SONY

MULTI ACCESS VIDEO DISK RECORDER

MAV-555

DISK RECORDER CONTROL PANEL
BKMA-505

INPUT AND OUTPUT PROCESSOR BOARDS
BKMA-510

A/D CONVERTER BOARD
BKMA-511

D/A CONVERTER BOARD
BKMA-512

ANALOG AUDIO EXPANSION UNIT
BKMA-570

MAINTENANCE MANUAL
Volume 1 1st Edition

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

MAV-555 (SY)	Serial No. 10001 and Higher
BKMA-505 (SY)	Serial No. 10001 and Higher
BKMA-510 (SY)	Serial No. 10001 and Higher
BKMA-511 (SY)	Serial No. 10001 and Higher
BKMA-512 (SY)	Serial No. 10001 and Higher
BKMA-570 (SY)	Serial No. 10001 and Higher
BKMA-570 (J)	Serial No. 30001 and Higher

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

Vorsicht!

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.

Ersatz nur durch denselben oder einen vom Hersteller empfohlenen ähnlichen Typ.
Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.
Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

ADVARSEL!

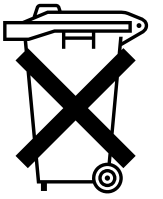
Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

Voor de klanten in Nederland

Dit apparaat bevat een MnO_2-Li batterij voor memory back-up.

Raadpleeg uw leverancier over de verwijdering van de batterij op het moment dat u het apparaat bij einde levensduur afdankt.

Gooi de batterij niet weg. maar lever hem in als KCA.



Bij dit produkt zijn batterijen geleverd. Wanneer deze leeg zijn, moet u ze niet weggooien maar inleveren als KCA.

Für Kunden in Deutschland

Entsorgungshinweis: Bitte werfen Sie nur entladene Batterien in die Sammelboxen beim Handel oder den Kommunen. Entladen sind Batterien in der Regel dann, wenn das Gerät abschaltet und signalisiert "Batterie leer" oder nach längerer Gebrauchsdauer der Batterien "nicht mehr einwandfrei funktioniert". Um sicherzugehen, kleben Sie die Batteriepole z.B. mit einem Klebestreifen ab oder geben Sie die Batterien einzeln in einen Plastikbeutel.

Attention-when the product is installed in Rack:

1. **Prevention against overloading of branch circuit**
   When this product is installed in a rack and is supplied power from an outlet on the rack, please make sure that the rack does not overload the supply circuit.

2. **Providing protective earth**
   When this product is installed in a rack and is supplied power from an outlet on the rack, please confirm that the outlet is provided with a suitable protective earth connection.

3. **Internal air ambient temperature of the rack**
   When this product is installed in a rack, please make sure that the internal air ambient temperature of the rack is within the specified limit of this product.

4. **Prevention against achieving hazardous condition due to uneven mechanical loading**
   When this product is installed in a rack, please make sure that the rack does not achieve hazardous condition due to uneven mechanical loading.

Table of Contents

Manual Structure

1. Error Message/Maintenance Functions

2. Service Overview

3. Parts and Board Replacement

4. Electrical Adjustment

5. Circuit Description

Manual Structure

Purpose of this manual

This manual is the maintenance manual volume 1 of the MAV-555 Multi Access Video Disk Recorder.

This manual is intended for use by trained system and service engineers, and describes the information that premise the service based on components replacement (error message/maintenance functions, service overview, parts and board replacement, electrical alignment, and circuit descriptions).
Moreover, describes the information for the following control panel, optional boards, and so on

- Disk Recorder Control Panel BKMA-505
- Input and Output Processor Boards BKMA-510
- A/D Converter Board BKMA-511
- D/A Converter Board BKMA-512
- Analog Audio Expansion Unit BKMA-570

Contents

The maintenance manual consists of “Volume 1” and “Volume 2”.
The following is a summary of all the section for understanding the contents of maintenance manual.

Maintenance Manual Volume 1

Section 1 Error Message/Maintenance Functions

This section describes the menu and error message, etc.

Section 2 Service Overview

This section describes the setting when the circuit board is replaced.

Section 3 Parts and Board Replacement

This section describes the removal of cabinet, replacement of main parts and boards.

Section 4 Electrical Alignment

This section describes the electrical alignment when maintenance.

Section 5 Circuit Descriptions

This section describes the circuit description of main boards

Maintenance Manual Volume 2

Section 1 Spare Parts
This section describes spare parts.

Section 2 Semiconductor Pin Assignments
This section describes the pin assignment of semiconductors.

Section 3 Block Diagrams
This section describes the overall block diagram and main board block diagrams.

Section 4 Schematic Diagrams
This section describes the schematic diagrams for circit baords and frame wiring.

Section 5 Board Layouts
This section describes the board layout for circuit board.

Related manuals

Besides this maintenance manual, the following manuals are available for the MAV-555.

- **MAV-555 Operation Manual (supplied with MAV-555)**
  This manual describes the operation and function of the MAV-555.
- **BKMA-505 Operation Manual (supplied with BKMA-505)**
  This manual describes the operation and function of the BKMA-505.
- **MAV-555 Installation Manual (Supplied with MAV-555)**
  This manual describes the information regarding the installation of the MAV-555.
- **BKMA-505 Installation Manual (Supplied with BKMA-505)**
  This manual describes the information regarding the installation of the optional control panel BKMA-505.
- **BKMA-510 Installation Manual (Supplied with BKMA-510)**
  This manual describes the information regarding the installation of the optional boards BKMA-510.
- **BKMA-511 Installation Manual (Supplied with BKMA-511)**
  This manual describes the information regarding the installation of the optional board BKMA-511.
- **BKMA-512 Installation Manual (Supplied with BKMA-512)**
  This manual describes the information regarding the installation of the optional board BKMA-512.
- **BKMA-570 Installation Manual (Supplied with BKMA-570)**
  This manual describes the information regarding the installation of the optional analog audio expansion unit BKMA-570.

Trademarks

- Ethernet is a registered trademark of Xerox Corporation.
- Windows is a registered trademark of Microsoft Corporation.
- IBM is a registered trademark of International Business Machine Inc.

Section 1
Error Message/Maintenance Functions

1-1. Error Message

This section describes the error messages that are displayed on the 7-segment LED on the board.

Board name	Ref.	
DM-120	ND600	For R1 (R2) port
DM-120	ND601	For P1 (P2) port
FM-68	ND100	
TM-40	ND400	
EM-1	ND300	

1-1-1. Normal Indication

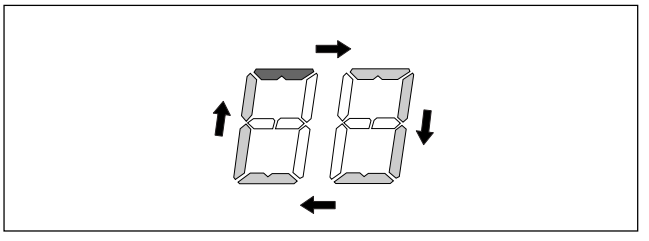
Note

The indication of the 7-segment LED changes as follows when the main power is turned on.

1. Boot-up indication
   The LED displays from “9” to “1” during booting.
2. Version indication
   When boot-up has completed, the version and release data are displayed alternately.
3. Normal indication
   When the version indication has completed, the normal indication is displayed.

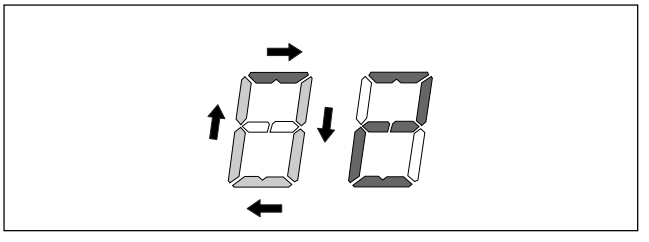
For FM-68, TM-40 and EM-1 boards

The segments illuminate in turn in clockwise order.



For DM-120 board

Higher digits : The segments illuminate in turn in clockwise order.
Lower digits : The operating status of the port is displayed.



Operating status of port

0 CLOSE (when UNLOAD has completed)
1 STOP (including UNLOAD processing)
2 REC
3
4 STILL
5 JOG
6 PLAY
7 VAR
8 SHUTTLE

1-1-2. Error Indication

If an error is detected during boot-up, the error message “EM Board Not Respond” appears on the front panel. If this message appears, restart the MAV-555. If the error message appears again, check the 7-segment LED on the following boards.

Board	Indication	Contents
DM-120	EE	FPGA Config Error
	EF	SDI Encoder Reset Error
TM-40	01	DM1 Communication Error
	02	DM2 Communication Error
	10	FM Communication Error
	20	EM Communication Error
EM-1	-F	Dual Port Memory Read/ Write Inspection Error
	-E	OS Resource Generation Error
	-A	Initialize Timeout Error
	EE	Video/Audio-Router Initialization Error

1-2. Acquiring the Logs

This section describes how to acquire the logs using the macro function of Tera Term.

Notes

- Before starting to acquire the logs, set all ports to the stop mode.
- If an error occurs, acquire the logs and the memory contents of the FM-68 board.

In this manual, the letters to be entered are differentiated from those that appear on the display, as shown in the example below when using a personal computer.

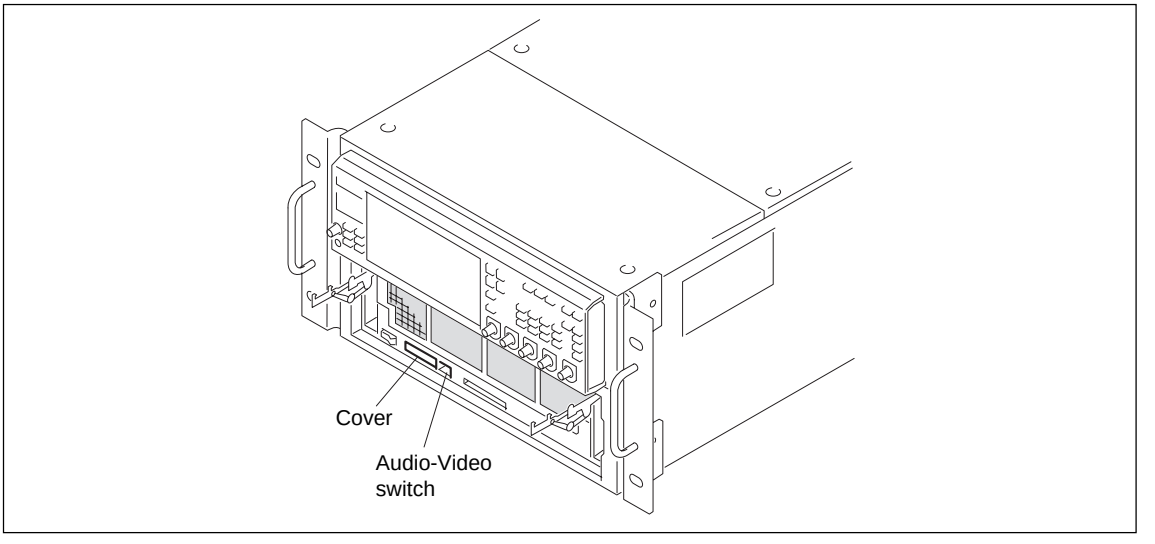
Font and style of letters	Display example	Reference for distinction
Times font	UTY>	Automatically displayed message by a program
Helvetica regular (Italic)	*SDC-UTY*	Characters to be entered
Symbols	⏎	Enter key
	␣	Space equivalent to a character

Table of Required Files

c:\Program File\TTERMPRO\TTERMP32.EXE : Tera Term Pro execution file
c:\Program File\TTERMPRO\LogMacro\Log_PU.ttl : Log acquiring macro of PU-109 board
c:\Program File\TTERMPRO\LogMacro\Log_ALL.ttl : Log acquiring macro of five boards (excluding PC-109)
c:\Program File\TTERMPRO\LogMacro\Log_DM1.ttl : Log acquiring macro of DM-120 board (standard installation)
c:\Program File\TTERMPRO\LogMacro\Log_DM2.ttl : Log acquiring macro of DM-120 board (option)
c:\Program File\TTERMPRO\LogMacro\Log_FM.ttl : Log acquiring macro of FM-68 board
c:\Program File\TTERMPRO\LogMacro\Log_TM.ttl : Log acquiring macro of TM-40 board
c:\Program File\TTERMPRO\LogMacro\Log_EM.ttl : Log acquiring macro of EM-1 board
c:\Program File\TTERMPRO\GCD.ini :

Connection (PU-109 board)

1. Remove the cover of the system top panel and connect the Ethernet cross cable to the Ether terminal.



2. Connect the other connector of the Ethernet cross cable to a personal computer.
3. Set the Audio-Video switch of the system set-up panel.

Connection (excluding PU-109 board)

Connect the Ethernet terminal of the rear panel to a personal computer using an Ethernet cross cable.

Preparation

1. Set the IP address and the sub-net mask of the MAV-555 to the factory settings.

   Notes

   - The IP address and sub-net mask can be confirmed in set-up menu No. 220.
   - The factory settings are as follows:
     IP address : 192.168.0.1
     Sub-net mask : 255.255.255.0

2. Set the IP address and the sub-net mask of the personal computer as follows:
   IP address : 192.168.0.2
   Sub-net mask : 255.255.255.0
3. Start up the personal computer.
4. Wait for the MS-DOS prompt (or command prompt) to appear.
5. Input [ping 192.168.0.1].

```
Microsoft(R) Windows 95
(C)Copyright Microsoft Corp 1981-1995.

C:\>ping␣192.168.0.1↵
```

6. Confirm that the reply is returned normally.
   Message example (normally)

```
C:\>ping␣192.168.0.1↵

Pinging 192.168.0.1 with 32 bytes of data:

Reply from 192.168.0.1: bytes=32 time=2ms TTL=254
Reply from 192.168.0.1: bytes=32 time=1ms TTL=254
Reply from 192.168.0.1: bytes=32 time<10ms TTL=254
Reply from 192.168.0.1: bytes=32 time=1ms TTL=254

C:\>
```

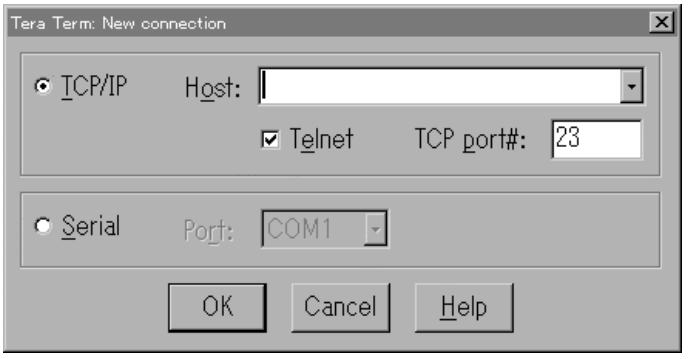
   Message example (abnormally)

```
C:\>ping␣192.168.0.1↵

Pinging 192.168.0.1 with 32 bytes of data:

Request timed out
Request timed out
Request timed out
Request timed out

C:\>
```

7. If the reply is not returned normally, input [arp -d 192.168.0.1] and perform from step 5 again.
   (There can be a case that the APR table information is left remained when two or more MAV-555s are connected continuously.)

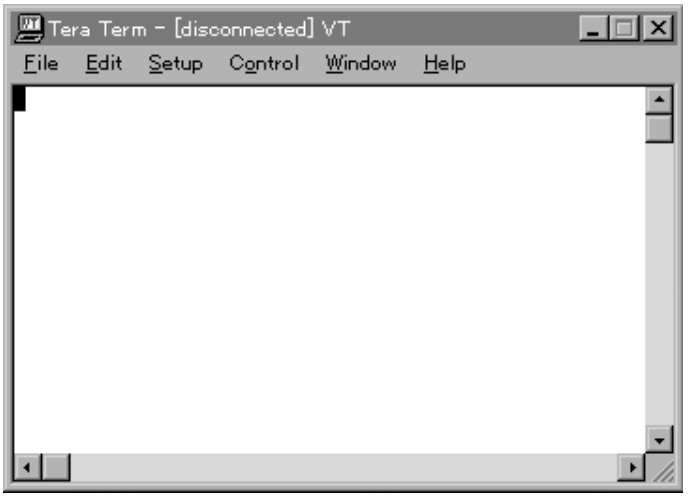
Procedure for acquiring log

1. Start up Tera Term (Tera Term Pro Ver.2.3 or higher).
2. When the Tera Term: New connection dialog box appears, click “Cancel”.



Confirm that “Tera Term – [disconnected]” is displayed in the title bar.

3. Select [Control] – [Macro] from the top menu.



4. Select [Log_**.ttl] file.
   Note
   To acquire all logs of the board, select [Log_ALL.ttl] file.
   The dialog box asks whether to acquire the DM2 (option) log. If this is not to be acquired, click “No”.

5. The log is acquired automatically and saved to a file.
   File name (example)
   LogFM_1999-07-25: Log of FM-68 board (downloaded on July 25, 1999)
   LogPuV_1999-07-25: Log of PU-109 board and video (downloaded on July 25, 1999)
   Note
   Acquiring the same log twice or more on the same day rewrites the file because the file name is the same as the previous one.

6. Quit Tera Term.

1-3. Backing Up and Restoring the Contents of Memory (FM-68 board)

This section describes how to back up or restore the memory contents (IC350 to IC357, IC400 to IC407) of the FM-68 board from the MS-DOS prompt (or command prompt).

Note

- The file management information (file system) and the set-up information are stored in these memories. Before operating, back up the contents.
  - When replacing the FM-68 board
  - When replacing the memories (IC350 to IC357, IC400 to IC407) of the FM-68 board
  - When replacing the back-up battery of the FM-68 board

- Backing-up is possible when the file is loaded. However, when backing up for restoration when replacing the battery, unload the file and back it up. (If the file is not unloaded, an error occurs during restoration so that restoration cannot be performed.)
- The contents of SRAM are retained by the super capacitor when the battery is replaced. If the operation does not take a long time (sixty minutes or less), restoration does not need to be performed after replacing the battery.
  If the following symptoms occur, restore the contents.
  Data or time is not correct.
  The file list does not appear on the display of the control panel.
  The settings of the set-up menu have returned to the factory settings.

Connection

Connect the Ether terminal of the rear panel to a personal computer using an Ethernet cross cable.

Preparation

1. Set the IP address of the MAV-555 to the factory setting.
   Notes
   - The IP address and sub-net mask can be confirmed in set-up menu No. 220.
   - The factory settings are as follows:
     IP address : 192.168.0.1
     Sub-net mask : 255.255.255.0

2. Set the IP address and the sub-net mask of the personal computer as follows:
   IP address : 192.168.0.2
   Sub-net mask : 255.255.255.0
3. Start up the personal computer.
4. Wait for the MS-DOS prompt (or command prompt) to appear.
5. Input [ping 192.168.0.1].
6. Confirm that the reply is returned normally.
7. If the reply is not returned normally, input [arp -d 192.168.0.1] and perform from step 5 again.
   (There can be a case that the APR table information is left remained when two or more MAV-555s are connected continuously.)

Backup procedure

1. Go to the MS-DOS prompt (or command prompt).
2. Enter the directory in which the back-up data is stored. (e.g.: cd\temp)
3. Input [ftp 192.168.0.1] and press the ENTER key.
4. When prompted for the User ID, input [Glider] and press the ENTER key.
5. When prompted for the password, input [Grydar] and press the ENTER key.
6. When the FTP connection is completed and [ftp>] is displayed, input [binary] and press the ENTER key to switch to the binary mode.
7. Input [get _SRAM_ALLfmbackup.fs] and press the ENTER key.
   (Input the new backup file name in the underlined characters.)
8. Input [bye], press the ENTER key, and release the FTP connection.
9. Check that the capacity of the back-up file is 8 MB (8,388,608 bytes).

Example of screen

```
c:\> cd␣\temp
c:\temp> ftp␣192.168.0.1
Connected to 192.168.0.1
220 Welcome to 192.168.0.1
User (192.168.0.1 : (none)): Glider
331 User name okay, need password.
Password : Grydar
230 Password okay.
ftp> binary
200 TYPE Command Okay!!
ftp> get␣_SRAM_ALL␣fm990725.fs
220 PORT Command Successful
150 Opening data connection for.
226 Transfer complete.
Please login with USER and PASS.
8388608 bytes sent in 17.08 seconds (491.14 Kbytes/sec)
ftp> bye
221 Good Bye See You
```

Note

The password is not displayed.

Restoration procedure

1. Go to the MS-DOS prompt (or command prompt).
2. Enter the directory in which the back-up data is stored. (e.g.: cd\temp)
3. Input [ftp 192.168.0.1] and press the ENTER key.
4. When prompted for the User ID, input [Glider] and press the ENTER key.
5. When prompted for the password, input [Grydar] and press the ENTER key.
6. When the FTP connection is completed and [ftp>] is displayed, input [binary] and press the ENTER key to switch to the binary mode.
7. Input [put fmbackup.fs _SRAM_ALL] and press the ENTER key.
   (Input the new backup file name in the underlined characters.)
8. Input [bye], press the ENTER key, and release the FTP connection.
9. Turn off the main power of the MAV-555.

Note

To restart quickly, execute [027-FAST REBOOT] of the set-up menu.

Example of screen

```
c:\> cd␣\temp
c:\temp> ftp␣192.168.0.1
Connected to 192.168.0.1
220 Welcome to 192.168.0.1
User (192.168.0.1 : (none)) : Glider
331 User name okay, need password.
Password : Grydar
230 Password okay.
ftp> binary
200 TYPE Command Okay!!
ftp> put␣fm990725.fs␣_SRAM_ALL
220 PORT Command Successful
150 Opening data connection for.
226 Transfer complete.
Please login with USER and PASS.
8388608 bytes sent in 17.08 seconds (491.14 Kbytes/sec)
ftp> bye
221 Good Bye See You
```

Note

The password is not displayed.

1-4. Upgrading the Software (excluding PU-109 board)

This section describes how to upgrade the software of each board (FM-68, TM-40, DM-120, EM-1) using the software download tool (GCD loader).

Connection

Connect the Ethernet cable to the Ether terminal of the rear panel.

Table of required files (example)

c:MAV-555\GCDloader.exe :	Software download tool
c:MAV-555\Fm\FM_V101.hex :	Software module of FM-68 board (Ver. 1.01)
c:MAV-555\Fm\FM_V102.hex :	Software module of FM-68 board (Ver. 1.02)
c:MAV-555\Tm\TM_V101.hex :	Software module of TM-40 board (Ver. 1.01)
c:MAV-555\Tm\TM_V102.hex :	Software module of TM-40 board (Ver. 1.02)
c:MAV-555Dm\DM_V101.hex :	Software module of DM-120 board (Ver. 1.01)
c:MAV-555\Dm\DM_V102.hex :	Software module of DM-120 board (Ver. 1.02)
c:MAV-555\Em\EM_V101.hex :	Software module of EM-1 board (Ver. 1.01)
c:MAV-555\Em\EM_V102.hex :	Software module of EM-1 board (Ver. 1.02)

Preparation

1. Confirm that [019-SYSTEM OPERATE CONFIGURATION] of the set-up menu is set to [PANEL]. If not, change the setting and restart the MAV-555.
2. Set all ports to the unload.
3. Set the IP address and the sub-net mask of the MAV-555 to the factory settings.

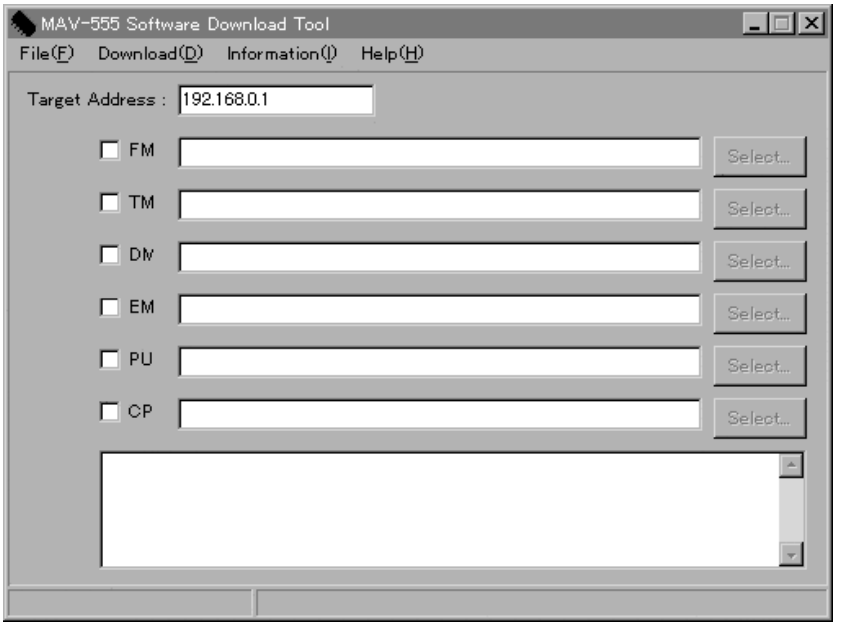
   Notes

   - The IP address and sub-net mask can be confirmed in set-up menu No. 220.
   - The factory settings are as follows:
     IP address : 192.168.0.1
     Sub-net mask : 255.255.255.0

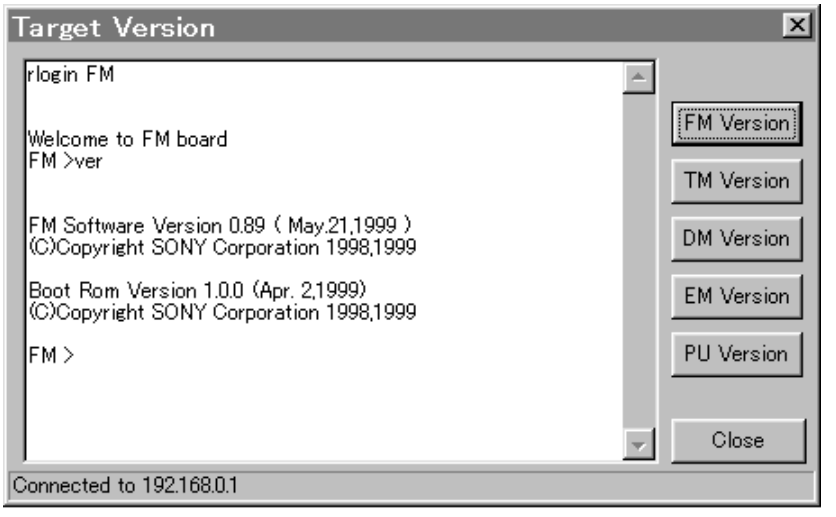
4. Set the IP address and the sub-net mask of the personal computer as follows:
   IP address: 192.168.0.2
   Sub-net mask: 255.255.255.0
5. Start up the personal computer.
6. Wait for the MS-DOS prompt (or command prompt) to appear.
7. Input [ping 192.168.0.1].
8. Confirm that the reply is returned normally.
9. If the reply is not returned normally, input [arp -d 192.168.0.1] and perform from step 7 again. (When downloading to several MAV-555s continuously, the information of the ARP table may remain.)

Download procedure

1. Start up the GCD loader.



2. Input the Target Address.
3. Select [Information] – [Target Version] from the top menu.
4. Click the Version button of each board and confirm the current version.

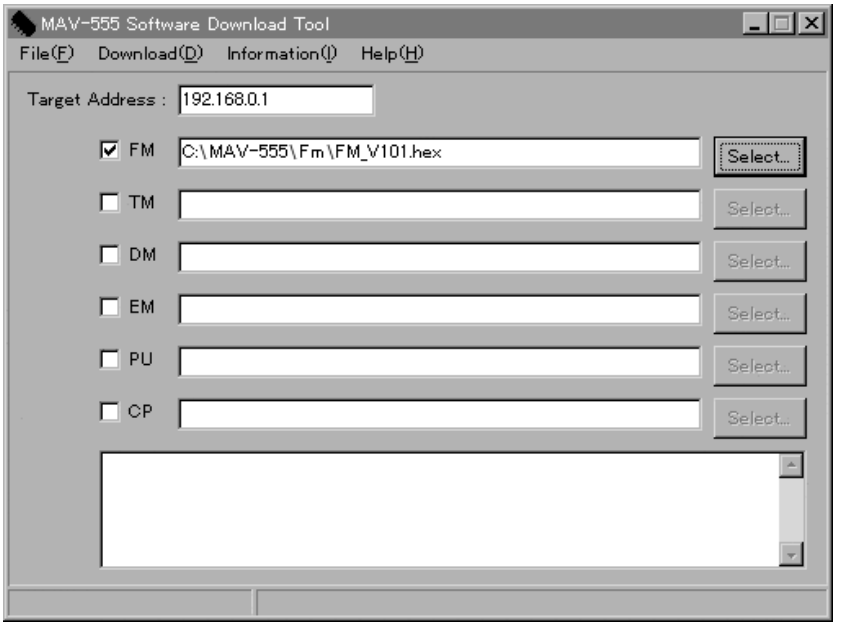


5. Press the Close button.
6. Click the check box of the board to be downloaded.

Note

The upgrade can be performed using the above procedure for the following boards only:
FM-68, TM-40, DM-120, EM-1

7. Click the Select button to select the file to be downloaded.



8. Perform steps 6 and 7 for all boards to be upgraded.
9. Select [Download] – [Start] from the top menu and click the OK button of the pop-up window.
10. Confirm that the download is completed and the MAV-555 is restarted automatically.
11. Perform steps 1 to 3.
12. Click the Version button of each board and confirm that the version has changed.

1-5. Upgrading the Software (PU-109 board)

This section describes how to upgrade the software of the PU-109 board using the macro function of Tera Term.

Video

Connection

1. Remove the cover of the system set-up panel and connect the Ethernet cross cable to the Ether terminal.
2. Connect the other connector of the Ethernet cross cable to a personal computer.
3. Connect CN102 of the PU-109 board to the personal computer using the RS-232C tool cable.
4. Set the Audio-Video switch of the system set-up panel to Video.

Table of required files

c:\Program File\TTERMPRO\TTERMP32.EXE :	Tera Term Pro execution file
c:\Program File\TTERMPRO\DownloadMacro/download.ttl :	Software download macro
c:\tftproot\ram.hex :	Software module of FM-68 board

Preparation

1. Set S400-7 of the PU-109 board to ON (lower side).
2. Install the TFTP Server to your personal computer. (Set the root directory of TFTP to c:\tftproot.)
3. Copy the three files shown the “Table of required files” to your computer.
4. Set the IP address and the sub-net mask of the MAV-555 to the factory settings.

