

1ST PRINTING JAN. 01

SEGA

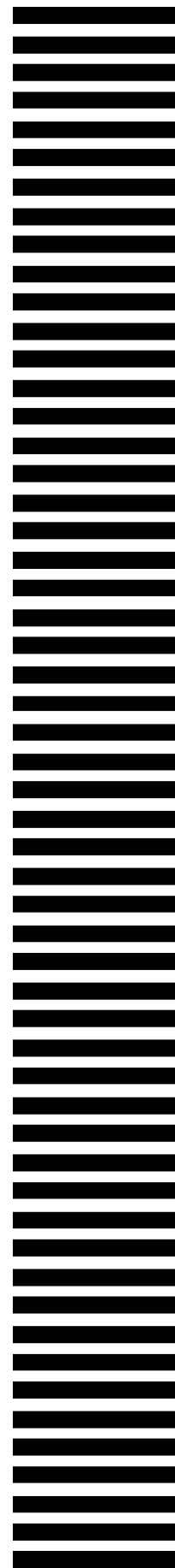


Owner's Manual



SEGA ENTERPRISES, INC. USA

MANUAL NO. 4201-6604-01



Warranty

Your new Sega Product is covered for a period of 90 days from the date of shipment. This certifies that the Printed Circuit Boards, Power Supplies and Monitor are to be free of defects in workmanship or materials under normal operating conditions. This also certifies that all Interactive Control Assemblies are to be free from defects in workmanship and materials under normal operating conditions. No other product in this machine is hereby covered.

Sellers sole liability in the event a warranted part described above fails shall be, at its option, to replace or repair the defective part during the warranty period. For Warranty claims, contact your Sega Distributor.

Should the Seller determine, by inspection that the product was caused by Accident, Misuse, Neglect, Alteration, Improper Repair, Installation or Testing, the warranty offered will be null and void.

Under no circumstances is the Seller responsible for any loss of profits, loss of use, or other damages.

This shall be the exclusive written Warranty of the original purchaser expressed in lieu of all other warranties expressed or implied. Under no circumstance shall it extend beyond the period of time listed above.

BEFORE USING THE PRODUCT, BE SURE TO READ THE FOLLOWING:

To maintain the safety:

To ensure the safe usage of the product, be sure to read the following before using the product. The following instructions are intended for the users, operators and the personnel in charge of the operation of the product. After carefully reading and sufficiently understanding the warning displays and cautions, handle the product appropriately. Be sure to keep this manual nearby the product or elsewhere convenient for referring to it when necessary.

Herein, explanations which require special attention are enclosed with dual lines. Depending on the potentially hazardous degrees, the terms of WARNING, CAUTION, etc. are used. Be sure to understand the contents of the displays before reading the text.



WARNING!

Indicates that mishandling the product by disregarding this warning will cause a potentially hazardous situation which can result in death or serious injury.



CAUTION!

Indicates that mishandling the product by disregarding this caution will cause a slight hazardous situation which can result in personal injury and or material damage.

For the safe usage of the product, the following pictographs are used:



Indicates “HANDLE WITH CARE.” In order to protect the human body and equipment, this display is attached to places where the Owner’s Manual and or Service Manual should be referred to.

○ Perform work in accordance with the instructions herein stated.

Instructions for work are explained by paying attention to the aspect of accident prevention. Failing to perform work as per the instructions can cause accidents. In the case where only those who have technical expertise should perform the work to avoid hazardous situation, the instructions herein state that the serviceman should perform such work.

○ Be sure to turn off power before working on the machine.

To prevent electric shock, be sure to turn off power before starting the work in which the worker touches the interior of the product. If the work is to be performed in the power-on status, the Instruction Manual herein always states to that effect.

○ Be sure to ground the Earth Terminal (this, however, is not required in the case where a power cord with earth is used).

This product is equipped with the Earth Terminal. When installing the product, Connect the Earth Terminal to the “accurately grounded indoor earth terminal” by using an earth wire. Unless the product is grounded appropriately, the user can be subject to electric shock. After performing repair, etc. for the Control equipment, ensure that the Earth Wire is firmly connected to the Control equipment.

○ Ensure that the Power Supply used is equipped with an Earth Leakage Breaker.

This product does not incorporate the Earth Leakage Breaker. Using a power supply which is not equipped with the Earth Leakage Breaker can cause a fire when earth leakage occurs.

○ Be sure to use fuses which meet the specified rating. (only for the machines which use fuses).

Using fuses exceeding the specified rating can cause a fire and electric shock.

○ **Specification changes (removal of equipment, conversion and addition) not designated by SEGA are not allowed.**

The parts of the product include warning labels for safety, covers for personal protection, etc. It is very hazardous to operate the product by removing parts and or modifying the circuits. Should doors, lids and protective parts be damaged or lost, refrain from operating the product, and contact where the product was purchased from or the office herein stated. SEGA shall not be held responsible for any accidents, compensation for damage to a third party, resulting from the specifications not designated by SEGA.

○ **Ensure that the product meets the requirements of appropriate Electrical Specifications.**

Before installing the product, check for Electrical Specifications. SEGA products have a nameplate on which Electrical Specifications are described. Ensure that the product is compatible with the power supply voltage and frequency requirements of the location. Using any Electrical Specifications different from the designated Specifications can cause a fire and electric shock.

○ **Install and operate the product in places where appropriate lighting is available, allowing warning labels to be clearly read.**

To ensure safety for the customers, labels and printed instructions describing potentially hazardous situation are applied to places where accidents can be caused. Ensure that where the product is operated has sufficient lighting allowing the warnings to be read. If any label is peeled off, apply it again immediately. Please place an order with where the product was purchased from or the office herein stated.

○ **When handling the Monitor, be very careful. (Applies only to the product w/monitor.)**

Some of the monitor (TV) parts are subject to high tension voltage. Even after running off power, some portions are still subject to high tension voltage sometimes. Monitor repair and replacement should be performed only by those technical personnel who have knowledge of electricity and technical expertise.

○ **Be sure to adjust the monitor (projector) properly. (Applies only to the product w/monitor.)**

Do not operate the product leaving on-screen flickering or blurring as it is. Using the product with the monitor not properly adjusted may cause dizziness or a headache to an operator, a player, or the customers.

○ **When transporting or reselling this product, be sure to attach this manual to the product.**

In the case where commercially available monitors and printers are used in this product, only the contents relating to this product are explained herein. Some commercially available equipment has functions and reactions not stated in this manual. Read this manual together with the specific Instruction Manual of such equipment.

- Descriptions herein contained may be subject to improvement changes without notice.
- The contents described herein are fully prepared with due care. However, should any question arise or errors be found, please contact SEGA.

INSPECTIONS IMMEDIATELY AFTER TRANSPORTING THE PRODUCT TO THE LOCATION.

Normally, at the time of shipment, SEGA products are in a status allowing for usage immediately after transporting to the location. Nevertheless, an irregular situation may occur during transportation. Before turning on power, check the following points to ensure that the product has been transported in a satisfactory status.

- Are there any dented portions or defects (cuts, etc.) on the external surfaces of the cabinet?
- Are Casters and Adjusters, damaged?
- Do the power supply voltage and frequency requirements meet with those of the location?
- Are all wiring connectors correctly and securely connected? Unless connected in the correct direction, connector connections can not be made accurately. Do not insert connectors forcibly.
- Do power cords have cuts and dents?
- Do the fuses used meet specified rating? Is the Circuit Protector in an energized status?
- Are all accessories available?
- Can all Doors and Lids be opened with the Accessory keys? Can Doors and Lids be firmly closed?

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BEFORE USING THE PRODUCT, BE SURE TO READ THE FOLLOWING:

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SPECIFICATIONS

Installation space	: 1,632 mm (W) X 1,602 mm (D) (64.3 in. X 63.1 in.)
Height	: 1,935 mm (76.2 in.)
Weight	: Approx. 471 kg.. (1,038.4 lbs.)
Power, maximum current	: 716 W 8.10 A (AC 110V 50 Hz AREA) 715 W 8.25 A (AC 110V 60 Hz AREA) 711 W 7.30 A (AC 120V 60 Hz AREA) 716 W 4.10 A (AC 220V 50 Hz AREA) 666 W 3.40 A (AC 220V 60 Hz AREA) 718 W 4.00 A (AC 230V 50 Hz AREA) 696 W 3.90 A (AC 230V 60 Hz AREA) 722 W 3.80 A (AC 240V 50 Hz AREA) 706 W 3.70 A (AC 240V 60 Hz AREA)
For TAIWAN	
Power, current	: 715 W 8.25A (MAX.) 475 W 5.50A (MIN.)
MONITOR	: 29 TYPE COLOR MONITOR

INTRODUCTION OF THE OWNERS MANUAL

This Owner's Manual is intended to provide detailed descriptions together with all the necessary information covering the general operation of electronic assemblies, electromechanicals, servicing control, spare parts, etc. as regards the product, **PLANET HARRIER TWIN TYPE.**

This manual is intended for the owners, personnel and managers in charge of operation of the product. Operate the product after carefully reading and sufficiently understanding the instructions. If the product fails to function satisfactorily, non-technical personnel should under no circumstances touch the internal system. Please contact where the product was purchased from.

Use of this product is unlikely to cause physical injuries or damages to property. However, where special attention is required this is indicated by a thick line, the word "IMPORTANT" and its sign in this manual.



Indicates that mishandling the product by disregarding this display can cause the product's intrinsic performance not to be obtained, resulting in malfunctioning.

IMPORTANT

SEGA ENTERPRISES, INC. (U.S.A.)/CUSTOMER SERVICE
45133 Industrial Drive, Fremont, California 94538, U.S.A.
Phone : (415) 701-6580
Fax : (415) 701-6594

DEFINITION OF LOCATION MAINTENANCE MAN AND SERVICEMAN



Non-technical personnel who do not have technical knowledge and expertise should refrain from performing such work that this manual requires the location's maintenance man or a serviceman to carry out, or work which is not explained in this manual. Failing to comply with this instruction can cause a severe accident such as electric shock.

Ensure that parts replacement, servicing & inspections, and troubleshooting are performed by the location's maintenance man or the serviceman. It is instructed herein that particularly hazardous work should be performed by the serviceman who has technical expertise and knowledge.

