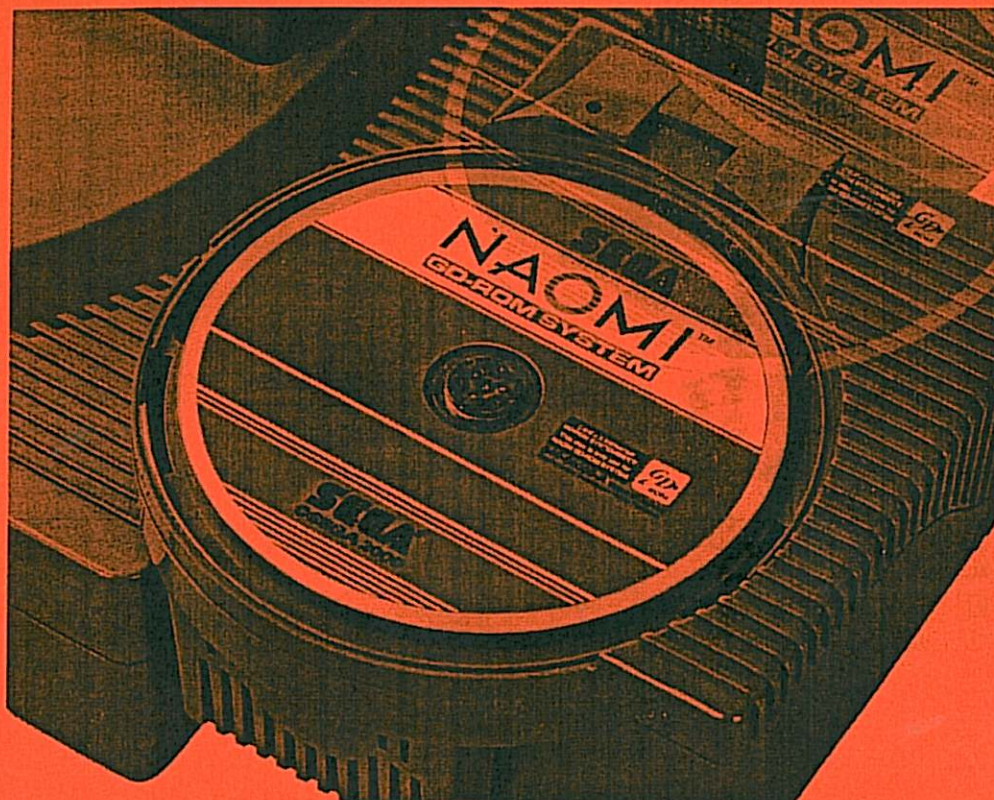


SERVICE MANUAL

NAOMI™

GD-ROM SYSTEM



IMPORTANT!

Before using this product, read this SERVICE MANUAL carefully to understand the contents stated herein. After reading this manual, be sure to keep it available nearby the product or somewhere convenient in order to be able to refer to it whenever necessary.

Manufactured in the UK by

SEGA



MANUFACTURING DIVISION (UK)

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1. HANDLING AND INSTALLATION PRECAUTIONS



WARNING!

- To prevent electric shock or IC Board malfunction, turn off the power to the cabinet when installing or removing the IC Board.
- Keep IC Board surfaces clean and free from dust, etc., to avoid risk of fire.
- Keep the IC Board well cooled. The NAOMI board case and GD-ROM drive are provided with ventilation fans. Do not block the outlet of these fans. Also, do not place anything close to the NAOMI board case or GD-ROM drive. Failure to observe these instructions may cause overheating and fire.



IMPORTANT!

- Installation and maintenance should only be carried out by **QUALIFIED SERVICE PERSONNEL**.
- Ensure all connections are secure.
- Use only a Logic Tester to inspect the IC Board circuits.
- Take anti-static precautions when handling or making connections to the IC Board.
- Use care when soldering buttons, etc., to the IC Board harnesses to avoid heat damage.
- Always use the NAOMI board in conjunction with the Shield Case to avoid emissions problems.
- The NAOMI board must only be used with 15kHz or 31kHz monitors and JVS compatible cabinet.

- Concerning the display of JAMMA VIDEO STANDARD:

JAMMA VIDEO STANDARD adopted by NAOMI is referred to as JVS. As against this standard, the conventional JAMMA STANDARD which employs 56P Edge Connectors adopted by ST-V, etc., is displayed as Old JAMMA STANDARD.

The specific manual attached to each game sometimes displays JVS as JV STANDARD, New JAMMA STANDARD, or JAMMA 2 STANDARD AGAINST OLD JAMMA STANDARD as JAMMA STANDARD, JS, etc.

- The contents herein described are subject to change without notice.

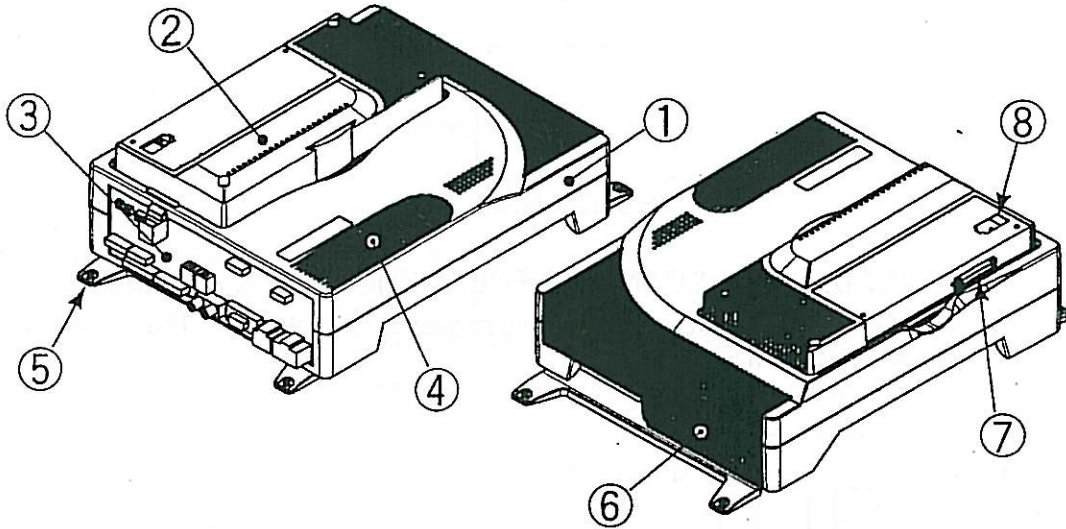
2. SPECIFICATIONS OF GD-ROM SYSTEM

2.1. CABINET

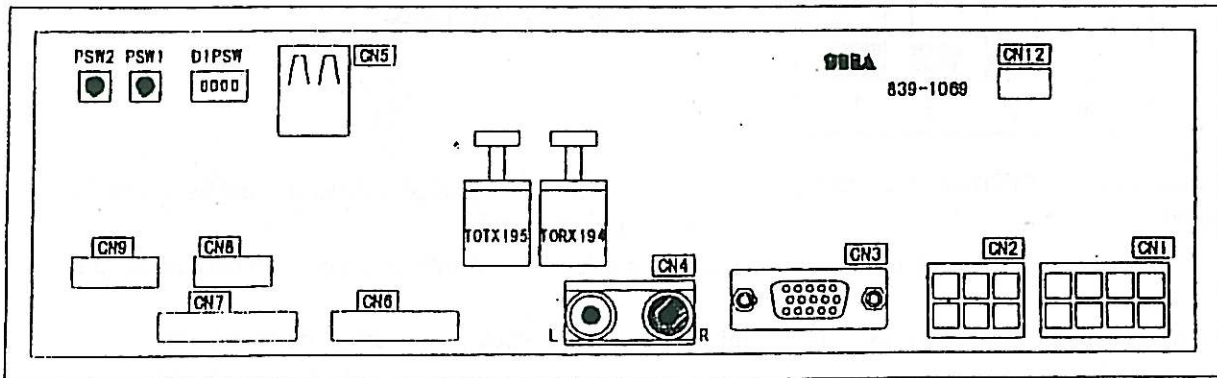
- Use the NAOMI GD-ROM system with a JVS compatible cabinet.
- If using the NAOMI GD-ROM system with the conventional JAMMA compatible cabinet, modification parts (power supply, I/O board, audio amplifier, etc.) are required to make the cabinet JVS compatible.
- Check with the cabinet manufacturer or distributor whether the cabinet is JVS compatible, or can be modified for JVS compatibility and used with the GD-ROM system.
- Some games may also require a dedicated control panel.

2.2. NAOMI CASE AND FILTER BOARD

- The NAOMI Main Board is contained in the Shield Case, in which it should always be used.
- Ensure that the Ventilation Ports and Heat Exhaust Fan Opening (see diagram) are not obstructed.



- | | | |
|---------------------|----------------------------|----------------------|
| ① NAOMI SHIELD CASE | ④ VENTILATION PORT | ⑦ GD Cable Connector |
| ② DIMM BOARD CASE | ⑤ LEG BRACKET | ⑧ Key Chip Slot |
| ③ FILTER BOARD | ⑥ HEAT EXHAUST FAN OPENING | |



CN1: POWER SUPPLY (JST VL 8P) 1:(N/C) 2:+3.3V 3:+5V 4: +12V 5-8: GND

CN2: POWER SUPPLY (JST VL 6P) 1:(N/C) 2:+3.3V 3:+5V 4-6: GND

CN3: VIDEO OUTPUT (MINI D-SUB 15P)

CN4: STEREO-AUDIO OUTPUT (RCA PIN JACK FEMALE) RED: RIGHT, WHITE: LEFT

CN5: STANDARD I/O (SERIES A TYPE) - Connected to I/O Board via USB Cable.

CN6-9, 12: Not normally used.

TORX194, TORX195: OPTIC FIBRE CONECTOR

Used for communication between multiple NAOMI boards.

For application, refer to the game's Service Manual.

PSW1: Functions as TEST button.

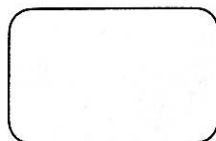
PSW2: Functions as SERVICE button.

DIPSW: Used for image frequency change, etc. Refer to 2.3

2.3. MONITOR DIRECTION AND HORIZONTAL SCANNING FREQUENCY

2.3.1. MONITOR DIRECTION

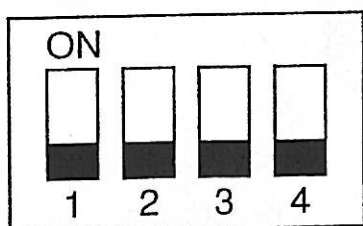
Install the monitor horizontally or vertically as specified in the relevant game's Service Manual. Install horizontally unless the Service Manual specifies otherwise.



