METAL CHIP	10K	5%	1/10W
R705	1-216-073-00	METAL CHIP	10K	5%	1/10W
R706	1-216-073-00	METAL CHIP	10K	5%	1/10W
R707	1-216-073-00	METAL CHIP	10K	5%	1/10W
R708	1-216-081-00	METAL CHIP	22K	5%	1/10W
R709	1-216-081-00	METAL CHIP	22K	5%	1/10W
R710	1-216-025-91	METAL GLAZE	100	5%	1/10W
R711	1-216-081-00	METAL CHIP	22K	5%	1/10W
R720	1-216-081-00	METAL CHIP	22K	5%	1/10W
R721	1-216-081-00	METAL CHIP	22K	5%	1/10W
R722	1-216-081-00	METAL CHIP	22K	5%	1/10W
R723	1-208-810-11	METAL CHIP	15K	0.50%	1/10W
R724	1-208-810-11	METAL CHIP	15K	0.50%	1/10W
R725	1-208-810-11	METAL CHIP	15K	0.50%	1/10W
R726	1-208-810-11	METAL CHIP	15K	0.50%	1/10W
R727	1-216-651-11	METAL CHIP	1K	0.5%	1/10W
R728	1-216-651-11	METAL CHIP	1K	0.5%	1/10W
R729	1-216-121-91	METAL GLAZE	1M	5%	1/10W
R730	1-216-295-91	CONDUCTOR, CHIP (2012)			
R731	1-216-073-00	METAL CHIP	10K	5%	1/10W
R732	1-216-025-91	METAL GLAZE	100	5%	1/10W
R734	1-216-017-91	METAL GLAZE	47	5%	1/10W
R735	1-216-081-00	METAL CHIP	22K	5%	1/10W
R736	1-216-081-00	METAL CHIP	22K	5%	1/10W
R737	1-216-081-00	METAL CHIP	22K	5%	1/10W
R740	1-216-041-00	METAL CHIP	470	5%	1/10W
R741	1-216-041-00	METAL CHIP	470	5%	1/10W
R745	1-216-081-00	METAL CHIP	22K	5%	1/10W
R746	1-216-041-00	METAL CHIP	470	5%	1/10W
R747	1-216-295-91	CONDUCTOR, CHIP (2012)			
		< VIBRATOR >			
X501	1-578-667-11	VIBRATOR, CRYSTAL (49.152MHz)			
X502	1-567-881-11	VIBRATOR, CRYSTAL (16MHz)			
X503	1-760-473-11	VIBRATOR, CRYSTAL (28.63636MHz)			
**********					
*	1-663-333-11	EJECT BOARD			
		**********			
		< CONNECTOR >			
* CN207	1-564-495-11	PIN, CONNECTOR 2P			
		< SWITCH >			
S208	1-554-303-21	SWITCH, TACTILE (⏏ EJECT)			
**********					
*	1-663-332-11	ENCODER BOARD			
		**********			
		< SWITCH >			
S216	1-692-722-11	SWITCH, ROTARY (ENCODER)(– ◀◀, ▶▶ +)			
**********					
*	1-663-329-11	HEADPHONE BOARD			
		**********			
		< CAPACITOR >			
C1803	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C1804	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
		< CONNECTOR >			
* CN1110	1-564-518-11	PLUG, CONNECTOR 3P			
		< JACK >			
J1800	1-778-722-11	JACK (LARGE TYPE)(HEADPHONES)			
		< JUMPER RESISTOR >			
JR1800	1-216-296-91	CONDUCTOR, CHIP (3216)			
JR1801	1-216-296-91	CONDUCTOR, CHIP (3216)			

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R1809	1-218-282-11	METAL GLAZE	22	5%	1/2W
R1810	1-218-282-11	METAL GLAZE	22	5%	1/2W
**********					
*	A-4699-270-A	JACK (1) BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C1900	1-162-290-31	CERAMIC	470PF	10%	50V
C1901	1-162-290-31	CERAMIC	470PF	10%	50V
C1902	1-162-290-31	CERAMIC	470PF	10%	50V
C1903	1-162-290-31	CERAMIC	470PF	10%	50V
C1904	1-162-290-31	CERAMIC	470PF	10%	50V
C1905	1-162-290-31	CERAMIC	470PF	10%	50V
C1906	1-128-551-11	ELECT	22uF	20%	25V
C1907	1-128-551-11	ELECT	22uF	20%	25V
C1908	1-128-551-11	ELECT	22uF	20%	25V
C1909	1-128-551-11	ELECT	22uF	20%	25V
C1910	1-162-282-31	CERAMIC	100PF	10%	50V
C1911	1-162-282-31	CERAMIC	100PF	10%	50V
C1912	1-126-964-11	ELECT	10uF	20%	50V
C1913	1-126-964-11	ELECT	10uF	20%	50V
C1914	1-162-282-31	CERAMIC	100PF	10%	50V
C1915	1-162-282-31	CERAMIC	100PF	10%	50V
C1924	1-162-282-31	CERAMIC	100PF	10%	50V
C1925	1-162-282-31	CERAMIC	100PF	10%	50V
C1926	1-162-282-31	CERAMIC	100PF	10%	50V
C1927	1-162-282-31	CERAMIC	100PF	10%	50V
C1928	1-162-306-11	CERAMIC	0.01uF	20%	16V
C1929	1-164-159-11	CERAMIC	0.1uF		50V
C1930	1-164-159-11	CERAMIC	0.1uF		50V
		< CONNECTOR >			
* CN1101	1-564-528-11	PLUG, CONNECTOR 13P			
		< IC >			
IC1900	8-759-634-51	IC M5218AP			
IC1901	8-759-634-51	IC M5218AP			
IC1902	8-759-634-51	IC M5218AP			
		< JACK >			
J1900	1-778-722-11	JACK (LARGE TYPE)(OUTPUT AUX 2)			
J1901	1-778-722-11	JACK (LARGE TYPE)(OUTPUT AUX 1)			
J1902	1-778-723-11	JACK (LARGE TYPE)(INPUT CH6)			
J1903	1-778-723-11	JACK (LARGE TYPE)(INPUT CH5)			
J1904	1-778-723-11	JACK (LARGE TYPE)(INPUT CH4)			
J1905	1-778-723-11	JACK (LARGE TYPE)(INPUT CH3)			
J1906	1-778-789-11	JACK (INPUT CH2)			
J1907	1-778-789-11	JACK (INPUT CH1)			