The location's maintenance man and serviceman are herein defined as follows:

"Location's Maintenance Man" :

Those who have experience in the maintenance of amusement equipment and vending machines, etc., and also participate in the servicing and control of the equipment through such routine work as equipment assembly and installation, servicing and inspections, replacement of units and consumables, etc. within the Amusement Facilities and or locations under the management of the Owner and Owner's Operators of the product.

Activities of Location's Maintenance Man :

Assembly & installation, servicing & inspections, and replacement of units & consumables as regards amusement equipment, vending machines, etc.

Serviceman :

Those who participate in the designing, manufacturing, inspections and maintenance service of the equipment at an amusement equipment manufacturer.

Those who have technical expertise equivalent to that of technical high school graduates as regards electricity, electronics and or mechanical engineering, and daily take part in the servicing & control and repair of amusement equipment.

Serviceman's Activities :

Assembly & installation and repair & adjustments of electrical, electronic and mechanical parts of amusement equipment and vending machines.

1. HANDLING PRECAUTIONS

When installing or inspecting the machine, be very careful of the following points and pay attention to ensure that the player can enjoy the game safely.

Non-compliance with the following points or inappropriate handling running counter to the cautionary matters herein stated can cause personal injury or damage to the machine.



WARNING!

- Before performing work, be sure to turn power off. Performing the work without turning power off can cause an electric shock or short circuit. In the case work should be performed in the status of power on, this manual always states to that effect.
- To avoid electric shock or short circuit, do not plug in or unplug quickly.
- To avoid electric shock, do not plug in or unplug with a wet hand.
- Do not expose Power Cords and Earth Wires on the surface, (floor, passage, etc.). If exposed, the Power Cords and Earth Wires are susceptible to damage. Damaged cords and wires can cause electric shock or short circuit.
- To avoid causing a fire or electric shock, do not put things on or damage Power Cords.
- When or after installing the product, do not unnecessarily pull the power cord. If damaged, the power cord can cause a fire or electric shock.
- In case the power cord is damaged, ask for replacement through where the product was purchased from or the office herein stated. Using the cord as is damaged can cause fire, electric shock or leakage.
- Be sure to perform grounding appropriately. Inappropriate grounding can cause an electric shock.
- Be sure to use fuses meeting specified rating. Using fuses exceeding the specified rating can cause a fire or electric shock.
- Completely make connector connections for IC BD and others. Insufficient insertion can cause an electric shock.
- Specification changes, removal of equipment, conversion and/or addition, not designated by SEGA are not permitted.
 - Failure to observe this may cause a fire or an electric shock. Non-compliance with this instruction can have a bad influence upon physical conditions of the players or the lookers-on, or result in injury during play.
 - SEGA shall not be held responsible for damage, compensation for damage to a third party, caused by specification changes not designated by SEGA.
- Be sure to perform periodic maintenance inspections herein stated.



IMPORTANT

- For the IC board circuit inspections, only the logic tester is allowed. The use of a multiple-purpose tester is not permitted, so be careful in this regard.
- When cleaning the CRT surfaces, use a soft, dry cloth. Do not apply chemicals such as thinner, benzine, etc.
- The electronic parts on the IC Board could be damaged due to human body's static electricity. Before performing IC Board related work, be sure to discharge physically accumulated statics by touching grounded metallic surfaces, etc.

2. PRECAUTIONS CONCERNING INSTALLATION

LOCATION



WARNING!

This product is an indoor game machine. Do not install it outside. Even indoors, avoid installing in places mentioned below so as not to cause a fire, electric shock, injury and or malfunctioning.

- Places subject to rain or water leakage, or places subject to high humidity in the proximity of an indoor swimming pool and or shower, etc.
- Places subject to direct sunlight, or places subject to high temperatures in the proximity of heating units, etc.
- Places filled with inflammable gas or vicinity of highly inflammable/volatile chemicals or hazardous matter.
- Dusty places.
- Sloped surfaces.
- Places subject to any type of violent impact.
- Vicinity of anti-disaster facilities such as fire exits and fire extinguishers.
- The operating (ambient) temperature range is from 5 Celsius to 40 Celsius. Only in the case a projector is employed, the temperature range is from 5 Celsius to 30 Celsius.

LIMITATIONS OF USAGE REQUIREMENTS



WARNING!

- Be sure to check the Electrical Specifications. Ensure that this product is compatible with the location's power supply, voltage and frequency requirements. A plate describing Electrical Specifications is attached to the product. Non-compliance with the Electrical Specifications can cause a fire and electric shock.
- This product requires the Breaker and Earth Mechanisms as part of the location facilities. Using them in a manner not independent can cause a fire and electric shock.
- Ensure that the indoor wiring for the power supply is rated at 15A or higher (AC single phase 100 ~ 120V area), and 7A or higher (AC 220 ~ 240V area). Non-compliance with the Electrical Specifications can cause a fire and electric shock.
- Be sure to independently use the power supply equipped with the Earth Leakage Breaker. Using a power supply without the Earth Leakage Breaker can cause an outbreak of fire when earth leakage occurs.
- Putting many loads on one electrical outlet can cause generation of heat and a fire resulting from overload.
- When using an extension cord, ensure that the cord is rated at 15A or higher (AC 100 ~ 120V area) and 7A or higher (AC 220 ~ 240V area). Using a cord rated lower than the specified rating can cause a fire and electric shock.

OPERATION AREA



- For the operation of this machine, secure a minimum area of 2.8m (W) X 2.3m (D). In order to prevent injury resulting from the falling down accident during game play, be sure to secure the minimum area for operation.
- Be sure to provide sufficient space so as to allow this product's ventilation fan to function efficiently. To avoid machine malfunctioning and a fire, do not place any obstacles near the ventilation opening.
- SEGA shall not be held responsible for damage, compensation for damage to a third party, resulting from the failure to observe this instruction.



For transporting the machine into the location's building, the minimum necessary dimensions of the opening (of doors, etc.) are 0.85m(W) and 1.55m(H).

Electric current consumption

- MAX. 8.10 A (AC 110V 50 Hz)
- MAX. 8.25 A (AC 110V 60 Hz)
- MAX. 7.30 A (AC 120V 60 Hz)
- MAX. 4.10 A (AC 220V 50 Hz)
- MAX. 3.40 A (AC 220V 60 Hz)
- MAX. 4.00 A (AC 230V 50 Hz)
- MAX. 3.90 A (AC 230V 60 Hz)
- MAX. 3.80 A (AC 240V 50 Hz)
- MAX. 3.70 A (AC 240V 60 Hz)
- MAX. 8.25 A (For TAIWAN)

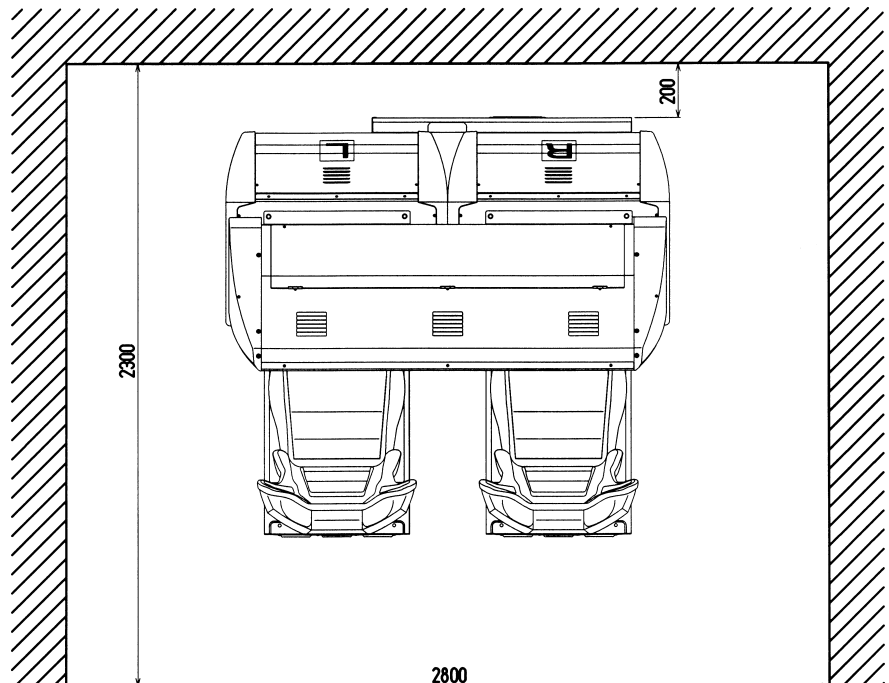


FIG. 2

3. OPERATION

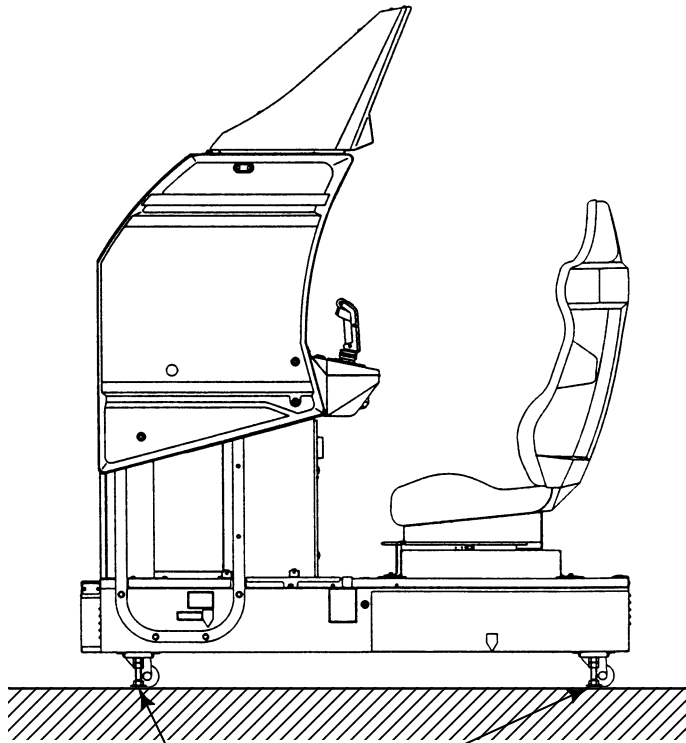
PRECAUTIONS TO BE HEEDED BEFORE STARTING THE OPERATION

To avoid injury and trouble, be sure to constantly give careful attention to the behavior and manner of the visitors and players.