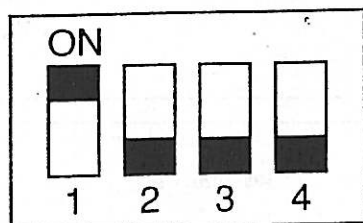
HORIZONTAL

2.3.2. HORIZONTAL SCANNING FREQUENCY: 15.85 / 31.69kHz

Refer to the game's Service Manual for the correct scanning frequency for that game. The frequency is selected by No.1 SW of the DIP SW on the Filter BD.



DIP SW 1 OFF: 31kHz



DIP SW 1 ON: 15kHz

Note: the actual DIP SW may differ from the illustration.

For both 15k and 31k, SW2-4 must be set to OFF unless specified.

Note that due to flickering and blurring, an Interlace display may be slightly inferior when compared to a Non-Interlace display.

Also, if the cabinet monitor does not correspond to an Interlace display, on-screen noise may result.

Among games corresponding to both 15k and 31k, there are some games for which the use of 31k is recommended. Setting such games to 15k may result in a WARNING message upon power-on.

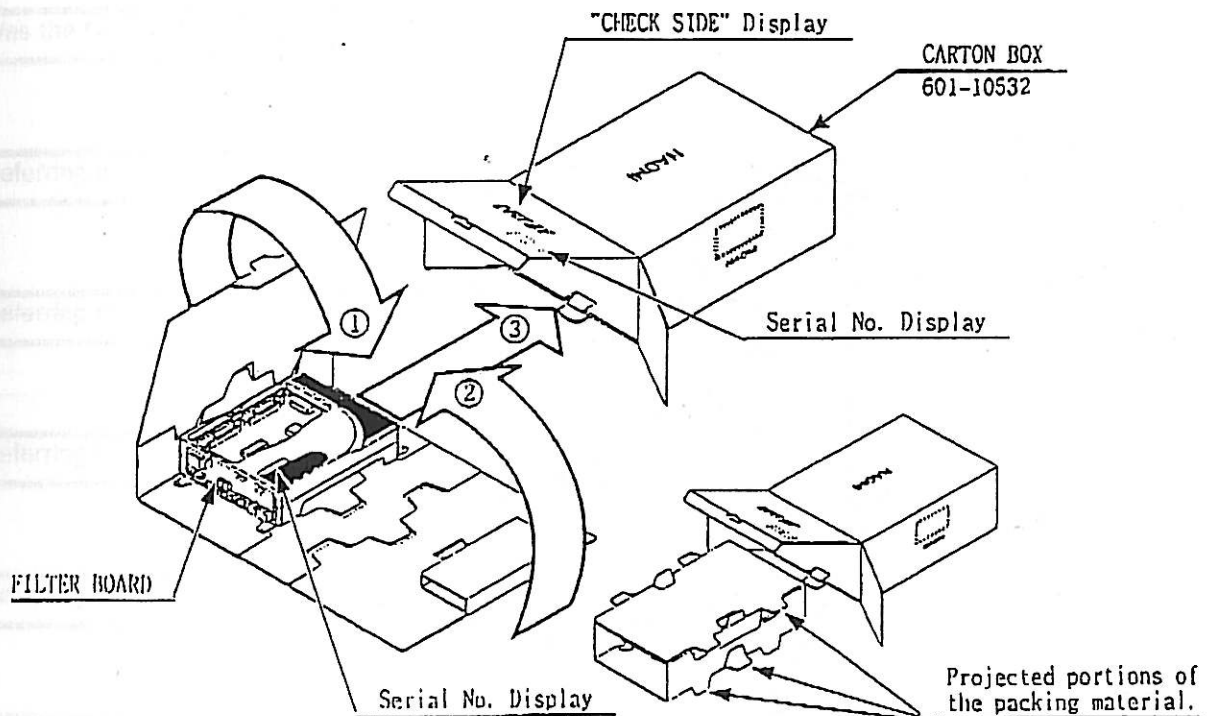
At the time of shipment, this setting depends on the game supplied. Before installing in the cabinet, check the setting of the DIP SW, and adjust if necessary.

2.4. SERVICE OR REPAIR (CARTON BOX)

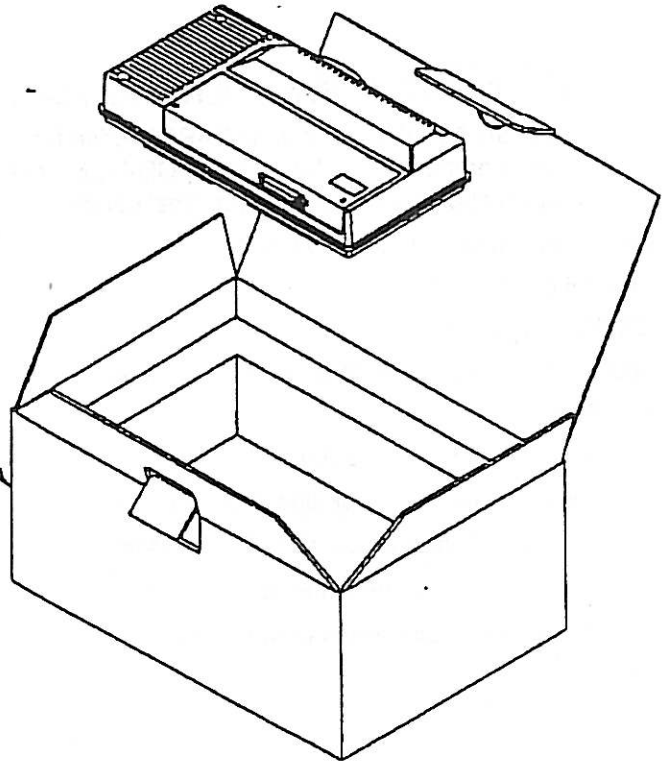
When returning the NAOMI board and GD-ROM drive for service or repair, follow the instructions below. Note that whenever the NAOMI board case, GD-ROM drive and DIMM board case are shipped for service or repair, they must be packaged in the original carton box.

For service or repair, ship all these parts:

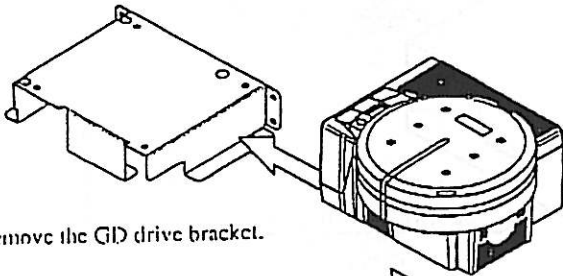
1. NAOMI board case
 2. DIMM board case
 - *Do not remove the key chip, leave it attached.
 3. GD-ROM drive
 - *Remove the GD drive bracket
 - *Remove the GD-ROM disk and store in its case.
- Remove all wire harnesses and cables before shipping.
 - Do not disassemble any of these parts – there are no user-serviceable parts inside.
 - Explain to the repairer the nature of the fault, and the game installed at the time.



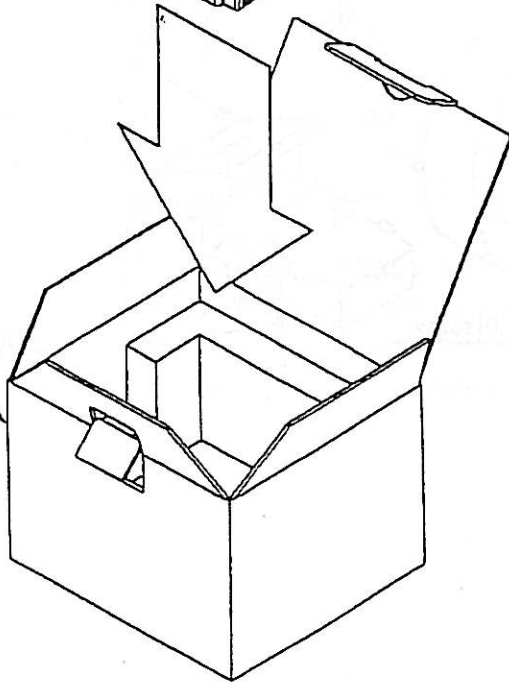
CARTON BOX
601-11030



Remove the GD drive bracket.



CARTON BOX
601-11031



3. ASSEMBLING THE NAOMI GD-ROM SYSTEM



WARNING!

The NAOMI
EPR-300
of the NAOMI



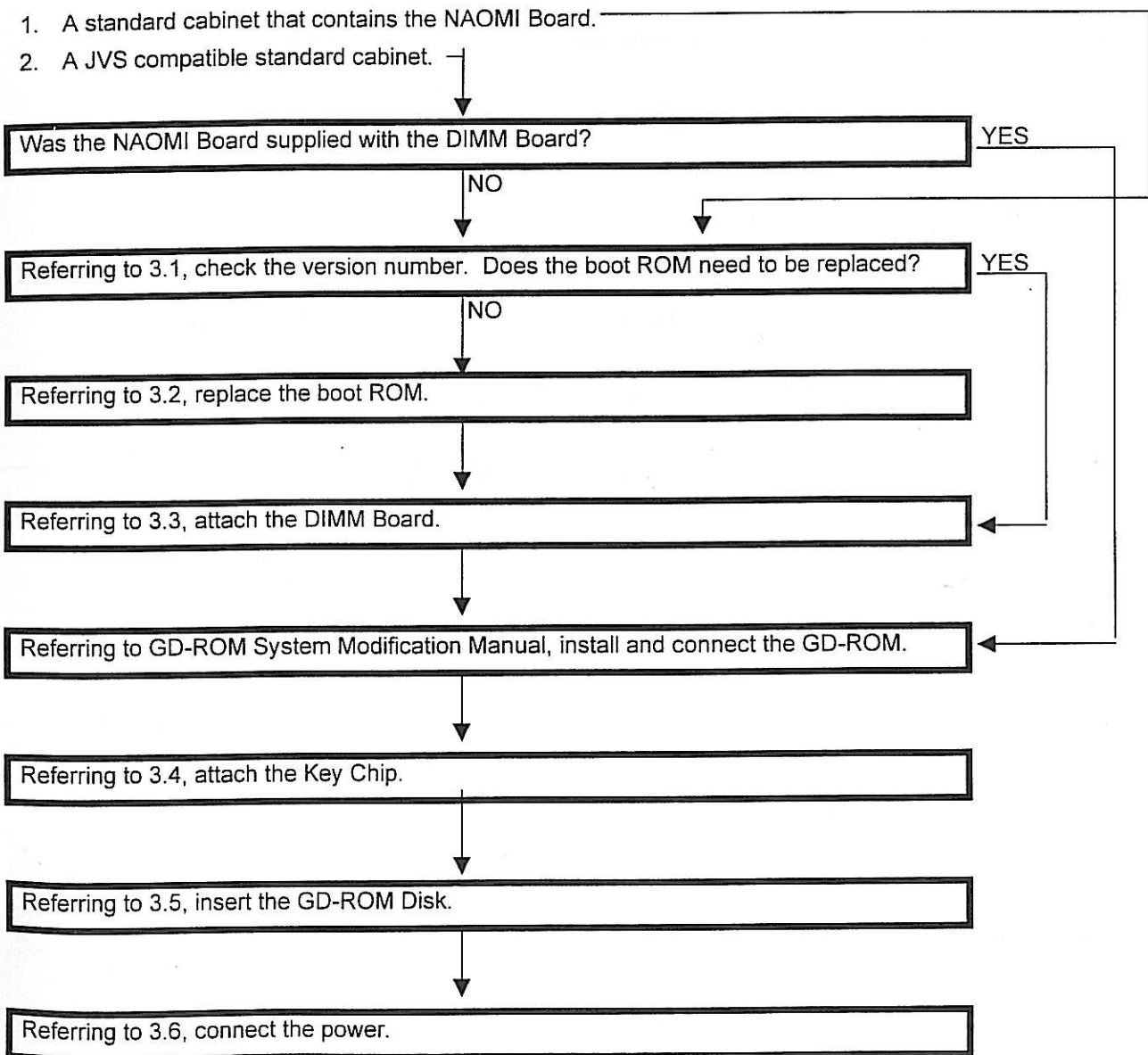
IMPORTANT!