   Notes

   - The IP address and sub-net mask can be confirmed in set-up menu No. 220.
   - The factory settings are as follows:
     IP address : 192.168.0.1
     Sub-net mask : 255.255.255.0

5. Set the IP address and the sub-net mask of the personal computer as follows:
   IP address : 192.168.0.2
   Sub-net mask : 255.255.255.0
6. Start up the personal computer.
7. Wait for the MS-DOS prompt (or command prompt) to appear.
8. Input [ping 192.168.0.1].
9. Confirm that the reply is returned normally.
10. If the reply is not returned normally, input [arp -d 192.168.0.1] and perform from step 8 again. (When downloading to several MAV-555s continuously, the information of the ARP table may remain.)
11. Start up the TFTP Server.

Download procedure

1. Start up Tera Term (Tera Term Pro Ver. 2.3 or higher).
2. When the Tera Term: New connection dialog box appears, click [Cancel].
   Confirm that “Tera Term – [disconnected]” is displayed in the title bar.
3. Select [Control] – [Macro] from the top menu.
4. Select [download.ttl] file.
5. Turn off the main power of the MAV-555 again, and restart the MAV-555.
6. The download is started automatically.
7. Confirm that the version of the software has changed.

Audio

Preparation

1. Connect CN801 of the PU-109 board and a personal computer using the RS-232C tool cable.
2. Set the Audio-Video switch of the system set-up panel to Audio.
3. Set S1101-7 of the PU-109 board to ON (lower side).
4. Set the S400-7 of the PU-109 board to OFF (upper side).

Download procedure

Perform the download procedure of Video from steps 1 to 7.

Setting after download is completed

Set S1101-7 of the PU-109 board to OFF (upper side).

Section 2
Service Overview

2-1. Setup when Replacing Board, Memory or Battery is Replaced

The required procedures are described below when the board, memory on board or battery is replaced.

AD-160 Board

Adjustment after board is replaced

A/D Video Level Adjustment (Refer to Section 4-6-4.)

DA-136 Board

Adjustment after board is replaced

D/A Video Level Adjustment (Refer to Section 4-5-2.)

FM-68 Board

Precaution when replacing battery

Even though contents of the RAMs are backed up by the super capacitor, replace the battery in a short time (60 minutes or less).

Procedure before replacing board or memories (IC350 to IC357 and IC400 to IC407)

1. Unload the file.
2. Back up the memory contents. (Refer to Section 1-3.)

Procedure after board or memory is replaced

Restore the memory contents. (Refer to Section 1-3.)
When the board is replaced, turn on the switch S103 (BATTERY).

PU-109 Board

Note

The HDD error information is stored in the RAMs (IC304 to IC306) on the PU-109 board.
This information cannot be backed up before initiating to replace the PU-109 board. Be careful of the followings when replacing the board, memory or battery.

Precaution when replacing battery

Contents of the RAM are backed up by the super capacitor. Replace the battery in a short time (60 minutes or less).

Precautions when replacing board or memories (IC303 to IC306)

- When replacing the board or RAMs, contents of the RAMs are erased. Erasing the HDD error information may prevent the HDD from being read or written normally.
- When the board is replaced, turn on the switch S300 (BATTERY).

Section 3
Parts and Board Replacement

3-1. Cautions before Servicing

The hard disk drives (HDD) are installed in the MAV-555.
The HDD is a precision part. The causes such as shock, vibration and static electricity to the unit, and the conditions of temperature and humidity may damage HDD or its data.
Before servicing, read the following cautions carefully, and perform the servicing with extra care.

Cautions about Shock and Vibration

When transporting and moving

- Pack the unit using the packaging materials specified by the manufacturer.
- Use a proper cart.
- Put a cushion* on the cart.
- Avoid rough routes, and manage the cart gently.

When placing on a floor or table

- Put a cushion* on stable and horizontal place, and put the MAV-555 on it gently.
- Do not place the unit near vibrating equipment.

For the MAV-555 and HDD

- Never hit the HDD by a tool, and drop it on the MAV-555.

Take extra care

- Never give vibration or shock to the HDD during the power on, or within about 30 seconds after turning off the power.

*Cushion : Polyethylene foam (density : 38 kg/m^3, surface intrinsic resistance : 10^{11} to 10^{12} Ω, thickness : 50 mm) or equivalent.

Cautions about Removal/Installation of the MAV-555 from Rack

- Never give shock to all the rack mounted unit which has a HDD.
- Be sure to turn off the power of the rack mounted unit which has a HDD.

Cautions about Static Electricity

- Keep static-producing items such as plastics (air cap and others) away from the working area.
- When deal with the HDD, must be put on the earth-band to establish a ground.

Cautions about Temperature and Humidity

- Temperature and humidity of storage and operating conditions must be kept within the correct specified range.
- Never turn on the power with the cabinet is removed in consideration of the air-cooling effect. When turn on the power without installing the cabinet, it is essential that the unit should be covered with the substitute for the cabinet.

Cautions when an Error Appears in HDD

- Treat the MAV-555 conform to the above cautions, even when an error appeared.
- Keep the MAV-555 in the condition in which the error appeared, and write down the details of the error.

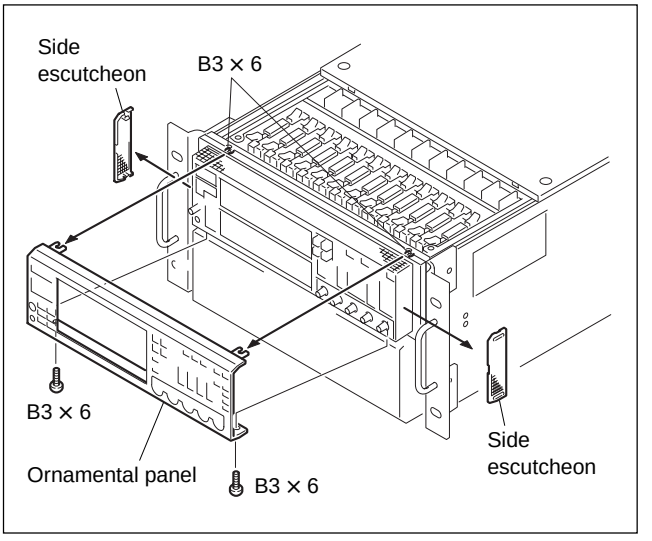
3-2. Removing the Cabinet

Note

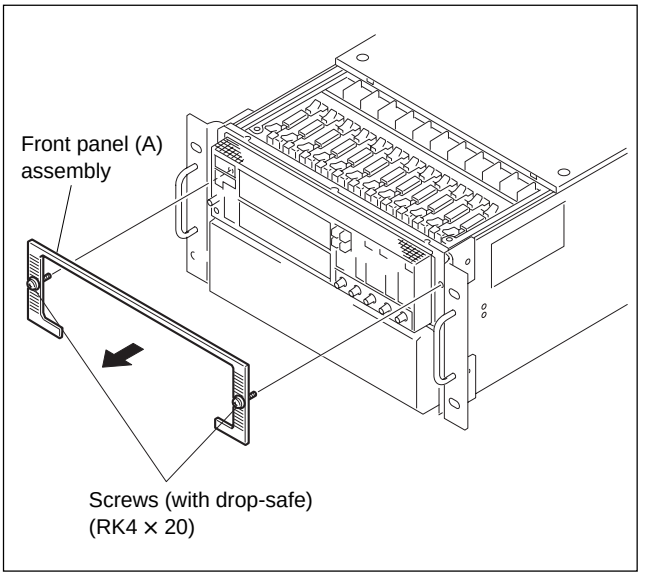
Be sure to turn off the main power before starting to remove the cabinet.

3-2-1. Removing the Front Panel

1. Remove the top plate B. (Refer to Section 3-2-2.)
2. Loosen the two upper screws of the ornamental panel, remove the two lower screws, then remove the ornamental panel.
3. Remove the side escutcheon.



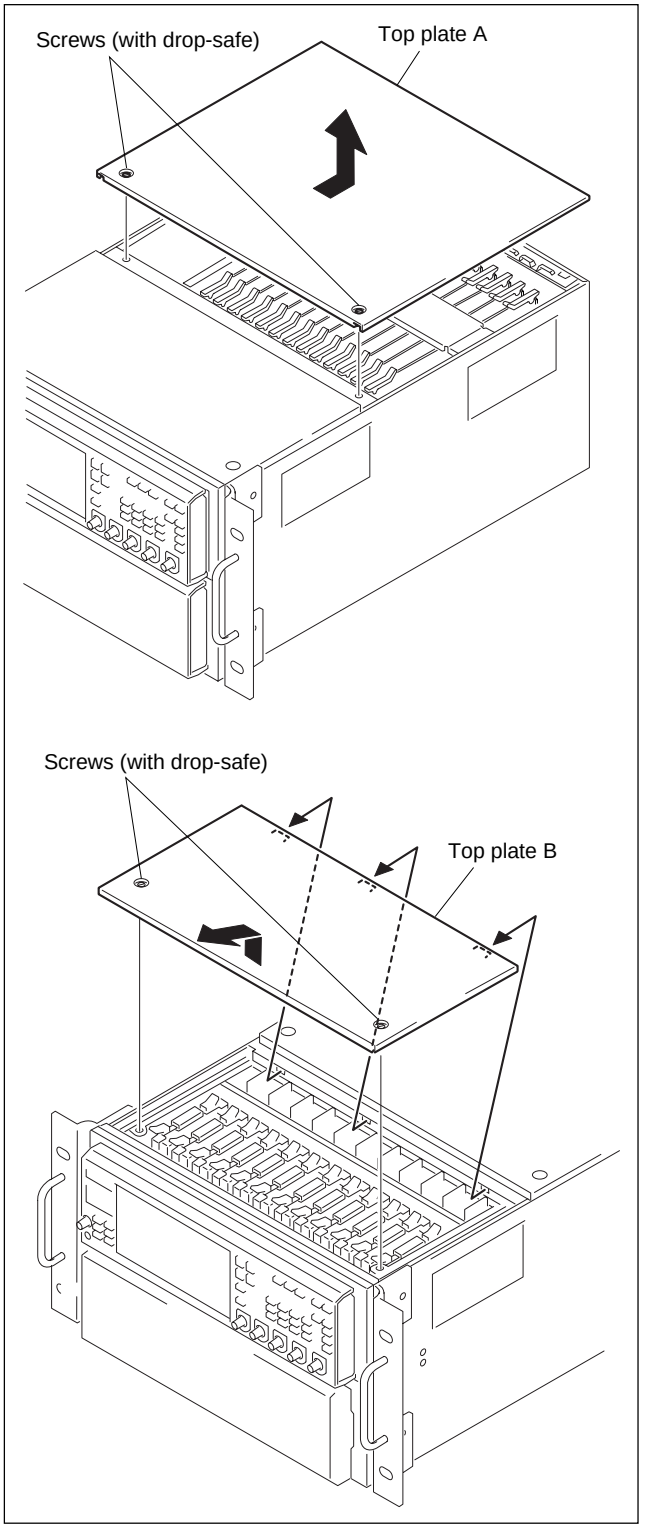
4. Loosen the two screws (with drop-safe) and remove the front panel (A) assembly.



3-2-2. Removing the Top Plate, Rear Panel and Bottom Plate

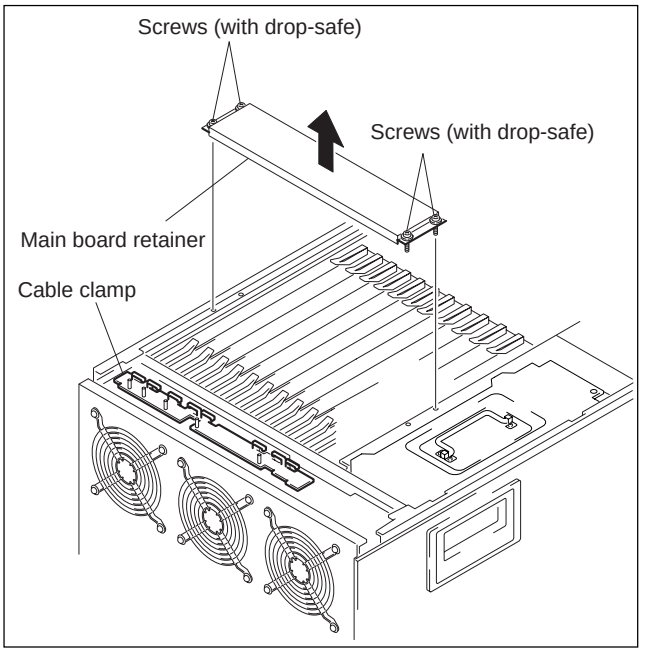
Top plate

1. Loosen the two screws (with drop-safe) and remove the top plate A.
2. Loosen the two screws (with drop-safe) and remove the top plate B.



Rear Panel

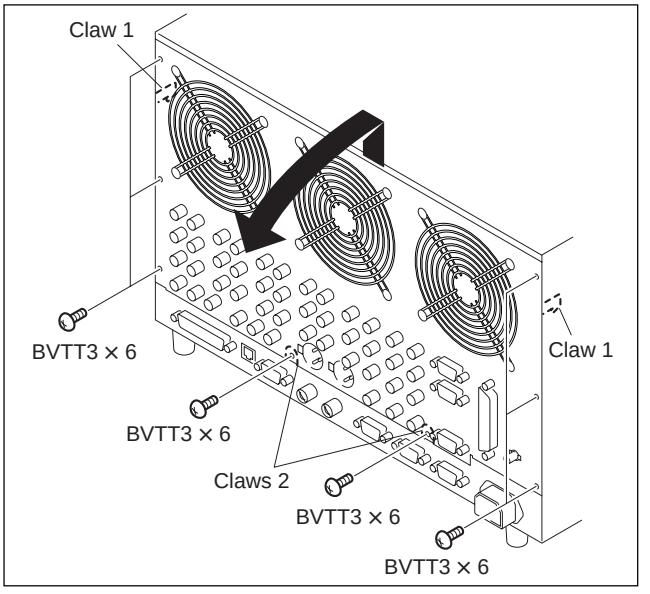
1. Remove the top plate A.
2. Loosen the four screws (with drop-safe) and remove the main board retainer.



3. Remove the harness from the cable clamp.
4. Remove all harnesses that are connected to the circuit boards of the MAV-555.
5. Remove the eight screws (BVTT3 × 6 (s)). Unlock the claw 1 by raising the rear panel assembly upward and open the rear panel.

Notes

- When opening the rear panel, be careful not to bend the claw 2 of the connector panel.
- Be sure to hold the rear panel when unlocking the claw. (The claw of the connector panel may be bent due to weight of the rear panel.)



6. Remove the nine connectors, and remove the rear panel assembly.

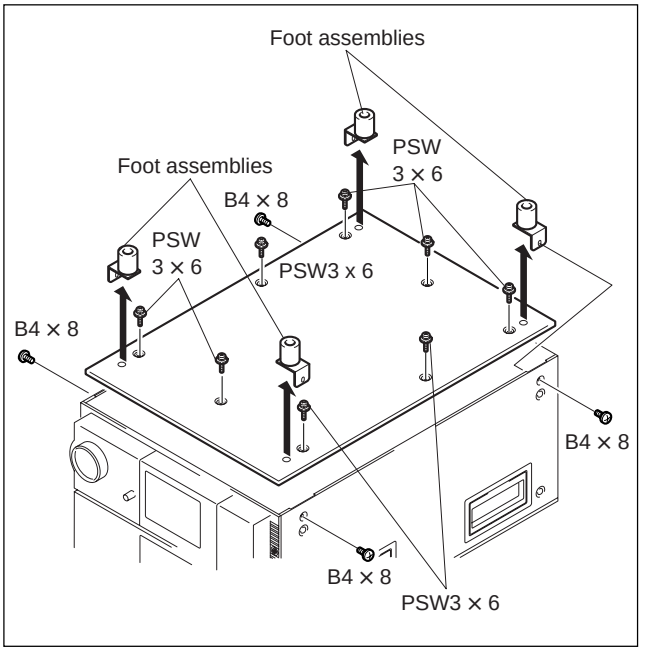
Board	Connector
CN-1816	CN30, CN34, CN50, CN90, CN110, CN120, CN121
CN-1817	CN5
CN1822	CN7

Note

Refer to Section 3-2-4 for the harness processing when re-assembling the panel.

Bottom plate

1. Remove the four screws (B4 × 8) and remove the four foot assemblies.
2. Remove the eight screws (PSW3 × 6) and remove the bottom plate.

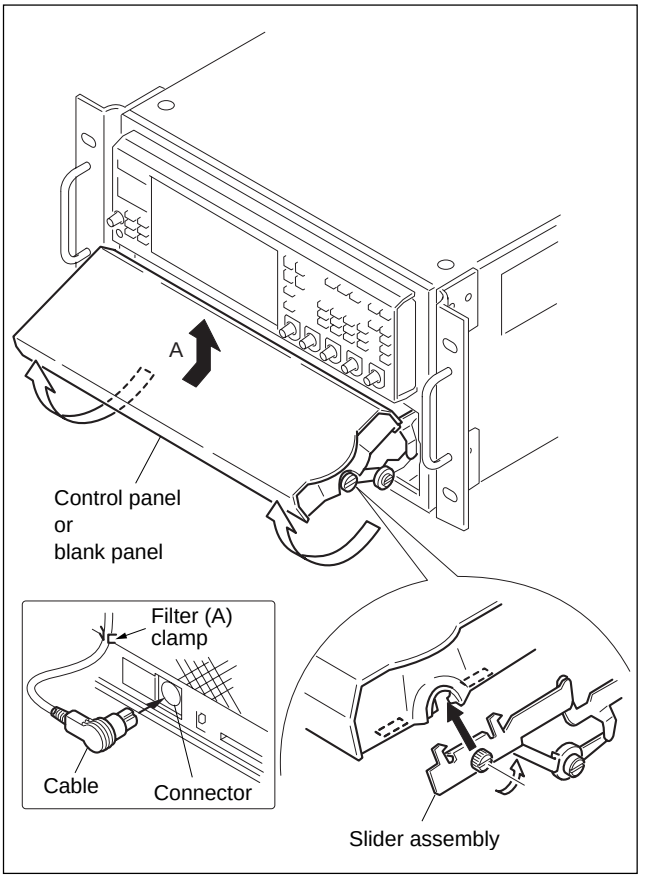


3-2-3. Removing the Control Panel/Blank Panel

Note

Be sure to turn off the main power of the MAV-555 before starting to remove the blank panel and control panel.

1. Be sure to swing up the blank panel or control panel by three to four notches.
2. When connecting the control panel, remove the cable that is connected to the MAV-555 and clamp of the filter (A).
3. Loosen the two screws of the blank panel or control panel, and remove the blank panel or control panel in the direction of the arrow A.



4. Attach the control panel or blank panel by reversing the disassembly procedure.

   Note

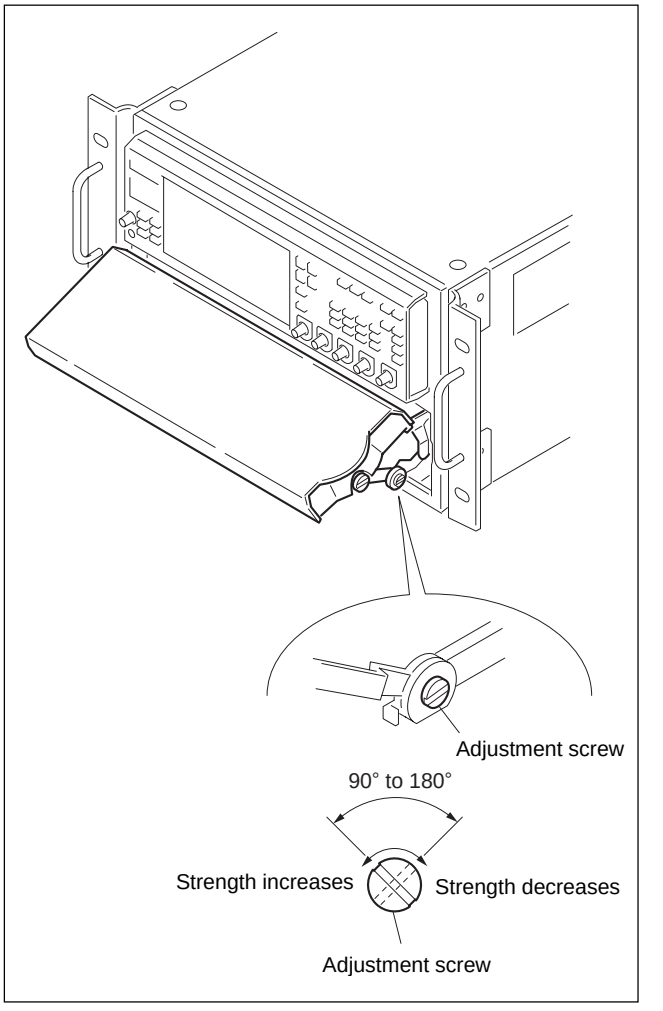
   Attach the control panel or blank panel by raising the slider assembly up so that both the right end and left end are at the same height (by three or four notches).

Adjusting the strength of opening/closing the blank panel or control panel

On both sides of the control panel of the MAV-555 there is a screw for adjusting the strength of opening/closing the control panel. The strength increases as the screw is turned clockwise and decreases as it is turned counterclockwise. The screw can be turned from 90˚ to 180˚. Adjust the strength as desired.

Note

Do not open or close the blank panel/control panel with the screw turned fully clockwise.



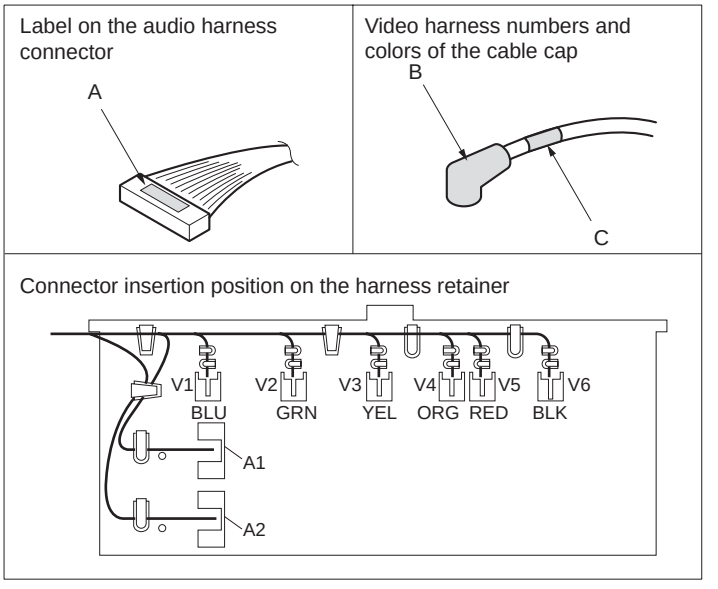
3-2-4. About Connection of the Harnesses

This section describes how to route the harness between the plug-in boards and the rear panel. When a fan or circuit board is replaced, be sure to route the harnesses while observing the following precautions.

On the locations of harness connection

SLOT	BOARD NAME	BOARD CN No.	A	B	C	Harness retainer
2	AD-160 (BKMA-511)	CN501 (white)	OP1 (white)			A1
		CN502 (red)	OP1 (red)			A2
3	DA-136 (BKMA-512)	CN501 (red)	OP2 (red)			A2
		CN504 BLK		black	13	V4
		CN503 RED		red	14	V3
4	DPR-127 (BKMA-510)	CN1501 BLK		black	5	V6
		CN1502 RED		red	6	V5
		CN102 ORG		orange	7	V4
		CN101 YEL		yellow	8	V3
		CN1504 9 GRN		green	9	V2
		CN1503 10 BLU		blue	10	V1
8	DPR-127 (Standard)	CN1501 BLK		black	1	
		CN1502 RED		red	2	
		CN102 ORG		orange	3	
		CN101 YEL		yellow	4	
		CN104 11 GRN		green	11	
		CN103 12 BLU		blue	12	
9	DA-136 (BKMA-512)	CN501 (red)	DA (red)			A1
10	AD-160 (BKMA-511)	CN501 (white)	AD (white)			A1
12	EM-1 (Standard)	CN901 (white)	EM-1 (white)			
		CN750 BLK		black	15	

When an option board is not inserted, attach the harness to the harness retainer. Follow the instruction as shown below the connector insertion position and harness routing.



About routing the harnesses

Portion a : Route the fan harness under all of the harnesses.

Note

Route the fan harness so that it never touches the fan blades.

Portion b : Route the harnesses of SLOT2 to SLOT4 between the fans (b) and (c).
Route the harnesses of SLOT8 to SLOT12 between the fans (a) and (b).

Portion c : Remove all of the overlapping of the harnesses and align the harnesses so that they are aligned flat. Route the harness as shown.

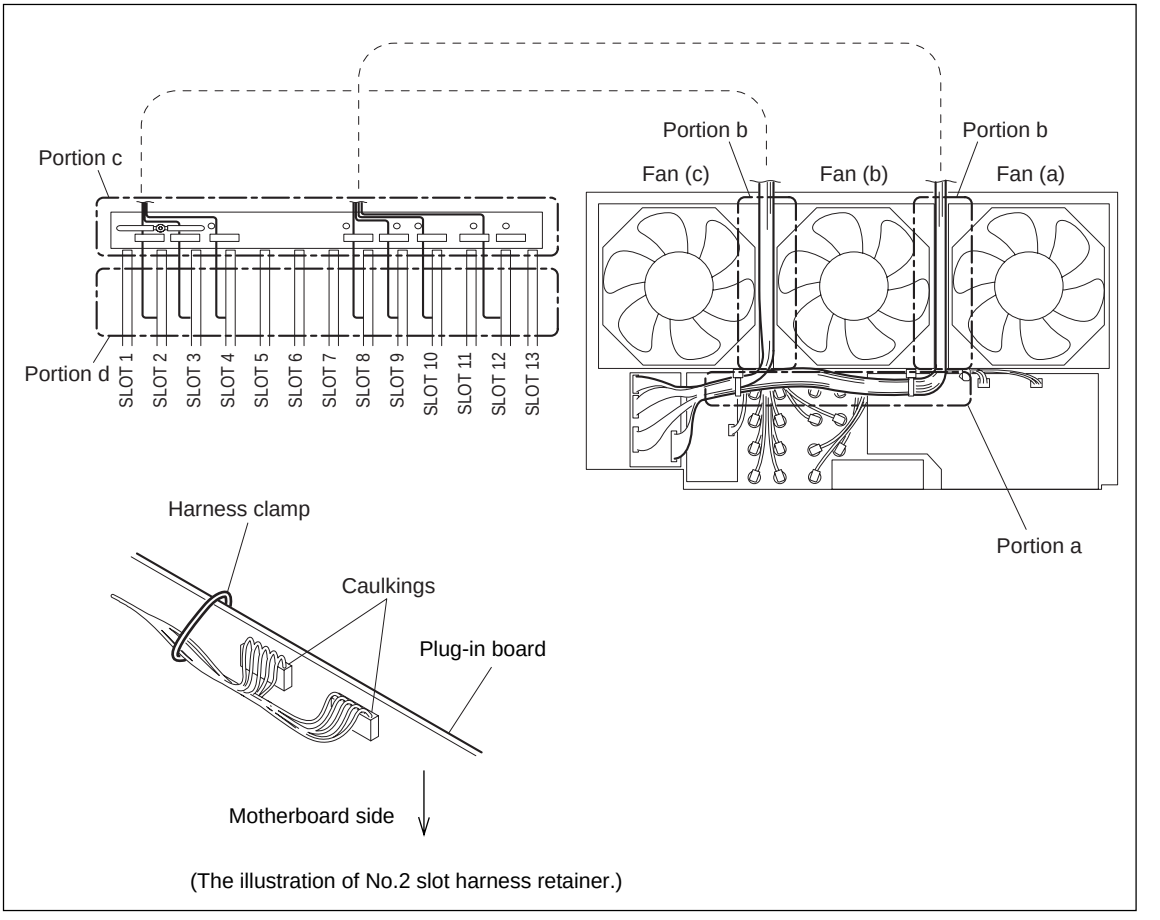
Note

Be sure to route the harnesses so that the top plate never pinches them when the top plate is attached.

Portion d : Push in the extra harness in between the circuit boards. As to the audio harness, route the audio harness as shown.

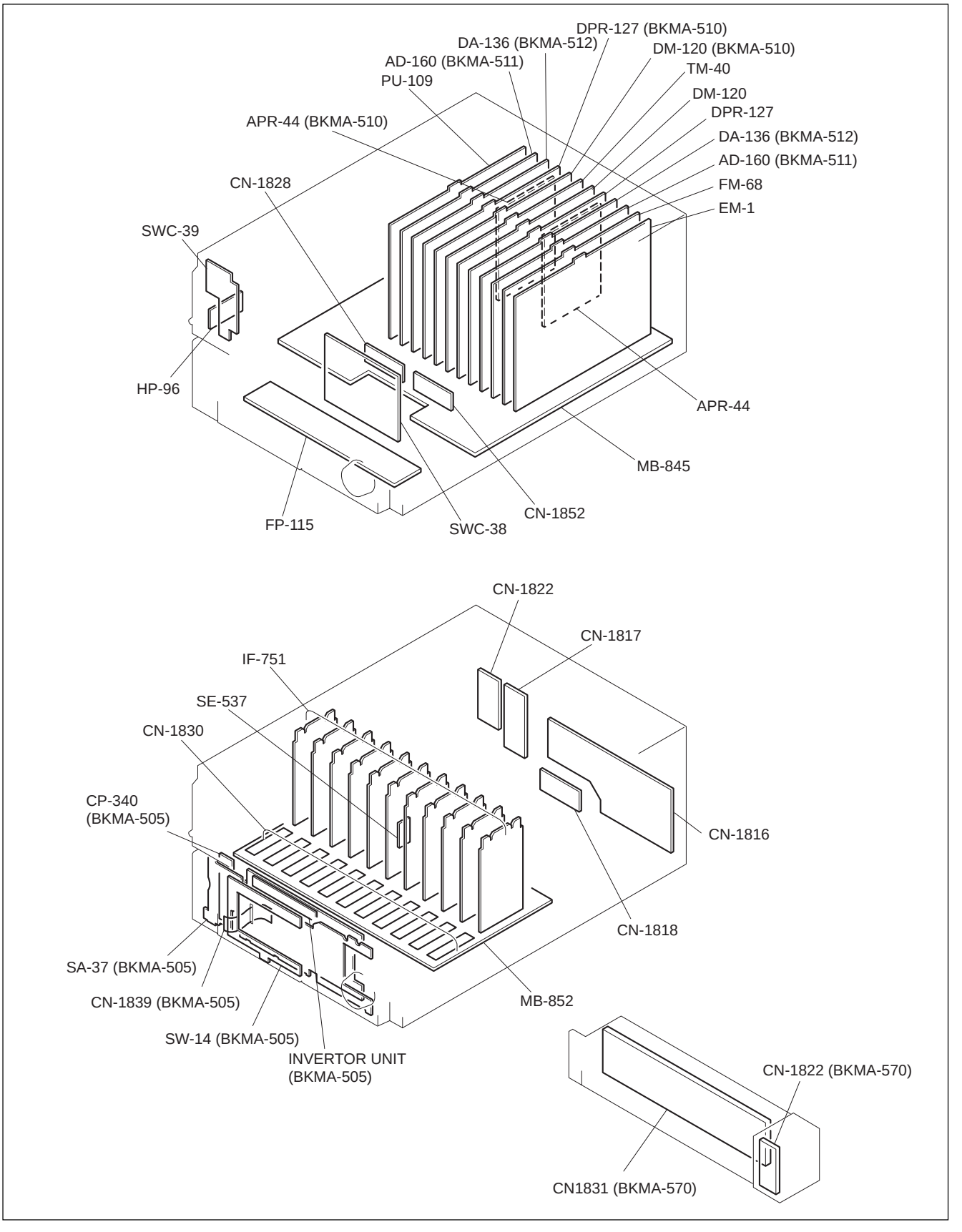
Notes

- Be careful that the caulked portion of the audio harness never receives any stress.
- Route the audio harness along the motherboard (in the bottom) in order to prevent the audio harness from pinching.