In order to avoid accidents, check the following before starting the operation:

- To ensure maximum safety for the players and the customers, ensure that where the product is operated has sufficient lighting to allow any warnings to be read. Operation under insufficient lighting can cause bodily contact with each other, hitting accident, and or trouble between customers.
- Be sure to perform appropriate adjustment of the monitor (projector). For operation of this machine, do not leave monitor's flickering or deviation as is. Failure to observe this can have a bad influence upon the players' or the customers' physical conditions.
- It is suggested to ensure a space allowing the players who feel sick while playing the game to take a rest.
- Check if all of the adjusters are in contact with the surface. If they are not, the Cabinet can move and cause an accident.



Ensure that all of the Adjusters are in contact with the floor.



- Do not put any heavy item on this product. Placing any heavy item on the product can cause a falling down accident or parts damage.
- Do not climb on the product. Climbing on the product can cause falling down accidents. To check the top portion of the product, use a step.
- To avoid electric shock, check to see if door & cover parts are damaged or omitted.
- To avoid electric shock, short circuit and or parts damage, do not put the following items on or in the periphery of the product.
Flower vases, flowerpots, cups, water tanks, cosmetics, and receptacles/
containers/vessels containing chemicals and water.



To avoid injury, be sure to provide sufficient space by considering the potentially crowded situation at the installation location. Insufficient installation space can cause making bodily contact with each other, hitting accidents, and or trouble between customers.

PRECAUTIONS TO BE HEEDED DURING OPERATION (PAYING ATTENTION TO CUSTOMERS)

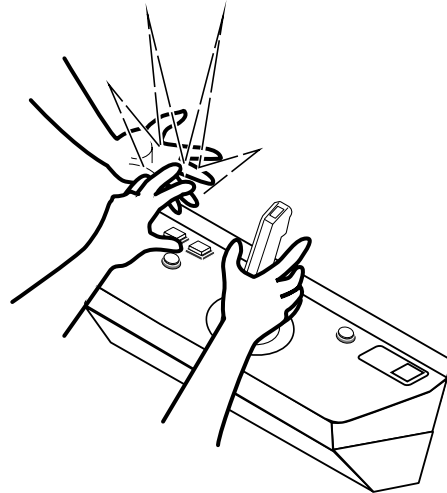
To avoid injury and trouble, be sure to constantly give careful attention to the behavior and manner of the visitors and players.



- To avoid injury and accidents, those who fall under the following categories are not allowed to play the game.
 - Those who need assistance such as the use of an apparatus when walking.
 - Those who have high blood pressure or a heart problem.
 - Those who have experienced muscle convulsion or loss of consciousness when playing video game, etc.
 - Those who have a trouble in the neck and or spinal cord.
 - Intoxicated persons.
 - Pregnant women or those who are in the likelihood of pregnancy.
 - Persons susceptible to motion sickness.
 - Persons whose act runs counter to the product's warning displays.
- A player who has never been adversely affected by light stimulus might experience dizziness or headache depending on his physical condition when playing the game. Especially, small children can be subject to those conditions. Caution guardians of small children to keep watch on their children during play.
- Instruct those who feel sick during play to have a medical examination.
- To avoid injury resulting from falling down and electric shock due to spilled drinks, instruct the player not to place heavy items or drinks on the product.
- To avoid electric shock and short circuit, do not allow customers to put hands and fingers or extraneous matter in the openings of the product or small openings in or around the doors.

- To avoid falling down and injury resulting from falling down, immediately stop the customer's leaning against or climbing on the product, etc.
- To avoid electric shock and short circuit, do not allow the customers to unplug the power plug without a justifiable reason.

- Caution lookers-on so as not to touch the operating unit while in play. Failure to observe this may cause bodily contact with the player and trouble between the customers.



- Caution the player so as not to hold a child in her/his lap to play. Failure to observe this may cause the child to be caught between the Control Panel and the player and fall down.



- Immediately stop such violent acts as hitting and kicking the product. Such violent acts can cause parts damage or falling down, resulting in injury due to fragments and falling down.
- Instruct the Player to adjust the seat before playing the game. Playing the game in a forcible posture can cause a contingent accident.

4. NAME OF PARTS

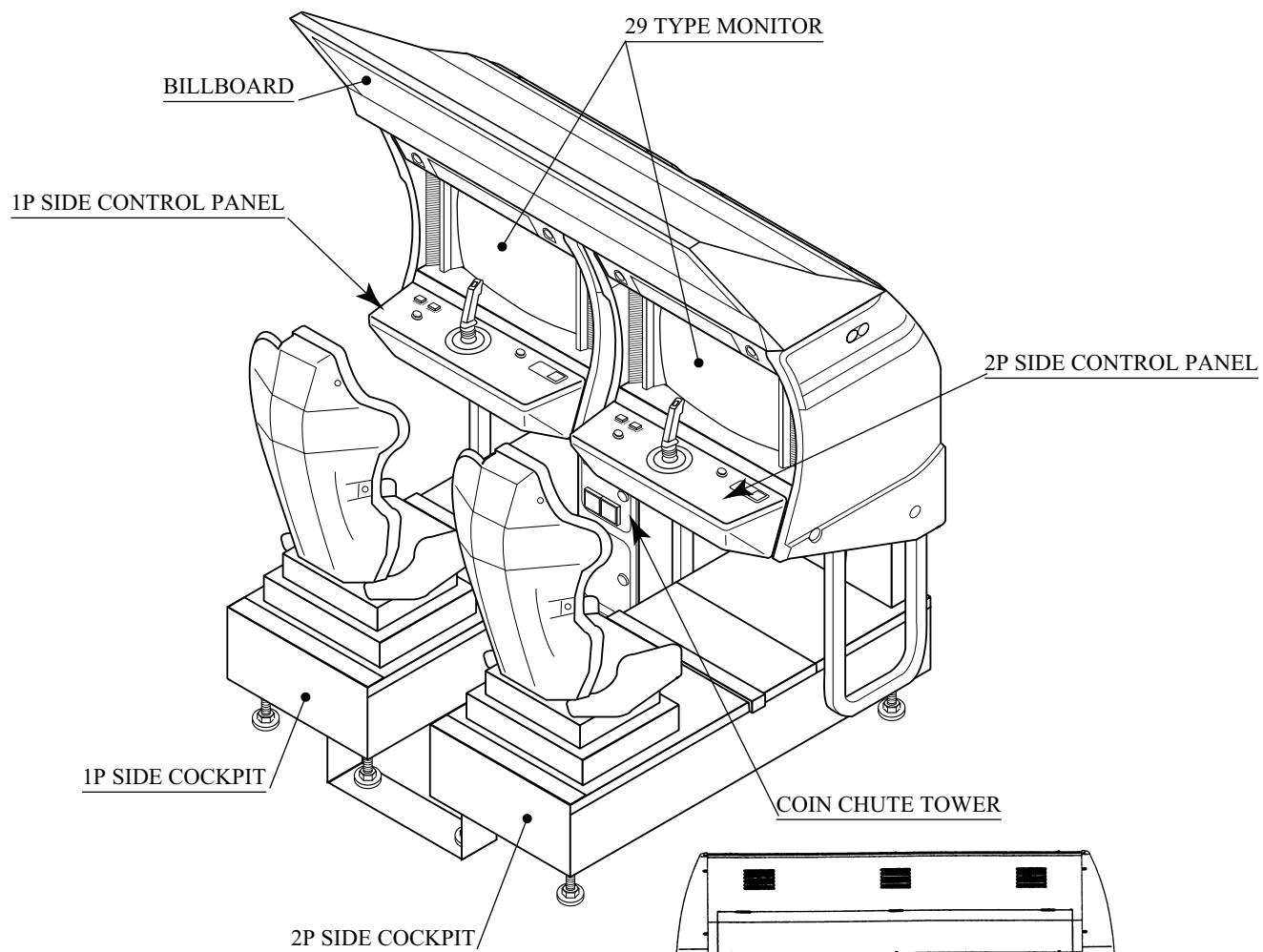


FIG. 4 a OVERVIEW

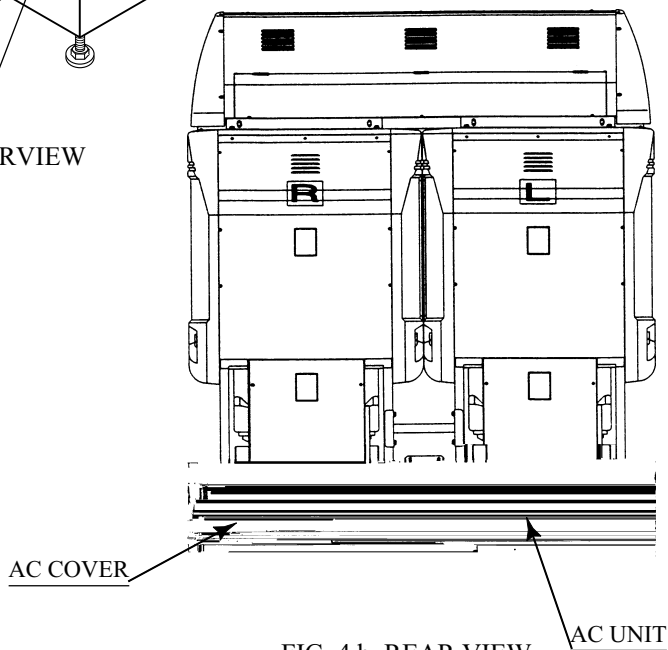


FIG. 4 b REAR VIEW

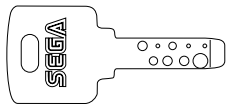
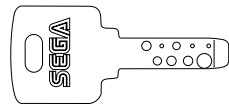
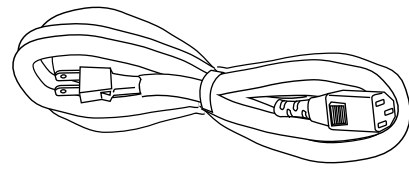
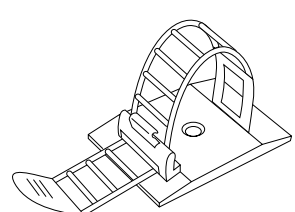
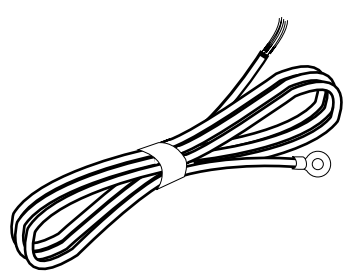
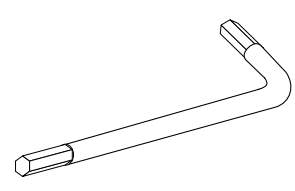
TABLE 4

	Width	Length	Height(mm)	Weight(kg.)
COCKPIT (per seat)	816	1,495	1,520	209
COIN CHUTE TOWER	265	325	570	15
BILLBOARD	1,608	568	420	31
When assembled	1,632	1,602	1,935	471

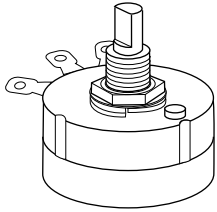
5. ACCESSORIES

When transporting the machine, make sure that the following parts are supplied.