- Turn power off before commencing work. Perform the assembly by following the procedure herein stated. Failure to comply with the instructions, for example, inserting the plug into an outlet at a stage not mentioned in this manual can cause an electric shock
- Assembling should be performed as per this manual. Since this is a complex machine, erroneous assembling can cause damage to the machine, or malfunction to occur.
- Assembly should only be carried out by **QUALIFIED SERVICE PERSONNEL.**

Assemble the NAOMI GD-ROM system as follows:

When the GD-ROM system is used with:

1. A standard cabinet that contains the NAOMI Board.
2. A JVS compatible standard cabinet.



3. When the GD-ROM System is used with a dedicated games cabinet:

Referring to the Service Manual supplied with the game, install the GD-ROM Drive and connect the wiring.



Referring to 3.4, attach the Key Chip.



Referring to 3.5, insert the GD-ROM Disk.



Referring to 3.6, connect the power.

3.1. CHECKING THE BOOT ROM VERSION NUMBER

STOP

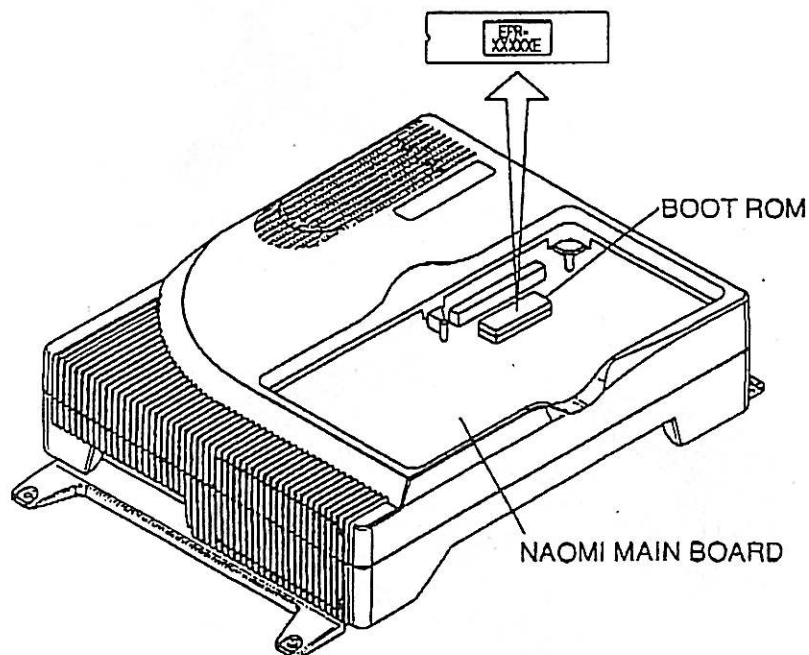
IMPORTANT!

- This operation should only be carried out by QUALIFIED SERVICE PERSONNEL.

The NAOMI Board can only be used with the GD-ROM System if its boot ROM version number is **EPR-xxxxxE** or later. The five-digit version number is indicated on the sticker of the boot ROM (IC27) of the NAOMI Main Board.

Visually check the boot ROM sticker and make sure the version number is as follows.

EXAMPLE: EPR-XXXXXD ✗ (Not suitable for a GD-ROM system)
 EPR-XXXXXE ✓ (Suitable for a GD-ROM system)
 EPR-XXXXXF ✓ (Suitable for a GD-ROM system)



If the boot ROM version number is not EPR-xxxxxD or before, replace the ROM with one of version EPR-xxxxxE or later.

If the boot ROM version number is EPR-xxxxxE or later, but not the latest version, replace the ROM with the latest version.

Note that the conventional ROM Board is unusable even if fitted with a GD-ROM System compatible boot ROM of version EPR-xxxxxE or later.

3.2. BOOT ROM REPLACEMENT

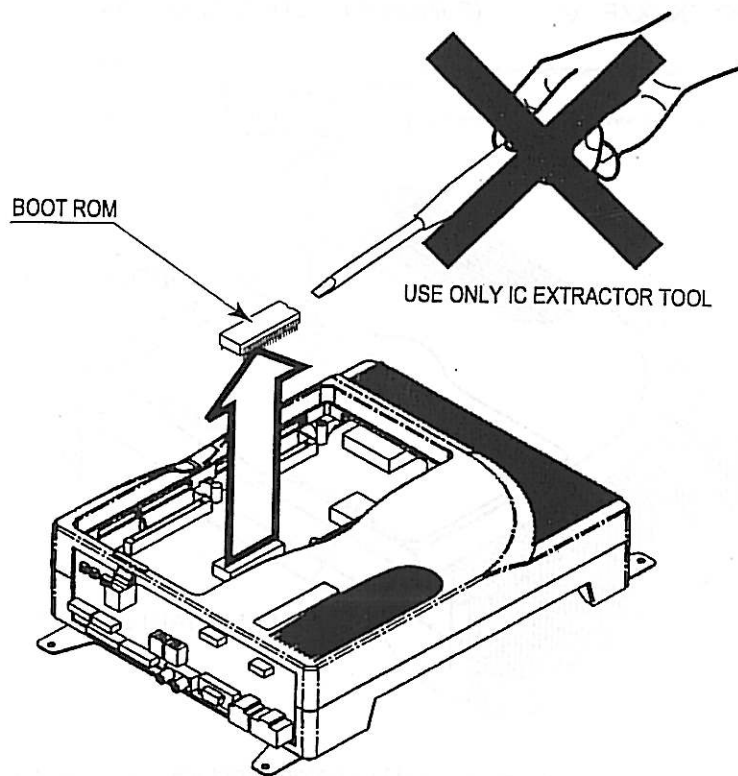


IMPORTANT!

- This operation should only be carried out by QUALIFIED SERVICE PERSONNEL.

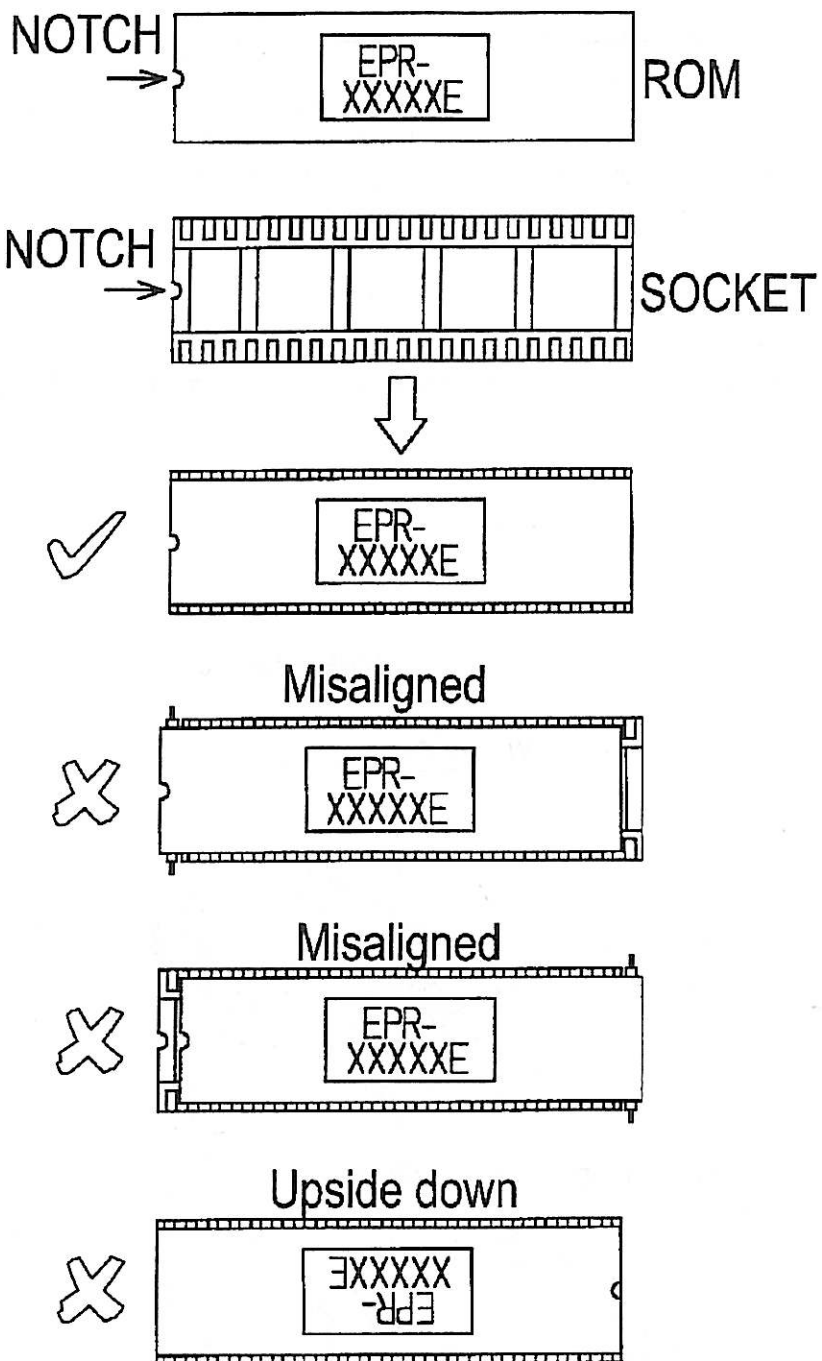
Do not perform this work unless necessary due to boot ROM version change, etc.