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R1900	1-259-404-11	CARBON	100	5%	1/6W
R1901	1-259-404-11	CARBON	100	5%	1/6W
R1902	1-259-404-11	CARBON	100	5%	1/6W
R1903	1-259-404-11	CARBON	100	5%	1/6W
R1904	1-259-404-11	CARBON	100	5%	1/6W
R1905	1-259-404-11	CARBON	100	5%	1/6W
R1906	1-259-468-11	CARBON	47K	5%	1/6W
R1907	1-259-468-11	CARBON	47K	5%	1/6W
R1908	1-259-468-11	CARBON	47K	5%	1/6W
R1909	1-259-468-11	CARBON	47K	5%	1/6W
R1910	1-259-460-11	CARBON	22K	5%	1/6W
R1911	1-259-460-11	CARBON	22K	5%	1/6W
R1912	1-259-460-11	CARBON	22K	5%	1/6W
R1913	1-259-460-11	CARBON	22K	5%	1/6W
R1914	1-259-460-11	CARBON	22K	5%	1/6W
R1915	1-259-460-11	CARBON	22K	5%	1/6W
R1916	1-259-460-11	CARBON	22K	5%	1/6W
R1917	1-259-460-11	CARBON	22K	5%	1/6W
R1918	1-259-404-11	CARBON	100	5%	1/6W
R1919	1-259-404-11	CARBON	100	5%	1/6W
R1920	1-259-460-11	CARBON	22K	5%	1/6W
R1921	1-259-460-11	CARBON	22K	5%	1/6W
R1922	1-259-404-11	CARBON	100	5%	1/6W
R1923	1-259-404-11	CARBON	100	5%	1/6W
R1932	1-259-460-11	CARBON	22K	5%	1/6W
R1933	1-259-460-11	CARBON	22K	5%	1/6W
R1934	1-259-404-11	CARBON	100	5%	1/6W
R1935	1-259-404-11	CARBON	100	5%	1/6W
R1937	1-259-396-11	CARBON	47	5%	1/6W
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*	A-4699-271-A	JACK (2) BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C1916	1-162-290-31	CERAMIC	470PF	10%	50V
C1917	1-162-290-31	CERAMIC	470PF	10%	50V
C1918	1-162-290-31	CERAMIC	470PF	10%	50V
C1919	1-162-290-31	CERAMIC	470PF	10%	50V
C1920	1-162-290-31	CERAMIC	470PF	10%	50V
C1921	1-162-290-31	CERAMIC	470PF	10%	50V
C1922	1-162-290-31	CERAMIC	470PF	10%	50V
C1923	1-162-290-31	CERAMIC	470PF	10%	50V
		< CONNECTOR >			
* CN1100	1-564-527-11	PLUG, CONNECTOR 12P			
		< JACK >			
J1908	1-778-723-11	JACK (LARGE TYPE)(RETURN 2 R)			
J1909	1-778-723-11	JACK (LARGE TYPE)(RETURN 2 L/MONO)			

JACK (2) MIDI MIXER

Ref. No.	Part No.	Description			Remark
J1910	1-778-723-11	JACK (LARGE TYPE)(RETURN 1 R)			
J1911	1-778-723-11	JACK (LARGE TYPE)(RETURN 1 L/MONO)			
J1912	1-778-722-11	JACK (LARGE TYPE)(OUTPUT TRACK 4)			
J1913	1-778-722-11	JACK (LARGE TYPE)(OUTPUT TRACK 3)			
J1914	1-778-722-11	JACK (LARGE TYPE)(OUTPUT TRACK 2)			
J1915	1-778-722-11	JACK (LARGE TYPE)(OUTPUT TRACK 1)			
		< RESISTOR >			
R1924	1-259-404-11	CARBON	100	5%	1/6W
R1925	1-259-404-11	CARBON	100	5%	1/6W
R1926	1-259-404-11	CARBON	100	5%	1/6W
R1927	1-259-404-11	CARBON	100	5%	1/6W
R1928	1-259-404-11	CARBON	100	5%	1/6W
R1929	1-259-404-11	CARBON	100	5%	1/6W
R1930	1-259-404-11	CARBON	100	5%	1/6W
R1931	1-259-404-11	CARBON	100	5%	1/6W

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*	1-663-328-11	MIDI BOARD				
		**********				
		< CAPACITOR >				
C1877	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	
C1878	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	
C1879	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	
C1880	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	
C1891	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
		< CONNECTOR >				
* CN1111	1-564-499-11	PIN, CONNECTOR 6P				
* CN1112	1-564-521-11	PLUG, CONNECTOR 6P				
		< JACK >				
J1801	1-778-940-11	JACK 2P (STEREO OUT)				
J1802	1-778-940-11	JACK 2P (MONITOR OUT)				
J1803	1-750-971-11	CONNECTOR, DIN 5P (MIDI IN, OUT)				
J1804	1-750-974-11	CONNECTOR, DIN 5P (MIDI THRU)				
		< RESISTOR >				
R1896	1-216-295-91	CONDUCTOR, CHIP(2012)				
R1897	1-216-295-91	CONDUCTOR, CHIP(2012)				
R1898	1-216-033-00	METAL CHIP	220	5%	1/10W	
R1899	1-216-033-00	METAL CHIP	220	5%	1/10W	
R1900	1-216-033-00	METAL CHIP	220	5%	1/10W	
R1901	1-216-033-00	METAL CHIP	220	5%	1/10W	

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*	A-4669-261-A	MIXER BOARD, COMPLETE				
		**********				
		< CAPACITOR >				
C1101	1-126-965-11	ELECT	22uF	20%	50V	
C1103	1-163-243-11	CERAMIC CHIP	47PF	5%	50V	
C1104	1-136-153-00	FILM	0.01uF	5%	50V	
C1105	1-126-965-11	ELECT	22uF	20%	50V	
C1107	1-136-161-00	FILM	0.047uF	5%	50V	
C1108	1-130-479-00	MYLAR	0.0047uF	5%	50V	
C1109	1-136-161-00	FILM	0.047uF	5%	50V	
C1110	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	
C1111	1-136-153-00	FILM	0.01uF	5%	50V	
C1112	1-130-477-00	MYLAR	0.0033uF	5%	50V	
C1113	1-130-481-00	MYLAR	0.0068uF	5%	50V	
C1114	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V	
C1115	1-136-153-00	FILM	0.01uF	5%	50V	
C1117	1-136-153-00	FILM	0.01uF	5%	50V	
C1119	1-126-965-11	ELECT	22uF	20%	50V	
C1201	1-126-965-11	ELECT	22uF	20%	50V	
C1203	1-163-243-11	CERAMIC CHIP	47PF	5%	50V	
C1204	1-136-153-00	FILM	0.01uF	5%	50V	
C1205	1-126-965-11	ELECT	22uF	20%	50V	
C1207	1-136-161-00	FILM	0.047uF	5%	50V	
C1208	1-130-479-00	MYLAR	0.0047uF	5%	50V	
C1209	1-136-161-00	FILM	0.047uF	5%	50V	
C1210	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	
C1211	1-136-153-00	FILM	0.01uF	5%	50V	
C1212	1-130-477-00	MYLAR	0.0033uF	5%	50V	
C1213	1-130-481-00	MYLAR	0.0068uF	5%	50V	
C1214	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V	
C1215	1-136-153-00	FILM	0.01uF	5%	50V	
C1217	1-136-153-00	FILM	0.01uF	5%	50V	
C1219	1-126-965-11	ELECT	22uF	20%	50V	
C1301	1-126-965-11	ELECT	22uF	20%	50V	
C1303	1-163-243-11	CERAMIC CHIP	47PF	5%	50V	
C1304	1-136-153-00	FILM	0.01uF	5%	50V	
C1305	1-126-965-11	ELECT	22uF	20%	50V	
C1307	1-136-161-00	FILM	0.047uF	5%	50V	
C1308	1-130-479-00	MYLAR	0.0047uF	5%	50V	
C1309	1-136-161-00	FILM	0.047uF	5%	50V	
C1310	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	
C1311	1-136-153-00	FILM	0.01uF	5%	50V	
C1312	1-130-477-00	MYLAR	0.0033uF	5%	50V	
C1313	1-130-481-00	MYLAR	0.0068uF	5%	50V	
C1314	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V	
C1315	1-136-153-00	FILM	0.01uF	5%	50V	
C1317	1-136-153-00	FILM	0.01uF	5%	50V	
C1319	1-126-965-11	ELECT	22uF	20%	50V	
C1401	1-126-965-11	ELECT	22uF	20%	50V	
C1403	1-163-243-11	CERAMIC CHIP	47PF	5%	50V	
C1404	1-136-153-00	FILM	0.01uF	5%	50V	