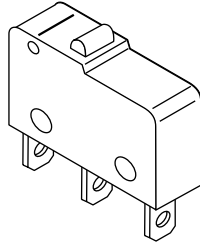
TABLE 5 ACCESSORIES

<p>DESCRIPTION OWNERS MANUAL Part No.(Qty.) 420-6604-01 (1) Note Figures If Part No. has no description, the Number has not been registered or can not be registered. Such a part may not be obtainable even if the customer desires to purchase it. Therefore, ensure that the part is in safekeeping with you.</p>	<p>KEY MASTER 220-5576 (2) For opening/closing the doors</p>	<p>KEY (2) For the CASHBOX DOOR</p>
<p>AC Cable (Power Cord) 600-6729 600-7228 (1) TAIWAN 600-6618 (1) OTHERS 600-6619 (1) HONG KONG Used for installation, see [5] of Section 6.</p>		
	<p>CORD CLAMP 280-5009-01 (1) Used for securing the power cord. see [5] of Section 6.</p>	<p>The Keys are inside the Coin Chute Door at the time of shipment from the factory.</p>
	<p>WIRE HARN EARTH W/LUG M6 600-6664-02 (1) For TAIWAN. Used for installation, see [5] of Section 6.</p>	<p>TAMPERPROOF†WRENCH M5 540-0007-01 (1) TOOL</p>
		

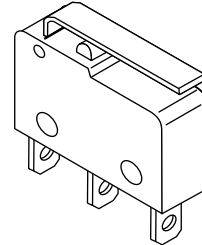
VOL CONT B-5K OHM
220-5737 (1)
Spare, see Section 10.



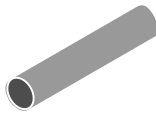
SW MICRO TYPE
509-5974 (1)
Spare, refer to Section 10.



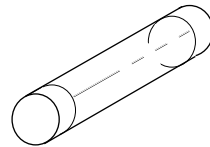
SW MICRO TYPE
509-5975 (1)
Spare, refer to Section 10.



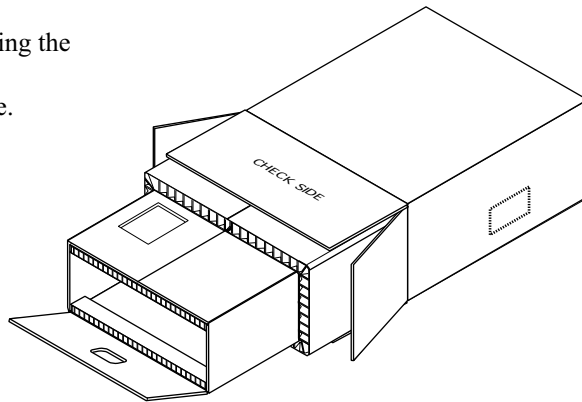
Heat-Shrinkable Tubing
310-5029-F20 (3)
Spare, see Section 10.



FUSE 5A
514-5036-5000 (1)
Spare, see Section 15.



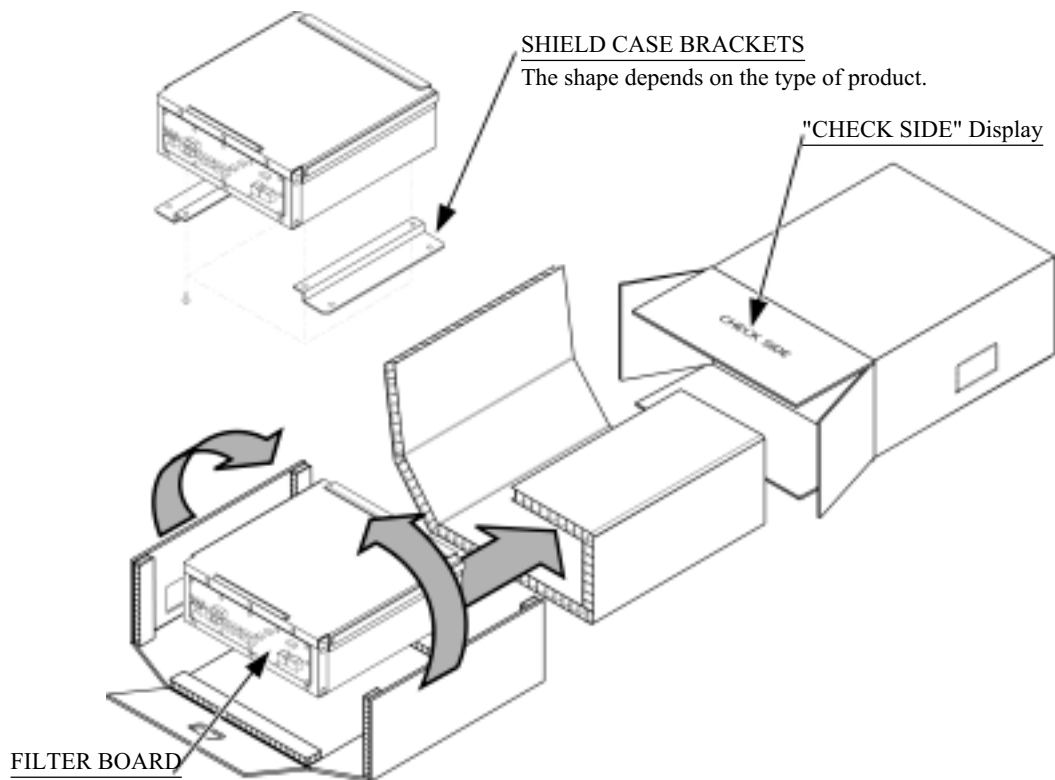
CARTON BOX
601-10642 (1)
Used for transporting the
Game Board.
Refer to Next Page.



HOW TO USE THE CARTON BOX



- When asking for the replacement or repair of the product's Game Board (SEGA HIKARU), be sure to put the Game Board together with the Shield Case in a Carton Box. Otherwise, the request is not acceptable.
- Put the Shield Case in the Carton Box by paying attention to the correct direction as per the following instructions and as shown by the instructions printed on the Carton Box. Handling in an erroneous manner can damage the Game Board.
- Remove the Shield Case Brackets from the Shield Case and put the Shield Case in the Carton Box.



Wrap the Shield Case with the packing material and put it in the Carton Box as shown. Putting it upside down or packing otherwise in the manner not shown can damage the Game Board and parts.

6. ASSEMBLING AND PRECAUTIONS



- Perform assembly work by following the procedure herein stated. Failing to comply with the instructions can cause electric shock hazard.
- Assembling should be performed as per this manual. Since this is a complex machine, erroneous assembling can cause an electric shock, machine damage and or not functioning as per specified performance.
- When assembling, be sure to use plural persons. Depending on the assembly work, there are some cases in which working by one person alone can cause personal injury or parts damage.
- Perform connector connection securely. Insufficient insertion can cause electric shock and short circuit hazards.

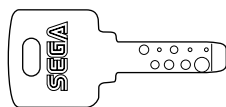


Perform the tightening of hexagon bolts described in 1 above after adjusting the adjusters as per 2. Make sure that until the adjuster adjustments are made, keep the hexagon bolts tightened temporarily.

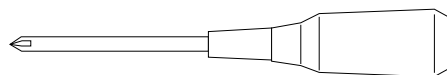
When carrying out the assembly work, follow the procedure in the following 7-item sequence:

- 1 ASSEMBLING THE COCKPIT
- 2 SECURING IN PLACE (ADJUSTER ADJUSTMENT)
- 3 INSTALLING THE BILLBOARD
- 4 INSTALLING THE AC COVERS (WIRING CONNECTION)
- 5 POWER SUPPLY, AND EARTH CONNECTION
- 6 TURNING POWER ON
- 7 ASSEMBLING CHECK

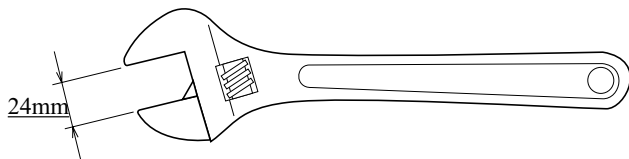
Note that the master key and the cashbox door key (accessories) in addition to the tools such as a Phillips type plus screwdriver, wrench for M16 hexagon bolt and socket wrench are required for the assembly work.



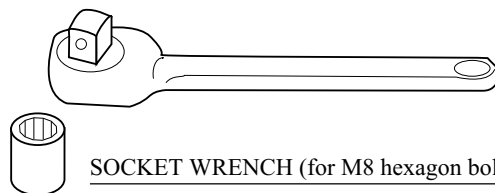
MASTER KEY



Phillips type screwdriver (for M4 screw)



WRENCH (for M16 hexagon bolt)



SOCKET WRENCH (for M8 hexagon bolt)

1

ASSEMBLING THE COCKPIT

- ① Place the two cockpits side by side. Position the 1P cabinet at the left-hand side as viewed facing the monitor. STICKER "L" is attached on the back of 1P cabinet, and STICKER "R" on the back of 2P cabinet (Fig. 6.1a).