1. Using the IC EXTRACTOR, remove ROM IC27 from its socket.
 - To prevent tearing off board tracks, etc., do not use tools such as flat-blade screwdrivers: use only the IC EXTRACTOR TOOL. Repair by Sega of damage or malfunctioning resulting from use of other tools will be charged.



2. Insert a new ROM into the socket. Note the orientation of the ROM must be as shown below.

- If difficulty of insertion is experienced, it may be due to the distance between the two rows of pins is greater than required. If this is the case, press the ROM pins onto a flat surface and bend them slightly until the distance is correct.
- Use care to ensure ROM orientation and to avoid breaking the pins.



Wrongly inserted ROM's may be damaged when the power is connected.

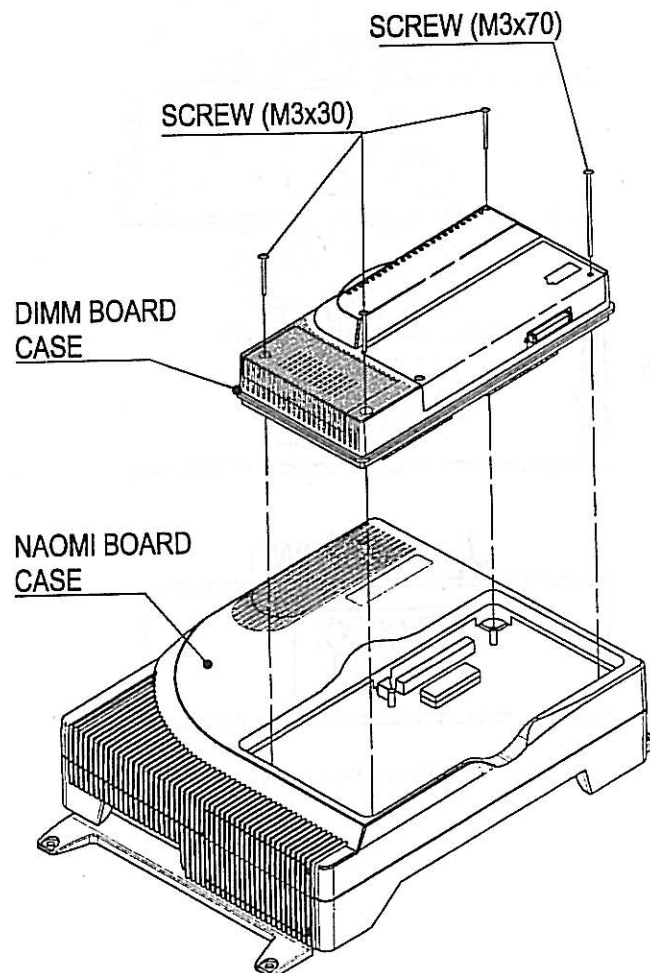
3.3. DETACHING / ATTACHING THE DIMM BOARD CASE



IMPORTANT!

- This operation should only be carried out by QUALIFIED SERVICE PERSONNEL.

- How to attach:
 1. Ensuring the orientation of the DIMM Board Case is correct, insert into the NAOMI Board Case so as to make the connections. Check the DIMM Board Case is seated firmly and completely.
 2. Fix in place using the screws supplied (three M3x30 and one M3x70), referring to the diagram below for the position of the longer screw.
- How to detach:
 1. Remove the fixing screws (three M3x30 and one M3x70).
 2. Grasp the ends of the DIMM Board Case and withdraw upwards from the NAOMI Board Case.



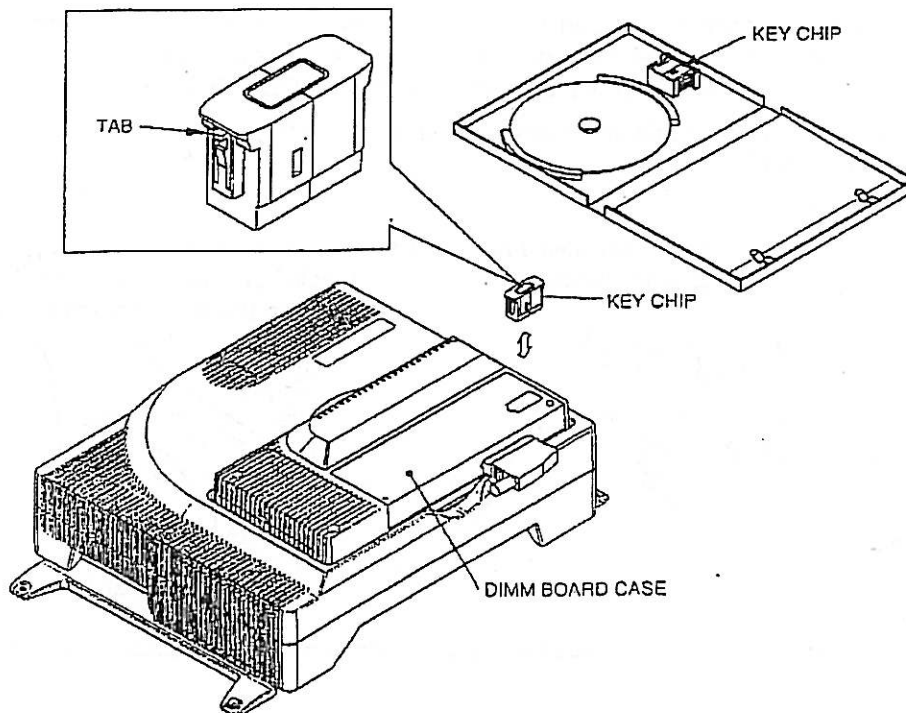
3.4. KEY CHIP



IMPORTANT!

- The Key Chip is a precision device. Handle carefully as it may be damaged by heat, shock and static electricity.
- The Key Chip is contained in the GD-ROM disk case. Always use them as a set.
- This operation should only be carried out by QUALIFIED SERVICE PERSONNEL.

- How to attach:
 1. Remove the Key Chip from the GD-ROM disk case
 2. Insert the Key Chip vertically in the slot of the DIMM Board Case; ensure correct orientation is observed and the Key Chip is seated firmly and completely.
- How to detach:
 1. Pressing the tab of the Key Chip, hold its end and remove from the DIMM Board Case.
 2. Keep the GD-ROM Disk and Key Chip as a set.

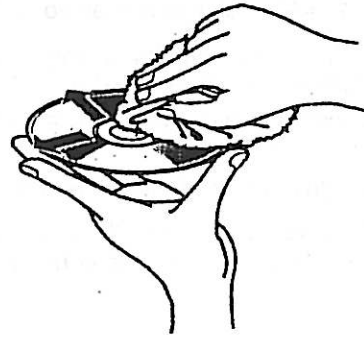


3.5. GD-ROM DISK



Handling the GD-ROM Disk:

- Do not contaminate the disk with fingerprints, dust, etc., as this may impair audio and video quality.
- When cleaning the disk, do not use volatile fluids (benzene, thinners, etc.), cleaning spray and anti-static agents. Instead, clean contaminated disks with a clean, soft cloth soaked in water and squeezed. Dry with another soft cloth.
- Do not use cracked, warped or damaged disks. Do not attach labels, etc., onto the disk. Do not scratch the disk. Do not use a disk from a case with broken seals, and do not insert a non-usable disk into the GD-ROM drive.
- This operation should only be carried out by QUALIFIED SERVICE PERSONNEL.



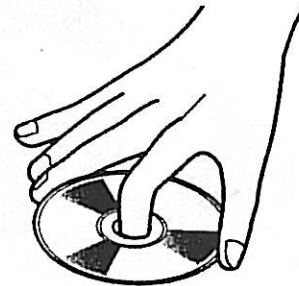
Use a clean cloth to wipe the disk gently in a radial direction.

How to hold the disk:

With both hands: Grip at four points as shown, using thumbs and forefingers.



With one hand: Insert forefinger into central hole, with thumb and middle finger holding the edge on either side.

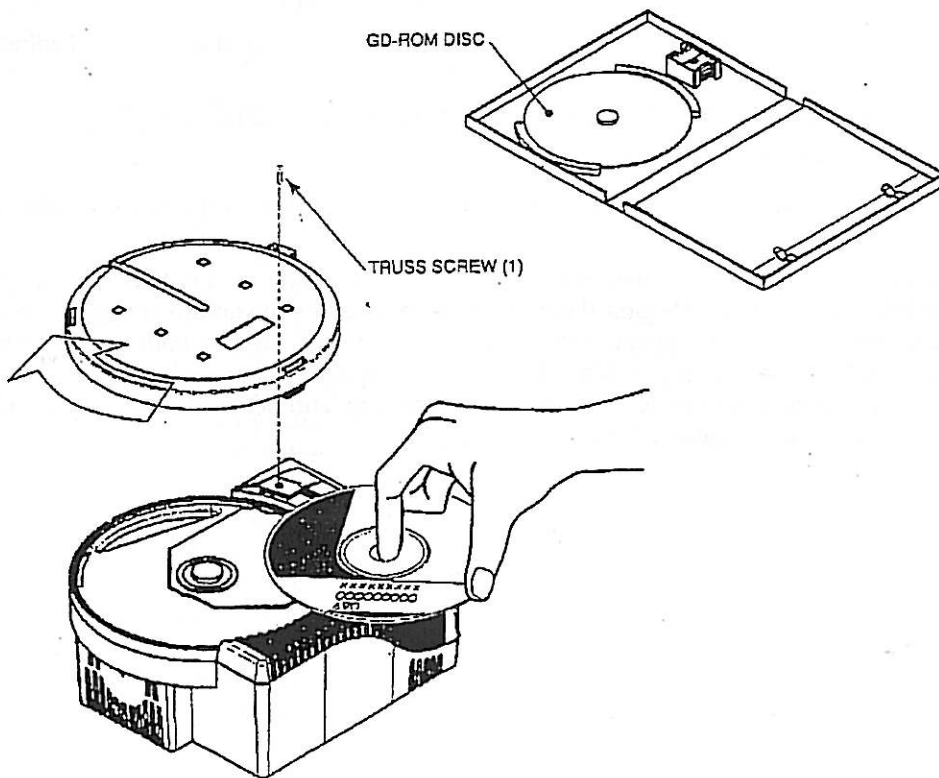


- How to attach:

1. Remove the single truss head screw that secures the GD-ROM Drive Lid. Turn the lid clockwise and withdraw upwards.
2. Remove the GD-ROM disk from its case and place in the GD-ROM Drive with the labelled side facing upwards.
3. Refit the lid and fix with the truss screw. Do not fasten too tightly.

- How to detach:

1. Remove the single truss head screw that secures the GD-ROM Drive Lid. Turn the lid clockwise and withdraw upwards.
2. Replace the GD-ROM Disk in its case, using care not to touch the underside of the disk.
3. Refit the lid and fix with the truss screw. Do not fasten too tightly.