Ref. No.	Part No.	Description			Remark
C1405	1-126-965-11	ELECT	22uF	20%	50V
C1407	1-136-161-00	FILM	0.047uF	5%	50V
C1408	1-130-479-00	MYLAR	0.0047uF	5%	50V
C1409	1-136-161-00	FILM	0.047uF	5%	50V
C1410	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1411	1-136-153-00	FILM	0.01uF	5%	50V
C1412	1-130-477-00	MYLAR	0.0033uF	5%	50V
C1413	1-130-481-00	MYLAR	0.0068uF	5%	50V
C1414	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C1415	1-136-153-00	FILM	0.01uF	5%	50V
C1417	1-136-153-00	FILM	0.01uF	5%	50V
C1419	1-126-965-11	ELECT	22uF	20%	50V
C1505	1-136-161-00	FILM	0.047uF	5%	50V
C1506	1-130-479-00	MYLAR	0.0047uF	5%	50V
C1507	1-136-161-00	FILM	0.047uF	5%	50V
C1508	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1512	1-136-153-00	FILM	0.01uF	5%	50V
C1513	1-126-965-11	ELECT	22uF	20%	50V
C1605	1-136-161-00	FILM	0.047uF	5%	50V
C1606	1-130-479-00	MYLAR	0.0047uF	5%	50V
C1607	1-136-161-00	FILM	0.047uF	5%	50V
C1608	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1612	1-136-153-00	FILM	0.01uF	5%	50V
C1613	1-126-965-11	ELECT	22uF	20%	50V
C1700	1-136-153-00	FILM	0.01uF	5%	50V
C1701	1-136-153-00	FILM	0.01uF	5%	50V
C1706	1-126-965-11	ELECT	22uF	20%	50V
C1707	1-126-965-11	ELECT	22uF	20%	50V
C1708	1-126-965-11	ELECT	22uF	20%	50V
C1709	1-126-965-11	ELECT	22uF	20%	50V
C1710	1-128-551-11	ELECT	22uF	20%	25V
C1711	1-128-551-11	ELECT	22uF	20%	25V
C1715	1-136-153-00	FILM	0.01uF	5%	50V
C1718	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1719	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1721	1-136-153-00	FILM	0.01uF	5%	50V
C1728	1-126-965-11	ELECT	22uF	20%	50V
C1729	1-126-965-11	ELECT	22uF	20%	50V
C1730	1-126-965-11	ELECT	22uF	20%	50V
C1731	1-126-965-11	ELECT	22uF	20%	50V
C1732	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C1733	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C1734	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C1735	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C1736	1-136-153-00	FILM	0.01uF	5%	50V
C1737	1-136-153-00	FILM	0.01uF	5%	50V
C1738	1-136-153-00	FILM	0.01uF	5%	50V
C1739	1-136-153-00	FILM	0.01uF	5%	50V
C1740	1-126-965-11	ELECT	22uF	20%	50V
C1741	1-126-965-11	ELECT	22uF	20%	50V
C1742	1-126-965-11	ELECT	22uF	20%	50V
C1743	1-126-965-11	ELECT	22uF	20%	50V

Ref. No.	Part No.	Description			Remark
C1800	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C1801	1-136-153-00	FILM	0.01uF	5%	50V
C1802	1-136-153-00	FILM	0.01uF	5%	50V
C1806	1-128-551-11	ELECT	22uF	20%	25V
C1808	1-128-551-11	ELECT	22uF	20%	25V
C1809	1-128-551-11	ELECT	22uF	20%	25V
C1810	1-128-551-11	ELECT	22uF	20%	25V
C1811	1-128-551-11	ELECT	22uF	20%	25V
C1812	1-128-551-11	ELECT	22uF	20%	25V
C1813	1-128-551-11	ELECT	22uF	20%	25V
C1816	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C1817	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C1818	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C1819	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C1820	1-136-153-00	FILM	0.01uF	5%	50V
C1821	1-136-153-00	FILM	0.01uF	5%	50V
C1824	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1825	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1837	1-126-964-11	ELECT	10uF	20%	50V
C1838	1-126-964-11	ELECT	10uF	20%	50V
C1839	1-136-153-00	FILM	0.01uF	5%	50V
C1840	1-136-153-00	FILM	0.01uF	5%	50V
C1842	1-126-965-11	ELECT	22uF	20%	50V
C1843	1-126-965-11	ELECT	22uF	20%	50V
C1848	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1849	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1854	1-136-153-00	FILM	0.01uF	5%	50V
C1855	1-136-153-00	FILM	0.01uF	5%	50V
C1860	1-136-153-00	FILM	0.01uF	5%	50V
C1861	1-136-153-00	FILM	0.01uF	5%	50V
C1862	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C1864	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C1865	1-126-933-11	ELECT	100uF	20%	16V
C1866	1-126-933-11	ELECT	100uF	20%	16V
C1867	1-136-153-00	FILM	0.01uF	5%	50V
C1868	1-136-153-00	FILM	0.01uF	5%	50V
C1871	1-126-965-11	ELECT	22uF	20%	50V
C1872	1-126-965-11	ELECT	22uF	20%	50V
C1881	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1882	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1883	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1884	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1885	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1886	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1887	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1888	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1889	1-136-153-00	FILM	0.01uF	5%	50V
C1890	1-136-153-00	FILM	0.01uF	5%	50V

< CONNECTOR >

CN1104	1-564-511-11	PLUG, CONNECTOR 8P
CN1105	1-564-510-11	PLUG, CONNECTOR 7P

MIXER

Ref. No.	Part No.	Description			Remark
CN1106	1-564-511-11	PLUG, CONNECTOR 8P			
* CN1109	1-564-509-11	PLUG, CONNECTOR 6P			
		< DIODE >			
D1100	8-719-016-74	DIODE 1SS352			
D1101	8-719-016-74	DIODE 1SS352			
		< FUSIBLE RESISTOR >			
⚠FR1801	1-212-873-11	FUSIBLE	47	5% 1/4W F	
⚠FR1802	1-212-873-11	FUSIBLE	47	5% 1/4W F	
		< IC >			
IC1100	8-759-636-55	IC M5218AFP			
IC1101	8-759-636-55	IC M5218AFP			
IC1200	8-759-636-55	IC M5218AFP			
IC1201	8-759-636-55	IC M5218AFP			
IC1300	8-759-636-55	IC M5218AFP			
IC1301	8-759-636-55	IC M5218AFP			
IC1400	8-759-636-55	IC M5218AFP			
IC1401	8-759-636-55	IC M5218AFP			
IC1501	8-759-636-55	IC M5218AFP			
IC1601	8-759-636-55	IC M5218AFP			
IC1700	8-759-636-55	IC M5218AFP			
IC1701	8-759-636-55	IC M5218AFP			
IC1702	8-759-636-55	IC M5218AFP			
IC1703	8-759-636-55	IC M5218AFP			
IC1704	8-759-636-55	IC M5218AFP			
IC1705	8-759-636-55	IC M5218AFP			
IC1800	8-759-636-55	IC M5218AFP			
IC1801	8-759-636-55	IC M5218AFP			
IC1802	8-759-636-55	IC M5218AFP			
IC1803	8-759-636-55	IC M5218AFP			
IC1804	8-759-636-55	IC M5218AFP			
IC1805	8-759-636-55	IC M5218AFP			
IC1806	8-759-636-55	IC M5218AFP			
IC1807	8-759-636-55	IC M5218AFP			
IC1808	8-759-636-55	IC M5218AFP			
IC1809	8-759-636-55	IC M5218AFP			
IC1810	8-759-602-79	IC M5216L			
IC1811	8-759-636-55	IC M5218AFP			
IC1812	8-759-636-55	IC M5218AFP			
IC1813	8-759-636-55	IC M5218AFP			
		< JUMPER RESISTOR >			
JR1001	1-216-296-91	CONDUCTOR, CHIP (3216)			
JR1002	1-216-296-91	CONDUCTOR, CHIP (3216)			
JR1003	1-216-296-91	CONDUCTOR, CHIP (3216)			
JR1004	1-216-296-91	CONDUCTOR, CHIP (3216)			
JR1005	1-216-296-91	CONDUCTOR, CHIP (3216)			
JR1006	1-216-296-91	CONDUCTOR, CHIP (3216)			
JR1007	1-216-296-91	CONDUCTOR, CHIP (3216)			
JR1008	1-216-296-91	CONDUCTOR, CHIP (3216)			