(The illustration of No.2 slot harness retainer.)

3-3. Main Parts and Board Layout Diagram



3-4. Replacing the Main Parts

Note

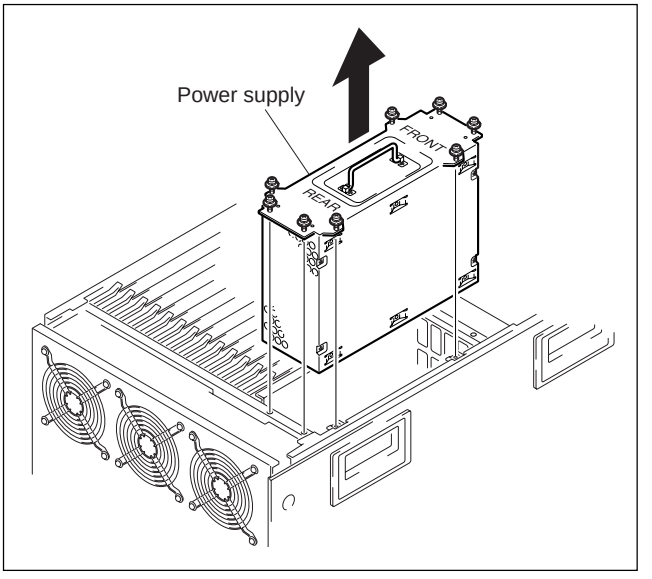
Before replacing, be sure to turn off the main power.

3-4-1. Power Supply

Part name : Switching regulator
Part No. : 1-468-405-1x

Removal

1. Remove the top plate (A). (Refer to Section 3-2-2.)
2. Loosen the eight screws (with drop-safe) and pull up the switching regulator by holding the handle.



Installation

Attach a new power supply by reversing the disassembly procedure of step 1 and 2 being careful of the direction of the FRONT/REAR.

Note

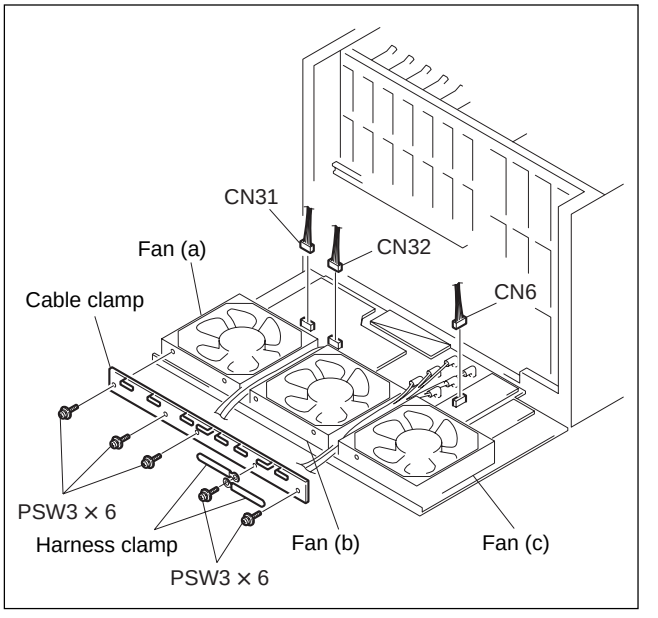
FRONT/REAR indication may be not displayed on a new power supply. In this case, attach the new power supply so that the direction of the power supply connector and that of the connector from the MAV-555 are same.

3-4-2. Fan

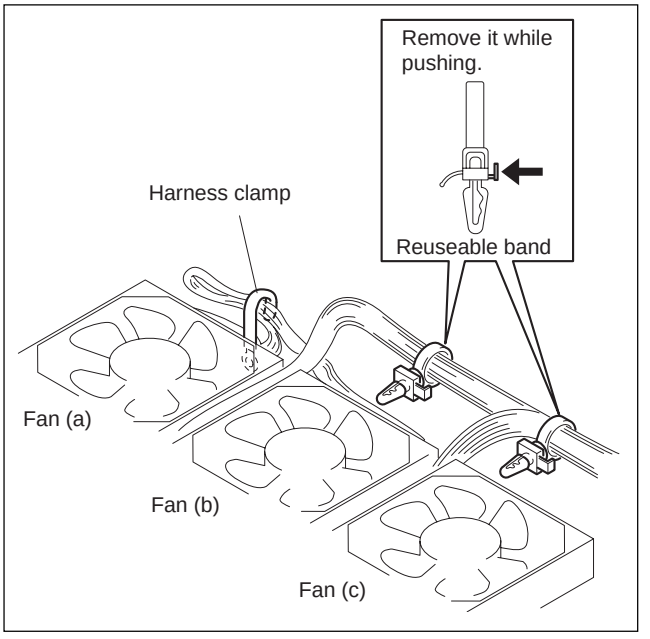
Part name : DC fan
Part No. : 1-763-354-1x

Removal

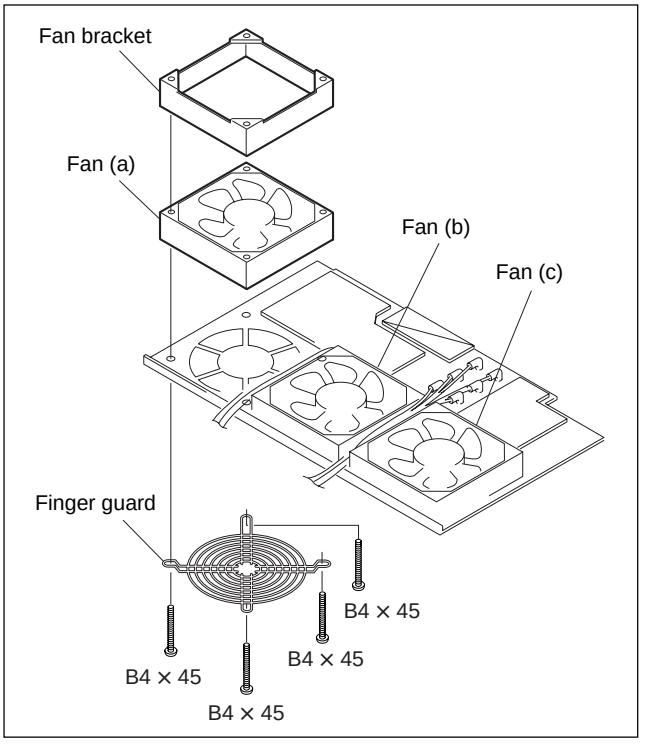
1. Remove the rear panel. (Refer to Section 3-2-2.)
2. Remove the five screws, and remove the cable clamp and harness clamp.
3. Remove the connectors of the harnesses.
   Fan (a) : CN31 (CN-1816 board)
   Fan (b) : CN32 (CN-1816 board)
   Fan (c) : CN6 (CN-1817 board)



4. Remove the FAN harness from the harness clamp under the fan bracket of the fan (a).
5. Remove the reusable band under the fan bracket of fans (b) and (c).



6. Remove the four screws and remove the finger guard, fan, and fan bracket.



Note

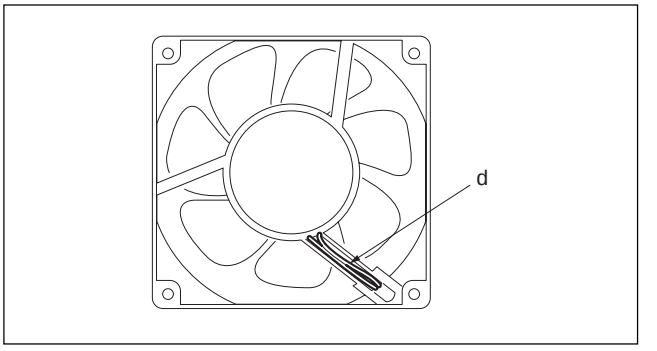
Loosen the screw of the harness clamp that is fitted to the fan bracket and remove fan (a).

Installation

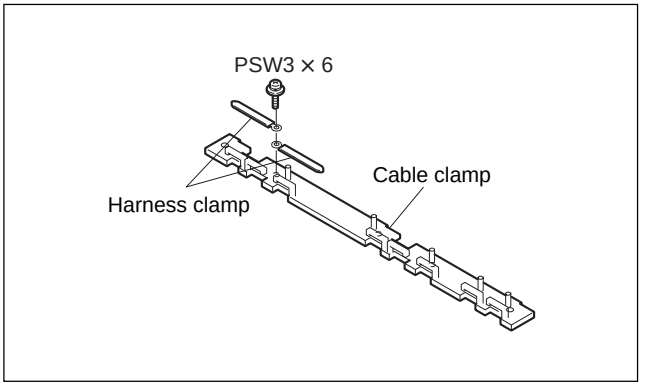
1. Attach a new fan by reversing the disassembling procedure of steps 1 through 6.
   (For connecting the harness, refer to Section 3-2-4.)

Note

- Be careful not to pinch portion d of the fan harness between the fan and rear panel.



- Put the fan harness under all harnesses to prevent it from touching the blades, and connect the fan harness.
- When the cable clamp is attached, attach the harness clamp as shown below.

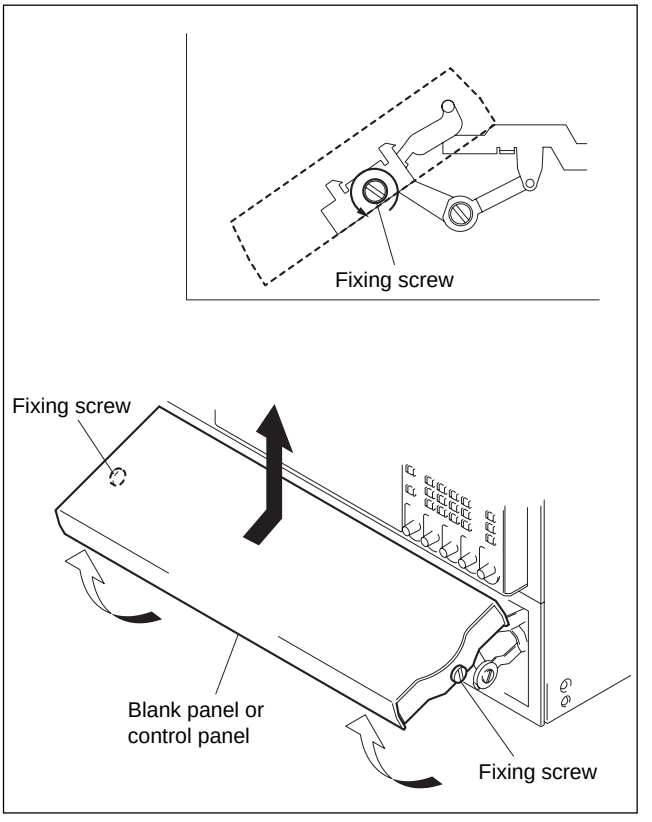


3-4-3. Filter

Part name : Filter (A)
Part No. : 3-622-670-0x
Part name : Filter (B)
Part No. : 3-622-671-0x

Removal

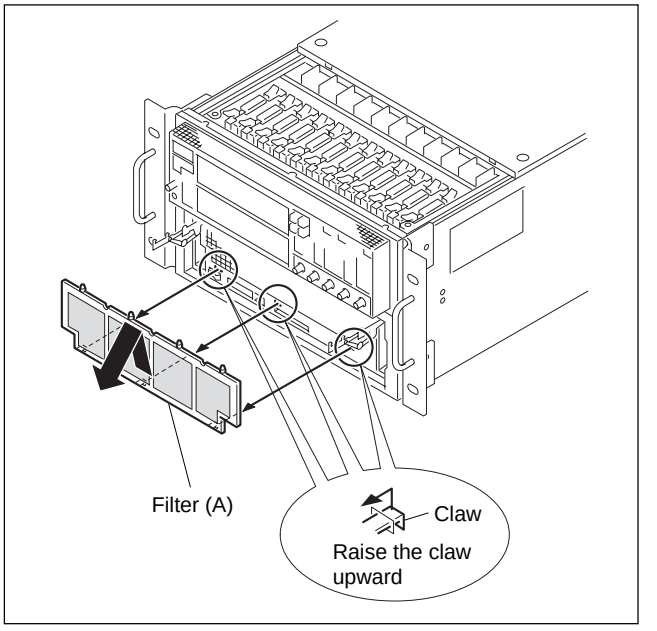
1. Loosen the fixing screw of the blank panel or the control panel (BKMA-505) and remove it from the MAV-555. (Refer to Section 3-2-3.)



2. Loosen the two screws (with drop-safe) and remove the top plate B. (Refer to Section 3-2-2.)
3. Remove the ornament panel, side escutcheon, and front panel (A) assembly. (Refer to Section 3-2-1.)
4. Remove the filter (A).

Note

The filter (A) is fixed with the three screws at the top and the three claws at the bottom. Raise the filter (A) upward, remove the screws, and unlock the claws before removing the filter.

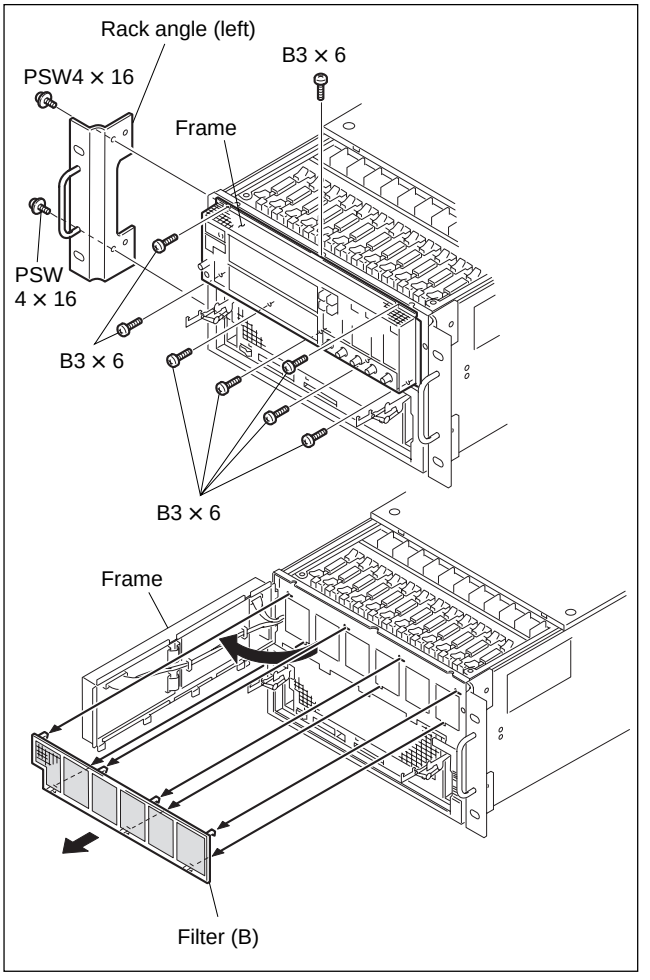


5. When the rack angle assembly is installed, remove the two fixing screws (PSW4 × 16) and remove the left rack angle assembly.
6. Remove the eight screws and open the frame in the left direction.

7. Remove the filter (B).

Note

The filter (B) is fixed with the four claws at the top and the three claws at the bottom. Unlock the claws, and remove the filter.



Installation

Attach new filters (A) and (B) by reversing the disassembly procedure of steps 1 through 7.

3-4-4. Backup Battery

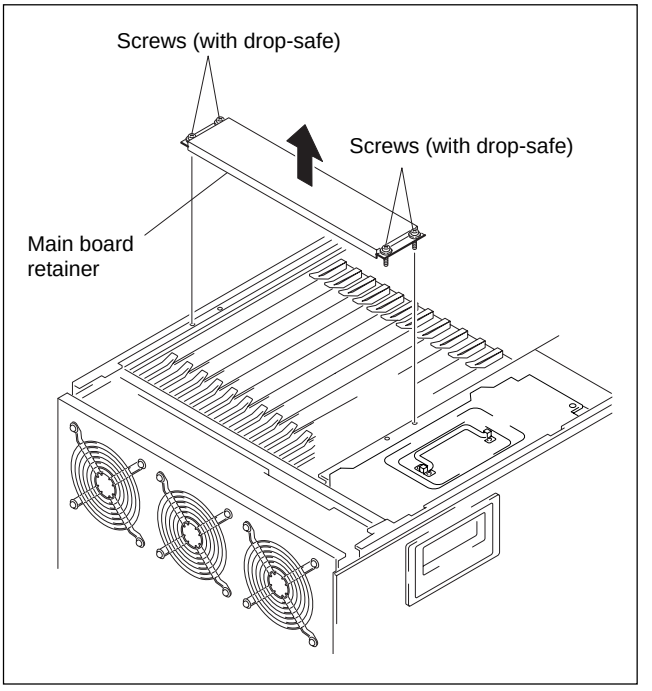
Part name : Lithium battery (CR2450)
Part No. : 1-528-229-4x

Note

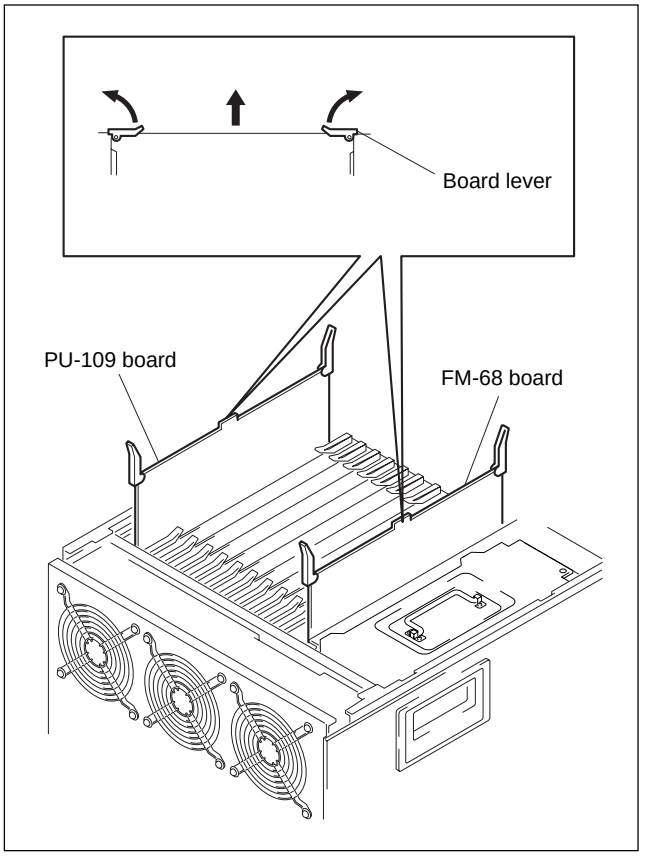
Replace a battery in a short period of time (about 60 minutes) because the memory contents can be erased.

Removal

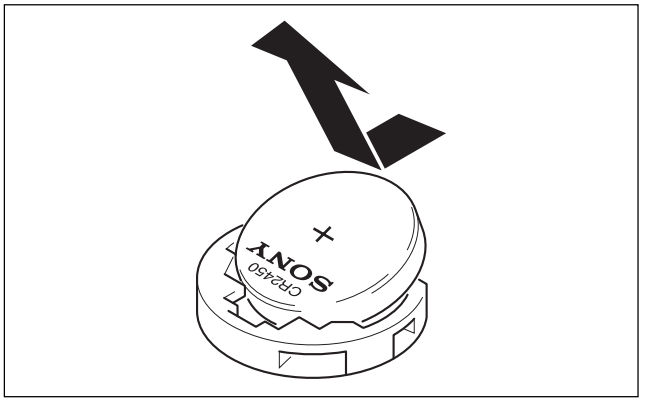
1. Attach the top plate (A). (Refer to Section 3-2-2.)
2. Loosen the four screws (with drop-safe) and the main board retainer.



3. Open the board lever in the direction of the arrow and pull out the board containing the backup battery to be replaced.



4. Replace the lithium battery (CR2450).
   FM-68 board : BT100
   PU-109 board : BT300



Installation

Attach the parts by reversing the disassembly procedure of steps 1 through 3.

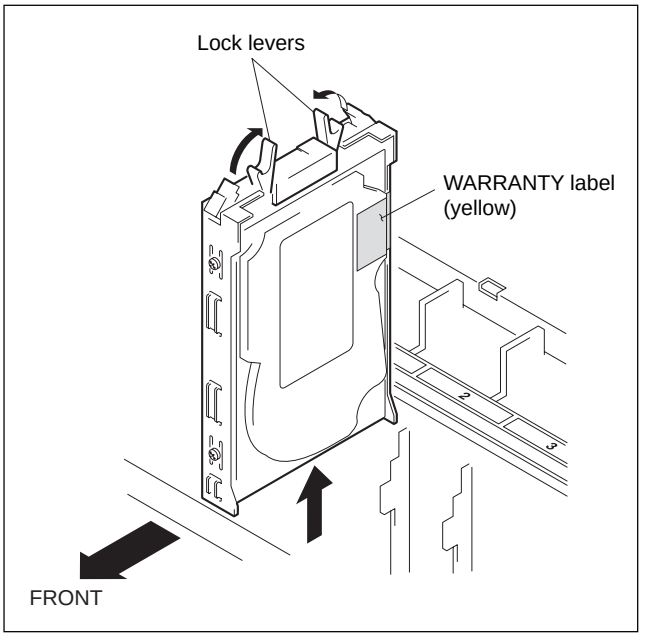
3-4-5. HDD Unit

Removal

1. Remove the top plate (B). (Refer to Section 3-2-2.)
2. Open the lock lever in the direction of the arrow and remove the HDD unit from the slot gently.

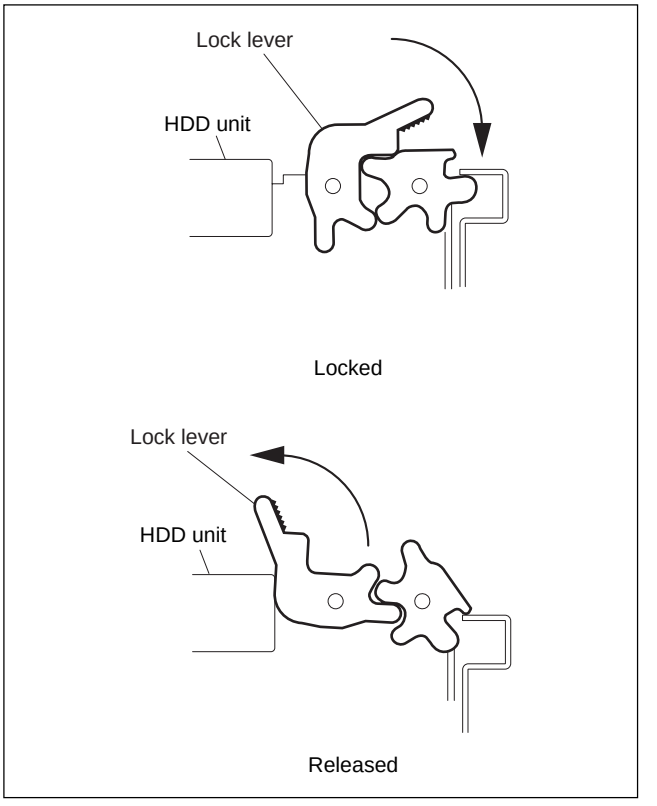
Note

When placing the removed HDD unit, place it on a cushion gently with the WARRANTY label side facing down.



Installation

1. Insert a new HDD unit into the slot gently with the lock levers opened.
2. Close the lock lever in the direction of the arrow to fix it.



Notes

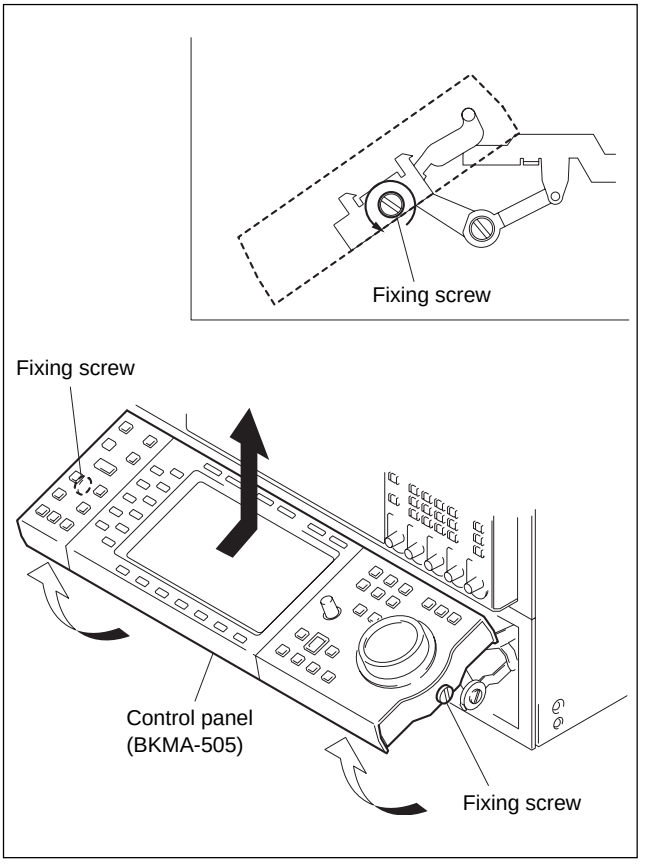
- Attach the HDD unit with the WARRANTY label side on the right.
- Avoid excessive shock.

3-4-6. LCD Unit

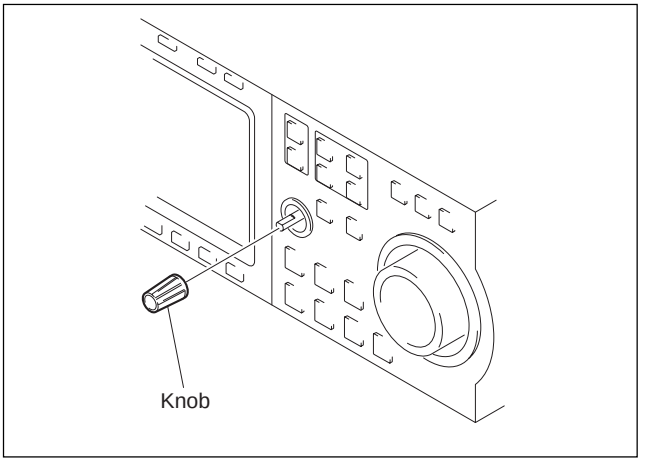
Part name : LCD unit
Part No. : 1-475-639-1x

Removal

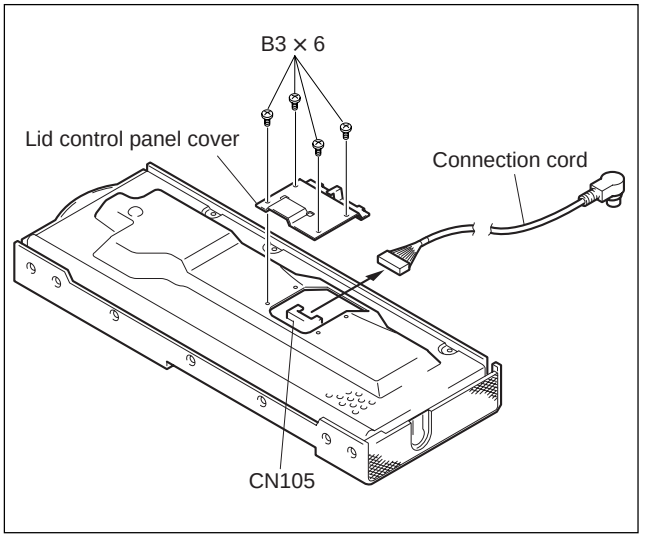
1. Loosen the fixing screws and remove the control panel (BKMA-505) from the MAV-555. (Refer to Section 3-2-3.)



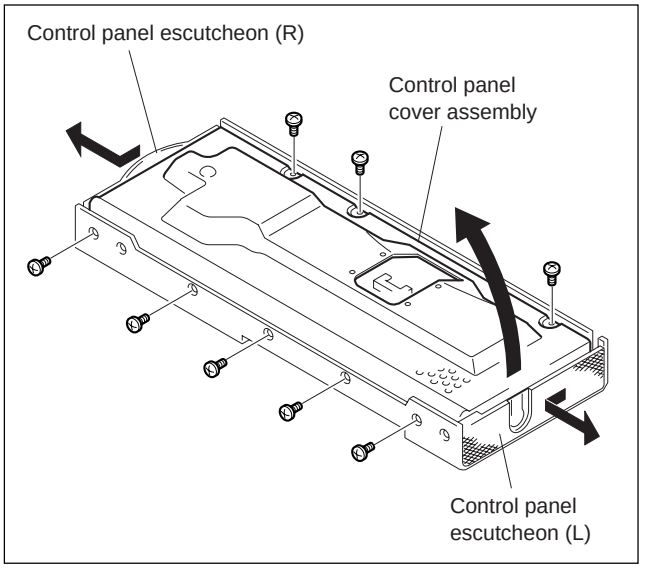
2. Pull out the knob of the multi control from the front side.