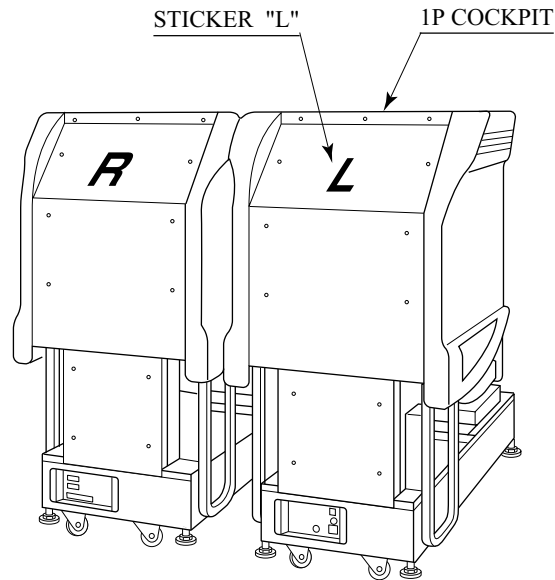


FIG. 6. 1 a

- ② Install the coin chute tower in between both cabinets. Open the coin chute door and the cashbox door to secure with the 4 hexagon bolts from inside the doors. At this time, make sure that the bolts are fastened temporarily (Fig. 6.1b).

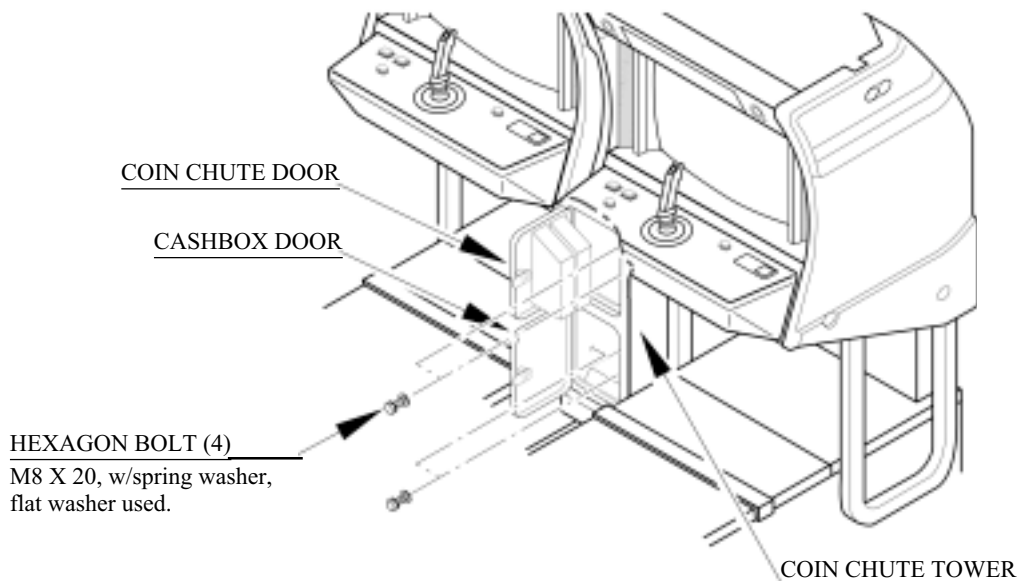
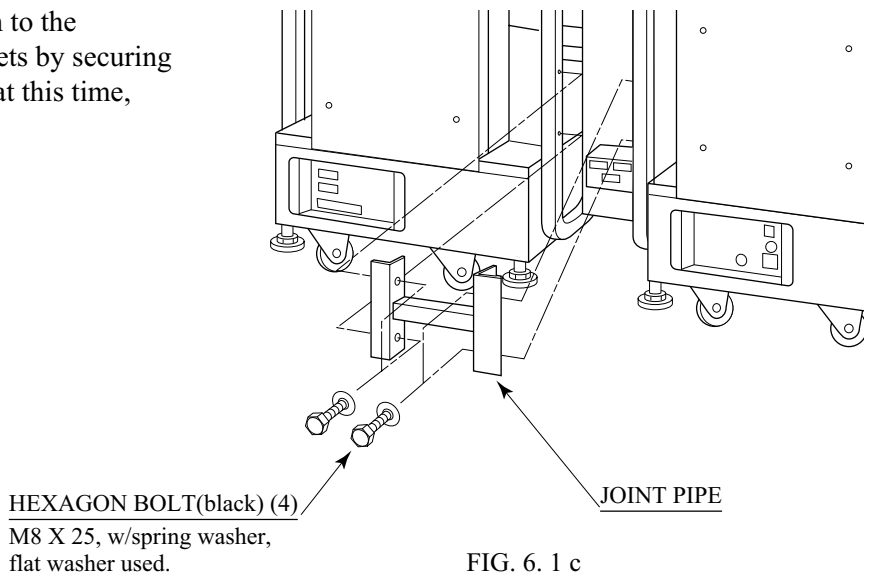
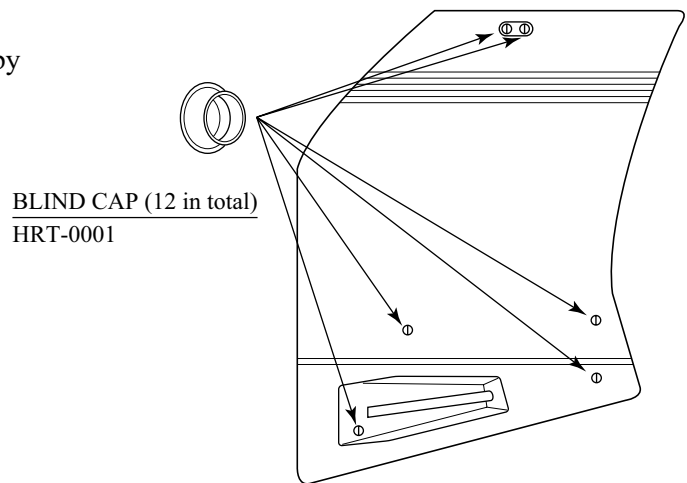


FIG. 6. 1 b

- ③ Install the joint pipe on to the backside of both cabinets by securing with 4 hexagon bolts (at this time, temporarily) (Fig.6.1c)



- ④ Attach the blind cap to the head of each hexagon bolt (6 bolts on each side of the monitor ... a total of 12) by pressing it in.



2 SECURING IN PLACE (ADJUSTER ADJUSTMENT)



Make sure that all of the adjusters are in contact with the floor. If they are not, the cabinet can move and cause an accident.

This machine has 8 casters and 8 adjusters (Fig. 6.2a). When the installation position is determined, cause the adjusters to come into contact with the floor directly, make adjustments in a manner so that the casters will be raised approximately 5mm. from the floor and make sure that the machine position is level.

- ① Move the machine to the installation position. When installing the machine against or close to a wall, be sure to secure a passage space to enable the player to take a ride in the machine.
- ② Attach the joint plate for the 2 internal adjusters shown. First, cause the other 6 adjusters to come into contact with the floor. Make adjuster adjustments with a wrench in a manner to ensure the machine's position is level (Fig.6.2b).
- ③ After making adjustments, fasten the adjuster nut upward and secure the height of the adjuster (Fig.6.2b).

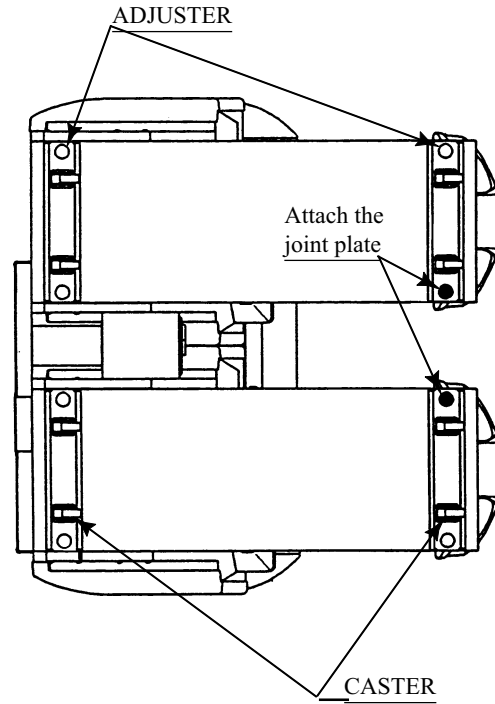


FIG. 6.2 a BOTTOM VIEW

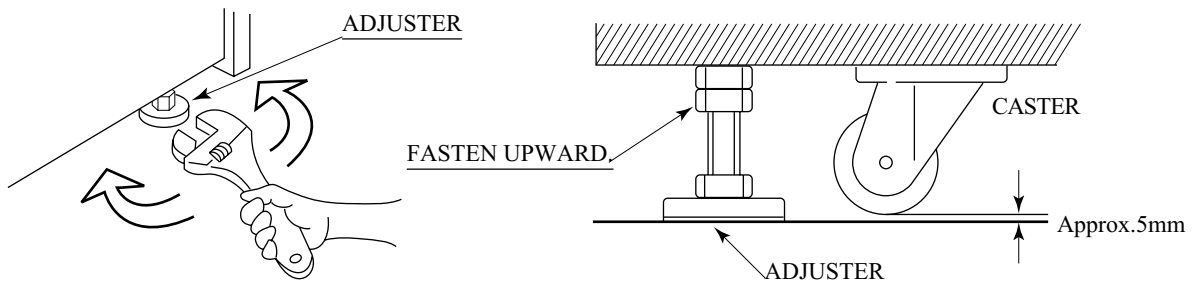


FIG. 6.2 b ADJUSTER

- ④ Insert the notch portions of the joint plate to the 2 adjuster bolt portions.
- ⑤ Lower the adjuster and fasten the nut upward. Secure the joint plate with the nuts and the bottom of adjuster (Fig.6.2c).