Ref. No.	Part No.	Description	Remark
JR1009	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1010	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1011	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1012	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1013	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1014	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1015	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1016	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1017	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1018	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1019	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1020	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1021	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1022	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1023	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR1024	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1025	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1026	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1027	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1028	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1029	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR1030	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1031	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1032	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR1033	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR1034	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1035	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1036	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1037	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1038	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1039	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1040	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1041	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1042	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1043	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1044	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1045	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR1046	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR1047	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1048	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1049	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1050	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1051	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1052	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1053	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1054	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR1513	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR1519	1-216-296-91	CONDUCTOR, CHIP (3216)	
		< TRANSISTOR >	
Q1700	8-729-920-31	TRANSISTOR DTC343TK	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
Q1701	8-729-920-31	TRANSISTOR	DTC343TK		
Q1702	8-729-920-31	TRANSISTOR	DTC343TK		
Q1703	8-729-920-31	TRANSISTOR	DTC343TK		
Q1704	8-729-920-31	TRANSISTOR	DTC343TK		
Q1705	8-729-920-31	TRANSISTOR	DTC343TK		
Q1800	8-729-920-31	TRANSISTOR	DTC343TK		
Q1801	8-729-920-31	TRANSISTOR	DTC343TK		
Q1802	8-729-920-31	TRANSISTOR	DTC343TK		
Q1803	8-729-920-31	TRANSISTOR	DTC343TK		
Q1804	8-729-424-08	TRANSISTOR	UN2111		
Q1805	8-729-424-08	TRANSISTOR	UN2111		
Q1806	8-729-424-08	TRANSISTOR	UN2111		
Q1807	8-729-424-08	TRANSISTOR	UN2111		
Q1808	8-729-920-31	TRANSISTOR	DTC343TK		
Q1809	8-729-920-31	TRANSISTOR	DTC343TK		
Q1811	8-729-920-31	TRANSISTOR	DTC343TK		
Q1812	8-729-920-31	TRANSISTOR	DTC343TK		
		< RESISTOR >			
R1101	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1102	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1103	1-216-043-91	METAL GLAZE	560	5%	1/10W
R1104	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1105	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R1106	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R1107	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1108	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1109	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1110	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R1111	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1112	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W
R1114	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1115	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W
R1116	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1118	1-216-085-00	METAL CHIP	33K	5%	1/10W
R1119	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1120	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1121	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1122	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1123	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1124	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1125	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1126	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1127	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1128	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1129	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1130	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W
R1131	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1201	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1202	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1203	1-216-043-91	METAL GLAZE	560	5%	1/10W
R1204	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1205	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R1207	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1208	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1209	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1210	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R1211	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1212	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W
R1214	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1215	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W
R1216	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1218	1-216-085-00	METAL CHIP	33K	5%	1/10W
R1219	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1220	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1221	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1222	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1223	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1224	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1225	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1226	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1227	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1228	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1229	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1230	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W
R1231	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1301	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1302	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1303	1-216-043-91	METAL GLAZE	560	5%	1/10W
R1304	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1305	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R1306	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R1307	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1308	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1309	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1310	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R1311	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1312	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W
R1314	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1315	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W
R1316	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1318	1-216-085-00	METAL CHIP	33K	5%	1/10W
R1319	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1320	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1321	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1322	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1323	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1324	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1325	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1326	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1327	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1328	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1329	1-216-065-00	METAL CHIP	4.7K	5%	1/10W

MIXER

Ref. No.	Part No.	Description			Remark
R1330	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W
R1331	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1401	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1402	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1403	1-216-043-91	METAL GLAZE	560	5%	1/10W
R1404	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1405	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R1406	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R1407	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1408	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1409	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1410	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R1411	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1412	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W
R1414	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1415	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W
R1416	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1418	1-216-085-00	METAL CHIP	33K	5%	1/10W
R1419	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1420	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1421	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1422	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1423	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1424	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1425	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1426	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1427	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1428	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1429	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1430	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W
R1431	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1505	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R1506	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1507	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1508	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1509	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R1510	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R1512	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R1513	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1514	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1515	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1605	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R1606	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1607	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1608	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1609	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R1610	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R1612	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R1613	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1614	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1615	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1712	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1713	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1714	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1715	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1716	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1717	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1718	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1719	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1720	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1721	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1722	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1723	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1724	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1725	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1726	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1727	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1728	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1729	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1730	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1731	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1732	1-216-081-00	METAL CHIP	22K	5%	1/10W
R1733	1-216-081-00	METAL CHIP	22K	5%	1/10W
R1736	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1737	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1738	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1739	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1740	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1741	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1742	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1743	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1748	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1749	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1750	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1751	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1752	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1753	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1754	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1755	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1756	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1757	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1758	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1759	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1760	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1761	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1762	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1763	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1764	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1765	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1766	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1767	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1770	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1771	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1772	1-216-025-91	METAL GLAZE	100	5%	1/10W

Ref. No.	Part No.	Description			Remark
R1773	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1800	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R1801	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1802	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1803	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1804	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1805	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R1806	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R1807	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R1808	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R1813	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1814	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1815	1-216-075-00	METAL CHIP	12K	5%	1/10W
R1816	1-216-075-00	METAL CHIP	12K	5%	1/10W
R1817	1-216-075-00	METAL CHIP	12K	5%	1/10W
R1818	1-216-075-00	METAL CHIP	12K	5%	1/10W
R1819	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1820	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1821	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1823	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1824	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1825	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1826	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1827	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1828	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1829	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1830	1-216-083-00	METAL CHIP	27K	5%	1/10W
R1831	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1832	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1833	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1834	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1835	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1836	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1837	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R1838	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R1839	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R1840	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R1849	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1850	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1851	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1852	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1853	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R1854	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R1855	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R1856	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R1857	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1858	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1859	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R1860	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R1861	1-216-097-91	METAL GLAZE	100K	5%	1/10W
R1862	1-216-097-91	METAL GLAZE	100K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R1863	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1864	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1866	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1871	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1872	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1876	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1877	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1878	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1879	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1880	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1881	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1882	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1883	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1884	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1885	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1886	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1890	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1891	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R1892	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1893	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R1910	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1912	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1913	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1914	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R1931	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1933	1-216-025-91	METAL GLAZE	100	5%	1/10W
R1935	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R1936	1-216-079-00	METAL CHIP	18K	5%	1/10W
R1937	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R1938	1-216-079-00	METAL CHIP	18K	5%	1/10W
R1940	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R1941	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R1942	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R1943	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R1951	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1952	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1953	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1954	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1955	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1956	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1957	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1958	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1959	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1960	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1961	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1962	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1963	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1964	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1965	1-216-073-00	METAL CHIP	10K	5%	1/10W
R1966	1-216-073-00	METAL CHIP	10K	5%	1/10W