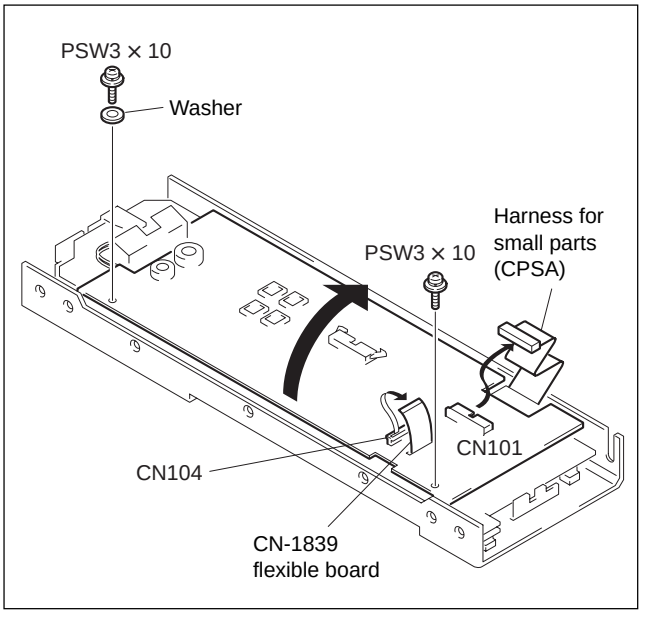
3. Turn the control panel, remove the four screws (B3 × 6), and remove the lid control panel cover.
4. Open the connector (CN105) on the board to remove the connection cord.



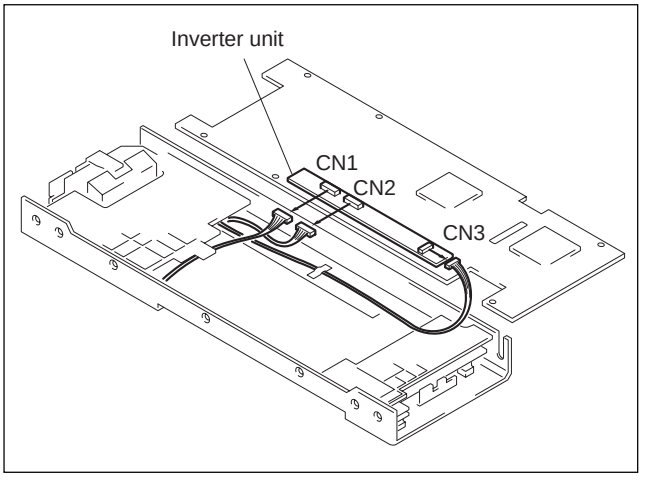
5. Remove the eight screws (B3 × 6) from the control panel cover assembly (three screws at the top and five screws at the bottom).
6. Remove the control panel escutcheons (R) and (L).
7. Remove the control panel cover assembly in the direction of the arrow.



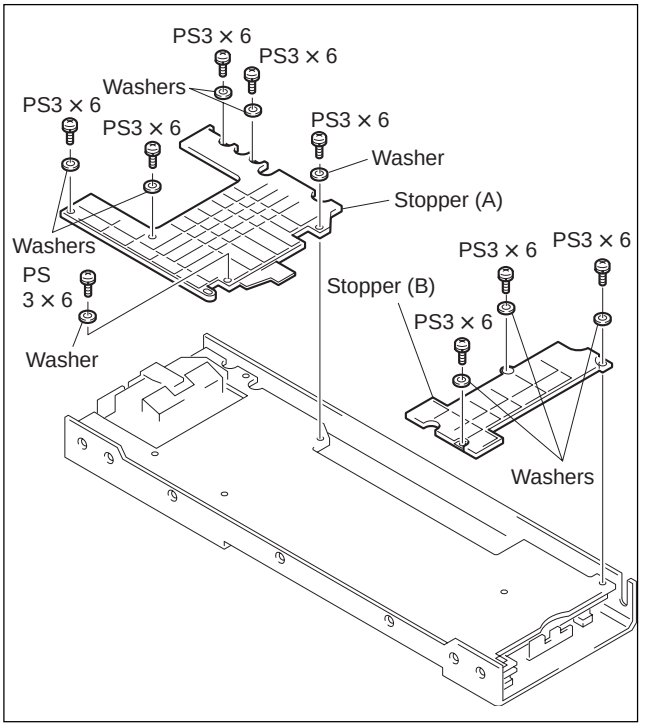
8. Remove the CN-1839 flexible board from the connector of the CP-340 board and remove the harness for small parts (CPSA) from the connector (CN101).
9. Remove the two screws (PSW3 × 10) of the CP-340 board and the washers.
10. Raise the CP-340 board by holding it from the bottom.



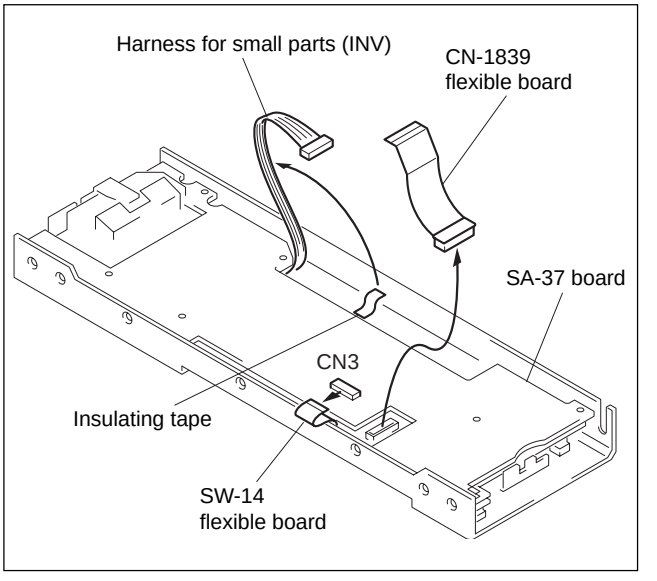
11. Remove the three harnesses that are connected to the inverter unit of the CP-340 board from the connectors (CN1, CN2, and CN3).



12. Remove the six fixing screws (PS3 × 6) of the stopper (A). (Be careful that the screws have washers.)
13. Remove the three fixing screws (PS3 × 6) of the stopper (B). (Be careful that the screws have washers.)



14. Remove the CN-1839 flexible board from the LCD unit.
15. Remove the connector (CN3) of the SW-14 flexible board that is connected to the SA-37 board and remove the harness for small parts (INV) from the insulating tape.

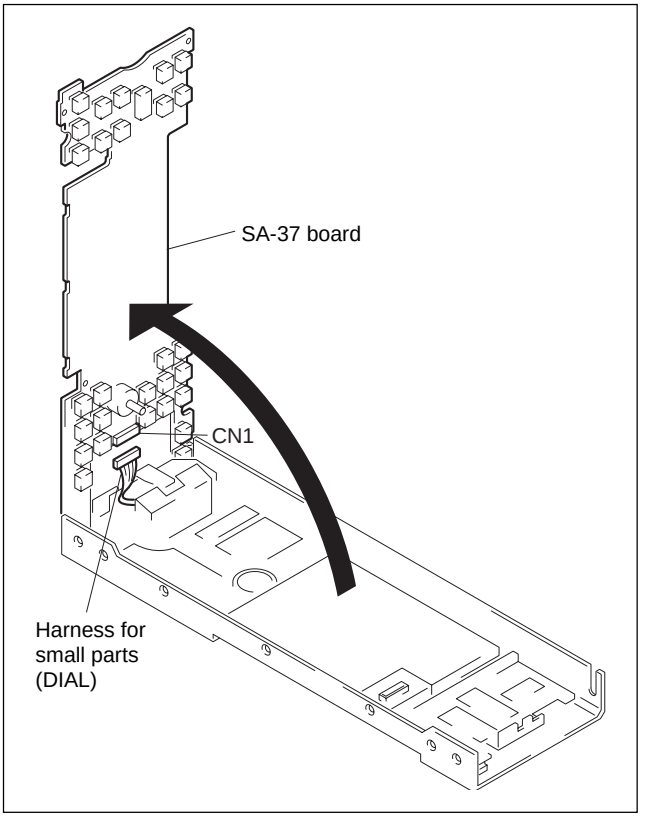


16. Open the SA-37 board by raising it from the right side.

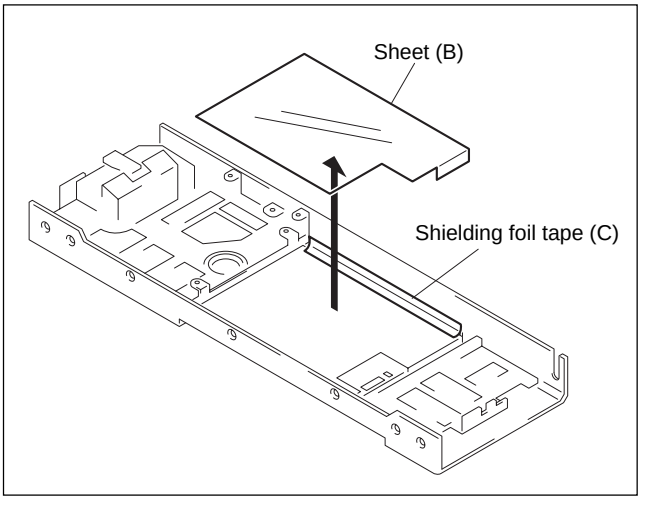
Note

Be careful that the harness of the jog dial is connected to the board at the left.

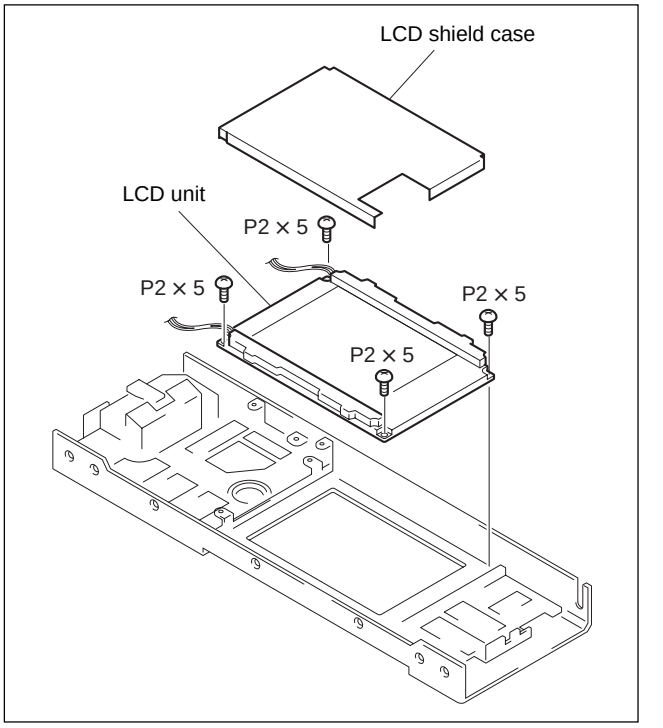
17. Remove the harness for small parts (DIAL) that is connected to the SA-37 board from the connector (CN1).



18. Peel off the sheet (B) from the LCD unit.
19. Peel off the shielding foil tape (C) on the upper side of the LCD unit.



20. Remove the four screws (P2 × 5) that fix the LCD unit.
21. Remove the LCD unit.
22. Remove the LCD shield case from the LCD unit.



Installation

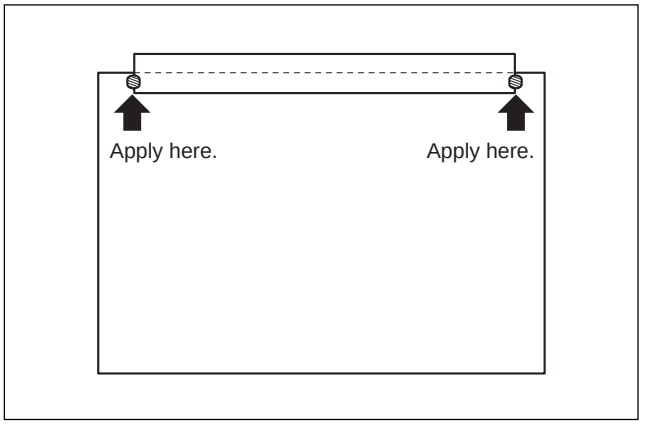
Attach a new LCD unit by reversing the disassembly procedure of steps 1 through 22.

Note

If the shielding foil tape (C) is stuck, apply SONY BOND (SC608) to the end portion where the tape is peeled off.

Part name : SONY BOND SC608

Part No. : 7-432-912-52

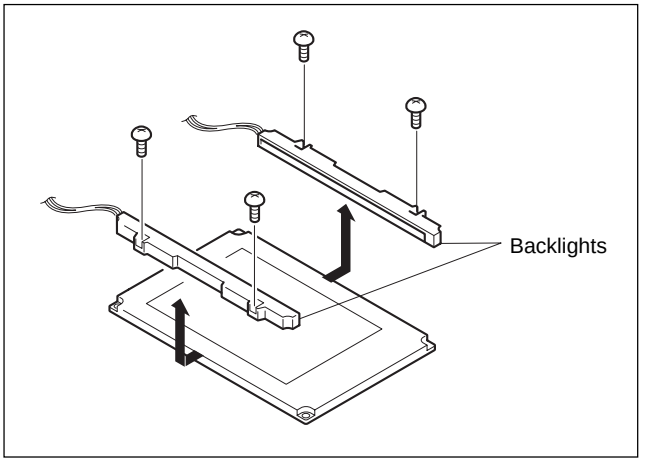


3-4-7. Backlight

Part name : Spare indicator unit
Part No. : 9-880-224-0x

Removal

1. Remove the LCD unit. (Refer to Section 3-4-6.)
2. Remove the four screws and backlights each in the directions of the arrows.



Installation

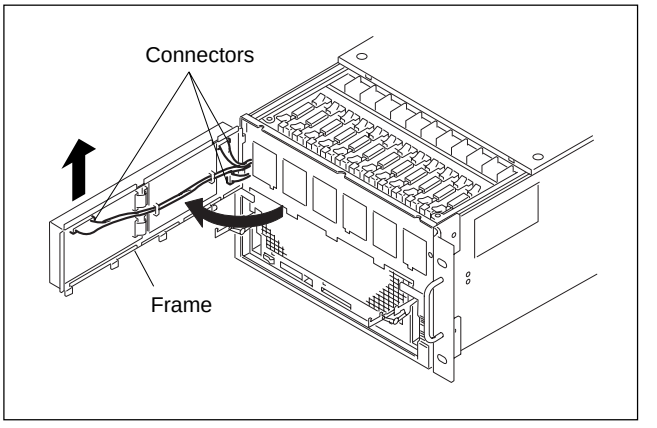
Attach new backlights by reversing the disassembly procedure of steps 1 through 2.

3-4-8. FL Tube (Indication Tube)

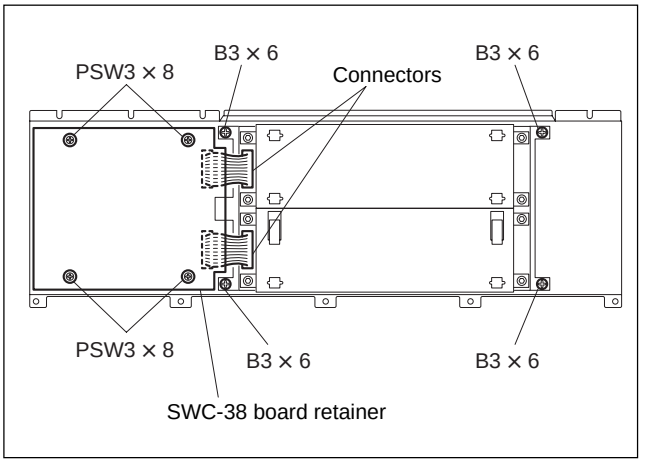
Part name : Indication tube case (A) assembly
Part No. : A-8279-144-x

Removal

1. Open the frame in the left direction referring to the replacing procedure of filter. (Refer to Section 3-4-3.)
2. Remove the three connectors (CN1, CN200, and CN600).
3. Raise the frame upward and remove it.



4. Remove the four screws (PSW3 × 8) and remove the SWC-38 board retainer.
5. Remove the connectors of the FL tube.
6. Remove the four screws (B 3 × 6) and remove the FL tubes.



Installation

Attach a new indication tube case (A) assembly by reversing the disassembly procedure of steps 1 through 6.

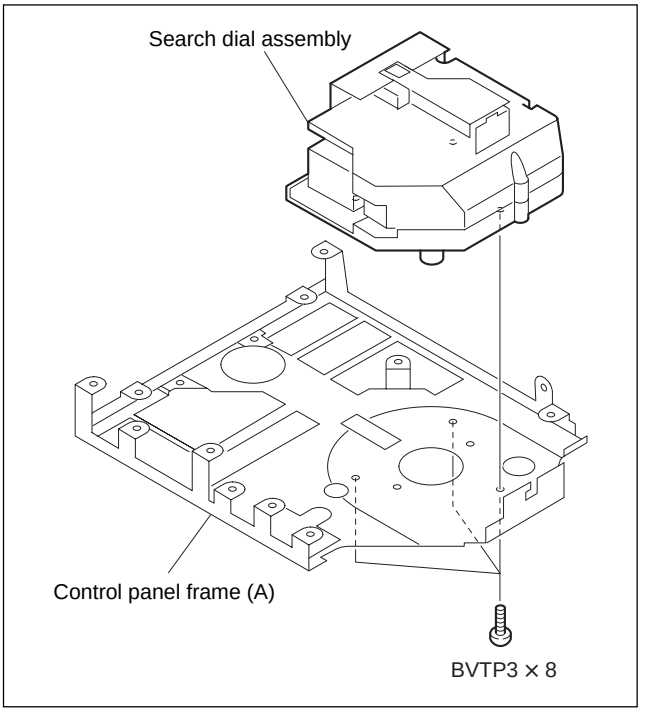
Note

Replace two FL tubes at the top and bottom.

3-4-9. Search Dial

Removal

1. Remove the control panel/blank panel. (Refer to Section 3-2-3.)
2. Remove the CP-340 board. (Refer to Section 3-5-1.)
3. Remove the CN-1839 board. (Refer to Section 3-5-2.)
4. Remove the SA-37 board. (Refer to Section 3-5-3.)
5. Remove the control panel frame (A). (Refer to Section “3-5-4. SW-14 Board”.)
6. Remove the three screws and remove the search dial assembly from the control panel frame (A).

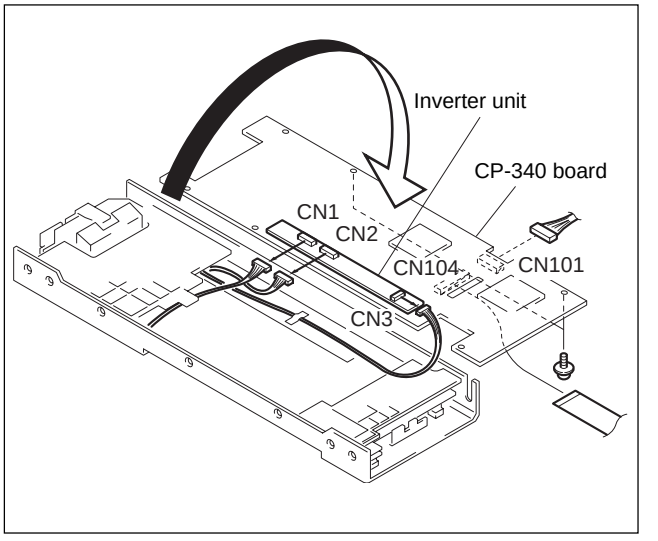


3-5. Replacing the Board

3-5-1. CP-340 Board

Removal

1. Remove the control panel. (Refer to Section 3-2-3.)
2. Remove the control panel cover. (Refer to Section 3-4-6.)
3. Remove the two connectors (CN101 and CN104) of the CP-340 board.
4. Remove the two screws and remove the three connectors (CN1, CN2, and CN3) of the inverter unit while holding the CP-340 board.



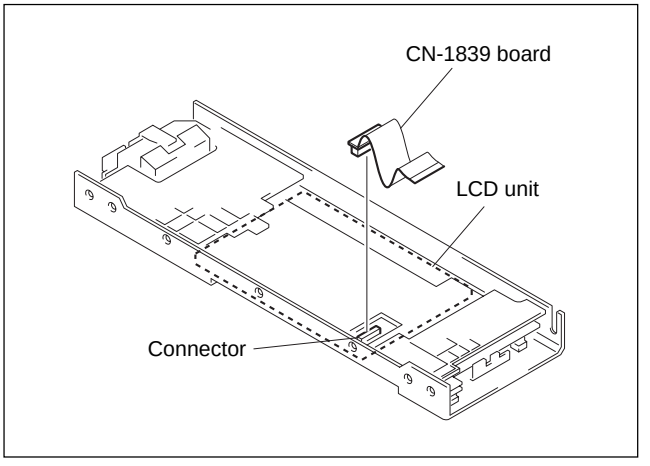
Installation

Attach a CP-340 board by reversing the disassembly procedure of steps 1 through 4.

3-5-2. CN-1839 Board

Removal

1. Remove the control panel. (Refer to Section 3-2-3.)
2. Remove the CP-340 board. (Refer to Section 3-5-1.)
3. Remove the CN-1839 board from the connector of the LCD unit.



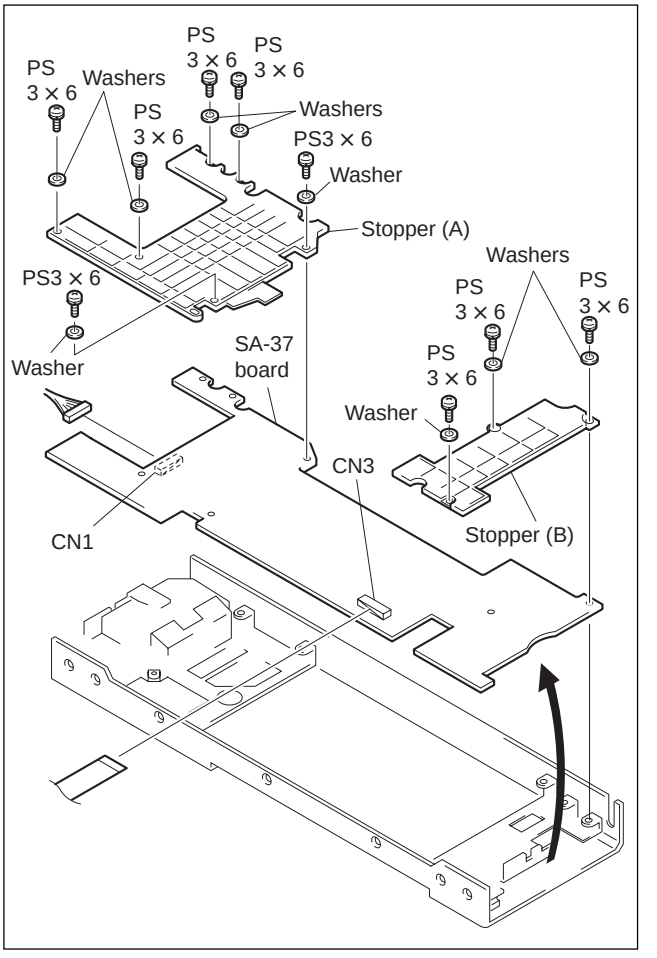
Installation

Attach a new CN-1839 board by reversing the disassembly procedure of steps 1 through 3.

3-5-3. SA-37 Board

Removal

1. Remove the control panel. (Refer to Section 3-2-3.)
2. Remove the CP-340 board. (Refer to Section 3-5-1.)
3. Remove the CN-1839 board. (Refer to Section 3-5-2.)
4. Remove the connector (CN3) of the SA-37 board.
5. Remove the three screws and remove the stopper (B). (Be careful that the screws have washers.)
6. Remove the six screws and remove the stopper (A). (Be careful that the screws have washers.)
7. Remove the SA-37 board in the direction of the arrow, and remove the connector (CN1) while holding the board.



Installation

Attach a new SA-37 board by reversing the disassembly procedure of steps 1 through 7.

3-5-4. SW-14 Board

Removal

1. Remove the control panel. (Refer to Section 3-2-3.)
2. Remove the SA-37 board. (Refer to Section 3-5-3.)
3. Remove the four screws (B3 × 6) and remove the control panel frame (B) in the direction of the arrow.
4. After removing the dial knob rubber, remove the screw (PWH2.6 × 5) and remove the dial knob from the shaft.

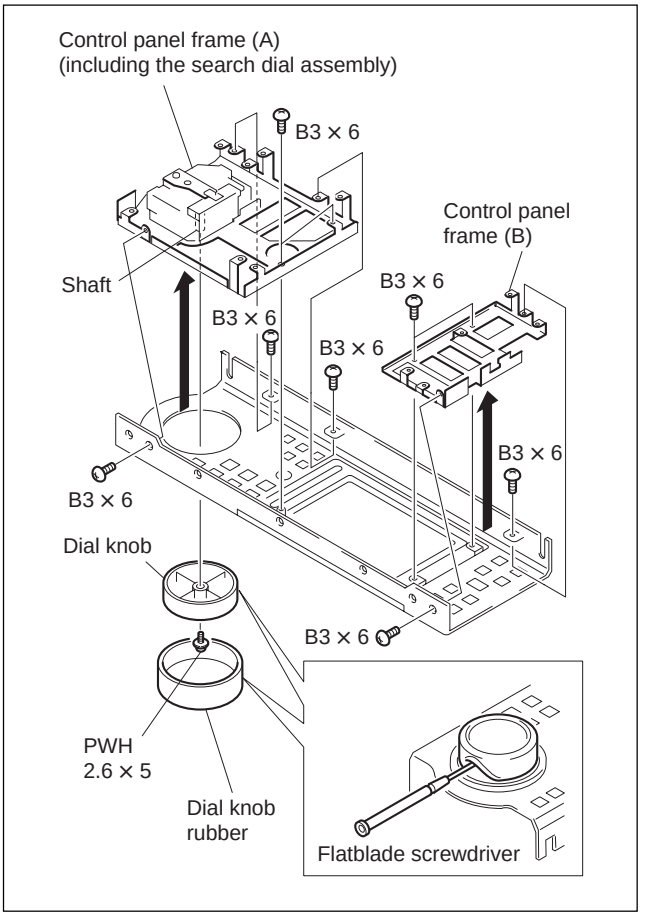
   Note

   If the dial knob rubber cannot be removed easily, remove it by pulling up the end with a flatblade screwdriver.

5. Remove the five screws (B3 × 6) and remove the control panel frame (A) (including the search dial assembly) in the direction of the arrow.
6. Remove the sheet (B), remove the four screws (B2 × 5), and remove the LCD unit. (Refer to Section 3-4-6.)

   Note

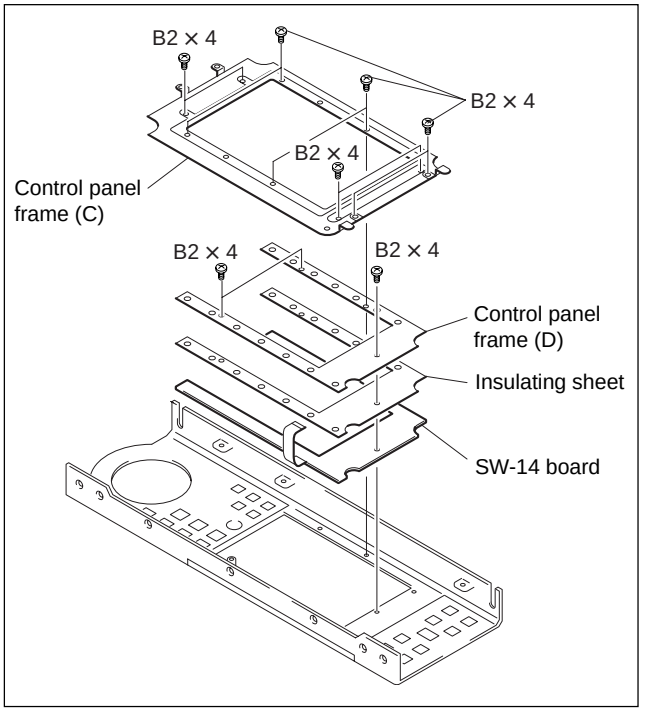
   The sheet (B) is fixed by double-sided adhesive tape. Remove the sheet (B) by peeling the tape off.



7. Remove the 10 screws (B2 × 4) and remove the control panel frame (C).
8. Remove the three screws (B2 × 4), the control panel frame (D) and insulating sheet, and remove the SW-14 board.

   Note

   When peeling off the insulating sheet, be careful not to damage it.

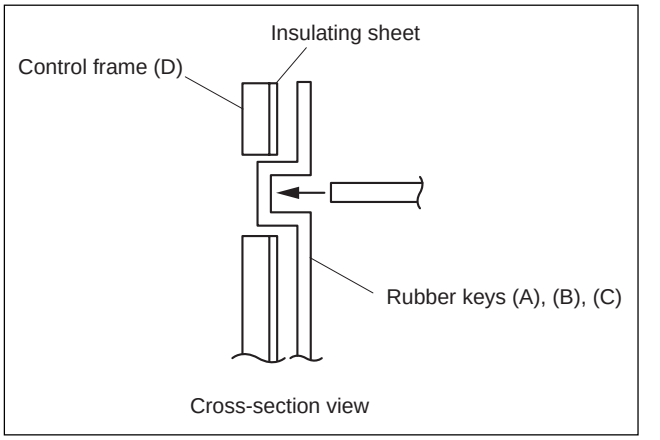


Installation

Attach a new SW-14 board by reversing the disassembly procedure of steps 1 through 8.

Note

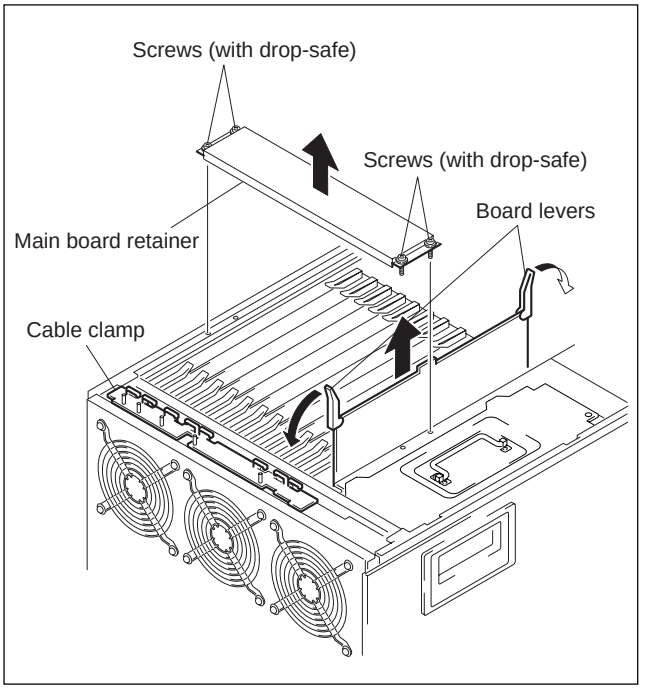
When assembling the rubber keys (A), (B) and (C), align the projected part with the holes of SW-14 board and that insulating sheet and that control frame (D). Then insert the pointed tool from the rear of the projected part to fix them tentatively.