3.6. CONNECTING THE POWER



CAUTION!



IMPORTANT!

- The disk in the GD-ROM Drive starts to turn when the power is connected, therefore the GD-ROM Drive Lid must not be removed while the power is on as the disk may fly out of the drive. The disk continues to spin under its own momentum when the power is turned off, so allow time for the disk to come to rest.

- Readout time varies depending on the charge of the DIMM Board battery pack. It may be several minutes when the power is connected for the first time, or when the power has been disconnected for a long time.
- Readout time varies with each game.
- This operation should only be carried out by **QUALIFIED SERVICE PERSONNEL**.

1. After ascertaining that the system has been correctly assembled, connect the power to the cabinet.
 2. Make sure that the NAOMI GD-ROM SYSTEM logo appears on screen.
 3. Make sure the system starts to read out the game from the GD-ROM. A percentage is displayed during readout.
 4. Make sure that the NAOMI GD-ROM SYSTEM logo appears on screen after readout.
 5. Make sure the advertising screen appears.
- If an ERROR message appears, disconnect power immediately and refer to section 4 to take necessary actions.
 - If the readout time takes longer than previous instances, the cause may be due to a low charge in the DIMM Board battery pack. The DIMM Board battery pack reduces its maximum charge each time it is discharged/recharged. After discharging/recharging about 500 times, the maximum charge may only be 70 to 80% of the initial charge. In other words, the DIMM Board battery pack will be at the limit of its service life around 16 months after its first use, based on the machine being switched off at the end of each day. In this case, refer to section 3.7 for instructions.

3.7. REPLACING THE DIMM BOARD BATTERY PACK.



- Do not disassemble.

Do not disassemble the battery pack or the batteries. If you fail to observe this instruction, the internal wires or the protective devices may become damaged; as a result the safety system may not function when discharging or recharging, eventually causing the battery pack to overheat increasing the risk of fire or explosion. Disassembly of the battery pack may also cause dangerous gasses to be emitted, which may affect respiration. It may also cause the battery cathode to heat up and catch fire.

- Do not short circuit.

Do not allow the battery pack to be short-circuited. If you fail to observe this instruction the battery pack may overheat increasing the risk of fire or explosion.

- Do not burn or heat the battery pack.

Do not burn or heat the battery pack. If you fail to observe this instruction the batteries may catch fire or explode. Do not leave the battery pack close to any heat source (fire or heater) or expose to direct sunlight. If you fail to observe this instruction, you may reduce the service life of the battery pack and in the worst case cause the battery pack to overheat, catch fire or explode.

- Do not submerge or allow the battery pack to become wet.

Do not expose the battery pack to any liquid. If you fail to observe this instruction, the internal wires or the protective devices may become damaged; as a result the safety system may not function when discharging or recharging, eventually causing the battery pack to overheat increasing the risk of fire or explosion. Also water may be electrolysed into oxygen and hydrogen, eventually the batteries sealed section may become corroded and the internal liquid may leak.

- Do not solder or heat.

Do not solder onto the battery packs terminals. If you fail to observe this instruction, the armour may be heated and melt. Or the internal wires, or the protective devices may become damaged; as a result the safety system may not function when discharging or recharging. Eventually causing the battery pack to overheat increasing the risk of fire or explosion. Also when batteries temperature reaches 100° C the battery may leak due to destruction of its plastic parts (gasket, separator, etc.). Or may overheat catch fire or explode due to internal short circuit.

- Do not invert the polarity.

Be careful to observe the correct polarity. If you fail to observe this instruction, the battery pack may become externally short-circuited and overheat, catch fire or explode.

- Do not tightly seal.

Do not seal the battery pack when installing it in an external device. Flammable gas is generated from the battery when its safety mechanism functions. If you fail to observe this instruction, sparks from motors, switches etc. may cause the gas to light. Therefore ensure adequate ventilation when installing the battery pack so that the gas can escape from the device.

- Do not use for other applications.

Do not use the battery pack for any device other than this game system. If you fail to observe this instruction, the battery pack or the device may be damaged due to non-applicable specifications.

- Do not deform or shock.

Do not strike with a nail, hammer or subject to any other forms of pressure or shock. If you fail to observe this instruction, the battery may become deformed. As a result the battery may burst, leaking its internal liquid. Or become short-circuited causing overheating, fire or explosion.

- Do not recharge.

Do not use any other battery charger on this pack. Only this game system should be used to recharge this pack. If you fail to observe this instruction, gas may be suddenly generated inside the battery, causing overheating, fire or explosion.



WARNING!

- If during normal operation or storage the battery shows any sign of damage (deformation, change of colour, bursting of the armour cover, etc.) Immediately stop using or storing it. If it leaks or smells abnormally keep it away from any sources of heat or naked flame and place in a safety box.
- If the liquid leaks and gets into your eyes, do not rub your eyes but immediately wash them with copious amounts of clean water, and seek immediate medical advice. If you fail to observe this instruction, the liquid may irreversibly damage your eyes.
- The battery pack armour (a polyvinyl chloride tube) may be damaged or deformed by external force or heat. When transporting the battery pack or replacing it with a new one, be careful not to drop or excessively shock the battery. Do not use any damaged or deformed battery pack. If you fail to observe this instruction, the battery may overheat, catch fire or explode.
- The battery pack contains a printed circuit board (PCB) for protective circuitry. It may be destroyed by an electrostatic discharge (ESD). When handling or servicing the battery pack take preventative measures against ESD. If your battery pack shows signs that the PCB is damaged. Discontinue use. If you fail to observe this instruction, the battery may overheat, catch fire or explode.
- When connecting the battery pack, do not apply excessive force to the connectors and lead wires. If you fail to observe this instruction, the battery may overheat, catch fire or explode.
- Do not dispose of used battery packs in normal household waste. They may contaminate the environment. Submit the battery packs for proper recycling and observe any local regulations regarding the disposal of Lithium-ion batteries.
- Pack the batteries to avoid damage, before delivering them to an industrial waste disposal plant.



IMPORTANT!

- This operation should only be carried out by QUALIFIED SERVICE PERSONNEL.

If the readout time takes longer than previous instances, the cause may be due to a low charge in the DIMM Board battery pack. The DIMM Board battery pack has a service life around 16 months after its first use, based on the machine being switched off at the end of each day.

The battery pack must be replaced with a new item; it cannot be recharged. Refer to the following procedure to replace:

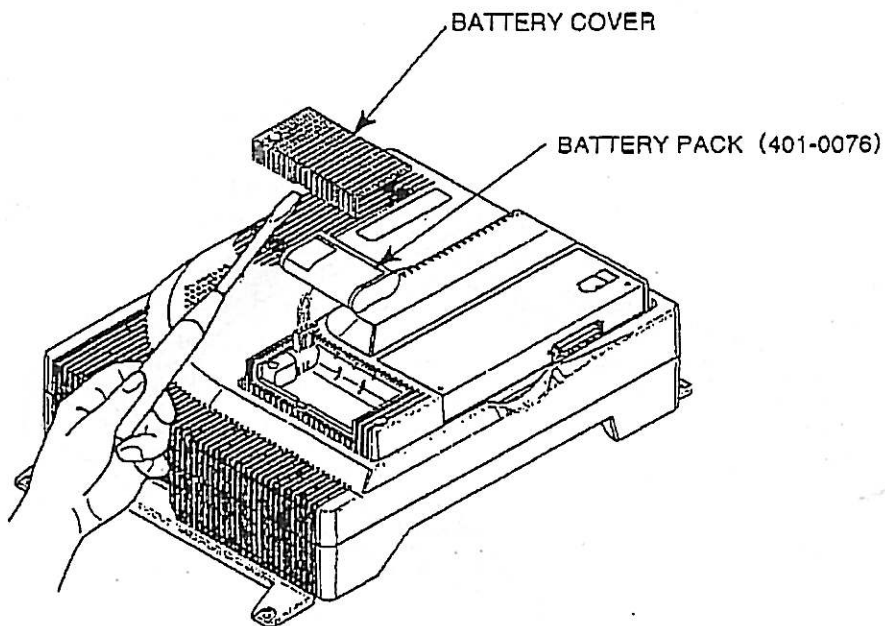
1. Use a flat head screwdriver or similar to gently prise off the battery cover and remove from the DIMM Board Case.
2. Disconnect the battery pack by pressing the tab, remove the battery pack from the DIMM Board.
3. Firmly connect the new battery pack.
4. Refit the battery cover to the DIMM Board Case.

The used battery pack must be disposed according to local laws and regulations.

DIMM Board Battery Pack

SEGA PART No. 401-0076

SEGA PART NAME BATTERY PACK CGR-B/241A



3.8. BATTERY REPLACEMENT (NAOMI MAIN BOARD)



IMPORTANT!

- This operation should only be carried out by QUALIFIED SERVICE PERSONNEL.

Perform this work only if the battery is known to be discharged.

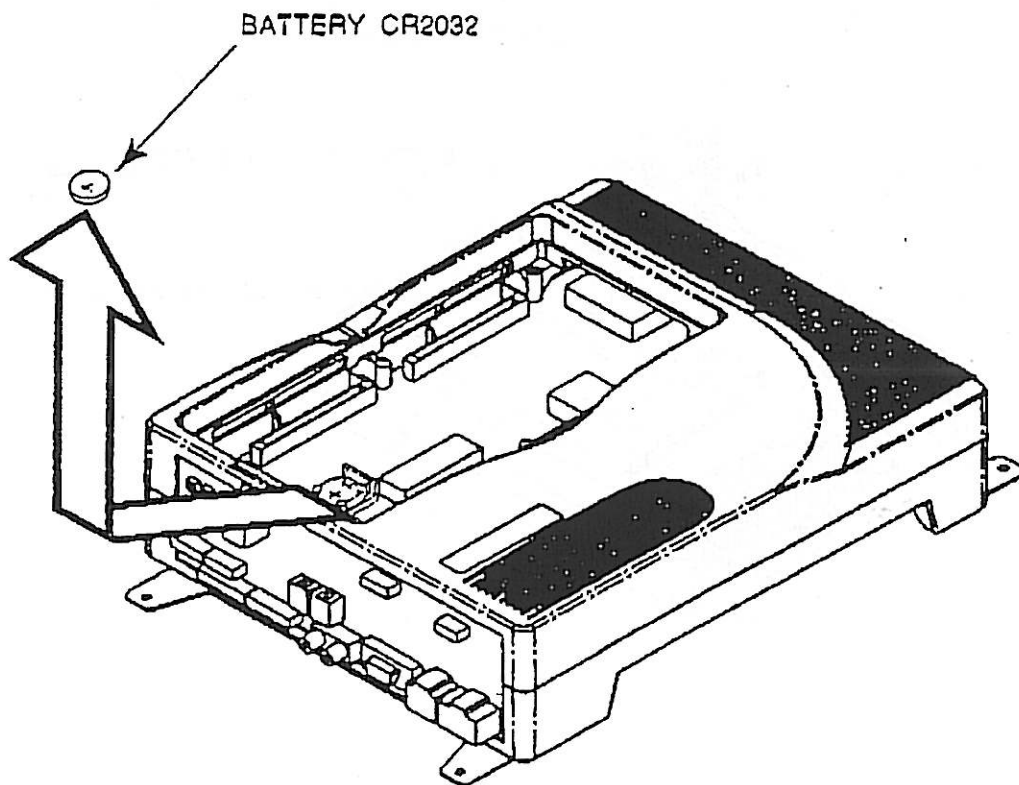
1. Turn power OFF and remove the ROM BD Case from NAOMI Case, referring to section 3.3 above.
2. Carefully remove the battery from its holder on the NAOMI Main Board.
3. Fit new battery into the holder, ensuring the positive pole faces upwards.
4. Reassemble in reverse order.