Ref. No.	Part No.	Description	Remark
		< VARIABLE RESISTOR >	
RV1100	1-225-394-11	RES, VAR, CARBON 100K (TRIM)(1ch)	
RV1101	1-225-392-11	RES, VAR, CARBON 50K (LOW)(1ch)	
RV1102	1-225-392-11	RES, VAR, CARBON 50K (HIGH)(1ch)	
RV1103	1-225-392-11	RES, VAR, CARBON 50K (MID)(1ch)	
RV1104	1-225-398-11	RES, VAR, SLIDE 20K (1)(1ch)	
RV1105	1-225-391-11	RES, VAR, CARBON 20K (PAN)(1ch)	
RV1106	1-225-390-12	RES, VAR, CARBON 20K (AUX)(1ch)	
RV1200	1-225-394-11	RES, VAR, CARBON 100K (TRIM)(2ch)	
RV1201	1-225-392-11	RES, VAR, CARBON 50K (LOW)(2ch)	
RV1202	1-225-392-11	RES, VAR, CARBON 50K (HIGH)(2ch)	
RV1203	1-225-392-11	RES, VAR, CARBON 50K (MID)(2ch)	
RV1204	1-225-398-11	RES, VAR, SLIDE 20K (2)(2ch)	
RV1205	1-225-391-11	RES, VAR, CARBON 20K (PAN)(2ch)	
RV1206	1-225-390-12	RES, VAR, CARBON 20K (AUX)(2ch)	
RV1300	1-225-394-11	RES, VAR, CARBON 100K (TRIM)(3ch)	
RV1301	1-225-392-11	RES, VAR, CARBON 50K (LOW)(3ch)	
RV1302	1-225-392-11	RES, VAR, CARBON 50K (HIGH)(3ch)	
RV1303	1-225-392-11	RES, VAR, CARBON 50K (MID)(3ch)	
RV1304	1-225-398-11	RES, VAR, SLIDE 20K (3)(3ch)	
RV1305	1-225-391-11	RES, VAR, CARBON 20K (PAN)(3ch)	
RV1306	1-225-390-12	RES, VAR, CARBON 20K (AUX)(3ch)	
RV1400	1-225-394-11	RES, VAR, CARBON 100K (TRIM)(4ch)	
RV1401	1-225-392-11	RES, VAR, CARBON 50K (LOW)(4ch)	
RV1402	1-225-392-11	RES, VAR, CARBON 50K (HIGH)(4ch)	
RV1403	1-225-392-11	RES, VAR, CARBON 50K (MID)(4ch)	
RV1404	1-225-398-11	RES, VAR, SLIDE 20K (4)(4ch)	
RV1405	1-225-391-11	RES, VAR, CARBON 20K (PAN)(4ch)	
RV1406	1-225-390-12	RES, VAR, CARBON 20K (AUX)(4ch)	
RV1500	1-225-395-11	RES, VAR, CARBON 50K/50K (LOW)(5/6ch)	
RV1501	1-225-395-11	RES, VAR, CARBON 50K/50K (HIGH)(5/6ch)	
RV1502	1-225-399-11	RES, VAR, SLIDE 20K/20K (5/6)(5/6ch)	
RV1503	1-225-396-11	RES, VAR, CARBON 20K/20K (BALANCE)(5/6ch)	
RV1700	1-225-393-11	RES, VAR, CARBON 20K (MASTER AUX 2)(5/6ch)	
RV1701	1-225-393-11	RES, VAR, CARBON 20K (MASTER AUX 1)(5/6ch)	
RV1702	1-225-397-11	RES, VAR, CARBON 20K/20K (RETURN 2)	(MASTER ch)
RV1703	1-225-397-11	RES, VAR, CARBON 20K/20K (RETURN 1)	(MASTER ch)
RV1771	1-225-393-11	RES, VAR, CARBON 20K (TRACK 1)(MASTER ch)	
RV1772	1-225-393-11	RES, VAR, CARBON 20K (TRACK 2)(MASTER ch)	
RV1773	1-225-393-11	RES, VAR, CARBON 20K (TRACK 3)(MASTER ch)	
RV1774	1-225-393-11	RES, VAR, CARBON 20K (TRACK 4)(MASTER ch)	
RV1911	1-225-399-11	RES, VAR, SLIDE 20K/20K (MASTER)(MASTER ch)	
RV1931	1-225-397-11	RES, VAR, CARBON 20K/20K (MONITOR)	(MASTER ch)
		< SWITCH >	
SW1100	1-572-714-11	SWITCH, PUSH (INPUT)(1ch)	
SW1101	1-572-714-11	SWITCH, PUSH (ASSIGN 1, 2)(1ch)	
SW1102	1-572-714-11	SWITCH, PUSH (ASSIGN 3, 4)(1ch)	
SW1200	1-572-714-11	SWITCH, PUSH (INPUT)(1ch)	
SW1201	1-572-714-11	SWITCH, PUSH (ASSIGN 1, 2)(2ch)	
SW1202	1-572-714-11	SWITCH, PUSH (ASSIGN 3, 4)(2ch)	
SW1300	1-572-714-11	SWITCH, PUSH (INPUT)(3ch)	
SW1301	1-572-714-11	SWITCH, PUSH (ASSIGN 1, 2)(3ch)	
SW1302	1-572-714-11	SWITCH, PUSH (ASSIGN 3, 4)(3ch)	
SW1400	1-572-714-11	SWITCH, PUSH (INPUT)(4ch)	
SW1401	1-572-714-11	SWITCH, PUSH (ASSIGN 1, 2)(4ch)	
SW1402	1-572-714-11	SWITCH, PUSH (ASSIGN 3, 4)(4ch)	
SW1500	1-572-714-11	SWITCH, PUSH (ASSIGN 1, 2)(5/6ch)	
SW1501	1-572-714-11	SWITCH, PUSH (ASSIGN 3, 4)(5/6ch)	
SW1700	1-572-714-11	SWITCH, PUSH (ASSIGN 1, 2)(MASTER ch)	
SW1701	1-572-714-11	SWITCH, PUSH (ASSIGN 1, 2)(5/6ch)	
SW1702	1-572-714-11	SWITCH, PUSH (ASSIGN 3, 4)(MASTER ch)	
SW1703	1-572-714-11	SWITCH, PUSH (ASSIGN 3, 4)(5/6ch)	
SW1800	1-572-714-11	SWITCH, PUSH (CUE)(MASTER ch)	
SW1801	1-572-714-11	SWITCH, PUSH (3-4)(MASTER ch)	
SW1802	1-572-714-11	SWITCH, PUSH (1-2)(MASTER ch)	
SW1803	1-572-714-11	SWITCH, PUSH (STEREO)(MASTER ch)	
**********			
*	1-653-412-11	MOTOR BOARD	
		**********	
		< CAPACITOR >	
C199	1-164-159-11	CERAMIC 0.1uF	50V
		< CONNECTOR >	
* CN191	1-568-944-11	PIN, CONNECTOR 6P	
CN192	1-770-011-41	CONNECTOR, BOARD TO BOARD 4P	
		< MOTOR >	
M191	A-4660-646-A	MOTOR (LOADING) ASSY	
**********			
*	A-4699-265-A	PANEL BOARD, COMPLETE	
		**********	
*	3-362-478-01	HOLDER (T), LED	
*	4-932-810-11	CUSHION (FL)	
		< CAPACITOR >	
C201	1-124-589-11	ELECT 47uF 20%	16V
C202	1-124-589-11	ELECT 47uF 20%	16V
C203	1-164-159-11	CERAMIC 0.1uF	50V
C204	1-164-159-11	CERAMIC 0.1uF	50V
C205	1-164-159-11	CERAMIC 0.1uF	50V
C206	1-164-159-11	CERAMIC 0.1uF	50V
C207	1-164-159-11	CERAMIC 0.1uF	50V
C208	1-164-159-11	CERAMIC 0.1uF	50V
C209	1-124-598-11	ELECT 22uF 20%	25V
C210	1-162-282-31	CERAMIC 100PF 10%	50V