3-5-5. Plug-in Board

Removal

1. Remove the top plate A. (Refer to Section 3-2-2.)
2. Loosen the four screw (with drop-safe) and remove the main board retainer.



3. Remove the harness from the cable clamp.
4. Open each board lever in the direction of the arrow and remove the board.
5. Remove all harnesses that are connected to the connector of the board shown in the table below.

Installation

Attach a new slot-in board by reversing the disassembly procedure of steps 1 through 5.

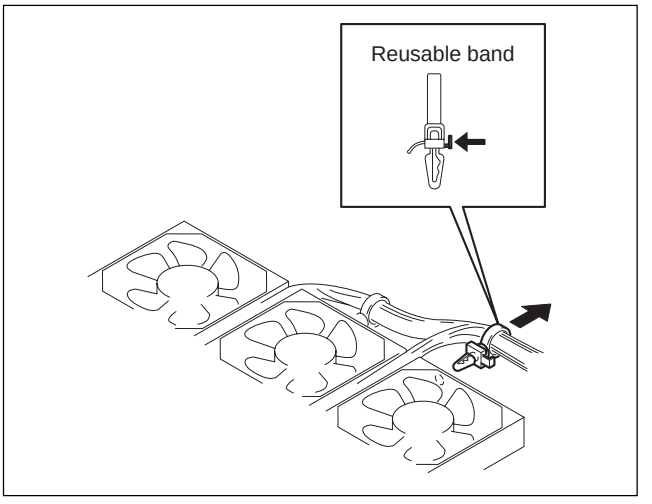
Note

When assembling the parts, route the harnesses referring to Section 3-2-4.

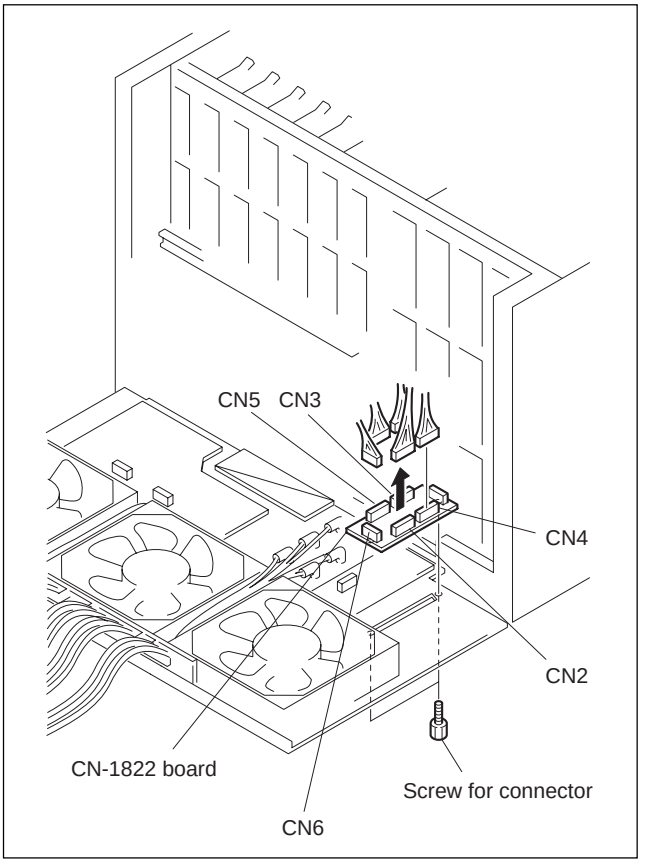
3-5-6. CN-1822 Board

Removal

1. Remove the top plate. (Refer to Section 3-2-2.)
2. Remove the rear panel assembly. (Refer to Section 3-2-2.)
3. Remove the reusable band.



4. Remove the two screws for connectors.
5. Remove the board and remove the harnesses (CN2, CN3, CN4, CN5, and CN6).



Installation

Attach a new CN-1822 board by reversing the disassembly procedure of steps 1 through 5.

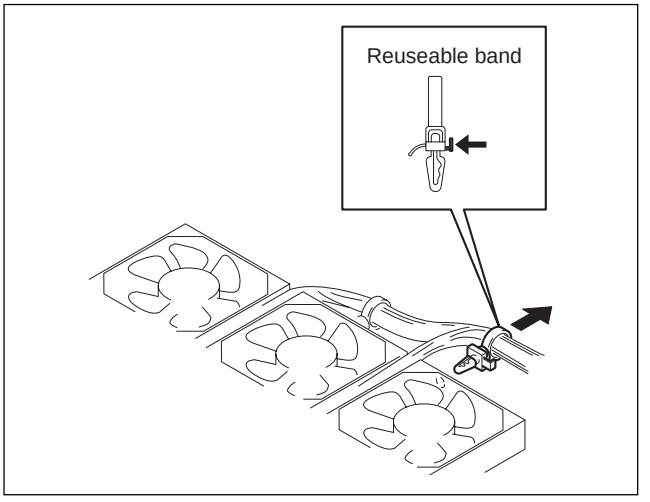
Notes

- When attaching the screws for connector, apply locking compound slightly.
- When attaching the reusable band, route the fan harness under all other harnesses, and pull and end of the fan harness toward the SDI connector.
- When attaching the rear panel to the MAV-555, remove the slack from the harnesses between fans and others.

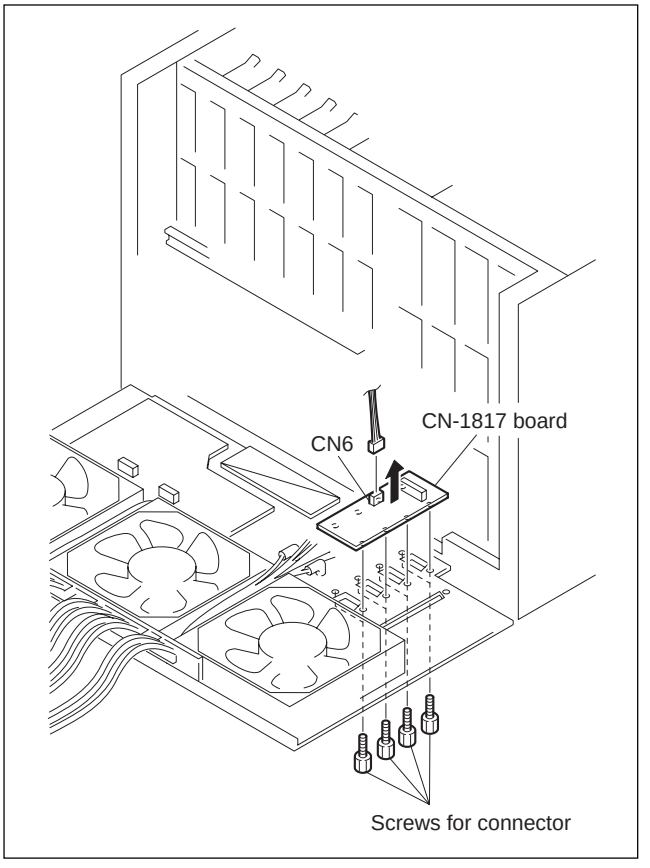
3-5-7. CN-1817 Board

Removal

1. Remove the top plate. (Refer to Section 3-2-2.)
2. Remove the rear panel assembly. (Refer to Section 3-2-2.)
3. Remove the reusable band.



4. Remove the connector (CN6) of the CN-1817 board.
5. Remove the eight screws for connector.



Installation

Attach a new CN-1817 board by reversing the disassembly procedure of steps 1 through 5.

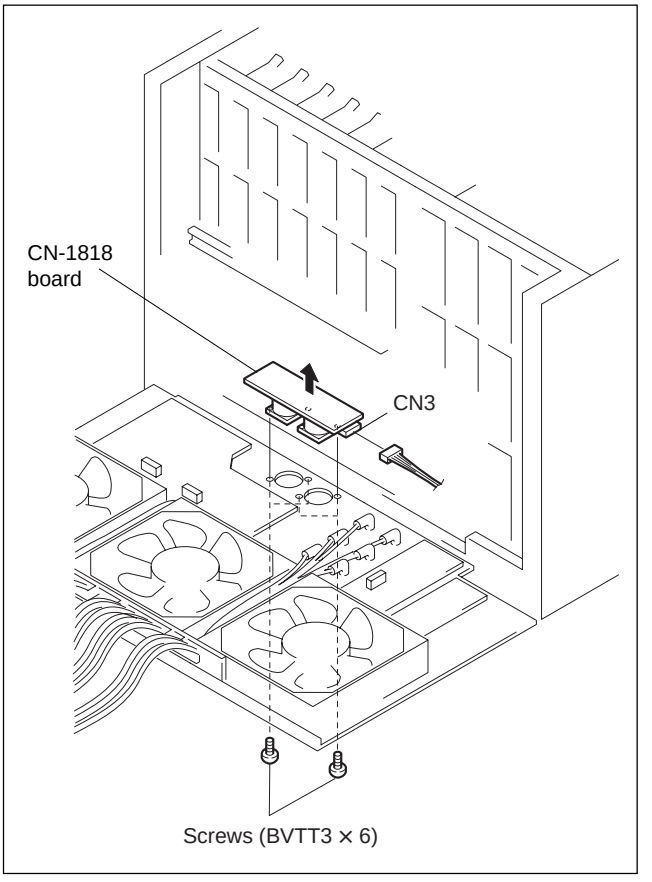
Notes

- When attaching the screws for connector, apply locking compound slightly.
- When attaching the reusable band, route the fan harness under all other harnesses, and pull and end of the fan harness toward the SDI connector.
- When attaching the rear panel to the MAV-555, remove the slack from the harnesses between fans and others.

3-5-8. CN-1818 Board

Removal

1. Remove the top plate. (Refer to Section 3-2-2.)
2. Remove the rear panel assembly. (Refer to Section 3-2-2.)
3. Remove four installing screws.
4. Remove the connector (CN3) from the CN-1818 board.



Installation

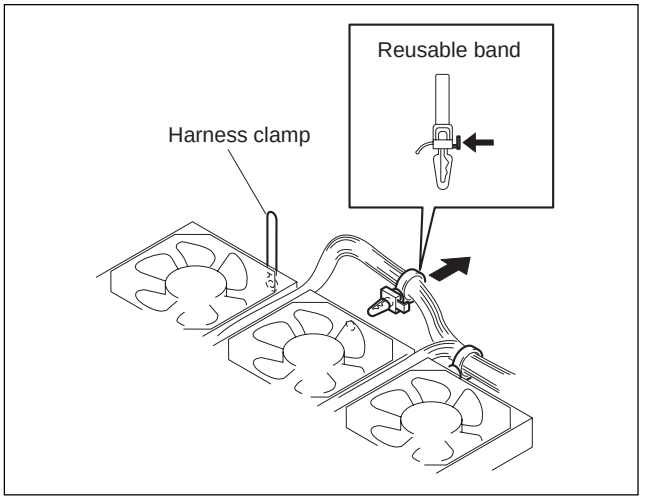
Attach a new CN-1818 board by reversing the disassembly procedure of steps 1 through 4.

Note

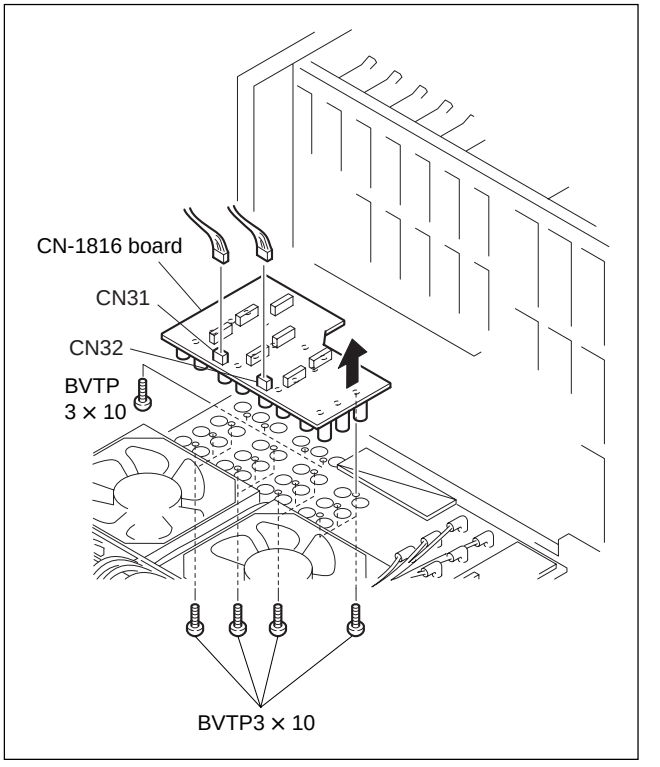
When attaching the rear panel to the MAV-555, remove the slack from the harnesses between fans and others.

3-5-9. CN-1816 Board

1. Remove the top plate. (Refer to Section 3-2-2.)
2. Remove the rear panel assembly. (Refer to Section 3-2-2.)
3. Remove the reusable band.
4. Remove the harness from the harness clamp.



5. Remove the two connectors (CN31 and CN32) of the CN-1816 board.
6. Remove the 16 screws and remove the CN-1816 board.



Installation

Attach a new CN-1816 board by reversing the disassembly procedure of steps 1 through 6.

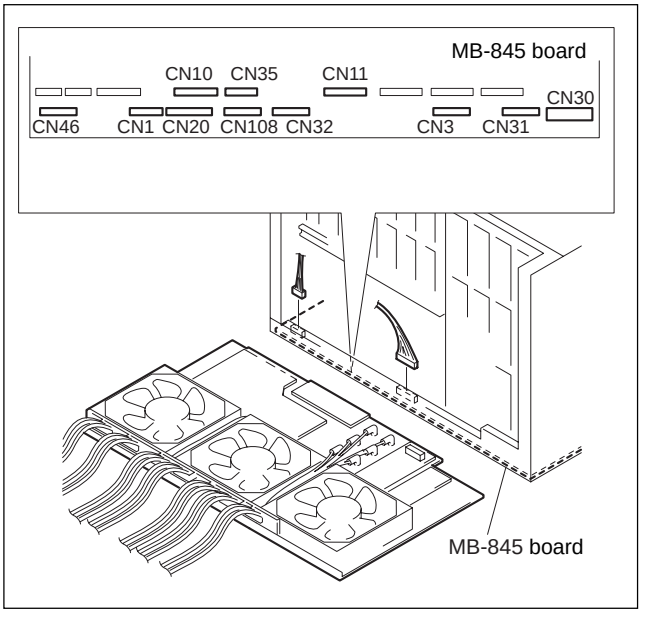
Notes

- When attaching the reusable band, route the fan harness under all other harnesses.
- When attaching the rear panel to the MAV-555, remove the slack from the harnesses between fans and others.

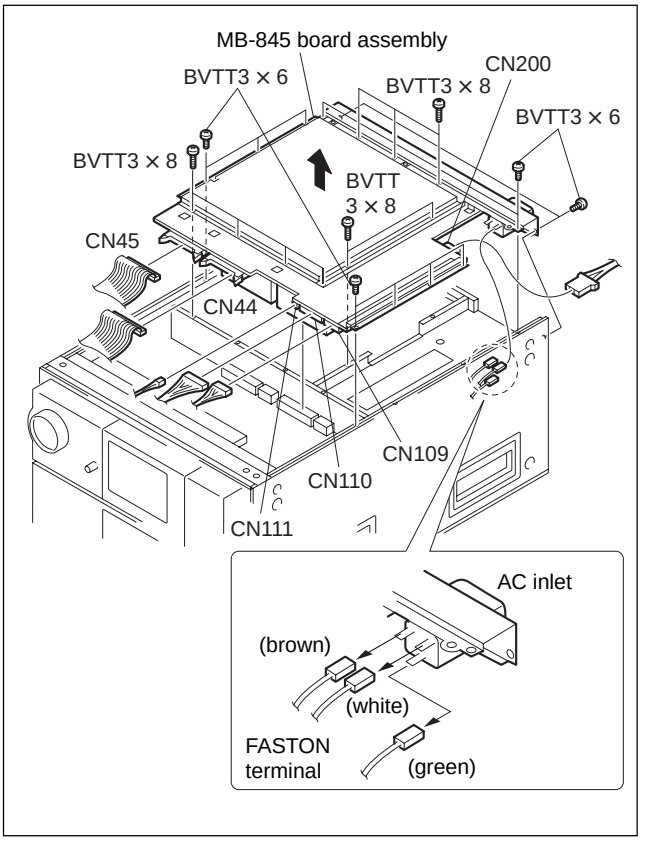
3-5-10. MB-845 Board

Removal

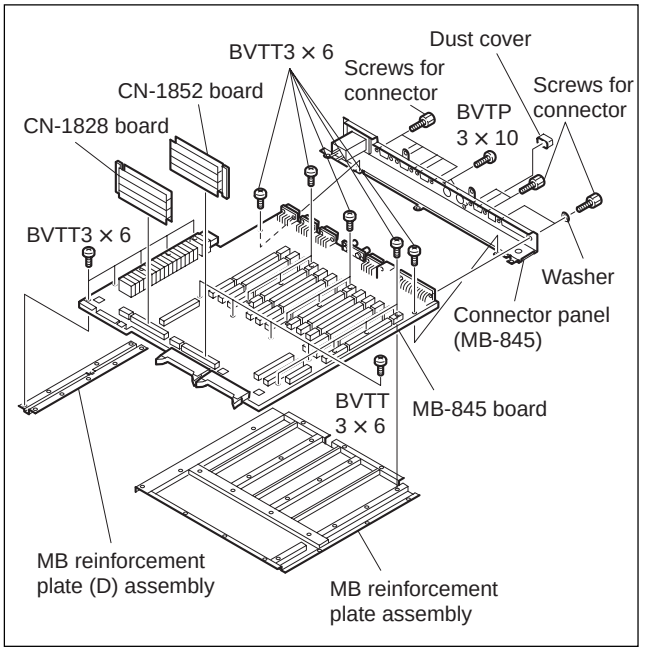
1. Remove the top plate. (Refer to Section 3-2-2.)
2. Remove the power supply. (Refer to Section 3-4-1.)
3. Remove all HDD units. (Refer to Section 3-4-5.)
4. Remove all plug-in boards. (Refer to Section 3-5-5.)
5. Remove all IF-751 boards. (Refer to Section 3-5-11.)
6. Remove the control panel or blank panel. (Refer to Section 3-2-3.)
7. Remove the frame. (Refer to Section 3-4-8.)
8. Remove the rear panel assembly. (Refer to Section 3-2-2.)
9. Remove the 11 connectors (CN1, CN3, CN10, CN11, CN20, CN30, CN31, CN32, CN35, CN46, and CN108) of the MB-845 board.



10. Turn the MAV-555 over and remove the bottom plate. (Refer to Section 3-2-2.)
11. Remove the six connectors (CN44, CN45, CN109, CN110, CN111, and CN200) of the MB-845 board.
12. Remove the three FASTON terminals from the AC inlet.
13. Remove the 11 screws (BVTT3 × 6) and nine screws (BVTT3 × 8), and remove the MB-845 board assembly in the direction of the arrow.



14. Remove the CN-1828 board and CN-1852 board from the MB-845 board.
15. Remove the five screws (BVTT3 × 6) and remove the MB reinforcement plate assembly (D).
16. Remove the 14 screws (BVTT3 × 6) and remove the MB reinforcement plate assembly.
17. Remove the 10 screws for connector, two washers and two screws (BVTP3 × 10), two screws (BVTT3 × 6), and remove the connector panel (MB-845).



Installation

Attach a new MB-845 board by reversing the disassembly procedure of steps 1 through 17.

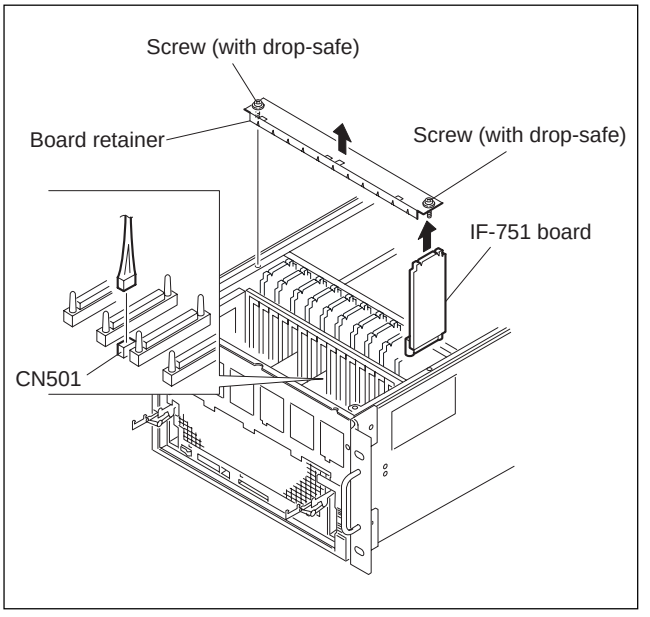
Note

Be sure to apply locking compound slightly when installing the screws for connector.

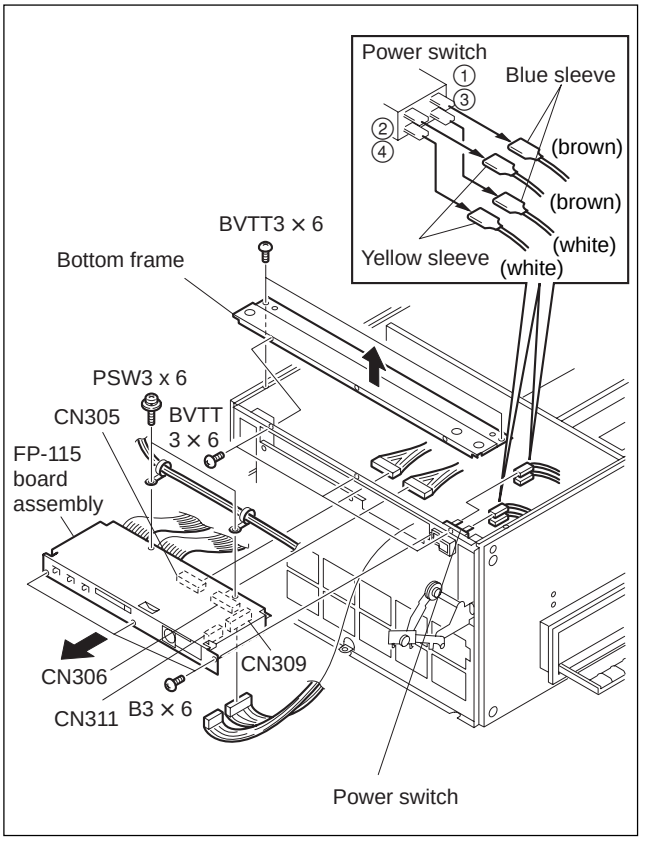
3-5-11. CN-1830 Board

Removal

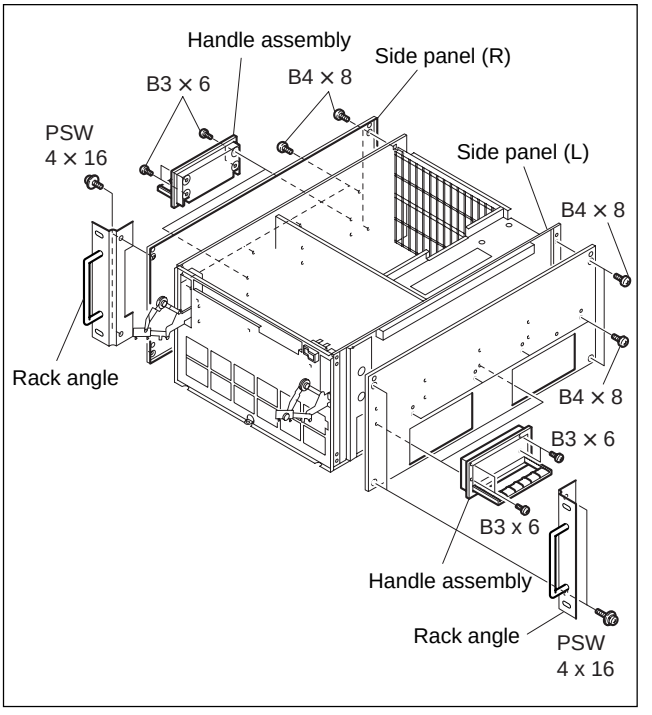
1. Remove the power supply. (Refer to Section 3-4-1.)
2. Remove the HDD unit. (Refer to Section 3-4-5.)
3. Remove the LCD unit. (Refer to Section 3-4-6.)
4. Remove the FL tube. (Refer to Section 3-4-8.)
5. Loosen the two screws (with drop-safe) and remove the board retainer.
6. Remove all IF-751 boards from the connectors of the MB-852 board.
7. Remove the connector CN501 of the MB-852 board.



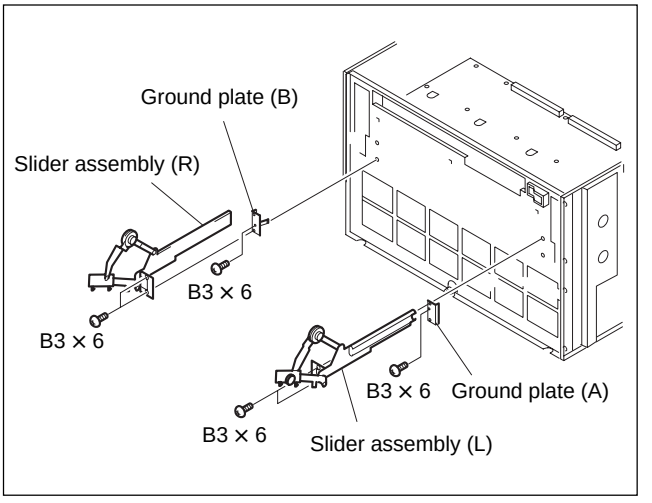
8. Turn the MAV-555 over and remove the bottom plate. (Refer to Section 3-2-2.)
9. Remove the MB-845 board. (Refer to Section 3-5-10.)
10. Remove the connectors (CN305 and CN306) of the FP-115 board.
11. Remove the two screws (PSW3 × 6) and remove the harness retainer.
12. Remove the three screws (B3× 6), pull out the FP-115 board assembly in the direction of the arrow, and remove the connectors (CN309 and CN311) of the FP-115 board.
13. Remove the five screws (BVTT3 × 6) and remove the bottom frame.
14. Remove the FASTON terminals from the power switch.



15. Remove the 16 screws (B3 × 6) and remove the four handle assemblies.
16. When the rack angles are installed, remove the four screws (PSW4 × 16) and the two rack angles.
17. Remove the 12 screws (B4 × 8) and remove the side panel (R)/(L). (When the rack angle is not installed, remove the 16 screws.)

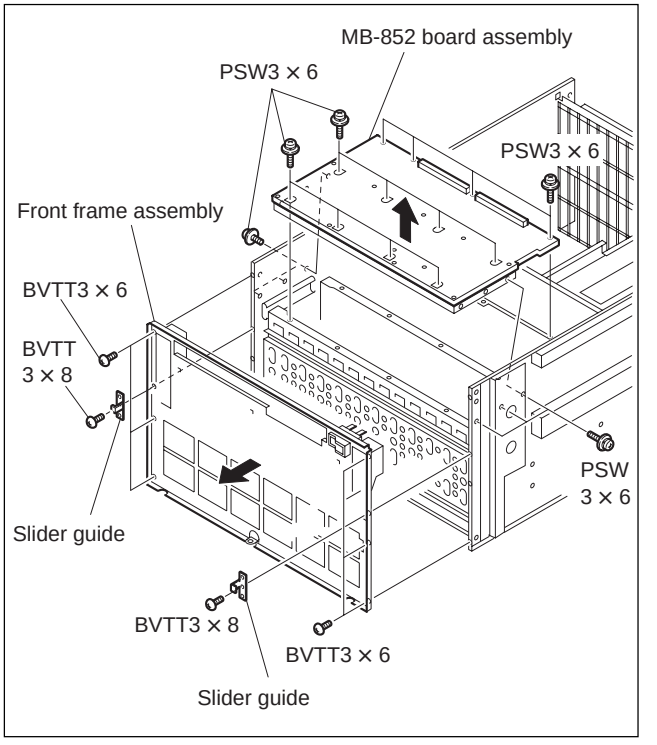


18. Remove the four screws (B3 × 6) and remove the slider assemblies (R) and (L).
19. Remove the two screws (B3 × 6) and remove the ground plate (R) and (L).

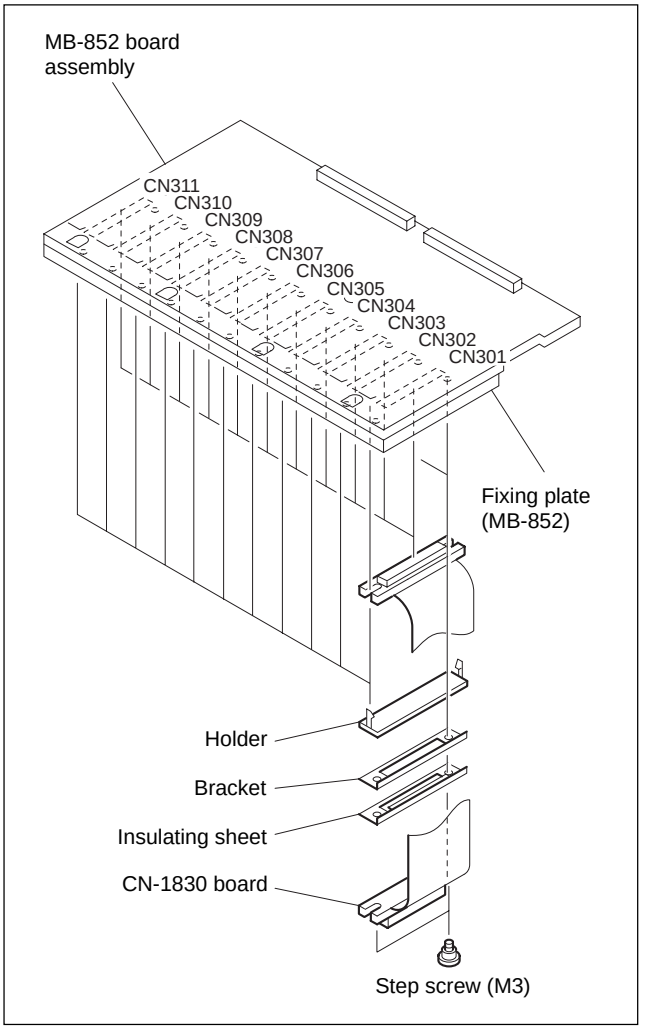


20. Remove the six screws (BVTT3 × 6), two screws (BVTT3 × 8) and remove the front frame assembly, two slider guides in the direction of the arrow.
Note
Keep the removed slider guide.