The used battery pack must be disposed according to local laws and regulations.

NAOMI Main Board Battery

SEGA PART No. 401-0054

SEGA PART NAME BATTERY CR2032/1F MATSUSHITA



4. ERROR MESSAGE

In the following cases an ERROR MESSAGE is displayed after the power has been turned on and the test mode has finished:

ERROR 01

[DISPLAY] ERROR 01
THIS GAME IS NOT ACCEPTABLE
BY MAIN BOARD.

[CAUSE] The ROM BOARD (or DIMM BOARD) is not connected correctly to the MAIN BD correctly.

[COUNTERMEASURES] First, turn power off, connect the ROM BD (or DIMM BOARD) correctly. If the status is not improved yet, the board may be malfunctioning.

ERROR 02

[DISPLAY] ERROR 02
THIS GAME IS NOT ACCEPTABLE
BY MAIN BOARD.

[CAUSE] A game of a certain country's version which is not compatible with the Main BD is connected to the Main BD.

[COUNTERMEASURES] Connect a game of a country's version which is compatible with the Main BD. Country setting change can not be performed in the TEST mode.

ERROR 03

[DISPLAY] ERROR 03
BOARD MALFUNCTIONING.

[CAUSE] Main board serial number cannot be read out.

[COUNTERMEASURES] Submit the DIMM board for repairing. (See Sections 2-4 and 3-3.)

ERROR 04

[DISPLAY] ERROR 04
BOARD MALFUNCTIONING.

[CAUSE] DIMM board serial number cannot be read out.

[COUNTERMEASURES] Submit the NAOMI board with the DIMM board for repairing. (See Section 2-4.)

- ERROR 21**
[DISPLAY] **ERROR 21**
[CAUSE] **THIS GAME IS NOT ACCEPTABLE BY MAIN BOARD.**
[COUNTERMEASURES] Game data (loaded from the GD-ROM to the DIMM board) are corrupted.
 Make sure that the GD-ROM drive is firmly connected to the NAOMI board.
 Make sure that the GD-ROM disk is not scratched or contaminated.
- ERROR 22**
[DISPLAY] **ERROR 22**
[CAUSE] **COMMUNICATION ERROR OCCURRED BETWEEN MAIN BOARD**
[COUNTERMEASURES] **AND OPTION BOARD.**
 The NAOMI main board receives no responses from the DIMM board.
 Correctly reconnect the DIMM board and the GD interface board. If the
 problem is still reproduced, replace the DIMM board and/or the GD
 interface board.
- ERROR 23**
[DISPLAY] **ERROR 23**
[CAUSE] **GD-ROM DRIVE COVER IS OPEN.**
[COUNTERMEASURES] The GD-ROM drive cover is open.
 Close the cover firmly.
- ERROR 24**
[DISPLAY] **ERROR 24**
[CAUSE] **GD-ROM IS NOT FOUND.**
[COUNTERMEASURES] The NAOMI GD-ROM disk can not be recognized.
 Reinsert the NAOMI GD-ROM disk.
 Make sure that the GD-ROM disk is not scratched or contaminated.
- ERROR 25**
[DISPLAY] **ERROR 25**
[CAUSE] **CAN NOT ACCESS GD-ROM DRIVE.**
[COUNTERMEASURES] (1) The GD-ROM drive can not be accessed. (2) The GD-ROM drive cover
 is open.
 (1) Correctly reconnect the GD cable and power cord to the GD-ROM drive.
 If the problem is still reproduced, replace the GD-ROM drive. (2) Close the
 cover firmly.
- ERROR 26**
[DISPLAY] **ERROR 26**
[CAUSE] **OPTION BOARD MALFUNCTIONING.**
[COUNTERMEASURES] The NAOMI board key chip can not be recognized.
 Make sure that you are using a correct key chip that meets the GD-ROM
 disk (If not so, change the present key chip with a correct one). Also make
 sure that the key chip is firmly inserted.
- ERROR 27**
[DISPLAY] **ERROR 27**
[CAUSE] **DIMM MEMORY IS NOT ENOUGH.**
[COUNTERMEASURES] (1) The capacity of the DIMM memory on the DIMM board is not sufficient.
 (2) The DIMM memory is not firmly connected.
 (1) Add the memory as required by the software you are using. (2) Firmly
 reconnect the DIMM memory on the DIMM board.

CAUTION 51

[DISPLAY]

CAUTION 51
GAME ASSIGNMENTS ARE
INCORRECT.
SET CORRECTLY IN SYSTEM
ASSIGNMENTS OF TEST MODE.

[CAUSE]

[COUNTERMEASURES]

CABINET TYPE setting is not correct for the game.
Enter the TEST mode and change the CABINET TYPE setting of SYSTEM
ASSIGNMENTS to the setting suitable for the game.
For the correct setting, refer to the Instruction Manual attached to the game.
Certain games require the replacement of Control Panel.

CAUTION 52

[DISPLAY]

CAUTION 52
CHANGE VIDEO OUTPUT OF
THIS GAME TO THE SETTING
CORRESPONDING TO HORIZONTAL
SCANNING FREQUENCY 15kHz.

[CAUSE]

[COUNTERMEASURES]

31kHz is employed when the game is corresponding to Horizontal Scanning
Frequency of 15kHz only.
Set the monitor to 15kHz, and No. 1 of NAOMI FILTER BD DIP SW to
ON.
For the setting method of monitor's Frequency, refer to the Instruction
Manual of the cabinet. If the monitor is not corresponding to 15kHz, the
game is not playable.

CAUTION 53

[DISPLAY]

CAUTION 53
CHANGE VIDEO OUTPUT OF
THIS GAME TO THE SETTING
CORRESPONDING TO HORIZONTAL
SCANNING FREQUENCY 31kHz.

[CAUSE]

[COUNTERMEASURES]

15kHz is employed when the game is corresponding to Horizontal Scanning
Frequency of 31kHz only.
Set the monitor to 31kHz, and No. 1 of NAOMI FILTER BD DIP SW to
ON.
For the setting method of monitor's Frequency, refer to the Instruction
Manual of the cabinet. If the monitor is not corresponding to 31kHz, the
game is not playable.

CAUTION 54

[DISPLAY]

CAUTION 54
GAME ASSIGNMENTS ARE
INCORRECT.
SET CORRECTLY IN SYSTEM
ASSIGNMENTS OF TEST MODE.

[CAUSE]

[COUNTERMEASURES]

The setting of MONITOR TYPE differs from the correct setting of the game.
Enter the TEST mode, and change the MONITOR TYPE setting of
MONITOR TYPE in SYSTEM ASSIGNMENTS to the correct setting
suitable for the game. For the correct setting, refer to the Instruction Manual
attached to the game. If necessary, perform Horizontal/Vertical
transposition of the monitor, as applicable.

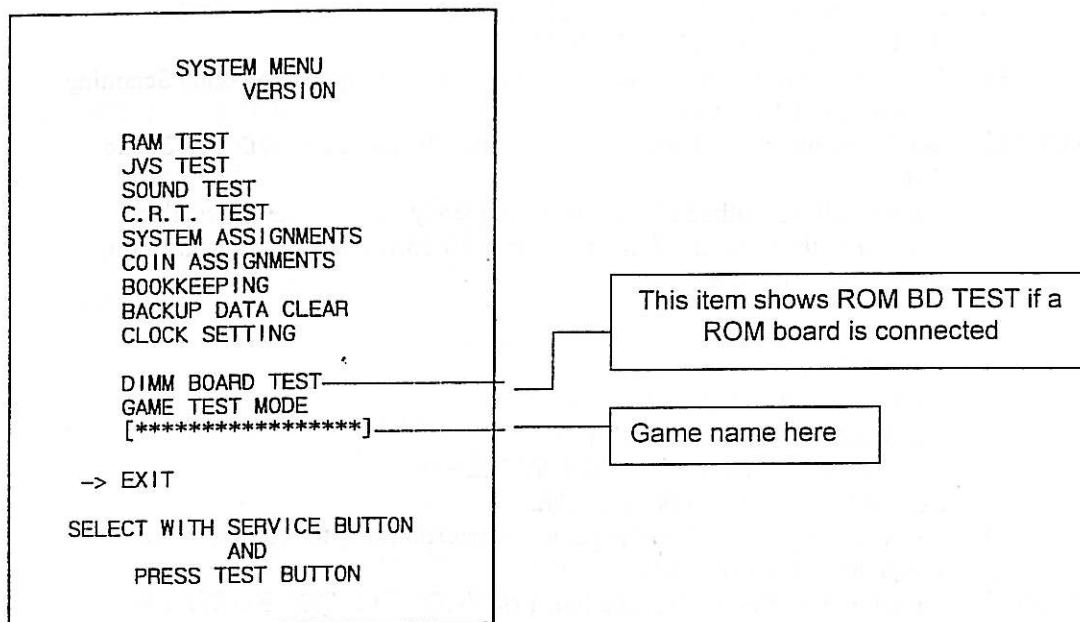
5. SYSTEM TEST MODE



- Setting changes made in SYSTEM ASSIGNMENTS, COIN ASSIGNMENTS and GAME TEST MODE are stored only when the TEST mode is exited properly. If the power is turned off before exiting, and changes made will be ineffectual.
- Do not activate any system test mode while the system is reading the GD-ROM, otherwise error messages may appear.
- These procedures should only be carried out by QUALIFIED SERVICE PERSONNEL.

The SYSTEM TEST MODE allows the IC Board to be checked for correct operation, monitor colour to be adjusted, and COIN and GAME ASSIGNMENTS to be adjusted.

1. After turning power ON, press the TEST Button to display the following menu:



2. Press the SERVICE Button to move the arrow to the desired item, and press TEST to select.
3. Select GAME TEST MODE to display the test menu for that specific game. For further information about GAME TEST MODE, refer to the service manual for the game.
4. Upon finishing the test, select EXIT to return to the game.