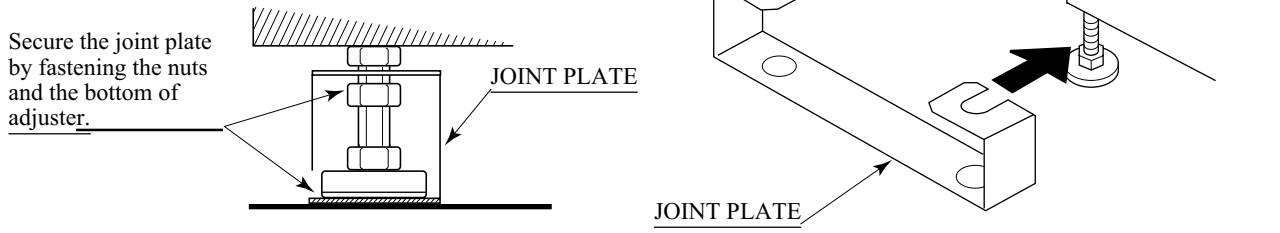


FIG. 6. 2 c JOINT PLATE

After securing the height of the adjusters, tighten all of the hexagon bolts which were fastened temporarily as per ① above.

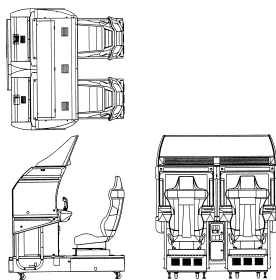


FIG. 6. 2 d
Refer to this Fig. (Scale:1/100)
for the layout of the place of
installation.

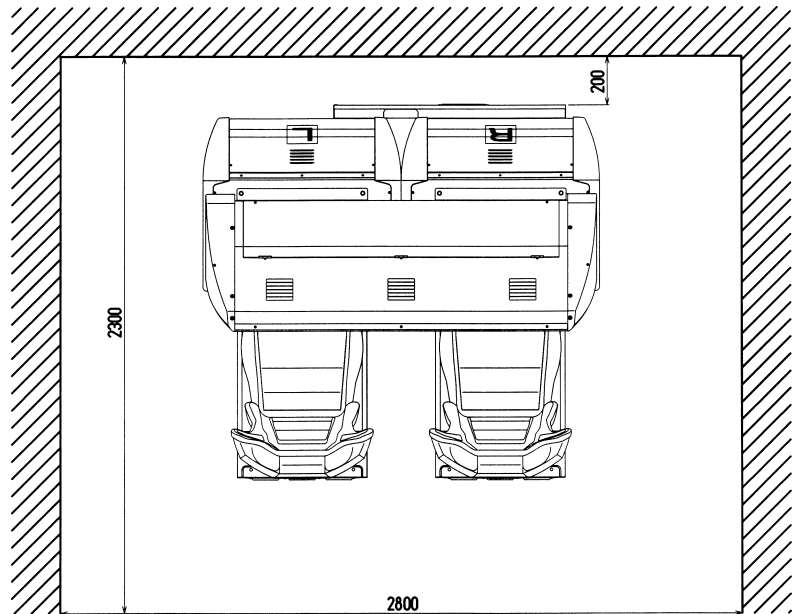
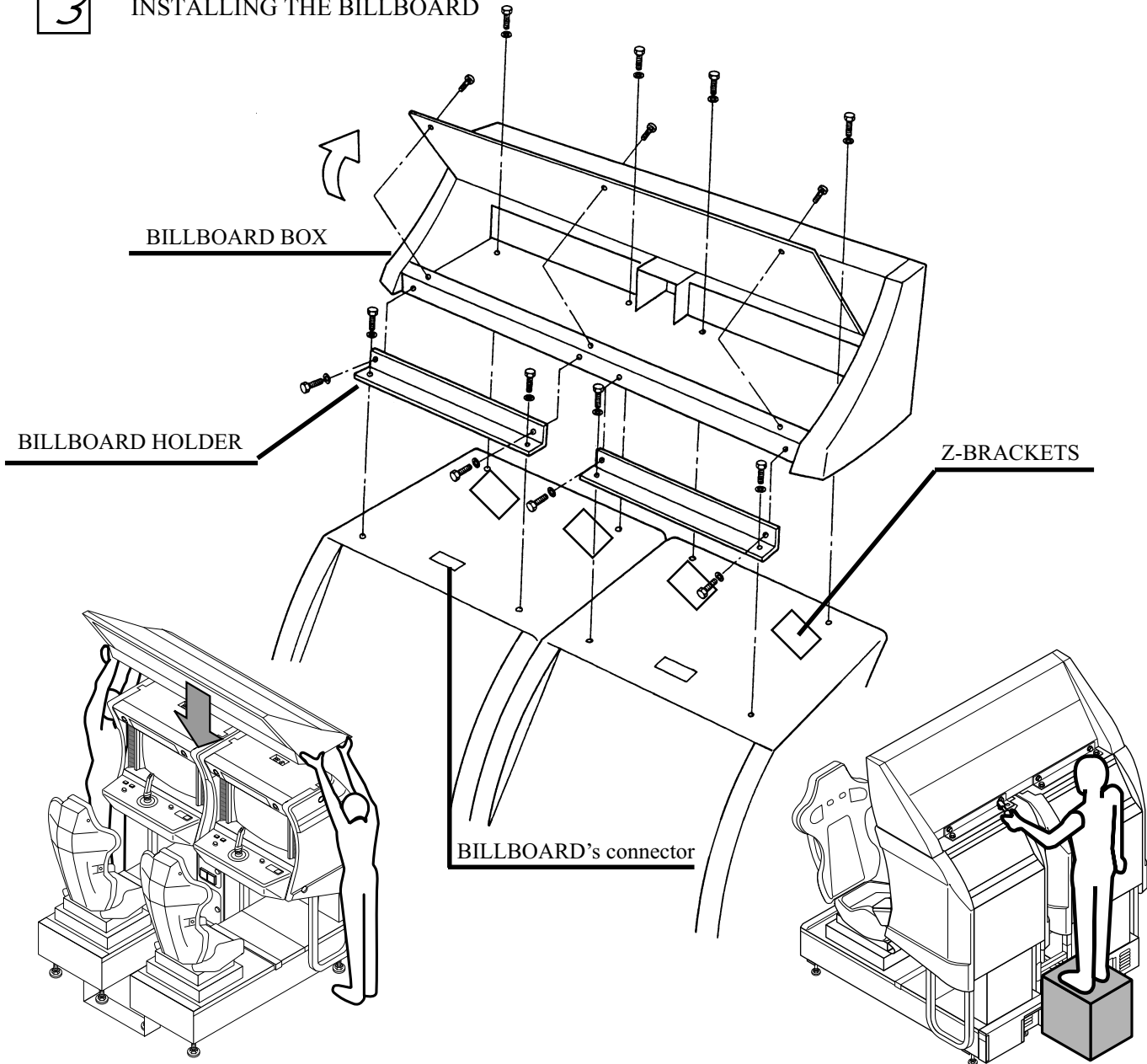


FIG. 6. 2 e
Provide sufficient space so as to allow for
ventilation by the ventilation fan.

3

INSTALLING THE BILLBOARD



After the 2 game halves are securely mounted together perform the following procedure:

- Install the 4 Z-brackets provided in the cash box in the holes provided on the top of the monitor box. (Note: Use the hex bolts provided in the parts bag and make sure the top edge of the bracket faces away from the player.)
- Using the assistance of at least one more person, place the billboard on top of the 2 joined sides of the game and use the mounted Z-brackets to hook the billboard to the top of the game.
- Connect the harnesses extending from the extending from the extending from the monitor tops to their mating connectors in the billboard.
- Install the 4 hex bolts through the brackets already mounted on the back of the billboard into the holes provided on the back of the monitor cabinet.



INSTALLING THE AC COVERS (WIRING CONNECTION)



- Before starting to work, ensure that the Power SW is OFF. Failure to observe this can cause electric shock and short circuit hazards.
- Use care so as not to damage wirings. Damaged wiring can cause electric shock and short circuit hazards.

The AC cover is used for protecting the wiring and optic fiber cables. When performing the work, be very careful so as not to cause damage by catching them. Pay due attention to handling optic fiber cables in particular. Ensure not to cause breakage to the cables due to excessive bending.

- ① Attach AC COVER A to the back of the cabinet (Fig. 6.4) by securing with 5 screws.
- ② Make wiring connections between both cabinets & the coin chute tower. Insert the supplied wiring connectors to the corresponding ones which have an identical color and the same number of pins.
- ③ Insert the optic fiber cables to the optic fiber connectors in a manner as applicable. There are "TX" and "RX" connectors. Make sure to connect the "TX" connector of one cabinet to the "RX" connector of the other cabinet.
- ④ Secure the wiring and optic fiber cable with cord clamps in AC COVER A.
- ⑤ Install AC COVER B. Insert AC COVER B to AC COVER A from above and secure with 4 screws.
- ⑥ Secure AC Cover C & AC Cover Lid with 4 screws for each.