21. Remove the 18 screws (PSW3 × 6) and remove the MB-852 board assembly in the direction of the arrow.



22. Remove the holder and remove the connector (CN301 to CN311) of the MB-852 board.
23. Remove the two step screws (M3) and remove the bracket, insulating sheet, and CN-1830 board.



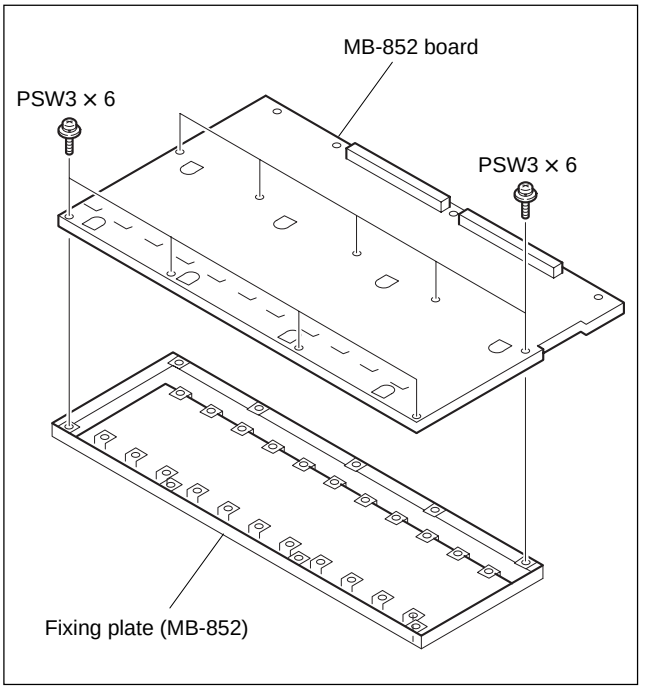
Installation

Attach a new CN-1830 board by reversing the disassembly procedure of steps 1 through 23.

3-5-12. MB-852 Board

Removal

1. Remove all CN-1830 boards. (Refer to Section 3-5-11.)
2. Remove the nine screws (PSW3 × 6) and remove the MB-852 board from the fixing plate (MB-852).



Installation

Attach a new MB-852 board by reversing the disassembly procedure of steps 1 and 2.

Note

The insulation sheet (MB-852) is attached to the fixing plate (MB-852). Be careful not to drop the insulation sheet.

Section 4
Electrical Adjustment

4-1. General Information for Electrical Adjustment

4-1-1. Equipment Required

Tools

- Extension board EX-693 assembly : A-8322-055-A
- AD/DA Adjustment Tool (ADjuster) : Supplied with MAV-555

Measurement equipment

- Analog composite signal generator :
  For 525/60 System : 1410 manufactured by Tektronix or the equivalent
  TSG-130 manufactured by Tektronix or the equivalent
  For 625/50 System : 1411 manufactured by Tektronix or the equivalent
  TSG-131 manufactured by Tektronix or the equivalent
- Analog audio signal generator : SG505 (option.02) manufactured by Tektronix or the equivalent
- Digital audio signal generator : Audio Precision SYSTEM TWO or the equivalent
  SYSTEM ONE, P1DD etc.
- Reference signal generator : TSG-422 manufactured by Tektronix or the equivalent
- Frequency counter : TR5821AK manufactured by Advantest or the equivalent
- Oscilloscope : 2465B manufactured by Tektronix or the equivalent
- Analog composite waveform monitor :
  For 525/60 System : 1750 manufactured by Tektronix or the equivalent
  For 625/50 System : 1751 manufactured by Tektronix or the equivalent
- Vector monitor : 1780R manufactured by Tektronix or the equivalent
- Analog audio measuring equipment :
  Audio Precision SYSTEM TWO or the equivalent
  SYSTEM ONE, P1DD etc.
- Audio level meter : HP3400A manufactured by Hewlett Packard or the equivalent
- Audio analyzer : AA501A (option.02) manufactured by Tektronix or the equivalent
- Personal computer : IBM-PC compatible in which Windows 95/98/NT
  (English version or Japanese version, 4.0 or higher in case of NT) is installed

4-1-2. Notes for Adjustment

In this manual, the letters to be entered are differentiated from those that appear on the display, as shown in the example below when using a personal computer.

Font and style of letters	Display example	Reference for distinction
Times font	UTY>	Automatically displayed message by a program
Helvetica regular (Italic)	*SDC-UTY*	Characters to be entered
Symbols	⏎	Enter key
	␣	Space equivalent to a character

4-2. EM-1 Board Adjustment

Note

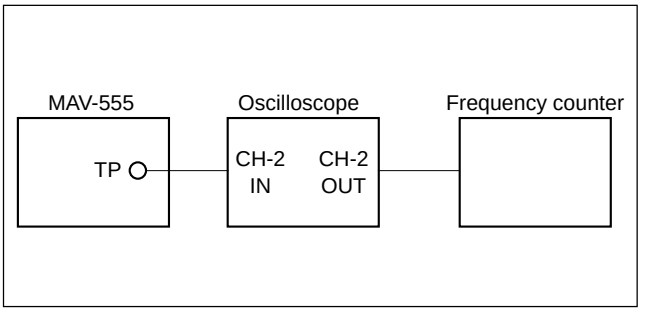
Specification values in the adjustment procedure are ones with EM-1 board extended by the extension board (EX-693).

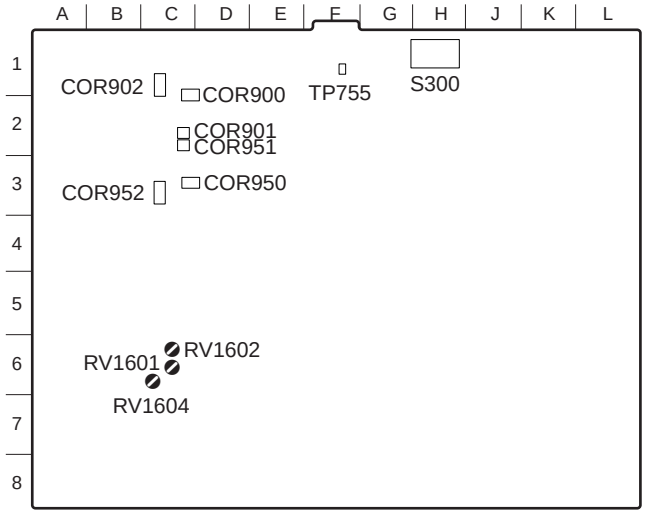
4-2-1. SDI ENC Free-run Adjustment

Preparation

- S300 (H-1)/EM-1 board → OFF
- COR900 (C-2)/EM-1 board → 20
- COR901 (C-2)/EM-1 board → UTY
- COR902 (C-1)/EM-1 board → +4
- COR950 (C-3)/EM-1 board → 20
- COR951 (C-2)/EM-1 board → UTY
- COR952 (C-3)/EM-1 board → +4

Connection





EM-1 board (A side)

Adjustment Procedure

1. Connect the MAV-555 with a personal computer via Ethernet.
2. Start up the terminal program such as Tera Term.
   Note
   Set IP address to the 192.168.0.1.
3. Enter “rlogin EM” to connect the EM board.

```
rlogin␣EM↵
EM>
```

4. Set “H” to bit1 of the register 0x02020004 by operating the menu display as shown.

```
EM>dbg↵
Grydar
DBG_EM>e␣02020004↵
02020004:xx-c2↵
02020005:xx-q↵
DBG_EM>
```

xx : Don’t care

5. Equipment : Frequency counter, oscilloscope
   Test point : TP755 (F-1) /EM-1 board
   Adj. point : ◐RV1604 (C-6) /EM-1 board
   Spec. : 27.00 ±0.27 MHz

6. Return the setting to the former position by operating the setup menu display as shown.

```
DBG_EM>e␣02020004↵
02020004:xx-c0↵
02020005:xx-q↵
DBG_EM>
```

xx : Don’t care

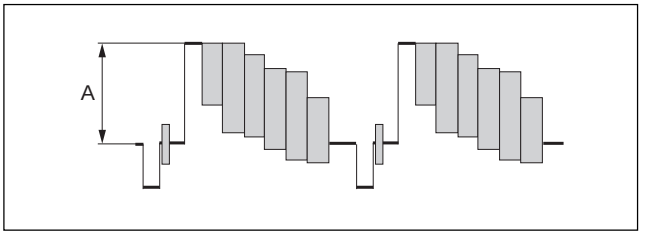
4-2-2. Video Monitor Out Level Adjustment (525/60 mode)

Note

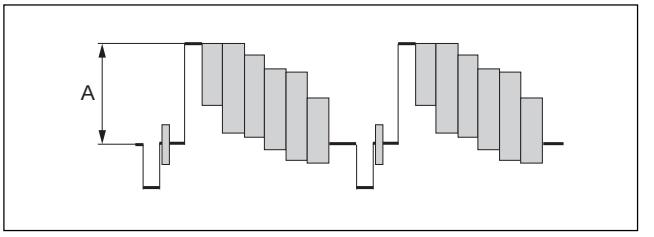
Allow 30 minutes or more of warm up of MAV-555 and measurement equipment before starting adjustments.

Adjustment Procedure

1. Connect the 75% color bar signal to the SDI IN-1 connector.
2. Set the setup menu “010-525/625” to “525/60”.
   Note
   Refer to the MAV-555 Installation Manual for the operating procedures.
3. Set the setup menu “703-OUT SETUP P1” and “704-OUT SETUP P2” to “off”.
4. Turn off the main power once then back on.
   Note
   To restart quickly, execute the setup menu item “027-FAST REBOOT”.
5. Set the CHARACTER switch of the system setup panel to OFF.
6. Press the R1 button of the PORT SELECT block on the meter panel.
7. Press the SDI button of the VIDEO INPUT SELECT block on the meter panel.
8. Enter the R1 port into the recording mode.
   Note
   For details of the recording procedure, refer to the Operation Manual of the MAV- 555 and that of the control panel.
9. Press the P1 button of the PORT SELECT block on the meter panel.
   Note
   Do not touch the buttons of the PORT SELECT block until this adjustment is complete.
10. Press the SDI button of the VIDEO INPUT SELECT block on the meter panel.
11. Select the material that is recorded in step 7, and enter the P1 port into the playback mode.
    Note
    For details of the playback procedure, refer to the Operation Manual of the MAV-555 and that of the control panel.
12. Press the Control switch on the VIDEO PROCESS block of the meter panel to set to the Local mode.
13. Set all the four buttons of Video, Chroma, Setup and Chroma Phase on the meter panel to “PRESET”.
14. Confirm that 75% color bar signal is played back.
15. Equipment : Waveform monitor
    Test point : ANALOG COMPOSITE MONITOR OUT (SUPER) connector/rear panel
    Adj. point : ⊘RV1601 (C-6) /EM-1 board
    Spec. : A = 710 ±3 mV



16. Equipment : Waveform monitor
    Test point : CONTROL PANEL (BNC) connector/ rear panel
    Adj. point : ⊘RV1602 (C-6) /EM-1 board
    Spec. : A = 708 ±3 mV



After Adjustment

1. Set the R1 port and the P1 port of the MAV-555 to the STOP mode.
2. Return the setup menu “010-525/625” to the same setting as that before adjustment.
3. Return the setup menus “703-OUT SETUP P1” and “704-OUT SETUP P2” to the same settings as those before adjustment.
4. Return the switch of the VIDEO BLOCK block on the meter panel to the same setting as that before adjustment.
5. Turn off the main power of the MAV-555.

4-2-3. Audio Monitor Out Level Adjustment

Note

Allow 30 minutes or more of warm up of MAV-555 and measurement equipment before starting adjustments.

Adjustment Procedure

1. Connect the audio signal (1 kHz, +4 dBm or −20 dB FS) to the SDI IN-1 connector on rear the panel.
2. Set the head room level to 20 dB and set the audio output level to +4 dBm/600 Ω terminated.
   - COR900 (C-2)/EM-1 board → 20
   - COR901 (C-2)/EM-1 board → UTY
   - COR902 (C-1)/EM-1 board → +4
   - COR950 (C-3)/EM-1 board → 20
   - COR951 (C-2)/EM-1 board → UTY
   - COR952 (C-3)/EM-1 board → +4
3. Press the R1 button of the PORT SELECT block on the meter panel.
4. Set the Audio Input Selects (CH-1 and CH-2) on the meter panel to SDI.
5. Set the Audio Level Controls (CH-1 and CH-2) on the meter panel to PRESET.
6. Set the Monitor Selects from L-ch to CH-1 and from R-ch to CH-2.
7. Equipment : Audio level meter
   Test point : ANALOG AUDIO MONITOR OUT-L connector/rear panel
   Adj. point : ⊘RV900 (C-2) /EM-1 board
   Spec. : +3.97 ±0.05 dBm (600 Ω load)
8. Equipment : Audio level meter
   Test point : ANALOG AUDIO MONITOR OUT-R connector/rear panel
   Adj. point : ⊘RV1000 (C-2) /EM-1 board
   Spec. : +3.97 ±0.05 dBm (600 Ω load)

After Adjustment

1. Return the Audio Input Select and Monitor Select to the same settings as those before adjustment.
2. Return the Audio Level Control to the same setting as that before adjustment.
3. Turn off the main power of the MAV-555.
4. Return the head room level and the audio output level to the same setting as those before adjustment.

4-2-4. Video Monitor Out Level Adjustment (625/50 mode)

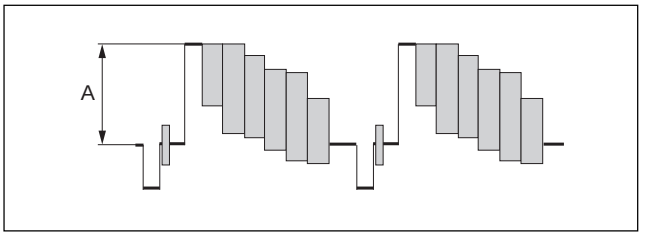
Note

Allow 30 minutes or more of warm up of MAV-555 and measurement equipment before starting adjustments.

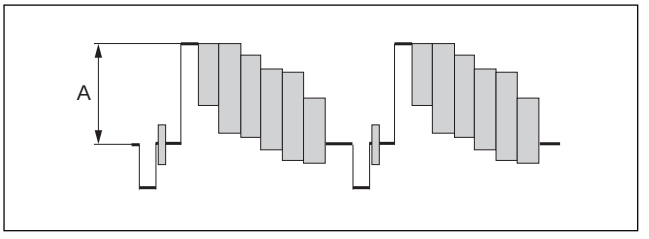
Adjustment Procedure

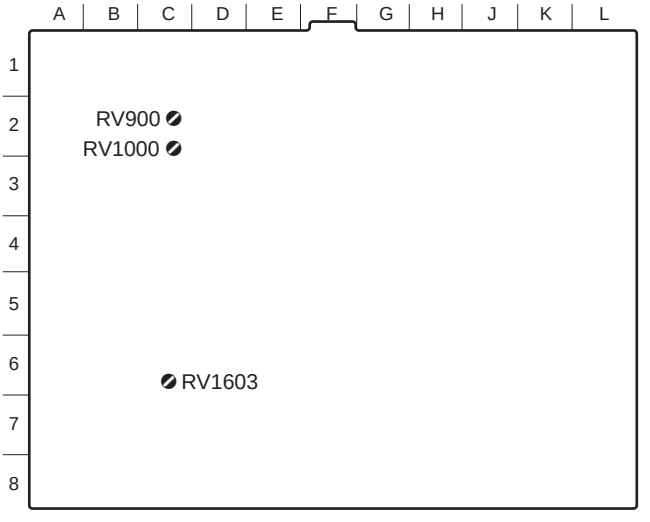
1. Connect the 75% color bar signal to the SDI IN-1 connector.
2. Set the setup menu “010-525/625” to “625/50”.
   Note
   Refer to the MAV-555 Installation Manual for the operating procedures.
3. Turn off the main power once then back on.
   Note
   To restart quickly, execute the setup menu item “027-FAST REBOOT”.
4. Set the CHARACTER switch of the system setup panel to OFF.
5. Press the R1 button of the PORT SELECT block on the meter panel.
6. Press the SDI button of the VIDEO INPUT SELECT block on the meter panel.
7. Enter the R1 port into the recording mode.
   Note
   For details of the recording procedure, refer to the Operation Manual of the MAV-555 and that of the control panel.
8. Press the P1 button of the PORT SELECT block on the meter panel.
   Note
   Do not touch the buttons of the PORT SELECT block until this adjustment is complete.
9. Press the SDI button of the VIDEO INPUT SELECT block on the meter panel.
10. Select the material that is recorded in step 7 and enter the P1 port into the playback mode .
    Note
    For details of the playback procedure, refer to the Operation Manual of the MAV-555 and that of the control panel.

11. Press the Control switch of the VIDEO PROCESS block on the meter panel several times until the Local mode is set.
12. Set all of the four buttons of Video, Chroma, Setup and Chroma Phase on the meter panel to “PRESET”.
13. Confirm that 75% color bar signal is played back.
14. Equipment : Waveform monitor
    Test point : ANALOG COMPOSITE MONITOR OUT (SUPER) connector/rear panel
    Adj. point : ⊘RV1603 (C-6) /EM-1 board
    Spec . : A = 696 ±3 mV



15. Check as follows.
    Equipment : Waveform monitor
    Test point : CONTROL PANEL (BNC) connector/ rear panel
    Spec. : A = 698 ±30 mV





EM-1 board (A side)

After Adjustment

1. Set the R1 port and the P1 port of the MAV-555 to the STOP mode.
2. Return the setup menu “010-525/625” to the same setting as that before adjustment.
3. Return the switch of the VIDEO PROCESS block on the meter panel to the same setting as that before adjustment.
4. Turn off the main power of the MAV-555.

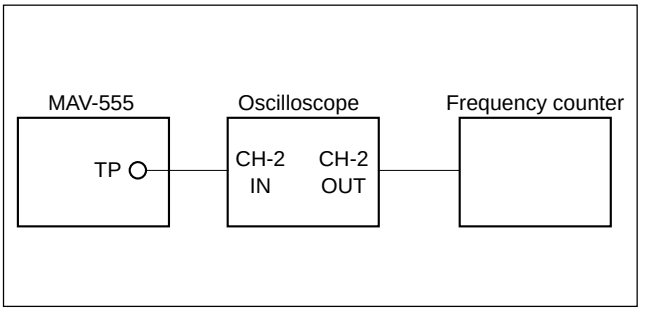
4-3. DPR-127 Board Adjustment

4-3-1. SDI ENC Free-run Adjustment

Preparation

When any cables are connected to the SERIAL V/A IN-R1 connector and to the SERIAL V/A IN-R2 connector on the rear panel, remove the cables.

Connection



Adjustment Procedure

1. Connect the MAV-555 with a personal computer via Ethernet.
2. Start up the terminal program such as Tera Term.
   Note
   Set IP address to the 192.168.0.1.

3. Enter “rlogin DM1” to connect to the DM board.
   Note
   When adjusting the DPR-127 board (R1 port) of the SLOT8 :
   rlogin DM1
   When adjusting the DPR-127 board (R2 port) of the SLOT4 :
   rlogin DM2

   ```
   rlogin␣DM1↵
   DM1>
   ```

4. Set “H” to Bit0 (LSB) of the register 0x02030111 by operating the menu display as shown.

   ```
   DM1>dbg↵
   Grydar
   DBG_DM1>e␣02030111↵
   02030103:xx-01↵
   02030104:xx-q↵
   DBG_DM1>
   DM1
   ```

   xx : Don’t care

5. Equipment : Frequency counter, oscilloscope
   Test point : TP203 (B-1) /DPR-127 board
   Adj. point : ◓RV101 (F-1) /DPR-127 board
   Spec. : 27.00 ±0.10 MHz

6. Set “H” to Bit0 (LSB) of the register 0x02030103 by operating the menu display as shown.

   ```
   DBG_DM1>e␣02030103↵
   02030103:xx-01↵
   02030104:xx-q↵
   DBG_DM1>
   ```

   xx : Don’t care

7. Equipment : Frequency counter, oscilloscope
   Test point : TP203 (B-1) /DPR-127 board
   Adj. point : ◓RV102 (C-1) /DPR-127 board
   Spec. : 27.00 ±0.10 MHz

8. Set the register by operating the menu display as shown.

   ```
   DBG_DM1>e␣02030111↵
   02030111:xx-00↵
   02030112:xx-01↵
   02030113:xx-q↵
   DBG_DM1>e␣02030103↵
   02030103:xx-00↵
   02030104:xx-q↵
   DBG_DM1>
   ```

   xx : Don’t care

9. Equipment : Frequency counter, oscilloscope
   Test point : TP203 (B-1) /DPR-127 board
   Adj. point : ◓RV1501 (K-1) /DPR-127 board
   Spec. : 27.00 ±0.10 MHz

10. Return the setting to the former position by operating the setup menu display as shown.

    ```
    DBG_DM1>e␣02030112↵
    02030103:xx-00↵
    02030104:xx-q↵
    DBG_DM1>
    ```

    xx : Don’t care

4-4. TM-40 Board Adjustment

Note

Allow 30 minutes or more of warm up of MAV-555 and measurement equipment before starting adjustments.

4-4-1. SCH DET Adjustment (525/60 mode)

Preparation

- Connect the black-burst signal “SCH : 0 degree” to the REFERENCE IN connector on the rear panel.
- Set the setup menu “010-525/625” to “525/60”.

  Note

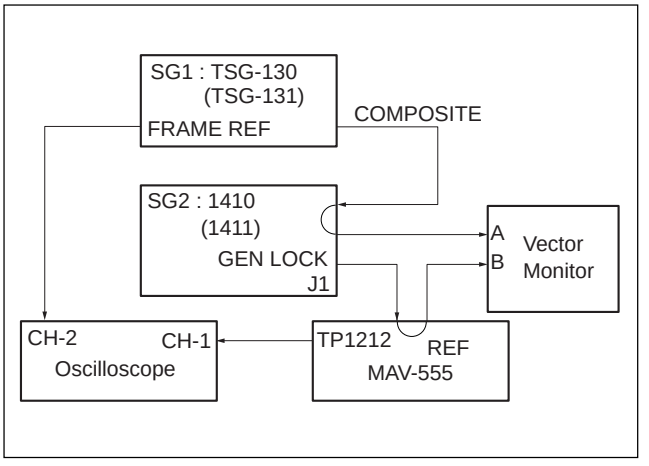
  Refer to the MAV-555 Installation Manual for the operating procedures.

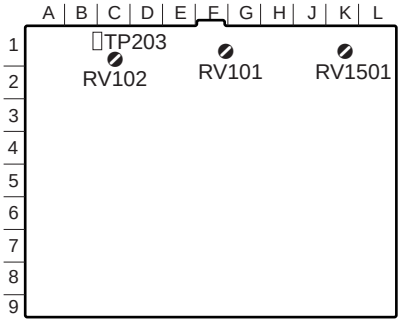
- Turn off the main power once then back on.

  Note

  To restart quickly, execute the setup menu item [027-FAST REBOOT].

Connection

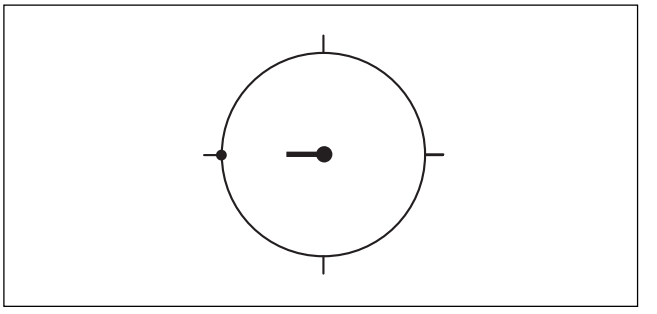




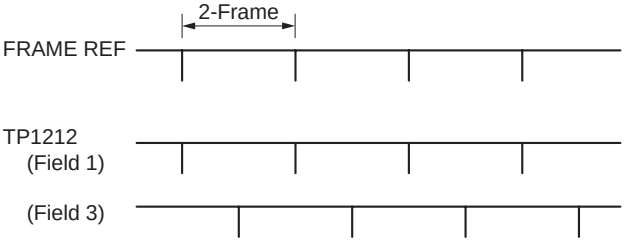
DPR-127 board (A side)

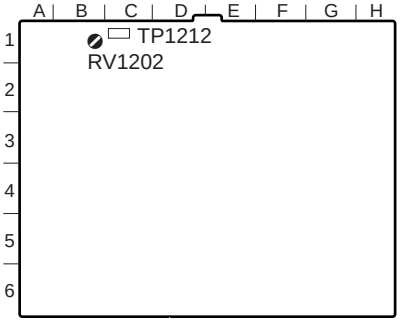
Adjustment Procedure

1. Set up the measurement equipment as follows:
   - Vectormonitor :
     SCH mode, INPUT : CH-B, EXT REF
   - Signal generator SG2 (1410)
     Synchronization : GEN LOCK
2. Adjust the PHASE knob of a vectormonitor to adjust the sync phase to 0°.
3. Change the vectormonitor setting as follows.
   INPUT : CH-A
4. Adjust the HORIZ DELAY knob of a signal generator SG2 to adjust the sync phase to 0°.



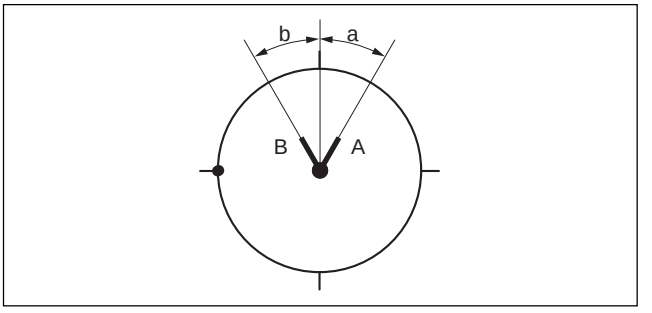
5. Set up an oscilloscope as follows:
   CH-1 : TP1212 (C-1)/TM-40 board, DC 2 V/DIV
   CH-2 : FRAME REF/SG1 (TSG-130), DC 5 V/DIV
   TIME : 20 ms/DIV
   TRIG : CH-2 (−slope)
6. Turn the RV1202 (B-1)/TM-40 board fully counter-clockwise (↺).
7. Turn the RV1202 slowly clockwise (↻) until the oscilloscope CH-1 waveform appears in the field 1.



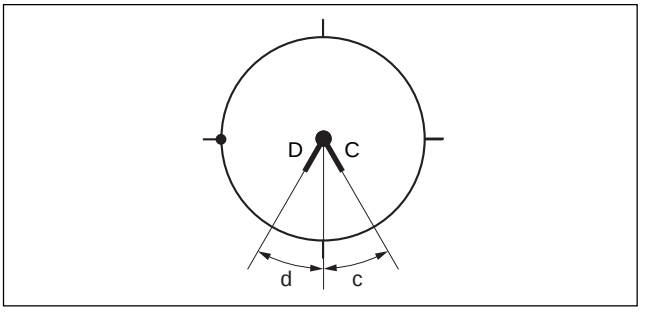


TM-40 board (A side)

8. Turn the SC PHASE knob of a signal generator SG2 slowly in the direction of −90° (↺). The vectormonitor waveform at the moment when the oscilloscope CH-1 waveform appears in field 3, is defined as the waveform A.



9. Turn the SC PHASE knob of a signal generator SG2 slowly in the direction of 0° (↺). The vectormonitor waveform at the moment when the oscilloscope CH-1 waveform appears in field 1, is defined as the waveform B.
10. Adjust RV1202 and repeat steps 7 through 9 until the specification [a = b] is satisfied.
11. Return the SC PHASE knob of a signal generator SG2 to the 0° position.
12. Turn the SC PHASE knob of a signal generator SG2 slowly in the direction of −90° (↺). The vectormonitor waveform at the moment when the oscilloscope CH-1 waveform appears in field 3, is defined as the waveform C.



13. Turn the SC PHASE knob of a signal generator SG2 slowly in the direction of 0° (↺). The vectormonitor waveform at the moment when the oscilloscope CH-1 waveform appears in field 1, is defined as the waveform D.
14. Confirm that [c = d].

4-4-2. SCH DET Adjustment (625/50 mode)

Preparation

- Connect the black-burst signal “SCH : 0°” to the REFERENCE IN connector on the rear panel.
- Set the setup menu “010-525/625” to “625/50”.

Note

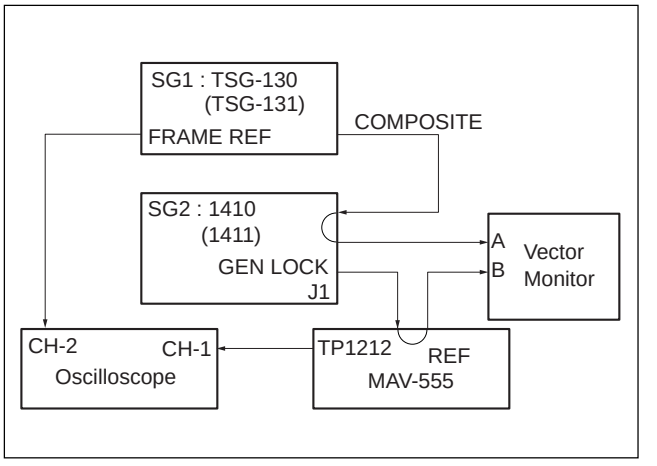
Refer to the MAV-555 Installation Manual for the operating procedures.

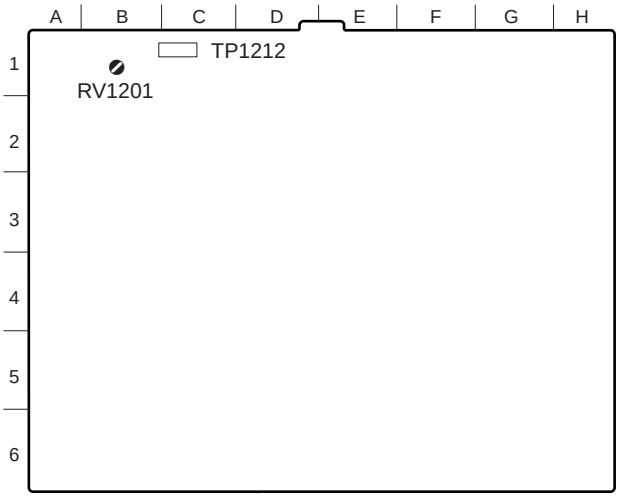
- Turn off the main power once then back on.