Ref. No.	Part No.	Description			Remark
C211	1-164-159-11	CERAMIC	0.1uF		50V
C212	1-162-294-31	CERAMIC	0.001uF	10%	50V
C213	1-124-598-11	ELECT	22uF	20%	25V
C217	1-164-159-11	CERAMIC	0.1uF		50V
C218	1-164-159-11	CERAMIC	0.1uF		50V
C219	1-124-598-11	ELECT	22uF	20%	25V
C220	1-162-203-31	CERAMIC	15PF	5%	50V
C221	1-162-203-31	CERAMIC	15PF	5%	50V
C222	1-130-477-00	MYLAR	0.0033uF	5%	50V
C223	1-164-159-11	CERAMIC	0.1uF		50V
C224	1-164-159-11	CERAMIC	0.1uF		50V
C225	1-164-159-11	CERAMIC	0.1uF		50V
C226	1-164-159-11	CERAMIC	0.1uF		50V
C227	1-164-159-11	CERAMIC	0.1uF		50V
C228	1-164-159-11	CERAMIC	0.1uF		50V
C229	1-124-598-11	ELECT	22uF	20%	25V
C235	1-164-159-11	CERAMIC	0.1uF		50V
		< CONNECTOR >			
* CN202	1-564-499-11	PIN, CONNECTOR 6P			
* CN205	1-564-500-11	PIN, CONNECTOR 7P			
		< DIODE >			
D201	8-719-987-63	DIODE 1N4148M			
D202	8-719-987-63	DIODE 1N4148M			
D203	8-719-987-63	DIODE 1N4148M			
D204	8-719-987-63	DIODE 1N4148M			
D205	8-719-987-63	DIODE 1N4148M			
D206	8-719-301-39	DIODE SEL2210S-D (LOCATE MARK)			
D207	8-719-301-39	DIODE SEL2210S-D (AUTO PUNCH)			
D208	8-719-987-63	DIODE 1N4148M			
D209	8-719-987-63	DIODE 1N4148M			
D210	8-719-987-63	DIODE 1N4148M			
D211	8-719-987-63	DIODE 1N4148M			
D212	8-719-987-63	DIODE 1N4148M			
D213	8-719-987-63	DIODE 1N4148M			
D214	8-719-987-63	DIODE 1N4148M			
D215	8-719-025-62	DIODE SML1216W (UNDO)			
D216	8-719-987-63	DIODE 1N4148M			
D217	8-719-987-63	DIODE 1N4148M			
D218	8-719-987-63	DIODE 1N4148M			
D219	8-719-987-63	DIODE 1N4148M			
D220	8-719-987-63	DIODE 1N4148M			
D221	8-719-987-63	DIODE 1N4148M			
D222	8-719-987-63	DIODE 1N4148M			
D223	8-719-301-39	DIODE SEL2210S-D (REC)			
D224	8-719-987-63	DIODE 1N4148M			
D225	8-719-987-63	DIODE 1N4148M			
D226	8-719-987-63	DIODE 1N4148M			
D227	8-719-987-63	DIODE 1N4148M			
D228	8-719-987-63	DIODE 1N4148M			
D229	8-719-987-63	DIODE 1N4148M			

Ref. No.	Part No.	Description	Remark
D230	8-719-301-39	DIODE SEL2210S-D (RHSL)	
D231	8-719-987-63	DIODE 1N4148M	
D232	8-719-987-63	DIODE 1N4148M	
D233	8-719-987-63	DIODE 1N4148M	
D234	8-719-987-63	DIODE 1N4148M	
D235	8-719-987-63	DIODE 1N4148M	
D236	8-719-987-63	DIODE 1N4148M	
D237	8-719-301-44	DIODE SEL2410E-D (PLAY ►)	
		< FLUORESCENT INDICATOR >	
FL201	1-517-584-11	INDICATOR TUBE, FLUORESCENT	
		< IC >	
IC201	8-759-242-60	IC TC74HC05AP	
IC202	8-759-634-97	IC M51953AL	
IC203	8-759-077-16	IC M66004M4FP	
IC204	8-759-445-81	IC HD6473256F10-MDM1	
		< PHOTO INTERUPTER >	
PH201	8-749-924-58	PHOTO COUPLER PC900V	
		< TRANSISTOR >	
Q201	8-729-900-80	TRANSISTOR DTC114ES	
Q202	8-729-422-57	TRANSISTOR UN4111	
Q203	8-729-422-57	TRANSISTOR UN4111	
Q204	8-729-422-57	TRANSISTOR UN4111	
Q205	8-729-422-57	TRANSISTOR UN4111	
Q206	8-729-422-57	TRANSISTOR UN4111	
Q207	8-729-422-57	TRANSISTOR UN4111	
Q208	8-729-422-57	TRANSISTOR UN4111	
		< RESISTOR >	
R201	1-249-409-11	CARBON 220 5% 1/4W	F
R202	1-249-417-11	CARBON 1K 5% 1/4W	F
R203	1-249-421-11	CARBON 2.2K 5% 1/4W	F
R204	1-247-807-31	CARBON 100 5% 1/4W	
R205	1-247-807-31	CARBON 100 5% 1/4W	
R206	1-247-807-31	CARBON 100 5% 1/4W	
R207	1-247-807-31	CARBON 100 5% 1/4W	
R208	1-247-807-31	CARBON 100 5% 1/4W	
R209	1-249-434-11	CARBON 27K 5% 1/4W	
R210	1-247-807-31	CARBON 100 5% 1/4W	
R211	1-247-807-31	CARBON 100 5% 1/4W	
R212	1-249-429-11	CARBON 10K 5% 1/4W	
R213	1-247-807-31	CARBON 100 5% 1/4W	
R214	1-247-807-31	CARBON 100 5% 1/4W	
R215	1-247-807-31	CARBON 100 5% 1/4W	
R216	1-247-807-31	CARBON 100 5% 1/4W	
R217	1-247-807-31	CARBON 100 5% 1/4W	
R218	1-247-807-31	CARBON 100 5% 1/4W	
R219	1-247-807-31	CARBON 100 5% 1/4W	