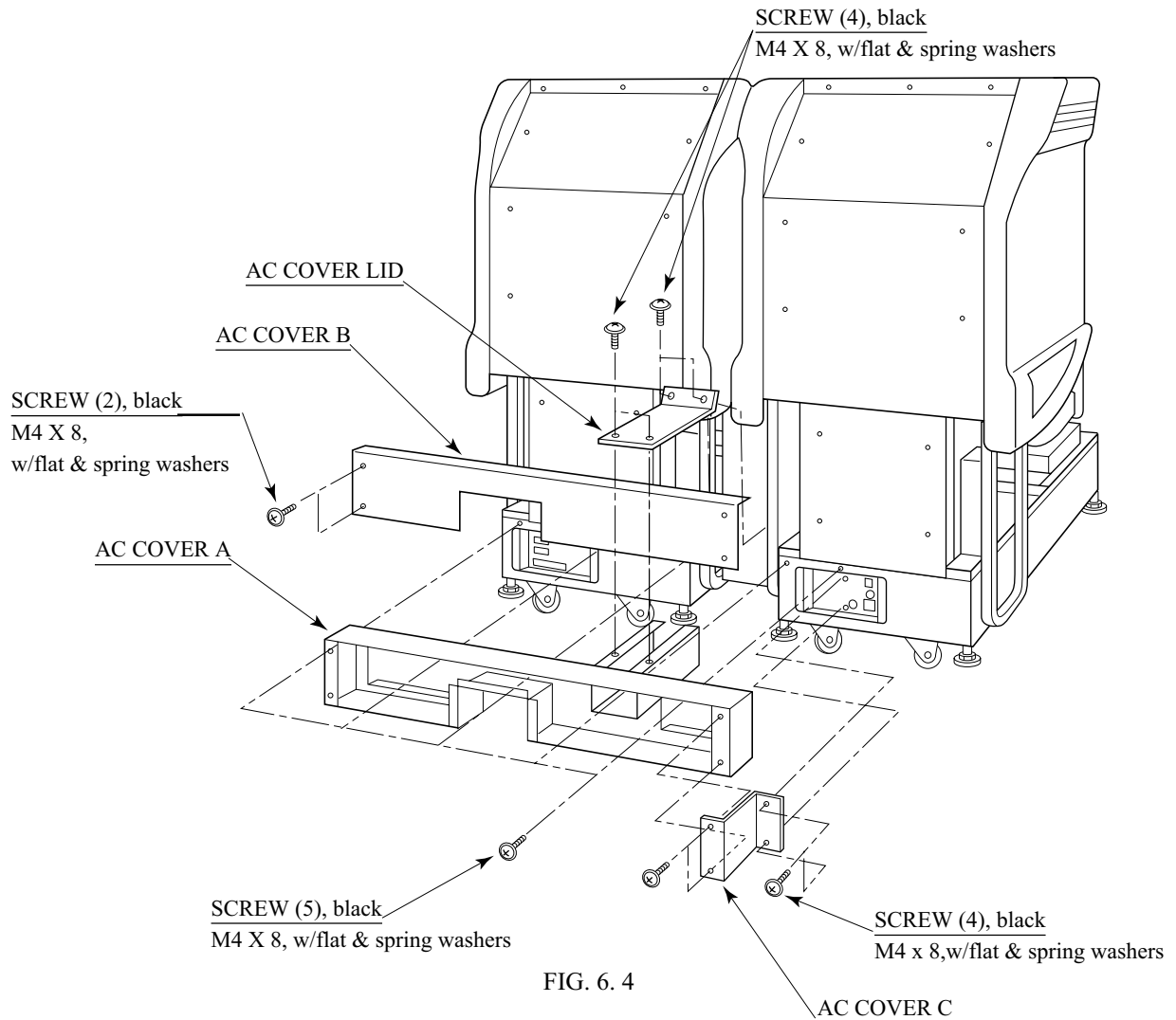


FIG. 6.4

5

POWER SUPPLY, AND EARTH CONNECTION



- Be sure to independently use the power supply socket outlet equipped with an Earth Leakage Breaker. Using a power supply without an Earth Leakage Breaker can cause a fire when electric leakage occurs.
- Ensure that the "accurately grounded indoor earth terminal" and the earth wire cable are available (except in the case where a power cord plug with earth is used). This product is equipped with the earth terminal. Connect the earth terminal and the indoor earth terminal with the prepared cable. If the grounding work is not performed appropriately, customers can be subjected to an electric shock, and the product's functioning may not be stable.
- Ensure that the power cord and earth wire are not exposed on the surface (passage, etc.). If exposed, they can be caught and are susceptible to damage. If damaged, the cord and wire can cause electric shock and short circuit accidents. Ensure that the wiring position is not in the customer's passage way or the wiring has protective covering.
- After wiring power cord on the floor, be sure to protect the power cord. Exposed power cord is susceptible to damage and causes an electric shock accident.

The AC Unit is mounted on the 1P COCKPIT. The AC Unit incorporates the Main SW, earth terminal and Inlet.

- ① Ensure that the Main SW is OFF.



Main SW off

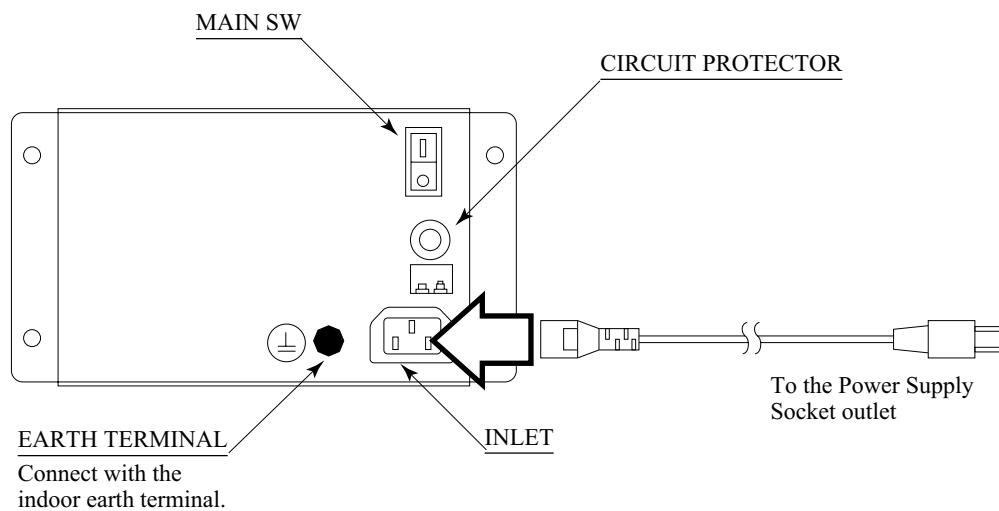


FIG. 6. 5 a AC unit

- ② Connect one end of the earth wire to the AC Unit earth terminal, and the other end to the indoor earth terminal. The AC Unit earth terminal has a Bolt and Nut combination. Take off the Nut, pass the end of earth wire through the Bolt, and fasten the Nut. Note that the Earth Wire is incorporated in the Power Cord for the Areas of AC 120V (USA) and AC 220 ~ 240V, and therefore, this procedure is not necessary.

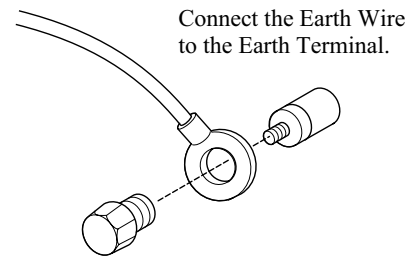


FIG. 6. 5 b Earth Wire Connection

- ③ Firmly insert the power plug into the socket outlet. Insert the opposite side of Power Cord plug to the AC Unit's connector ("INLET").
- ④ Perform wiring for the Power Cord and Earth Wire. Install protective covering for the Power Cord and Earth Wire.

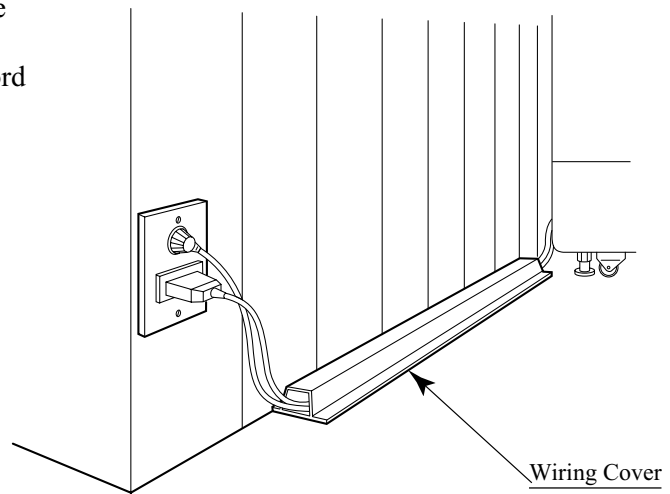
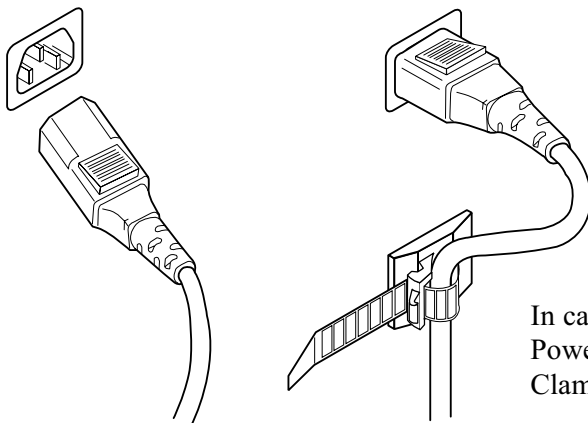


FIG. 6. 5 c Connecting Power Cord and Earth Wire



In case the Power Plug is apt to come out of place, secure the Power Cord to the periphery of the AC Unit with the Cord Clamp (an accessory).

HOW TO USE THE CORD CLAMP

6

TURNING POWER ON

Turn on the AC unit's main switch to connect the power. When the power is connected, the fluorescent light and two cathode ray tubes in the billboard become on.

When the power is connected, the system automatically starts to check the network. Do not touch the system until the system completes a network checking and displays an advertising screen.

The CHECKING NETWORK NOW message is displayed on the screen during a network checking. Generally it takes 1 to 3 minutes until the system completes a network checking and stops displaying the CHECKING NETWORK NOW message. If a communication problem occurs in the network, the system continues displaying the message.

After the completion of a network checking the system displays an advertising screen (ply for hire screen). Sound is output from the speakers on the right and left of the monitor and the speakers and woofers on the seat's backrest. Sound is not output if you have set the function to off.

After the power is disconnected, the system can maintain the data of credit number, fractional number of coins, bonus adder count, ranking, and latest scores. Assume that the remaining credit number is enough for a play when the power is disconnected. When the power is reconnected, in this state, the system immediately displays an initial playing screen.