Note

To restart quickly, execute the setup menu item [027-FAST REBOOT].

Connection



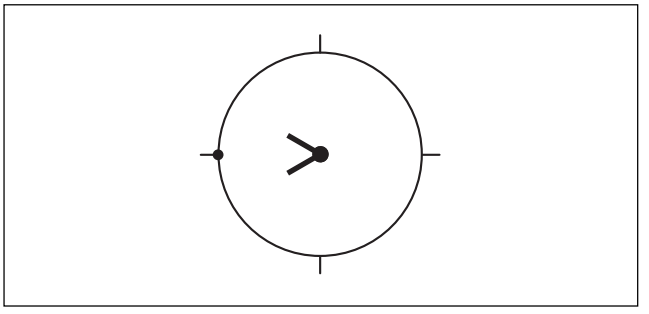


TM-40 board (A side)

Adjustment Procedure

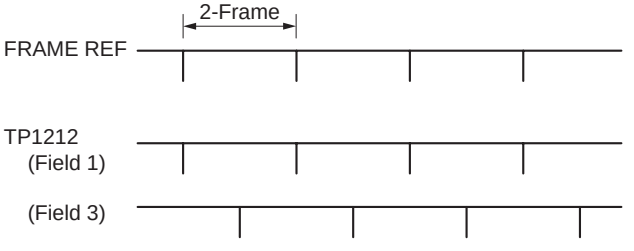
1. Set up the measurement equipment as follows:
   - Vectormonitor :
     SCH mode, INPUT : CH-B, EXT REF
   - Signal generator SG2(1411) :
     Synchronization : GEN LOCK

2. Adjust the PHASE knob of a vectormonitor to adjust the sync phase to 0°.
3. Change the vectormonitor setting as follows.
   INPUT : CH-A
4. Adjust the HORIZ DELAY knob of a signal generator SG2 to adjust the sync phase to 0°.

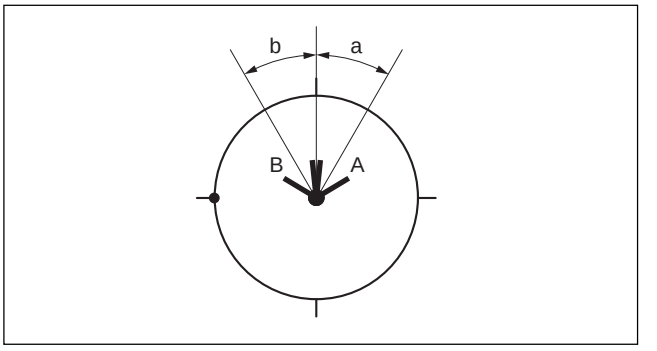


5. Set up an oscilloscope as follows:
   CH-1 : TP1212 (C-1)/TM-40 Board, DC 2 V/DIV
   CH-2 : FRAME REF/SG1 (TSG-131), DC 5 V/DIV
   TIME : 20 ms/DIV
   TRIG : CH-2 (−slope)

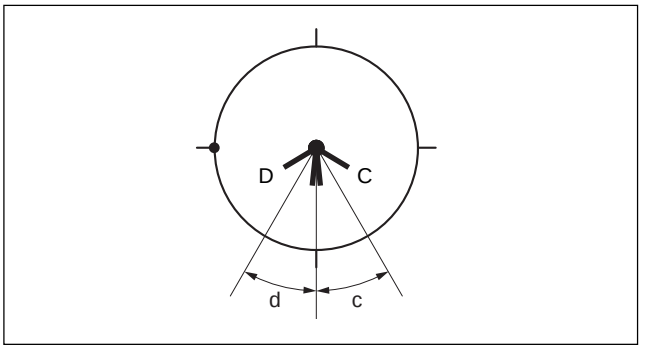
6. Turn the RV1201 (B-1)/TM-40 board fully counter-clockwise (↺).
7. Turn the RV1201 slowly clockwise (↻) until the oscilloscope CH-1 waveform appears in the field 1.



8. Turn the SC PHASE knob of a signal generator SG2 slowly in the direction of −90° (↺). The vectormonitor waveform at the moment when the oscilloscope CH-1 waveform appears in field 3, is defined as the waveform A.



9. Turn the SC PHASE knob of a signal generator SG2 slowly in the direction of 0° (↺). The vectormonitor waveform at the moment when the oscilloscope CH-1 waveform appears in field 1, is defined as the waveform B.
10. Adjust the RV1201 and repeat steps 7 through 9 until the specification [a = b] is satisfied.
11. Return the SC PHASE knob of a signal generator SG2 to the 0° position.
12. Turn the SC PHASE knob of a signal generator SG2 slowly in the direction of −90° (↺). The vectormonitor waveform at the moment when the oscilloscope CH-1 waveform appears in field 3, is defined as the waveform C.



13. Turn the SC PHASE knob of a signal generator SG2 slowly in the direction of 0° (↺). The vectormonitor waveform at the moment when the oscilloscope CH-1 waveform appears in field 1, is defined as the waveform D.
14. Confirm that [c = d].

4-5. DA-136 Board Adjustment

4-5-1. Audio Level Adjustment

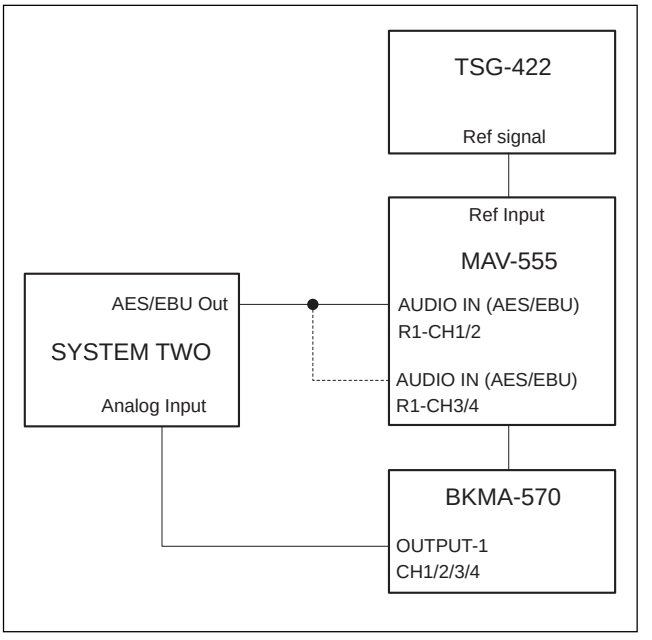
Note

Allow 30 minutes or more of warm up of MAV-555 and the measuring equipment before starting adjustments.

Preparation

1. Set the headroom level.
   COR101 (C-3), COR201(D-3), COR301 (E-3), and COR401 (G-3)/DA-136 Board → 20 dB
2. Set the output level.
   COR102 (B-2), COR202 (D-2), COR302 (E-2), and COR402 (G-2)/DA-136 Board → +4 dBm/terminated with 600 Ω
3. Extend the DA-136 board using an extension board.
4. Make wiring as shown in the connection diagram in accordance with the ports that require adjustment.
5. Turn on the main power.
6. Press the R1 button of the PORT SELECT block on the meter panel.
7. Audio Input Select (CH-1 to CH-4)/meter panel → AES/EBU.
8. AUDIO LEVEL CONTROL/meter panel → PRESET.
9. Press the P1 or P2 button of the Port Select block of the meter panel according to the port to be adjusted.
10. Audio Level Control/meter panel → PRESET.

Connection



Adjustment Procedure

1. Digital Audio Signal Generator : Generate the sine wave having amplitude from SYSTEM TWO : −20 dB FS at frequency :1 kHz. (When emphasis has been set, set Emphasis OFF.)
2. Press the R1 button of the PORT SELECT block on the meter panel.
3. Set R1 port into record mode.
4. Select P1 and P2 of the PORT SELECT block in accordance with the port to be adjusted.
5. Playback the material that is recorded by step 3.
6. Equipment : Analog Audio Measuring Equipment
   Test point : OUTPUT-1 (CH-1)/CN-1831 board (BKMA-570)
   Adj. point : ⊘RV101 (C-2)/DA-136 board
   Spec. : +3.99 ±0.03 dBm (terminated with 600 Ω).

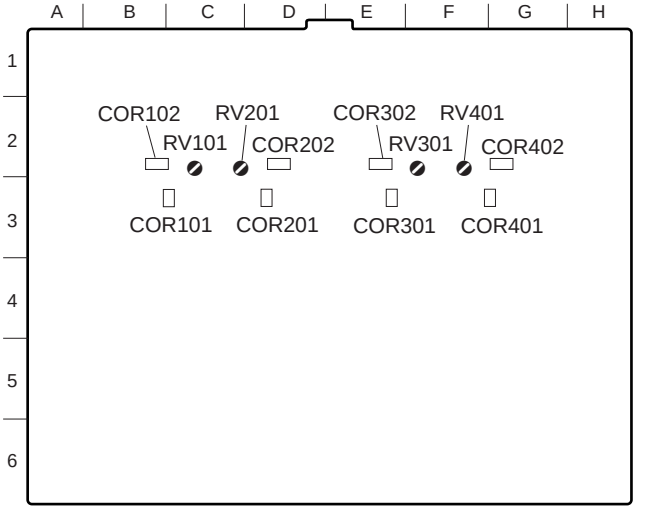
   Adjust CH-2 to CH-4 in the same way as CH-1

CH-2	⊘RV201 (C-2)/DA-136 Board
CH-3	⊘RV301 (F-2)/DA-136 Board
CH-4	⊘RV401 (F-2)/DA-136 Board

Note

Set the filter of the Analog Audio Measuring Equipment to the following setting.
High Pass Filter : 10 Hz
Low Pass Filter : 80 kHz

7. Set the R1 port P1 (or P2) of the MAV-555 to the STOP mode.
8. Return the AUDIO LEVEL CONTROLs of the respective channels on the meter panel, to the original positions before adjustment.
9. Turn off the main power.
10. Return the head room level and the audio output level to the same settings as those before adjustment.
11. Remove the extension board and insert the DA-136 board to the specified slot of the MAV-555.



DA-136 board (A side)

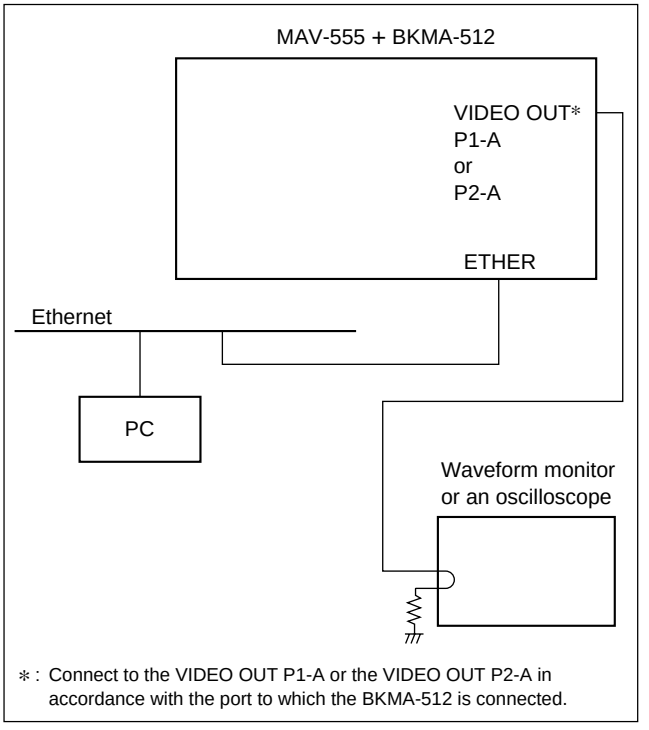
4-5-2. D/A Video Level Adjustment

Notes

Check the following setup menus before starting adjustment.

- Check the NTSC/PAL setup. (Refer to menu No. 010 of Section 1-9-2 of the MAV-555 Installation Manual.)
- Check the network setup. (Refer to menu No. 220 of Section 1-9-6 of the MAV-555 Installation Manual.)

Connection



∗ : Connect to the VIDEO OUT P1-A or the VIDEO OUT P2-A in accordance with the port to which the BKMA-512 is connected.

Setting

1. Open “782-INT VD SG R1” of the setup menu.
   Note
   For details on how to use the setup menu, refer to the Operation Manual.

2. Press the VIDEO/MENU knob once.

782-INT VD SG R1
off

3. Turn the VIDEO/MENU knob and select “CB100” (100% color-bar signal).

782-INT VD SG R1
CB100

4. Press the SET button.
5. Set “703-OUT SETUP P1” or “704-OUT SETUP P2” to “off” on the setup menu in accordance with the port that the BKMA-512 is connected to. (Refer to Section 1-9-5 of the MAV-555 Installation Manual.)
   Note
   The setting is not required in case of the 625-mode (PAL).

6. Turn off the main power and back on. Restart the MAV-555.
   Note
   To restart the MAV-555 quickly, execute “027-FAST REBOOT” of the setup menu.

7. Press the R1 button on the PORT SELECT block of the meter panel.
   (Set so that the internal SG is output to the R1 port.)
8. Press the COMPOSITE button of the VIDEO INPUT SELECT block of the meter panel for at least three seconds. (The internal SG starts, and the COMPOSITE button and the SDI button are turned on.)
9. Press either the P1 or the P2 button of the PORT SELECT block of the meter panel in accordance with the port to which the BKMA-512 is connected.
10. Press the CONTROL button of the VIDEO PROCESS block on the meter panel several times, and enter the LOCAL mode.
11. Set all buttons of VIDEO, CHROMA, SETUP, and CHROMA PHASE on the meter panel to “PRESET”.

12. Start up the MS-DOS prompt of the personal computer.
13. Enter “ping 192.168.0.1” on the MS-DOS prompt line. (The underlined number is the IP address of the MAV-555.)

Note

The IP address of the MAV-555 is the value set for No. 220 of the setup menu.

```
Microsoft(R) Windows 95
(C)Copyright Microsoft Corp 1981-1995.

C:\>ping␣192.168.0.1↵
```

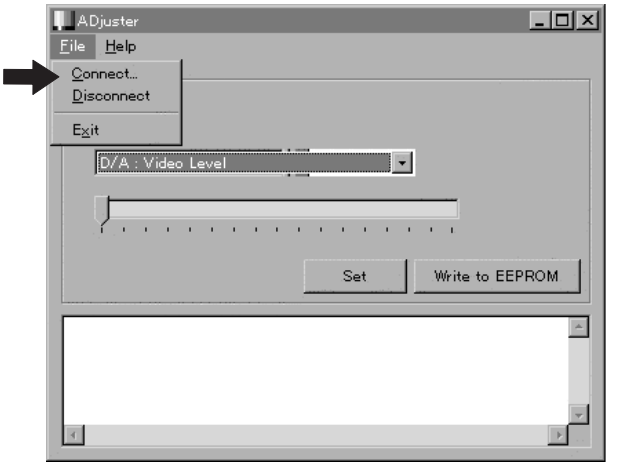
14. Check that a reply is returned normally.
Example of message (normal)

```
C:\>ping␣192.168.0.1↵

Pinging 192.168.0.1 with 32 bytes of data:

Reply from 192.168.0.1: bytes=32 time=2ms TTL=254
Reply from 192.168.0.1: bytes=32 time=1ms TTL=254
Reply from 192.168.0.1: bytes=32 time<10ms TTL=254
Reply from 192.168.0.1: bytes=32 time=1ms TTL=254

C:\WINDOWS>
```

Example of message (abnormal)

```
C:\>ping␣192.168.0.2↵

Pinging 192.168.0.2 with 32 bytes of data:

Request timed out
Request timed out
Request timed out
Request timed out

C:\WINDOWS>
```

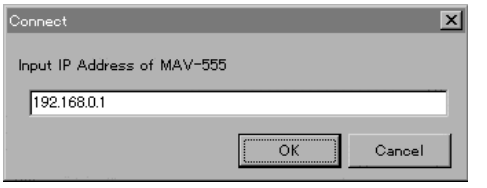
15. Start the ADjuster program from the floppy disk that is supplied with the MAV-555.



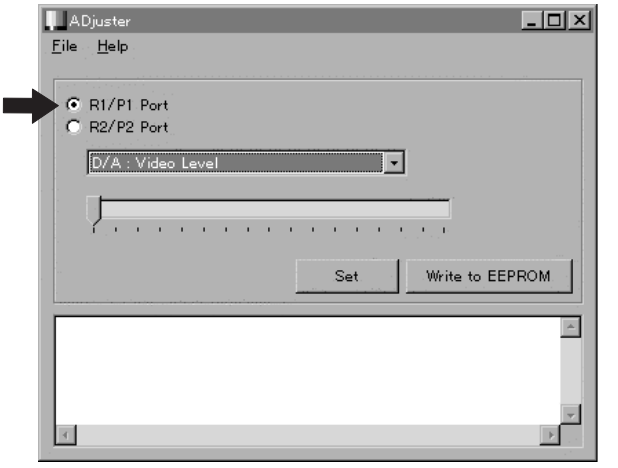
16. Select “File” – “Connect” from the top menu.
17. Enter the IP address of the MAV-555 and click OK.

Note

The IP address of the MAV-555 is the value set for No. 220 of the setup menu.



18. Select either “R1/P1 port” or “R2/P2 port” of the ADjuster in accordance with the port to which the BKMA-512 is connected.
When the BKMA-512 is connected to the P1 port (inserted into slot No. 9) : Select the R1/P1 port.
When the BKMA-512 is connected to the P2 port (inserted into slot No. 3) : Select the R2/P2 port.

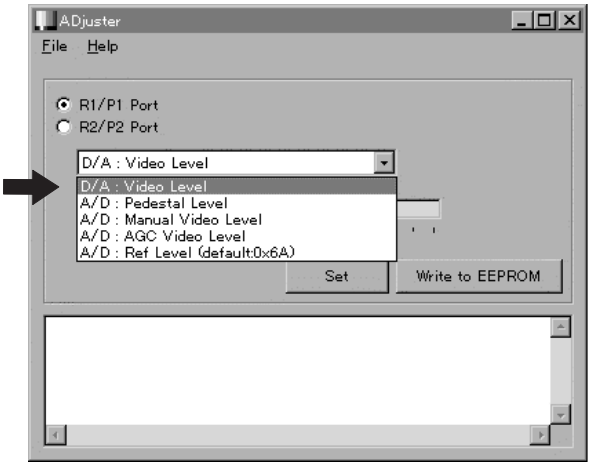


Adjustment Procedure

Note

Turn on the main power of the MAV-555 and measuring equipment. Wait for at least 30 minutes of warm up before starting any adjustments.

1. Select “D/A Video Level” of the ADjuster.



2. Press the R1 button of the PORT SELECT block on the meter panel.
3. Enter the R1 port into the record mode. (The internal SG signal (100% color bars) is recorded on the R1 port.)

   Note

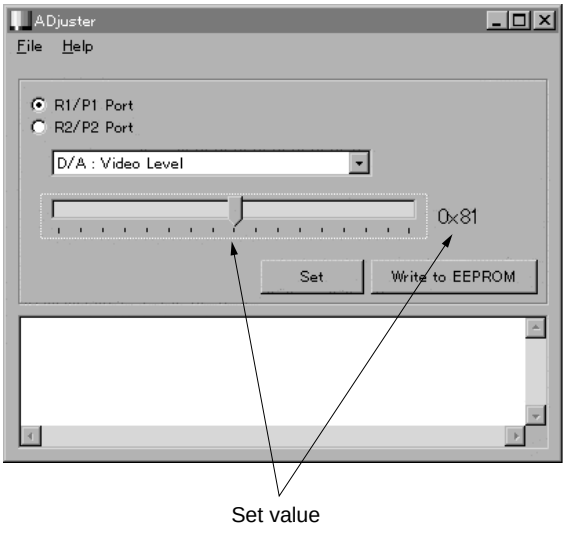
   For details of the recording procedure, refer to the Operation Manual of the MAV-555 and that of the control panel.

4. Press either the P1 or the P2 button of the PORT SELECT block of the meter panel in accordance with the port to which the BKMA-512 is connected.
5. Select the material that is recorded in step 3. Enter the P1 (or P2) port into the playback mode.

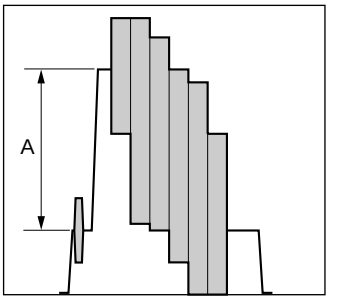
   Note

   For details of the playback procedure, refer to the Operation Manual of the MAV-555 and that of the control panel.

6. After the setup value of the level bar of the ADjuster has been set using the [←] and [→] keys, or mouse of a personal computer, click “Set” to check the level.



7. Repeat step 6 until the specification is satisfied.
   Specification : A = 714 ±7 mV (100 ±1 IRE) : 525/60 mode
   A = 700 ±7 mV (100 ±1 IRE) : 625/50 mode



8. Save the set value by clicking “Write to EEPROM” of the ADjuster.

After Adjustment

1. Set the R1 port and P1 (or P2) port of the MAV-555 to the STOP mode.
2. Select “File” – “Disconnect” on the top menu of the ADjuster.
3. Exit the ADjuster.
4. Return the setting of “782-INT VD SG” on the setup menu to the original setting before starting the adjustment.
5. Return the setting of “703-OUT SETUP P1” and “704-OUT SETUP P2” on the setup menu to the original setting before starting the adjustment.
6. Return the switch setting of VIDEO PROCESS on the meter panel to the original setting before starting the adjustment.
7. Turn off the main power of the MAV-555.

4-6. AD-160 Board Adjustment

Notes

- Allow 30 minutes or more of warm up of MAV-555 and measurement equipment before starting adjustments.
- Be sure that the EM-1 Board has already been completed of its adjustment.

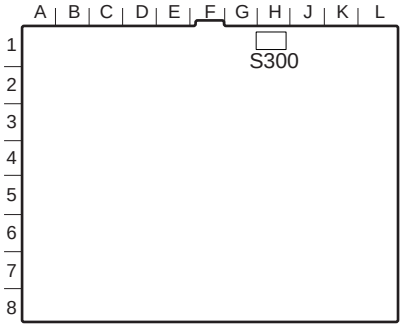
4-6-1. Analog Audio Offset Adjustment

Preparation

- AUDIO REC/PB level control knobs (CH-1 to CH-4)/ meter panel → PRESET
- COR501 (C-2)/AD-160 board → +4
- COR502 (C-2)/AD-160 board → 20
- COR601 (E-2)/AD-160 board → +4
- COR602 (E-2)/AD-160 board → 20
- COR701 (H-2)/AD-160 board → +4
- COR702 (G-2)/AD-160 board → 20
- COR801 (J-2)/AD-160 board → +4
- COR802 (K-2)/AD-160 board → 20
- AUDIO INPUT CH-1 LEVEL switch/BKMA-570 → HIGH/ON (600 Ω)
- AUDIO INPUT CH-2 LEVEL switch/BKMA-570 → HIGH/ON (600 Ω)
- AUDIO INPUT CH-3 LEVEL switch/BKMA-570 → HIGH/ON (600 Ω)
- AUDIO INPUT CH-4 LEVEL switch/BKMA-570 → HIGH/ON (600 Ω)
- S300-1 (H-1)/EM-1 board → ON

Setting the setup menu

- Set the setup menu “010-525/625” to “525/60”.
- Set the setup menu “804 AUDIO HEAD ROOM” to “20 dB”.
- Set the setup menu “882 EMPHASIS ON/OFF R1” to “OFF”. (When the R1 port is used)
- Set the setup menu “883 EMPHASIS ON/OFF R2” to “OFF”. (When the R2 port is used)



EM-1 board (A side)

Adjustment Procedure

CH-1 adjustment

1. Short TP502 (B-3) /AD-160 board and E501 (B-3) / AD-160 board using a shorting clip.
2. Connect and setup an oscilloscope as follows.
   CH-1 : TP408 (E-4) /AD-160 board, DC 5 V/ DIV
   GND : E401(F-4)/AD-160 board
   CH-2 : TP407 (C-4) /AD-160 board, DC 5 V/ DIV
   TIME : 2 µs/DIV
   TRIG : CH-2, +slope
   BW Limit : ON (20 MHz)
3. Equipment : Oscilloscope
   Test point : TP408 (E-4)/AD-160 board
   Adj. point : ⊘RV504 (D-3)/AD-160 board
   Spec. : As specified by the waveform of TP408 (AUDIO CH-1) shown on the next page.
4. Remove the shorting clip from AD-160 board TP502 and E501.

CH-2 adjustment

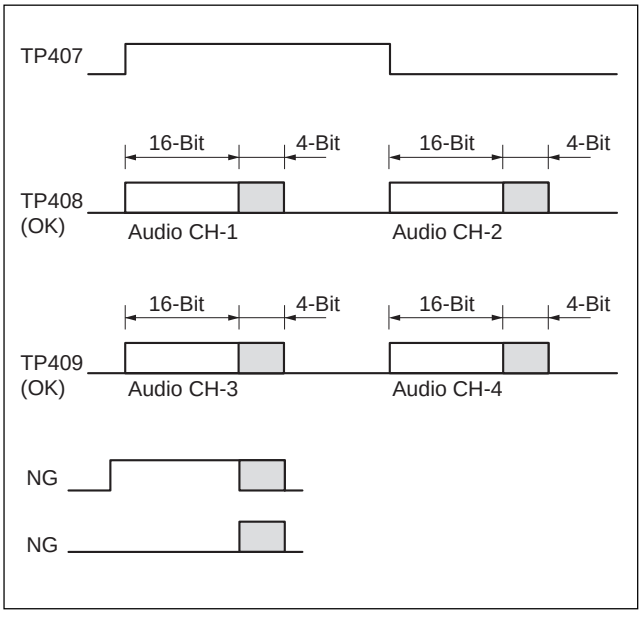
1. Short TP602 (F-3) /AD-160 board and E501 (B-3) / AD-160 board using a shorting clip.
2. Connect and set an oscilloscope as follows.
   TRIG : CH-2, −slope
3. Equipment : Oscilloscope
   Test point : TP408 (E-4)/AD-160 board
   Adj. point : ⊘RV604 (D-3)/AD-160 board
   Spec. : As specified by the waveform of TP408 (AUDIO CH-2) shown on the next page.
4. Remove the shorting clip from AD-160 board TP602 and E501.

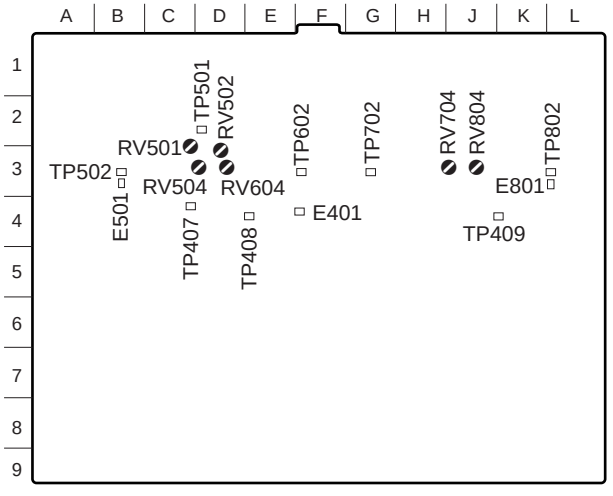
CH-3 adjustment

1. Short TP702 (G-3) /AD-160 board and E801 (L-3) / AD-160 board using a shorting clip.
2. Connect and set an oscilloscope as follows.
   CH-1 : TP409 (J-4) /AD-160 board
   TRIG : CH-2, +slope
3. Equipment : Oscilloscope
   Test point : TP409 (J-4)/AD-160 board
   Adj. point : ⊘RV704 (J-3)/AD-160 board
   Spec. : As specified by the waveform of TP409 (AUDIO CH-3) shown on the next page.
4. Remove the shorting clip from AD-160 board TP702 and E801.

CH-4 adjustment

1. Short TP802 (L-3) /AD-160 board and E801 (L-3) / AD-160 board using a shorting clip.
2. Connect and set an oscilloscope as follows.
   TRIG : CH-2, −slope
3. Equipment : Oscilloscope
   Test point : TP409 (J-4)/AD-160 board
   Adj. point : ⊘RV804 (J-3)/AD-160 board
   Spec.: As specified by the waveform of TP409 (AUDIO CH-4) shown below.
4. Remove the shorting clip from AD-160 board TP802 and E801.





AD-160 board (A side)

4-6-2. Analog Audio Input Adjustment

Preparation

- AUDIO REC/PB level control knob (CH-1 to CH-4)/ meter panel → PRESET
- INPUT button/meter panel → Lights up
- ANALOG CH-1 to CH-4 buttons/meter panel → Lights up
- Press either R1 or R2 button on the meter panel in accordance with the port to which the AD-160 board is connected.

Adjustment Procedure

Set an audio analyzer as follows.
Adjustment mode : LEVEL, dBm (600 Ω)
Input filter : 80 kHz low-pass filter

CH-1 adjustment

1. Short TP501 (D-2) /AD-160 board and E501 (B-3) / AD-160 board using a shorting clip.
2. Connect the audio signal (1 kHz, +4 dBm) to the AUDIO INPUT CH-1 connector/BKMA-570 of the port to which the AD-160 board is connected.
3. Press the MONITOR button of the MONITOR SELECT block on the meter panel. Press then the CH-1 button to turn it on. (The CH-1 signal is outputted to the MONITOR OUT-L connector.)
   Note
   Turn off the ANALOG CH-2 to CH-4 buttons.

4. Equipment : Audio analyzer
   Test point : AUDIO MONITOR OUT-L connector/ rear panel
   Adj. point : ⊘RV501 (C-3) /AD-160 board
   Spec. : +4.0 ±0.1 dBm (600 Ω load)

5. Remove the shorting clip from AD-160 board TP501 and E501.

6. Equipment : Audio analyzer
   Test point : AUDIO MONITOR OUT-L connector/ rear panel
   Adj. point : ⊘RV502 (D-3) /AD-160 board
   Spec. : +4.0 ±0.1 dBm (600 Ω load)

CH-2 adjustment

1. Short TP601 (D-2) /AD-160 board and E501 (B-3) / AD-160 board using a shorting clip.

2. Connect the audio signal (1 kHz, +4 dBm) to the AUDIO INPUT CH-2 connector/BKMA-570 of the port to which the AD-160 board is connected.
3. Press the MONITOR button of the MONITOR SELECT block on the meter panel. Press then the CH-2 button to turn it on. (The CH-2 signal is outputted to the MONITOR OUT-L connector.)