PANEL **PEDAL** **POWER**

Ref. No.	Part No.	Description			Remark
R220	1-249-408-11	CARBON	180	5%	1/4W F
R226	1-247-807-31	CARBON	100	5%	1/4W
R227	1-249-413-11	CARBON	470	5%	1/4W F
R228	1-249-413-11	CARBON	470	5%	1/4W F
R229	1-249-413-11	CARBON	470	5%	1/4W F
R230	1-249-413-11	CARBON	470	5%	1/4W F
R231	1-249-413-11	CARBON	470	5%	1/4W F
R232	1-249-413-11	CARBON	470	5%	1/4W F
R233	1-249-417-11	CARBON	1K	5%	1/4W
R234	1-249-417-11	CARBON	1K	5%	1/4W
R235	1-249-437-11	CARBON	47K	5%	1/4W
R236	1-249-437-11	CARBON	47K	5%	1/4W
R237	1-249-413-11	CARBON	470	5%	1/4W F
R238	1-249-413-11	CARBON	470	5%	1/4W F
R239	1-249-410-11	CARBON	270	5%	1/4W F
R242	1-249-408-11	CARBON	180	5%	1/4W F
R243	1-249-413-11	CARBON	470	5%	1/4W F
R244	1-249-411-11	CARBON	330	5%	1/4W
R245	1-247-807-31	CARBON	100	5%	1/4W
R246	1-247-807-31	CARBON	100	5%	1/4W
R247	1-247-807-31	CARBON	100	5%	1/4W
R248	1-247-807-31	CARBON	100	5%	1/4W
R249	1-249-429-11	CARBON	10K	5%	1/4W
R250	1-249-429-11	CARBON	10K	5%	1/4W
		< SWITCH >			
S201	1-554-303-21	SWITCH, TACTILE (⏮)			
S202	1-554-303-21	SWITCH, TACTILE (TOP)			
S203	1-554-303-21	SWITCH, TACTILE (AUTO, PUNCH)			
S204	1-554-303-21	SWITCH, TACTILE (SYSTEM, PITCH)			
S205	1-554-303-21	SWITCH, TACTILE (LOCATE MARK)			
S206	1-554-303-21	SWITCH, TACTILE (LOCATE A, E)			
S207	1-554-303-21	SWITCH, TACTILE (REC SELECT 1)			
S209	1-554-303-21	SWITCH, TACTILE (⏭)			
S210	1-554-303-21	SWITCH, TACTILE (REC)			
S211	1-554-303-21	SWITCH, TACTILE (UNDO)			
S212	1-554-303-21	SWITCH, TACTILE (EDIT)			
S213	1-554-303-21	SWITCH, TACTILE (LOCATE IN, DEST.)			
S214	1-554-303-21	SWITCH, TACTILE (LOCATE B, F)			
S215	1-554-303-21	SWITCH, TACTILE (REC SELECT 2)			
S217	1-554-303-21	SWITCH, TACTILE (PLAY ▶)			
S218	1-554-303-21	SWITCH, TACTILE (◀, EXIT, NO)			
S219	1-554-303-21	SWITCH, TACTILE (REPEAT, DISPLAY)			
S220	1-554-303-21	SWITCH, TACTILE (LOCATE OUT)			
S221	1-554-303-21	SWITCH, TACTILE (LOCATE C, G)			
S222	1-554-303-21	SWITCH, TACTILE (REC SELECT 3)			
S223	1-554-303-21	SWITCH, TACTILE (STOP ■)			
S224	1-554-303-21	SWITCH, TACTILE (▶, ENTER, YES)			
S225	1-554-303-21	SWITCH, TACTILE (RHSL.)			
S226	1-554-303-21	SWITCH, TACTILE (LOCATE SHIFT)			
S227	1-554-303-21	SWITCH, TACTILE (LOCATE D, H)			

Ref. No.	Part No.	Description			Remark
S228	1-554-303-21	SWITCH, TACTILE (REC SELECT 4)			
		< VIBRATOR >			
X201	1-577-110-11	VIBRATOR, CRYSTAL (20MHz)			
**********					
*	1-663-331-11	PEDAL BOARD			
		**********			
		< CAPACITOR >			
C230	1-164-159-11	CERAMIC	0.1uF		50V
C231	1-164-159-11	CERAMIC	0.1uF		50V
C232	1-164-159-11	CERAMIC	0.1uF		50V
C233	1-164-159-11	CERAMIC	0.1uF		50V
		< CONNECTOR >			
* CN209	1-564-496-11	PIN, CONNECTOR 3P			
		< JACK >			
J201	1-778-722-11	JACK (LARGE TYPE)(ASSIGN SW 2)			
J202	1-778-722-11	JACK (LARGE TYPE)(ASSIGN SW 1)			
		< RESISTOR >			
R240	1-249-417-11	CARBON	1K	5%	1/4W F
R241	1-249-417-11	CARBON	1K	5%	1/4W F
**********					
*	A-4699-250-A	POWER BOARD, COMPLETE (US,CND)			
		**********			
*	A-4699-272-A	POWER BOARD, COMPLETE (AEP,UK)			
		**********			
*	4-363-146-21	HEAT SINK, V.OUT			
*	4-921-402-41	HEAT SINK			
	7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3			
	7-685-871-01	SCREW +BVTT 3X6 (S)			
		< CAPACITOR >			
C1	1-126-024-11	ELECT	220uF	20%	16V
C2	1-126-024-11	ELECT	220uF	20%	16V
C3	1-164-159-11	CERAMIC	0.1uF		50V
C4	1-164-159-11	CERAMIC	0.1uF		50V
C5	1-164-159-11	CERAMIC	0.1uF		50V
C6	1-164-159-11	CERAMIC	0.1uF		50V
C7	1-126-933-11	ELECT	100uF	20%	10V
C8	1-164-159-11	CERAMIC	0.1uF		50V
C9	1-126-937-11	ELECT	4700uF	20%	16V
C10	1-126-937-11	ELECT	4700uF	20%	16V
C11	1-126-933-11	ELECT	100uF	20%	16V
C12	1-164-159-11	CERAMIC	0.1uF		50V
C13	1-128-547-11	ELECT	6800uF	20%	16V

Ref. No.	Part No.	Description			Remark
C14	1-164-159-11	CERAMIC	0.1uF		50V
C16	1-126-933-11	ELECT	100uF	20%	10V
C17	1-124-903-11	ELECT	1uF	20%	50V
C18	1-164-159-11	CERAMIC	0.1uF		50V
C19	1-164-159-11	CERAMIC	0.1uF		50V
C21	1-115-364-11	ELECT	22000uF	20%	16V
C22	1-126-965-11	ELECT	22uF	20%	50V
C23	1-128-547-11	ELECT	6800uF	20%	16V
C24	1-128-576-11	ELECT	100uF	20%	63V
⚠C33	1-113-920-11	CERAMIC	0.0022uF	20%	250V
⚠C34	1-113-920-11	CERAMIC	0.0022uF	20%	250V
⚠C36	1-113-920-11	CERAMIC	0.0022uF	20%	250V
⚠C37	1-113-916-11	CERAMIC	0.01uF	20%	250V
⚠C38	1-113-916-11	CERAMIC	0.01uF	20%	250V
C39	1-126-933-11	ELECT	100uF	20%	16V
C40	1-126-941-11	ELECT	470uF	20%	25V
		< CONNECTOR >			
CN1	1-564-511-11	PLUG, CONNECTOR 8P			
CN3	1-691-769-11	PLUG (MICRO CONNECTOR) 7P			
* CN4	1-564-514-11	PLUG, CONNECTOR 11P			
CN7	1-564-321-00	PIN, CONNECTOR 2P			
CN8	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P			
CN10	1-564-510-11	PLUG, CONNECTOR 7P			
* CN12	1-564-512-11	PLUG, CONNECTOR 9P			
CN14	1-564-505-11	PLUG, CONNECTOR 2P			
		< DIODE >			
D1	8-719-987-63	DIODE 1N4148M			
D2	8-719-200-02	DIODE 10E2			
D3	8-719-200-02	DIODE 10E2			
D4	8-719-015-13	DIODE UZP-9.1BC-TP			
D6	8-719-043-71	DIODE FMB-24			
D8	8-719-200-02	DIODE 10E2			
D9	8-719-200-02	DIODE 10E2			
D10	8-719-987-63	DIODE 1N4148M			
D11	8-719-987-63	DIODE 1N4148M			
D12	8-719-200-02	DIODE 10E2			
D13	8-719-200-02	DIODE 10E2			
D14	8-719-200-02	DIODE 10E2			
D15	8-719-987-63	DIODE 1N4148M			
		< GROUND TERMINAL >			
EPT2	1-537-770-21	TERMINAL BOARD, GROUND			
		< FUSIBLE RESISTOR >			
⚠FR1	1-212-873-11	FUSIBLE	47	5%	1/4W F
⚠FR2	1-212-873-11	FUSIBLE	47	5%	1/4W F
		< IC >			
IC2	8-759-520-49	IC PQ30RV21			