5.1. RAM TEST

This screen carries out a test on the RAM on the NAOMI Main Board. The test begins immediately that the screen appears.

TESTING NOW is displayed while the system is testing.

```
RAM TEST

IC29 GOOD
IC35 GOOD
IC09 GOOD IC10 GOOD
IC11 GOOD IC12 GOOD
IC16 GOOD IC18 GOOD
IC20 GOOD IC22 GOOD
IC17 GOOD IC19 GOOD
IC21 GOOD IC23 GOOD

PRESS TEST BUTTON TO EXIT
```

GOOD should appear next to each IC number if the RAM is satisfactory. BAD will appear next to abnormal IC's. The test takes about two and a half minutes to complete testing on all IC's.

After testing, press TEST to return to the system menu screen.

5.2. JVS TEST

Use this test to check specifications of the I/O Board connected to the NAOMI Main Board, while INPUT TEST can be performed on the input switches. First, I/O Board specifications are displayed.

```

                JVS TEST
                INPUT TEST
                NEXT NODE
                -> EXIT
NODE           1/1
NAME          SEGA ENTERPRISES, LTD.
              1/0 838-18683
              VER 1.04
              98/12
CMD VER       1.1
JVS VER       2.0
COM VER       1.0
SWITCH        2PLAYER(S) 11BITS
COIN          2SL0T
ANALOG        8CH
ROTARY        0CH
KEYCODE       0
SCREEN        X:0 Y:0 CH:0
CARD          0SL0T
HOPPER OUT    0CH
DRIVER OUT    8SL0T
ANALOG OUT    0CH
CHARACTER     CHARA:0 LINE:0
BACKUP        0

                SELECT WITH SERVICE BUTTON
                AND
                PRESS TEST BUTTON
    
```

Select from the following:

INPUT TEST: Proceed to the INPUT TEST of the I/O BOARD displayed.

NEXT NODE: In the case of more than two I/O Boards being connected, this proceeds to the next I/O Board.

EXIT: Returns to the Menu Mode.

INPUT TEST SCREEN

```

                JVS TEST
                INPUT TEST
                NEXT NODE
                -> EXIT

NODE 1/1

SWITCH _____
SYSTEM 00000000
PLAYER1 00000000
        00000000
PLAYER2 00000000
        00000000

COIN _____
0000 0000

ANALOG _____
0000 0000 0000 0000
0000 0000 0000 0000

                SELECT WITH SERVICE BUTTON
                AND
                PRESS TEST BUTTON
    
```

When the control panel switches, etc., are actuated the display changes from 0 to 1.

If the Coin SW is actuated, the counter starts. When TEST mode is exited the display returns to 0000.

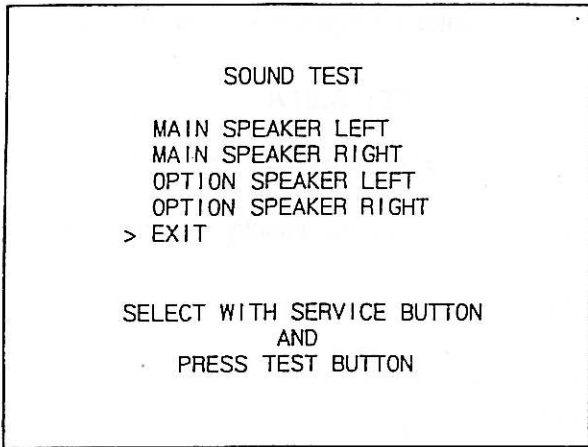
Analogue values are displayed between 0000 and FF00.

5.2.1. SOUND TEST

Select the sound test to check the status of the amplifiers, sound boards and speakers.

Press the SERVICE button or view change button to move the arrow to the desired test item.

Press TEST button to output the sound.

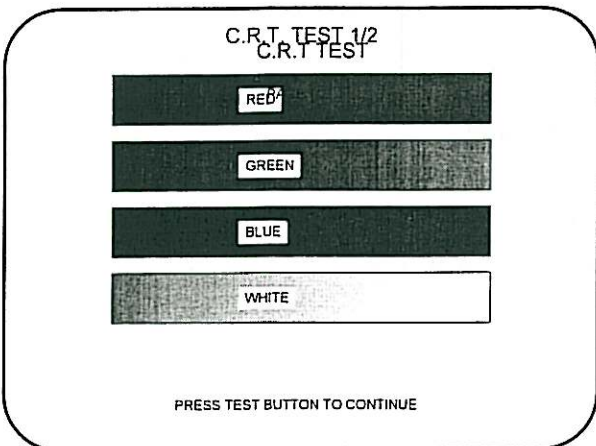


- Select the sound source with SERVICE.
- On pressing TEST, the test sound is emitted from the selected source.

Front speakers are located on the Control Panel.
Rear speakers are located in the seat back.

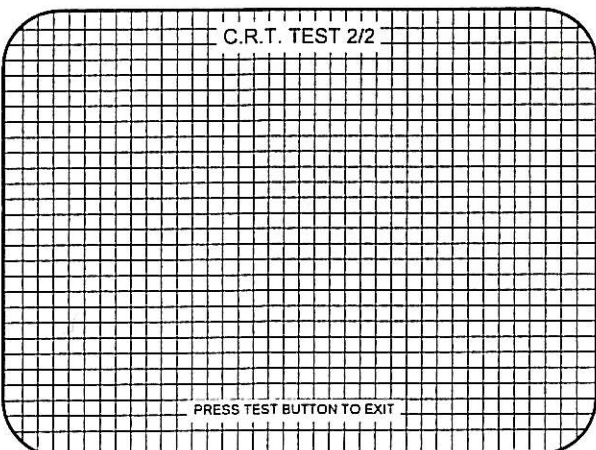
Select EXIT to return to MENU screen.

5.2.2. CRT TEST



Selecting CRT test allows the projector adjustment to be checked for colour and distortion.

Press the test or start button to have the second CRT test screen appear.



5.3. SYSTEM ASSIGNMENTS

STOP

IMPORTANT!

- If the settings of CABINET and MONITOR TYPE are not suitable for the connected game, an ERROR message is displayed when the game is turned on and TEST mode has finished, and the game cannot be played. Refer to the game's service manual for the correct settings, or enter settings corresponding to the cabinet and control panel specifications.
- These procedures should only be carried out by QUALIFIED SERVICE PERSONNEL.

This mode configures the cabinet and board settings. For settings relating to game difficulty, etc., refer to the dedicated service manual for the game software.

1. Select the setting to be changed using SERVICE and TEST.
2. Select EXIT after settings have been performed.

```
SYSTEM ASSIGNMENTS

CABINET TYPE    2PLAYER(S)
ADVERTISE SOUND ON
MONITOR TYPE    HORIZONTAL
SERVICE TYPE   COMMON
-> EXIT

SELECT WITH SERVICE BUTTON
      AND
PRESS TEST BUTTON
```

- CABINET TYPE [1PLAYER(S), 2PLAYER(S), 3PLAYER(S), 4PLAYER(S)]
Sets the number of players between one and four.
- ADVERTISE SOUND (ON, OFF)
Sets whether ADVERTISE sound is emitted or not.
- MONITOR TYPE (HORIZONTAL, VERTICAL)
Sets the on-screen display according to the orientation of the monitor.
- SERVICE TYPE (COMMON, INDIVIDUAL)

If several SERVICE buttons exist, this setting decides the function.

- COMMON: Service credit is obtained for all players when any SERVICE button is pressed.
- INDIVIDUAL: Service credit is obtained for the player corresponding to the SERVICE button used.

5.4. COIN ASSIGNMENTS

```
COIN ASSIGNMENTS
COIN CHUTE TYPE          COMMON
COIN/CREDIT SETTING     #1
COIN CHUTE #1
  1COIN 1CREDIT

COIN CHUTE #2
  1COIN 1CREDIT

· MANUAL SETTING
  SEQUENCE SETTING
> EXIT

SELECT WITH SERVICE BUTTON
  AND
  PRESS TEST BUTTON
```

Select the coin assignments mode to set the coin to credit ratios.

This can be any of the pre-set values or can be done manually.

5.4.1. COIN/CREDIT SETTING (COIN CHUTE COMMON TYPE)

SETTING	FUNCTIONING OF COIN CHUTE #1		FUNCTIONING OF COIN CHUTE #2	
SETTING #1	1 COIN	1 CREDIT	1 COIN	1 CREDIT
SETTING #2	1 COIN	2 CREDITS	1 COIN	1 CREDIT
SETTING #3	1 COIN	3 CREDIT	1 COIN	1 CREDIT
SETTING #4	1 COIN	4 CREDITS	1 COIN	1 CREDIT
SETTING #5	1 COIN	5 CREDITS	1 COIN	1 CREDIT
SETTING #6	1 COIN	2 CREDITS	1 COIN	2 CREDITS
SETTING #7	1 COIN	5 CREDITS	1 COIN	2 CREDITS
SETTING #8	1 COIN	3 CREDITS	1 COIN	3 CREDITS
SETTING #9	1 COIN	4 CREDITS	1 COIN	4 CREDITS
SETTING #10	1 COIN	5 CREDITS	1 COIN	5 CREDITS
SETTING #11	1 COIN	6 CREDITS	1 COIN	6 CREDITS
SETTING #12	2 COINS	1 CREDIT	2 COINS	1 CREDIT
SETTING #13	1 COIN	1 CREDIT	2 COINS	1 CREDIT
SETTING #14	1 COIN	2 CREDITS	2 COINS	1 CREDIT
SETTING #15	1 COIN	1 CREDIT	1 COIN	1 CREDIT
	2 COINS	3 CREDITS	2 COINS	3 CREDITS
SETTING #16	1 COIN	3 CREDITS	1 COIN	1 CREDIT
			2 COINS	3 CREDITS
SETTING #17	3 COINS	1 CREDIT	3 COINS	1 CREDIT
SETTING #18	4 COINS	1 CREDIT	4 COINS	1 CREDIT
SETTING #19	1 COIN	1 CREDIT	1 COIN	1 CREDIT
	2 COINS	2 CREDITS	2 COINS	2 CREDITS
	3 COINS	3 CREDITS	3 COINS	3 CREDITS
	4 COINS	5 CREDITS	4 COINS	5 CREDITS
SETTING #20	1 COIN	5 CREDITS	1 COIN	1 CREDIT
			2 COINS	2 CREDITS
			3 COINS	3 CREDITS
			4 COINS	5 CREDITS
SETTING #21	5 COINS	1 CREDIT	5 COINS	1 CREDIT
SETTING #22	1 COIN	2 CREDITS	3 COINS	1 CREDIT
			5 COINS	2 CREDITS
SETTING #23	2 COINS	1 CREDIT	2 COINS	1 CREDIT
	4 COINS	2 CREDITS	4 COINS	2 CREDITS
	5 COINS	3 CREDITS	5 COINS	3 CREDITS
SETTING #24	1 COIN	3 CREDITS	2 COINS	1 CREDIT
			4 COINS	2 CREDITS
			5 COINS	3 CREDITS
SETTING #25	1 COIN	1 CREDIT	1 COIN	1 CREDIT
	2 COINS	2 CREDITS	2 COINS	2 CREDITS
	3 COINS	3 CREDITS	3 COINS	3 CREDITS
	4 COINS	4 CREDITS	4 COINS	4 CREDITS
	5 COINS	6 CREDITS	5 COINS	6 CREDITS
SETTING #26	1 COIN	6 CREDITS	1 COIN	1 CREDIT
			2 COINS	2 CREDITS
			3 COINS	3 CREDITS
			4 COINS	4 CREDITS
			5 COINS	6 CREDITS
SETTING #27	FREE PLAY		FREE PLAY	