   Note

   Turn off the ANALOG CH-1, CH-3 and CH-4 buttons.

4. Equipment : Audio analyzer
   Test point : AUDIO MONITOR OUT-L connector/ rear panel
   Adj. point : ⊘RV601 (D-3) /AD-160 board
   Spec. : +4.0 ±0.1 dBm (600 Ω load)

5. Remove the shorting clip from AD-160 board TP601 and E501.

6. Equipment : Audio analyzer
   Test point : AUDIO MONITOR OUT-L connector/ rear panel
   Adj. point : ⊘RV602 (D-3) /AD-160 board
   Spec. : +4.0 ±0.1 dBm (600 Ω load)

CH-3 adjustment:

1. Short TP701 (J-2) /AD-160 and E801 (L-3) /AD-160 using a shorting clip.
2. Connect the audio signal (1 kHz, +4 dBm) to the AUDIO INPUT CH-3 connector/BKMA-570 of the port to which the AD-160 board is connected.
3. Press the MONITOR button of the MONITOR SELECT block on the meter panel. Press then the CH-3 button to turn it on. (The CH-3 signal is outputted to the MONITOR OUT-L connector.)

   Note

   Turn off the ANALOG CH-1, CH-2 and CH-4 buttons.

4. Equipment : Audio analyzer
   Test point : AUDIO MONITOR OUT-L connector/ rear panel
   Adj. point : ⊘RV701 (H-3) /AD-160 board
   Spec. : +4.0 ±0.1 dBm (600 Ω load)

5. Remove the shorting clip from AD-160 board TP701 and E801.

6. Equipment : Audio analyzer
   Test point : AUDIO MONITOR OUT-L connector/ rear panel
   Adj. point : ⊘RV702 (J-3) /AD-160 board
   Spec. : +4.0 ±0.1 dBm (600 Ω load)

CH-4 adjustment

1. Short TP801 (J-2) /AD-160 board and E801 (L-3) / AD-160 board using a shorting clip.
2. Connect the audio signal (1 kHz, +4 dBm) to the AUDIO INPUT CH-4 connector/BKMA-570 of the port to which the AD-160 board is connected.
3. Press the MONITOR button of the MONITOR SELECT block on the meter panel. Press then the CH-4 button to turn it on. (The CH-4 signal is outputted to the MONITOR OUT-L connector.)

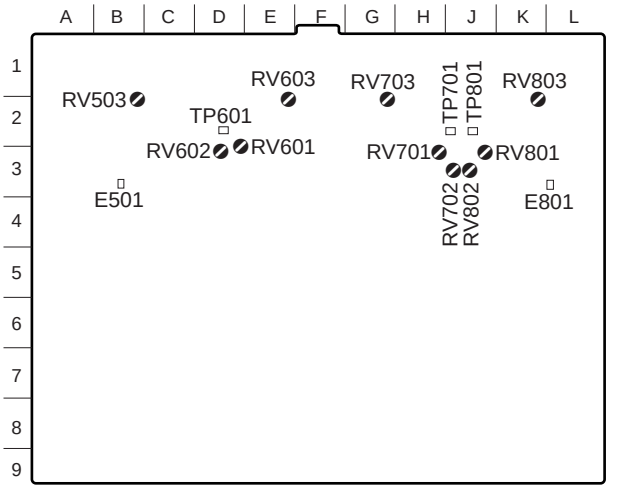
   Note

   Turn off the ANALOG CH-1, CH-2 and CH-3 buttons.

4. Equipment : Audio analyzer
   Test point : AUDIO MONITOR OUT-L connector/ rear panel
   Adj. point : ⊘RV801 (J-3) /AD-160 Board
   Spec. : +4.0 ±0.1 dBm (600 Ω load)

5. Remove the shorting clip from AD-160 board TP801 and E801.

6. Equipment : Audio analyzer
   Test point : AUDIO MONITOR OUT-L connector/rear panel
   Adj. point : ⊘RV802 (J-3) /AD-160 board
   Specifications : +4.0 ±0.1 dBm (600 Ω load)



AD-160 board (A side)

4-6-3. Distortion Adjustment

Adjustment Procedure

- Set an audio analyzer as follows.
  Adjustment mode : THD+N
  Range : 2%
  Input filter : 80 kHz low-pass filter

CH-4 adjustment

1. Connect the audio signal (1 kHz, +23.5 dBm) to the AUDIO INPUT CH-4 connector/BKMA-570 of the port to which the AD-160 board is connected.
2. Press the MONITOR button of the MONITOR SELECT block on the meter panel. Press then the CH-4 button to turn it on. (The CH-4 signal is outputted to the MONITOR OUT-L connector.)
   Note
   Turn off the ANALOG CH-1, CH-2 and CH-3 buttons.

3. Equipment : Audio analyzer
   Test point : AUDIO MONITOR OUT-L connector/ rear panel
   Adj. point : ⊘RV803 (K-2) /AD-160 board
   Spec. : Minimum (0.10% or less is acceptable)

CH-3 adjustment

1. Connect the audio signal (1 kHz, +23.5 dBm) to the AUDIO INPUT CH-3 connector/BKMA-570 of the port to which the AD-160 board is connected.
2. Press the MONITOR button of the MONITOR SELECT block on the meter panel. Press then the CH-3 button to turn it on. (The CH-3 signal is outputted to the MONITOR OUT-L connector.)
   Note
   Turn off the ANALOG CH-1, CH-2 and CH-4 buttons.

3. Equipment : Audio analyzer
   Test point : AUDIO MONITOR OUT-L connector/ rear panel
   Adj. point : ⊘RV703 (G-2) /AD-160 board
   Spec. : Minimum (0.10% or less is acceptable)

CH-2 adjustment

1. Connect the audio signal (1 kHz, +23.5 dBm) to the AUDIO INPUT CH-2 connector/BKMA-570 of the port to which the AD-160 board is connected.
2. Press the MONITOR button of the MONITOR SELECT block on the meter panel. Press then the CH-2 button to turn it on. (The CH-2 signal is outputted to the MONITOR OUT-L connector.)
   Note
   Turn off the ANALOG CH-1, CH-3 and CH-4 buttons.

3. Equipment : Audio analyzer
   Test point : AUDIO MONITOR OUT-L connector/ rear panel
   Adj. point : ⊘RV603 (E-2) /AD-160 board
   Spec. : Minimum (0.10% or less is acceptable)

CH-1 adjustment

1. Connect the audio signal (1 kHz, +23.5 dBm) to the AUDIO INPUT CH-1 connector/BKMA-570 of the port to which the AD-160 board is connected.
2. Press the MONITOR button of the MONITOR SELECT block on the meter panel. Press then the CH-1 button to turn it on. (The CH-1 signal is outputted to the MONITOR OUT-L connector.)
   Note
   Turn off the ANALOG CH-2, CH-3 and CH-4 buttons.

3. Equipment : Audio analyzer
   Test point : AUDIO MONITOR OUT-L connector/ rear panel
   Adj. point : ⊘RV503 (B-2) /AD-160 board
   Spec. : Minimum (0.10% or less is acceptable)

Setting After Adjustment

Return all the switches and setup menu to the original setting before starting the adjustment.

4-6-4. A/D Video Level Adjustment

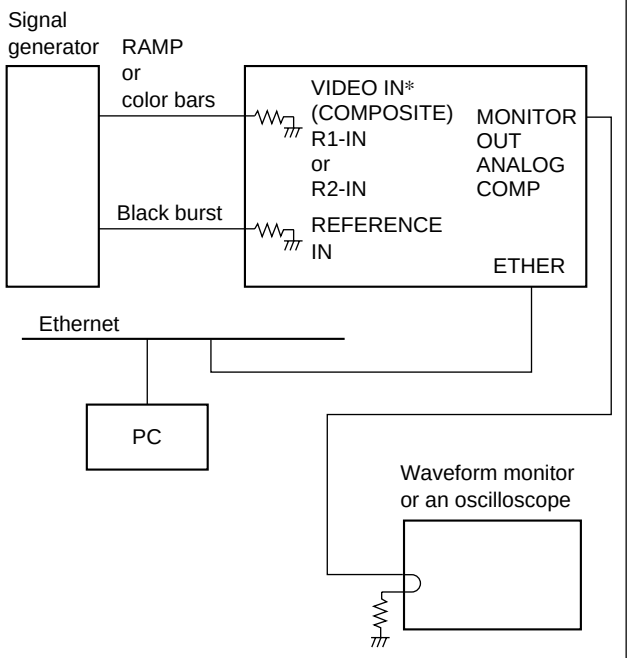
Preparation

Note

Check the following setup menus before starting adjustment.

- Check the NTSC/PAL setup. (Refer to menu No. 010 of Section 1-9-2 of the MAV-555 Installation Manual.)
- Check the network setup. (Refer to menu No. 220 of Section 1-9-6 of the MAV-555 Installation Manual.)

Connection



*: Connect to the VIDEO IN R1-IN or the VIDEO IN R2-IN in accordance with the port to which the BKMA-511 is connected.

Monitor Output Level Check

Note

Turn on the main power of the MAV-555 and measuring equipment. Wait for at least 30 minutes of warm up before starting any adjustments.

1. Set “782-INT VD SG” of the setup menu to “CB100”. (Refer to Section 1-1-1.)
2. Set either “701-IN SETUP RMV P2” or “702-IN SET UP RMV P2” to “off” on the setup menu in accordance with the port that the BKMA-511 is connected to. (Refer to Section 1-9-5 of the MAV-555 Installation Manual.)
3. Set “703-OUT SET UP P1” and “704-OUT SET UP P2” to “off” on the setup menu. (Refer to Section 1-9-5 of the MAV-555 Installation Manual.)

   Note

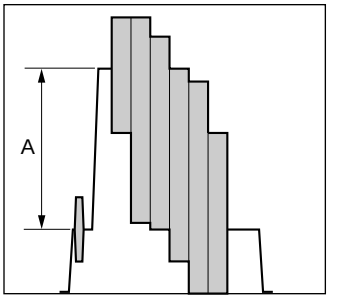
   Keep the menus No. 701 (or 702), 703 and 704 until all adjustments of the BKMA-511 are complete.

4. Turn the main power off and back on. Restart the MAV-555.

   Note

   To restart the MAV-555 quickly, execute “027-FAST REBOOT” of the setup menu.

5. Press the R1 button on the PORT SELECT block of the meter panel.
   (Set so that the internal SG is output to the R1 port.)
6. Press the COMPOSITE button of the VIDEO INPUT SELECT block of the meter panel for at least three seconds.
   (The internal SG starts, and the COMPOSITE button and the SDI button are turned on.)
7. Confirm that the following specifications are satisfied.
   Specifications :
   A = 714 ±7 mV (100 ±1 IRE) : 525/60 mode
   A = 700 ±7 mV : 625/50 mode



8. If the specifications are not satisfied, adjust as follows.
   Adjustment point :
   ⊘RV1601 (C06) /EM-1 board : 525/60 mode
   ⊘RV1603 (C06) /EM-1 board : 625/50 mode
   Specifications :
   A = 714 ±7 mV (100 ±1 IRE) : 525/60 mode
   A = 700 ±7 mV : 625/50 mode

   Note

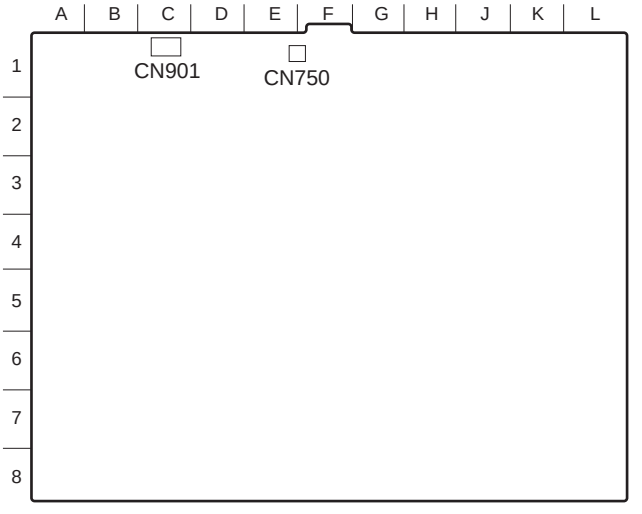
   To extend the EM-1 board, connect as follows :
   - Connect the harness that is removed from CN901 (C-1)/EM-1 board, to CN17/EX-693.
   - Connect the harness that is removed from CN750 (F-1)/EM-1 board, to CN4/EX-693.
   - Connect the connectors CN901 (C-1)/EM-1 board and CN18/EX-693. (Use the harness that is supplied with EX-693 assembly.)
   - Connect the connectors CN750 (F-1)/EM-1 board and CN3/EX-693. (Use the harness that is supplied with EX-693 assembly.)

9. Set “782-INT VD SG” of the setup menu to “off”.

   Note

   Keep “782-INT VD SG” of the setup menu to “off” until all adjustments of the BKMA-511 are complete.

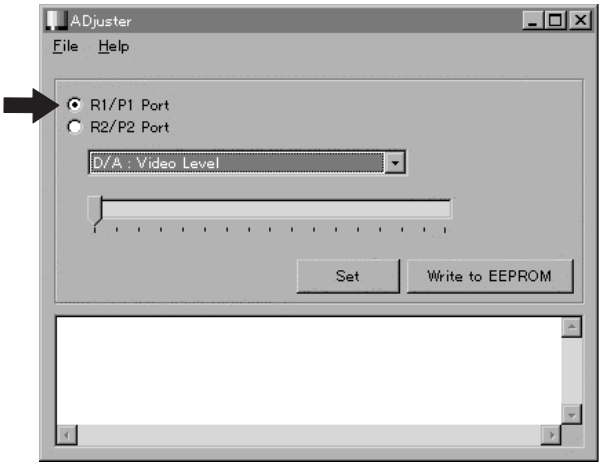
10. Turn off the main power.



EM-1 board (A side)

Setting

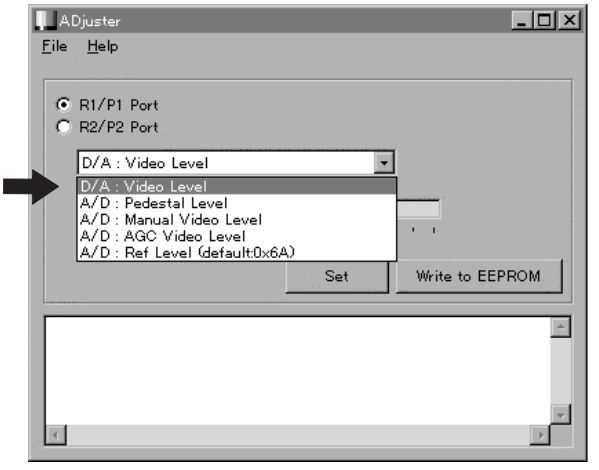
1. Start up the MS-DOS prompt of the personal computer and execute the ping command.
   For the operation procedure, refer to steps 12 to 14 of Section “1-9-1. Adjustment upon Completion of Installation” of the BKMA-512 Installation Manual.
2. Start the ADjuster program from a personal computer and enter the IP address.
   For the operation procedure, refer to steps 15 to 17 of Section “1-9-1. Adjustment upon Completion of Installation” of the BKMA-512 Installation Manual.
3. Select either “R1/P1 port” or “R2/P2 port” of the ADjuster in accordance with the port to which the BKMA-511 is connected.
   The BKMA-511 is connected to the R1 port (inserted into slot No.10) : Select the R1/P1 port.
   The BKMA-511 is connected to the R2 port (inserted into slot No.2) : Select the R2/P2 port.



4. Press either the R1 or the R2 button of the PORT SELECT block of the meter panel in accordance with the port to which the BKMA-511 is connected.

A/D Reference Video Level Setting

1. Select “A/D Ref Level” of the ADjuster.



2. Press “Set” of the ADjuster. (Default value is set.)
3. Click “Write to EEPROM” of the ADjuster.

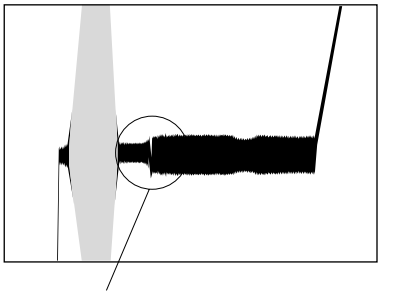
A/D Pedestal Video Level Adjustment

Note

Turn on the main power of the MAV-555 and measuring equipment. Wait for at least 30 minutes before starting any adjustments.

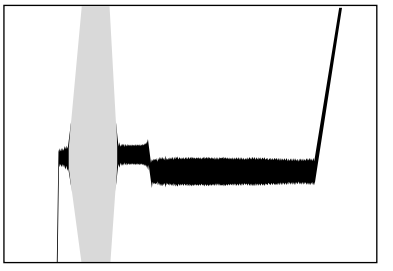
1. Select “A/D Pedestal Level” of the ADjuster.
2. Input the ramp signal from signal generator.
3. Change the set value of the level bar of the ADjuster using [←] and [→] key of a personal computer or with a mouse. Click “Set” and confirm the pedestal level.
4. Repeat step 3 until the specifications are satisfied.
   Specifications : As specified by the waveform shown below.

OK



Specifications : The pedestal level must not have any flight of stairs.

NG



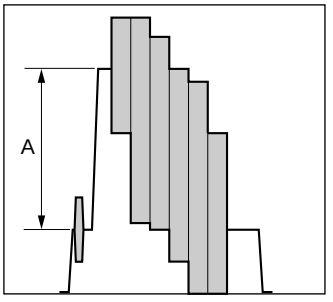
5. Click “Write to EEPROM” of the Adjuster and save the set value.

A/D Manual Video Level Adjustment

Note

Turn on the main power of the MAV-555 and measuring equipment. Wait for at least 30 minutes before starting any adjustments.

1. Select “A/D Manual Video Level” of the ADjuster.
2. Input the 100% color bar signal from signal generator.
3. Change the set value of the level bar of the ADjuster using [←] and [→] key of a personal computer or with a mouse. Click “Set” and confirm the pedestal level.
4. Repeat step 3 until the specifications are satisfied.
   Specifications :
   A = 714 ±7 mV (100 ± 1 IRE) : 525/60 mode
   A = 700 ±7 mV : 625/50 mode



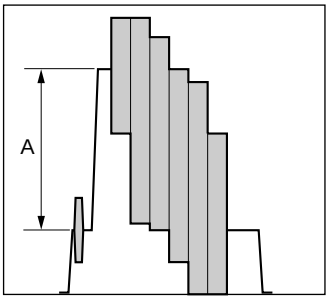
5. Click “Write to EEPROM” of the ADjuster and save the set value.

A/D AGC Video Level Adjustment

Note

Turn on the main power of the MAV-555 and measuring equipment. Wait for at least 30 minutes before starting any adjustments.

1. Select “A/D AGC Video Level” of the ADjuster.
2. Input the 100% color bar signal from signal generator.
3. Change the set value of the level bar of the ADjuster using [←] and [→] key of a personal computer or with a mouse. Click “Set” and confirm the pedestal level.
4. Repeat step 3 until the specifications are satisfied.
   Specifications :
   A = 714 ±7 mV (100 ±1 IRE) : 525/60 mode
   A = 700 ±7 mV : 625/50 mode



5. Click “Write to EEPROM” of the ADjuster and save the set value.

After Adjustment

1. Select “File” – “Disconnect” on the top menu of the ADjuster.
2. Exit the ADjuster.
3. Return the setup menus (menu Nos. 782, 701, 702, 703 and 704) to the original setup before starting the adjustment.
4. Turn off the main power of the MAV-555.

Section 5
Circuit Description

1. Reference Block

The REF signal that is used as the reference of the main unit is selected as described below. On the CN-1816 board, one of the REF signal and R1/R2 COMPOSITE VIDEO IN signal at the input terminal on the rear panel is first selected and output to the TM-40 board. This selection control signal is output from the TM-40 board. On the TM-40 board, moreover, the timing signal produced from the selected signal and the timing signal produced from an R1 or R2 SDI IN signal are selected and used as the REF signal of the main unit. The video and audio signals at a PB port and the MONITOR OUT video and audio signals output from the EM-1 board use this REF signal as reference. The signal that controls the time slot at each port also uses this REF signal as reference. The data transfer, recorded and reproduced in HDD, between the DM-120 and PU-109 boards is also performed in synchronization with this REF signal.

2. Video Block

REC mode

A video signal is usually input from the SDI (COMPONENT) IN terminal of an R1 port. The SDI signal input to the rear panel is directly sent to the DPR-127 board via a coaxial cable. The SDI active through signal produced on the DPR-127 board is also directly sent to the real panel via a coaxial cable. If BKMA-511 (option) is inserted into each port, the analog composite signal input to the COMPOSITE IN signal terminal on the rear panel is passed through the buffer on the CN-1816 board and input to the AD-160 board via the MB-845 board. On the AD-160 board, the analog composite signal is Y/C-separated. The C (chroma) signal is also decoded to B-Y and R-Y signals, converted into three (Y, B-Y, and R-Y) component signals, and input to the DPR-127 board. On the DPR-127 board, the input signal from the SDI IN terminal and the signal from the AD-160 board are selected to compress a video signal. The compression system is MPEG2 4:2:2 Profile @ML. An intra-frame is compressed in this case. The compressed vide data is converted into an HDD-write format (packing), multiplexed with audio data, and output to the DM-120 board. On the DM-120 board, the data is loaded into memory once and transferred to the PU-109 board as video data and HDD command data in synchronization with the time slot signal in equipment. On the PU-109 board, the video data is processed so that it is distributed to each HDD (8 + parity). The processed video data is then output to the IF-751 board corresponding to each HDD in a ratio of 1 to 1. On the IF-751 board, data is written in HDD via SPC (SCSI Protocol Controller).

In this case, the information on the area of HDD in which data is written is obtained from the file system memorized in the FM-68 board when the video data is transferred from the DM-120 board to the PU-109 board. The information is added immediately before the video data as command data and output to the PU-109 board.

PB mode

Information is obtained from the file system memorized in the FM-68 board, and PB control data is output from the DM-120 board to the PU-109 board. The PB control data is decoded by the PU-109 board and the corresponding video data is read from HDD. The video data is sent to the DM-120 board through the IF-751 and PU-109 boards. On the DM-120 board, the video data sent from the PU-109 board is stored in memory once and one-frame video data is output to the DPR-127 board during one-frame period. On the DPR-127 board, the video data is converted from an HDD write format (depacking), input to an MPEG2 decoder, and decoded to a video signal. The decoded signal is output from the DPR-127 board to the rear connector panel as an SDI (COMPONENT) signal via a coaxial cable. If BKMA-512 (option) is inserted into each port, the video signal decoded using an MPEG2 decoder is output from the DPR-127 board to the DA-136 board and converted into a composite signal.
The video signal is then converted from digital to analog and output as an analog composite signal through the MB-845 and CN-1816 boards.

Monitor system and others

The four signals in recording systems (R1 and R2) and playback systems (P1 and P2) are sent from the DPR-127 board to the EM-1 board as a monitor signal. One of these signals is selected on the EM-1 board. The selected signal is mixed in characters, converted into an SDI signal, and output to the rear panel via a coaxial cable. After the output signal is converted into a composite signal, it is converted from digital to analog and output to the rear panel through the MB-845 and CN-1816 boards as an analog composite signal.
Moreover, animation data is output from the EM-1 board to the control panel (BKMA-505). The video signal at each port is selected using a router by the control operation from the control panel. The video signal is then converted into an analog composite signal and output through the MB-845 board to the multi-connector on the front panel and the rear panel as a control panel signal.

3. Audio Block

An audio signal is usually input from the SDI (COMPONENT) IN terminal or AES/EBU terminal of an R1 port (selectable). The audio signal input from the AES/EBU terminal is input to the DPR-127 board through the CN-1816 and MB-845 boards. If BKMA-511 (option) is inserted into each port, the analog signal input to BKMA-570 (option) is passed through the AUDIO I/F terminal on the rear panel and directly sent from the rear panel to the AD-160 board via a harness. On the AD-160 board, the analog signal is converted from analog to digital and sent to the DPR-127 board. The three types of signals (SDI, AES/EBU, and analog) sent to the DPR-127 board are sent to the sub-board (APR-44 board) of the DPR-127 board. After one of these signals is selected, it is converted into an HDD-write format (packing) and output to the DPR-127 board again. On the DPR-127 board, the output signal is multiplexed with the compressed video data. On the DM-120 board, PU-109 board, IF-751 board, and HDD (1+1), the output signal is processed and recorded in the same manner as for video data. On the HDD, IF-751 board, PU-109 board, and DM-120 board, a signal is also processed in the same manner as for video data during playback.

The reproduced audio data is input through the DPR-127 board to the sub-board (APR-44 board) and converted into an HDD-write format (depacking). The data then branches into two paths via the processing display. One is added to an SDI signal and output to the DPR-127 board. The other is converted into an AES/EBU signal by the APR-44 board and output from the rear panel through the DPR-127, MB-845, and CN-1816 boards. If BKMA-512 (option) is inserted into each port, the reproduced audio data is output from the APR-44 board to the DA-136 board through the DPR-127 and MB-845 boards. The output data is then converted from digital to analog and output to the AUDIO I/F terminal on the rear panel through the harness. After that, the output data is sent to BKMA-570 (option).

4. Raid Block

The raid block consists of a PU-109 board, IF-751 boards (11), and HDDs (11). A data bus is connected from the DM-120 (standard and optional systems) and FM-68 boards to the raid block. In a video system, two systems are used in reciprocation via a 16-bit bus. In an audio system, two systems are used in reciprocation via an 8-bit bus. For the video system, the processing in raid level 3 is carried out. For the audio system, the processing in raid level 1 is carried out. For the video system, the data divided into four blocks is input from the DM-120 board to the PU-109 board. The input data is assigned to two HDDs per block and recorded on eight HDDs in total. The parity for eight HDDs is assigned to one HDD. For the audio system, mirror data is input from the DM-120 board to the PU-109 board and striped into two HDDs on the PU-109 board. Data is output through the MB-853 board from the PU-109 board to the IF-751 board corresponding to HDD in a ratio of 1 to 1.

The IF-751 board mounts SPC controlled by SCSI. This board interfaces with HDD through the MB-853 and CN-1830 boards. During PB operation, data is ECC-processed on the PU-109 board and output to the DM-120 board. On the PU-109 board, data is automatically rebuilt or patrol-sought using an empty time slot.

5. Control Block

The MAV-555 uses MPC860 as CPU. One MPC860 is each mounted for the EM-1, TM-40, FM-68, and DM-120 boards. Two MPC860s are mounted for the PU-109 board. On the EM-1, TM-40, FM-60, and DM-60 boards, dual port RAM (DPM) is used for the inter-board communication.

Each board controls the following functions.

The TM-40 board is connected with DPM on the DM-120, FM-68, and EM-1 boards so as to control DPM on each board. During communication between boards, the control operation is usually performed through DPM on the TM-40 board. The TM-40 board also communicates with the control panel. This board distributes the command from the control panel to the DM-120, FM-68, and EM-1 boards or transfers the information from each board to the control panel. UDP is used as the communication protocol between the control panel and TM-40 board. Moreover, the TM-40 board manages a time slot or controls a reference signal.

The FM-68 board manages a file system, performs the system management (error or warning) of the whole unit, or memorizes a setup menu. The FM-68 board also communicates with the PU-109 board and acquires the raid status.

On the DM-120 board, the control signal input from the RS-422 connector on the rear panel is input to the DM-120 board through the CN-1817 and MB-845 boards. The input signal controls the REC/PB system and audio/video processing system. A CPU bus is connected from the DM-120 board to the DPR-127, APR-44, AD-160, and DA-136 boards at the corresponding port. The DM-120 board also controls the flow of audio and video data with respect to the PU-109 board during REC/PB operation as well as controlling these boards.

The EM-1 board mainly communicates with the meter panel. The communication with the meter panel is carried out through the FP-115 and MB-845 boards using the dual port RAM (DPM) on the FP-115 board. Moreover, the AV monitor signal of the main unit is AV-processed, routed, and superimposed, and output from the rear panel. An RS-422 (VTR) signal or remote parallel signal is input from the connector on the rear panel and sent through the MB-845 board to the EM-1 board so as to control the editing and effect functions and AV router.

The PU-109 board mounts each CPU for video and audio systems and controls the raid-related block.

6. Meter Panel (Top panel on the Front Panel)

The fluorescent (FL) display tube, buttons, switches, and rotary encoders on the meter panel are controlled by the FP-115 board. The FP-115 board communicates with the EM-1 board, and notifies each board of each setting through the EM-1 board or acquires it.

For the headphone jack pin on the meter panel, the analog audio signal from the EM-1 board is output through the MB-845 board. The signal whose gain was changed using the headphone volume is output through the MB-845 board to the EM-1 board again.

7. Time Slot

The MAV-555 can simultaneously access the four ports (maximum) of an AV signal. Therefore, a time slot system is used for how to access the data in a raid block. Actually, the DM-120 board (provided as a standard feature) that inputs and outputs 1IN (R1) and 1OUT (P1) AV data and the DM-120 board that inputs and outputs optional 1IN (R2) and 1OUT (P2) AV data are connected using the same buses (the bus transferred to the raid block and the bus transferred from the raid block) as for the PU-109 board. Each port (R1, R2, P1, or P2) uses the buses for communication or data transfer by time sharing. When the four ports are all used for recording and playback, the time that each port can occupy is four frames. The MAV-555 can access the raid block every 16 frames.

If a port to which any access (recording/playback) is not gained exists, however, another port uses the empty time slot of the port so as to increase the access speed or a raid block uses the empty time slot for rebuilding. The use of an empty time slot changes dynamically.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

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 3.5 mA. 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 5.25 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 20 V AC range are suitable. (See Fig. A)

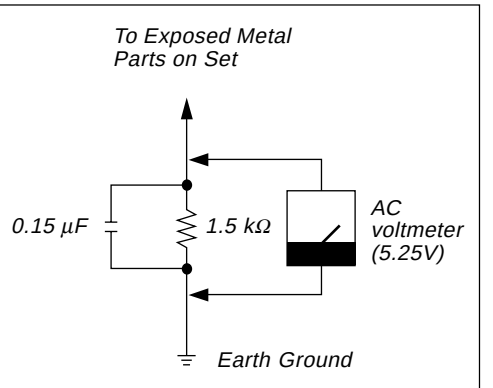


Fig A. Using an AC voltmeter to check AC leakage.

MAV-555 (SY)
BKMA-505 (SY)
BKMA-510 (SY)
BKMA-511 (SY)
BKMA-512 (SY)
BKMA-570 (SY, J) J, E
9-967-832-01

Sony Corporation
Broadcasting & Professional Systems Company

Printed in Japan
1999. 9 16