Ref. No.	Part No.	Description			Remark
IC3	8-759-504-46	IC PQ05RF1			
IC4	8-759-274-37	IC BA3963			
IC5	8-759-701-56	IC NJM78M05FA			
IC6	8-759-701-65	IC NJM79M05FA			
		< COIL >			
L1	1-410-397-21	FERRITE BEAD INDUCTOR			
L3	1-410-397-21	FERRITE BEAD INDUCTOR			
L4	1-410-397-21	FERRITE BEAD INDUCTOR			
		< LINE FILTER >			
⚠LF1	1-424-485-11	FILTER, LINE			
		< THERMISTER >			
⚠PTH1	1-801-696-11	THERMISTOR, POSITIVE (AEP, UK)			
⚠PTH2	1-801-696-11	THERMISTOR, POSITIVE (AEP, UK)			
⚠PTH3	1-801-696-11	THERMISTOR, POSITIVE (AEP, UK)			
⚠PTH4	1-801-696-11	THERMISTOR, POSITIVE (AEP, UK)			
		< TRANSISTOR >			
Q1	8-729-119-76	TRANSISTOR 2SA1175-HFE			
Q2	8-729-119-76	TRANSISTOR 2SA1175-HFE			
Q3	8-729-140-97	TRANSISTOR 2SB734-34			
Q4	8-729-422-57	TRANSISTOR UN4111			
Q5	8-729-900-80	TRANSISTOR DTC114ES			
		< RESISTOR >			
R2	1-249-425-11	CARBON	4.7K	5%	1/4W F
R3	1-249-435-11	CARBON	33K	5%	1/4W
R4	1-249-429-11	CARBON	10K	5%	1/4W
R5	1-249-437-11	CARBON	47K	5%	1/4W
R6	1-247-807-31	CARBON	100	5%	1/4W
R7	1-249-433-11	CARBON	22K	5%	1/4W
R8	1-249-429-11	CARBON	10K	5%	1/4W
R9	1-247-843-11	CARBON	3.3K	5%	1/4W
R10	1-249-413-11	CARBON	470	5%	1/4W F
R11	1-249-433-11	CARBON	22K	5%	1/4W
R12	1-249-421-11	CARBON	2.2K	5%	1/4W F
R13	1-249-437-11	CARBON	47K	5%	1/4W
R14	1-249-441-11	CARBON	100K	5%	1/4W
		< SWITCH >			
⚠S1	1-572-267-51	SWITCH, PUSH (AC POWER)(1 KEY)(POWER)			

****

MISCELLANEOUS
****

5	1-776-833-11	WIRE (FLAT TYPE) (18 CORE)
6	1-776-834-11	WIRE (FLAT TYPE) (30 CORE)
⚠19	1-575-651-21	CORD, POWER (AEP,UK)
⚠19	1-590-836-11	CORD, POWER (US,CND)
⚠357	8-583-009-11	OPTICAL PICK UP KMS-210A/J-N

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
FL201	1-517-584-11	INDICATOR TUBE, FLUORESCENT	
HR901	1-500-304-21	HEAD, OVER WRITE	
M1	1-698-909-11	FAN, DC	
M101	A-4660-651-A	MOTOR (SLED) ASSY	
M102	A-4660-650-A	CHASSIS ASSY, BU (SPINDLE)	
M191	A-4660-646-A	MOTOR (LOADING) ASSY	
S102	1-762-148-11	SWITCH, PUSH (2 KEY)	
⚠T1	1-429-725-11	TRANSFORMER, POWER (AEP,UK)	
⚠T1	1-429-942-11	TRANSFORMER, POWER (US,CND)	

****

ACCESSORIES & PACKING MATERIALS
****

3-858-580-11 MANUAL, INSTRUCTION (ENGLISH,FRENCH,GERMAN)

****

****
HARDWARE LIST
****

#1	7-685-649-79	SCREW +BVTP 3X14 TYPE2 N-S
#2	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S
#3	7-685-871-01	SCREW +BVTT 3X6 (S)
#4	7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3
#5	7-685-104-19	SCREW +P 2X6 TYPE2 NON-SLIT
#6	7-685-645-79	SCREW +BVTP 3X6 TYPE2 N-S
#7	7-621-773-86	SCREW +BVTT 2.6X4 (S)
#8	7-621-775-20	SCREW +B 2.6X5
#9	7-621-255-25	SCREW +PTT 2X4 (S)
#10	7-621-770-67	SCREW +PWH 2.6X6
#11	7-685-105-19	TPG +P 2X8, TYPE 2, NON-SLIT
#12	7-627-852-08	SCREW,PRECISION +P 1.7X2.5
#13	7-682-551-04	SCREW +P 3X14

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

9-960-807-11

Sony Corporation
Home A&V Products Company

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MDM-X4

SONY

SERVICE MANUAL

US Model
Canadian Model
AEP Model
UK Model

SUPPLEMENT-1

File this supplement with the service manual.

Subject : TEST MODE AND ELECTRICAL ADJUSTMENTS

• Test Mode and Electrical Adjustments

In this unit, the test mode and electrical adjustments of the MD mechanism (MDM-2CR) cannot be performed.
To perform the test mode or electrical adjustments, connect the tool set (MDS-JA3ES) to the MD mechanism of the unit.
Perform the test mode and electrical adjustment procedures described in the Service Manual for MDS-JA3ES.

Take note of the following differences in the laser power adjustments.

• Difference in Numbers in Laser Power Adjustment

MDS-JA3ES display	MDS-JA3ES adjustment values	MDM-X4 adjustment values	Comment
LD$4B = 3.5mW	3.4 (+0.1/–0) mW	3.7 (+0.1/–0) mW	(MO-Read)
LD$96 = 7.0mW	7.0 (±0.3) mW	7.6 (±0.3) mW	(MO-Write)
LD$0F = 0.7mW	0.7 (±0.1) mW	0.76 (±0.1) mW	(MO-Read)

The IOP digital voltmeter value during MO-write is also 1.095 times ± 10% of the value on the pickup label.

9-960-807-82

Sony Corporation
Home A&V Products Company

97L091610-1D

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MDM-X4

SONY

SERVICE MANUAL

US Model
Canadian Model
AEP Model
UK Model

CORRECTION-1

Correct your service manual as shown below.

Page	INCORRECT				CORRECT			
	Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
120	52	A-4699-270-A	JACK (1) BOARD, COMPLETE		52	A-4699-271-A	JACK (2) BOARD, COMPLETE	
	53	A-4699-271-A	JACK (2) BOARD, COMPLETE		53	A-4699-270-A	JACK (1) BOARD, COMPLETE	

(RPC-99001)

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