5.4.2. COIN/CREDIT SETTING (COIN CHUTE INDIVIDUAL TYPE)

SETTING	FUNCTIONING OF COIN CHUTE #1	
SETTING #1	1 COIN	1 CREDIT
SETTING #6	1 COIN	2 CREDITS
SETTING #8	1 COIN	3 CREDITS
SETTING #9	1 COIN	4 CREDITS
SETTING #10	1 COIN	5 CREDITS
SETTING #11	1 COIN	6 CREDITS
SETTING #12	2 COINS	1 CREDIT
SETTING #15	1 COIN	1 CREDIT
	2 COINS	3 CREDITS
SETTING #17	3 COINS	1 CREDIT
SETTING #18	4 COINS	1 CREDIT
SETTING #19	1 COIN	1 CREDIT
	2 COINS	2 CREDITS
	3 COINS	3 CREDITS
	4 COINS	5 CREDITS
SETTING #21	5 COINS	1 CREDIT
SETTING #22	3 COINS	1 CREDITS
	5 COINS	2 CREDITS
SETTING #23	2 COINS	1 CREDIT
	4 COINS	2 CREDITS
	5 COINS	3 CREDITS
SETTING #25	1 COIN	1 CREDIT
	2 COINS	2 CREDITS
	3 COINS	3 CREDITS
	4 COINS	4 CREDITS
	5 COINS	6 CREDITS
SETTING #27	FREE PLAY	

5.4.3. MANUAL SETTING

```

COIN ASSIGNMENTS
MANUAL SETTING

COIN TO CREDIT          1
BONUS ADDER             0
COIN CHUTE #1 MULTIPLIER
1 COINCOUNT AS 1COIN
COIN   1  2  3  4  5  6  7  8  9
CREDIT 1  2  3  4  5  6  7  8  9

COIN CHUTE #2 MULTIPLIER
1 COINCOUNT AS 1COIN
COIN   1  2  3  4  5  6  7  8  9
CREDIT 1  2  3  4  5  6  7  8  9

SEQUENCE SETTING
> EXIT

SELECT WITH SERVICE BUTTON
AND
PRESS TEST BUTTON
    
```

Select manual setting to manually set the coin to credit ratios.

The available combinations are detailed below.

MANUAL SETTING

COIN TO CREDIT	1 COIN	1 CREDIT
	2 COINS	1 CREDIT
	3 COINS	1 CREDIT
	4 COINS	1 CREDIT
	5 COINS	1 CREDIT
	6 COINS	1 CREDIT
	7 COINS	1 CREDIT
	8 COINS	1 CREDIT
	9 COINS	1 CREDIT

BONUS ADDER	NO BONUS ADDER
	2 COINS GIVE 1 EXTRA COIN
	3 COINS GIVE 1 EXTRA COIN
	4 COINS GIVE 1 EXTRA COIN
	5 COINS GIVE 1 EXTRA COIN
	6 COINS GIVE 1 EXTRA COIN
	7 COINS GIVE 1 EXTRA COIN
	8 COINS GIVE 1 EXTRA COIN
	9 COINS GIVE 1 EXTRA COIN

COIN CHUTE MULTIPLIER	1 COIN COUNTS AS 1 COIN
	1 COIN COUNTS AS 2 COINS
	1 COIN COUNTS AS 3 COINS
	1 COIN COUNTS AS 4 COINS
	1 COIN COUNTS AS 5 COINS
	1 COIN COUNTS AS 6 COINS
	1 COIN COUNTS AS 7 COINS
	1 COIN COUNTS AS 8 COINS
	1 COIN COUNTS AS 9 COINS

5.4.4. SEQUENCE SETTING

Selecting SEQUENCE SETTING allows the number of credits required to start the game to be set. Each sequence can be set between 1 and 5. Select EXIT to return to the first screen.

```
COIN ASSIGNMENTS
SEQUENCE SETTING

SEQUENCE1 *CREDIT
SEQUENCE2 *CREDIT
SEQUENCE3 *CREDIT
SEQUENCE4 *CREDIT
SEQUENCE5 *CREDIT
SEQUENCE6 *CREDIT
SEQUENCE7 *CREDIT
SEQUENCE8 *CREDIT
> EXIT

[XXXXXXXXXXXXXXXXXX]
[ SEGA ENTERPRISES, LTD. ]
DESCRIPTION OF SEQUENCE
SEQ1 CREDIT TO 1 PLAYER START
SEQ2 NOT USED
SEQ3 NOT USED
SEQ4 NOT USED
SEQ5 NOT USED
SEQ6 NOT USED
SEQ7 NOT USED
SEQ8 NOT USED

SELECT WITH SERVICE BUTTON
AND
PRESS TEST BUTTON
```

5.4.5. BOOKKEEPING

```
BOOKKEEPING PAGE#1

TOTAL TIME      55H27M13S
COIN1           16 SERVICE1      5
COIN2           4 SERVICE2      0
CREDIT          10

TOTAL COIN      20
COIN CREDIT     10
SERVICE CREDIT 5
TOTAL CREDIT    15

PRESS SERVICE BUTTON TO ANOTHER PAGE
PRESS TEST BUTTON TO EXIT
```

```
BOOKKEEPING PAGE#2

PLAYER1
SE01      1
SE02      0
SE03      1
SE04      0
SE05      0
SE06      0
SE07      0
SE08      0

PRESS SERVICE BUTTON TO ANOTHER PAGE
PRESS TEST BUTTON TO EXIT
```

This mode consists of 2 pages that allow the data relating to credit and game play time to be checked.

In page 1 mode press SERVICE to proceed to page 2, in page 2 mode press TEST to return to the test menu.

- Total time is displayed as XXH XXM XXS and no date will be displayed after exceeding 24 hours.
- The displays for number of coin and number of service vary depending on the CABINET TYPE set in SYSTEM ASSIGNMENTS. Number of credit displays 1 if COIN CHUTE TYPE is set to COMMON in COIN ASSIGNMENTS. If COIN CHUTE TYPE is set to INDIVIDUAL, the applicable number in CABINET TYPE setting will be displayed.
- On the second screen, each sequence displays the frequency of functioning.

5.4.6. BACKUP DATA CLEAR

```
BACKUP DATA CLEAR

YES (CLEAR)
> NO (CANCEL)

SELECT WITH SERVICE BUTTON
AND
PRESS TEST BUTTON
```

Clears the contents of bookkeeping. When clearing bring the arrow to "YES (CLEAR)" and press the test button. When the data has been cleared "COMPLETED" will be displayed. Bring the arrow to "NO (CANCEL)" and press the test button to return to the menu mode.

Note that this does not clear the contents of BOOKKEEPING in GAME TEST MODE. For this, use the BACKUP DATA CLEAR in GAME TEST MODE (see dedicated service manual for the game software).

5.4.7. CLOCK SETTING

YEAR, MONTH, DAY, HOUR and MINUTE are changed in this mode. Select the desired item with SERVICE button and press TEST to increase the value. Select EXIT to return to MENU mode.

```
CLOCK SETTING

2000  7/ 7  7: 7  7  FRI

      YEAR
      MONTH
      DAY
      HOUR
      MINUTE
      SECOND

-> EXIT
   CANCEL
      2000  7/ 7  7: 7  ** FRI

SELECT WITH SERVICE BUTTON
      AND
PRESS TEST BUTTON
```

5.4.8. DIMM BOARD TEST

This mode appears only if a DIMM Board is connected to the NAOMI. If not, ROM BOARD TEST will appear.

In this test, the DIMM memory and IC's are checked. If GOOD is displayed, it is satisfactory. Press TEST to exit.

```
DIMM BOARD TEST

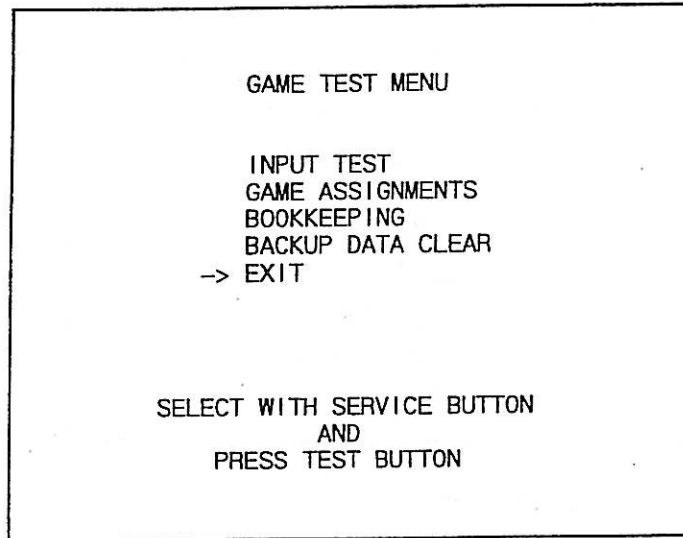
PROGRAM VER : 1.02
DIMM SLOT 0 : GOOD
DIMM SLOT 1 : GOOD
DIMM STATUS : GOOD

CHECKING DIMM BD
DIMM0 - GOOD
DIMM1 - GOOD
IC34,35S - GOOD
IC10,11S - GOOD
GD DRIVE - GOOD
—— COMPLETE ——

PRESS TEST BUTTON TO EXIT
```

5.4.9. GAME TEST MODE

Use GAME TEST MODE for settings pertaining to the game board. Refer to the dedicated manual for the game software when using this mode.



SEGA AMUSEMENTS EUROPE

Unit 2 Industrial Estate
Leigh Close
New Malden
Surrey
KT3 3NL
UK

UK Customers

Tel: +44(0) 20 8336 1222

Fax: +44(0) 20 8336 1715

European Customers

Tel: +44(0) 20 8336 2256

Fax: +44(0) 20 8942 1343

SEGA



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