NETWORK check screen

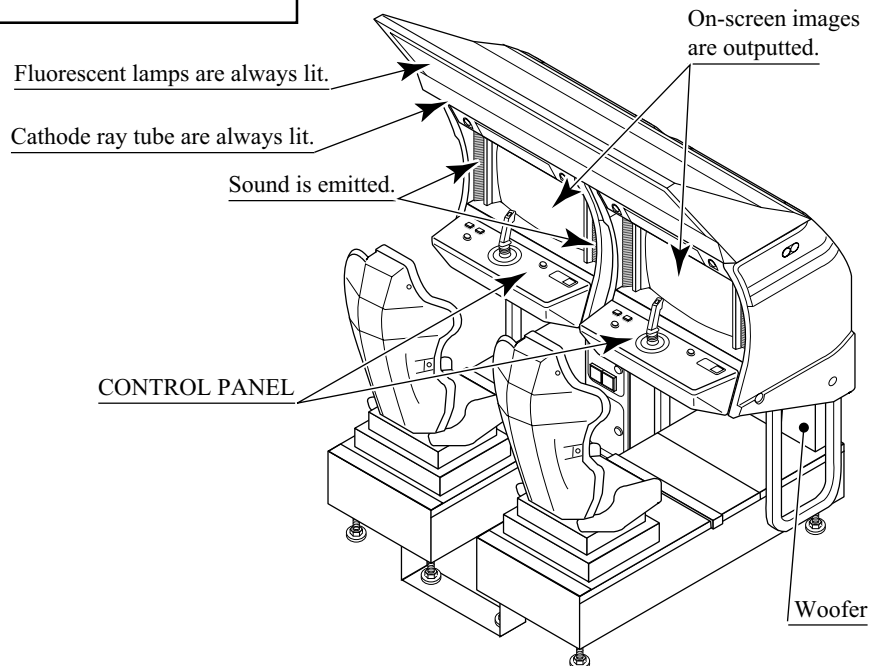
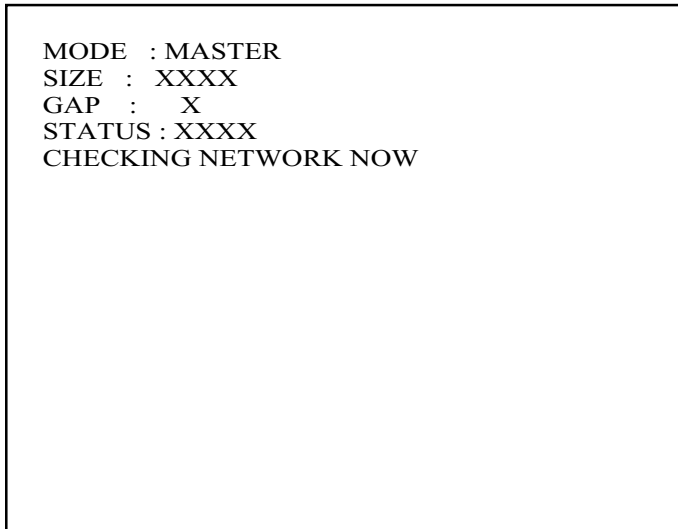


FIG. 6. 6



ASSEMBLING CHECK

In the TEST MODE, ascertain that the assembly has been made correctly and IC BD. is satisfactory (refer to Section 9).

In the test mode, perform the following test:

(1) MEMORY TEST

RAM TEST	
IC15 IC16 IC17S IC18S	GOOD
IC22 IC23 IC24S IC25S	GOOD
IC28 IC29S	GOOD
IC41	GOOD
IC42	GOOD
IC44 IC45S IC46 IC47S	GOOD
IC91S IC92S	GOOD
IC98	GOOD
OPTIONAL SOUND BOARD:	
IC2	GOOD
OPTIONAL COMMUNICATION BOARD:	
IC7 IC8 IC9 IC10	GOOD
PRESS TEST BUTTON TO EXIT	

Selecting the RAM TEST on the system test mode menu screen causes the on-board memory to be tested automatically. The game board is satisfactory if the display beside each IC No. shows GOOD.

(2) C.R.T. TEST

C.R.T. TEST PAGE #1	
0	31
RED	
GREEN	
BLUE	
WHITE	
PRESS SERVICE BUTTON TO ANOTHER PAGE	
PRESS TEST BUTTON TO EXIT	

In the system test mode menu, selecting C.R.T. TEST allows the screen (on which the monitor is tested) to be displayed. Although the monitor adjustments have been made at the time of shipment from the factory, color deviation, etc., may occur due to the effect caused by geomagnetism, the location building's steel frames and other game machines in the periphery. By watching the test mode screen, make judgment as to whether an adjustment is needed. If it is necessary, adjust the monitor by referring to Section 11.

Use the DEMAG SW to remove color deviation due to magnetization.

C.R.T. TEST PAGE#2	
PRESS SERVICE BUTTON TO ANOTHER PAGE	
PRESS TEST BUTTON TO EXIT	

(3) SOUND TEST

```
SOUND TEST

MAIN SPEAKER LEFT
MAIN SPEAKER RIGHT
OPTION SPEAKER LEFT
OPTION SPEAKER RIGHT
> EXIT

SELECT WITH SERVICE BUTTON
AND
PRESS TEST BUTTON
```

In the system test mode, selecting SOUND TEST causes the screen (on which sound related BD and wiring connections are tested) to be displayed.

Check if the sound is satisfactorily emitted from each speaker and the sound volume is appropriate.

(4) INPUT TEST

```
INPUT TEST

BULLET OFF
MISSILE OFF
BOMB OFF
VR L OFF
VR R OFF
START OFF
SERVICE OFF
TEST OFF
STICK H 00H
STICK V 00H

PRESS TEST AND SERVICE BUTTON TO EXIT
```

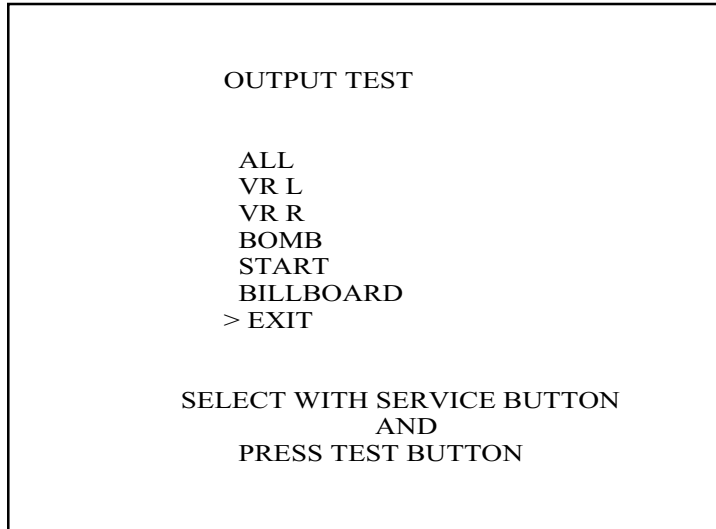
Selecting the INPUT TEST on the game test mode menu screen causes the screen (on which each switch is tested) to be displayed. Press each switch. For the coin switch test, insert a coin from the coin inlet with the coin chute door open. If the display beside each switch indicates "ON," the switch and wiring connections are satisfactory.

```
JVS TEST
> DISPLAY CONFIG
EXIT

NODE 1/1
SWITCH
SYSTEM -----
PLAYER1 -----
PLAYER2 -----
COIN
SLOT1 0000 SLOT2 8000
ANALOG
CH1 0000 CH2 0000 CH3 0000 CH4 0000
CH5 0000 CH6 0000 CH7 0000 CH8 0000

SELECT WITH SERVICE BUTTON
AND
PRESS TEST BUTTON
```

(5) OUTPUT TEST



Select OUTPUT TEST from the Menu screen in the Game Test Mode to cause the screen (on which output unit such as lamps and wiring connections are tested) to appear. Ensure that the output unit functions satisfactorily.

Perform the above inspections also at the time of monthly inspection.

7. PRECAUTIONS TO BE HEEDED WHEN MOVING THE MACHINE



WARNING!

- When moving the machine, be sure to unplug the power plug. Moving the machine with the plug as is inserted can damage the power cord, and cause fire and electric shock hazards.
- When moving the machine on the floor, retract the Adjusters and ensure that Casters make contact with the floor. During transportation, pay careful attention so that Casters do not tread power cords and earth wires. Damaging the power cords can cause electric shock and short circuit hazards.
- When moving the machine, do not push the cabinet from the left/right direction. Pushing the cabinet from the left/right direction can cause the cabinet to fall down, resulting in injury and or parts damage.



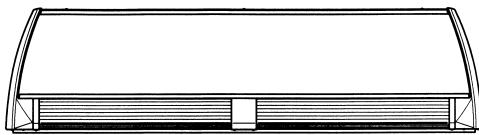
CAUTION!

- Do not push the plastic made parts. Failure to observe this may damage parts and cause injury due to fragments resulting from damage.
- Do not use the lever to move the product. Failure to observe this may cause the parts to be deformed or damaged.



IMPORTANT

When transporting the product in places with steps, disassemble into each unit before transporting. Inclining the product in an as is assembled condition or placing the cabinet in places with steps can damage the unit's joining portions.



When transporting the product in places with step-like differences in grade, disassemble into each unit before transporting.

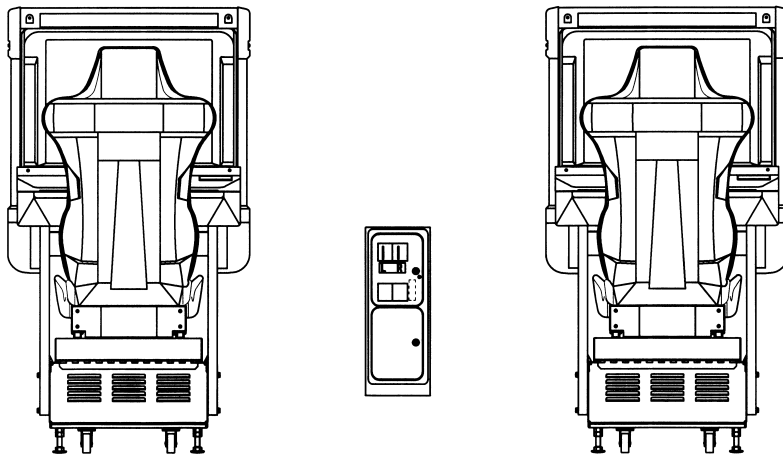
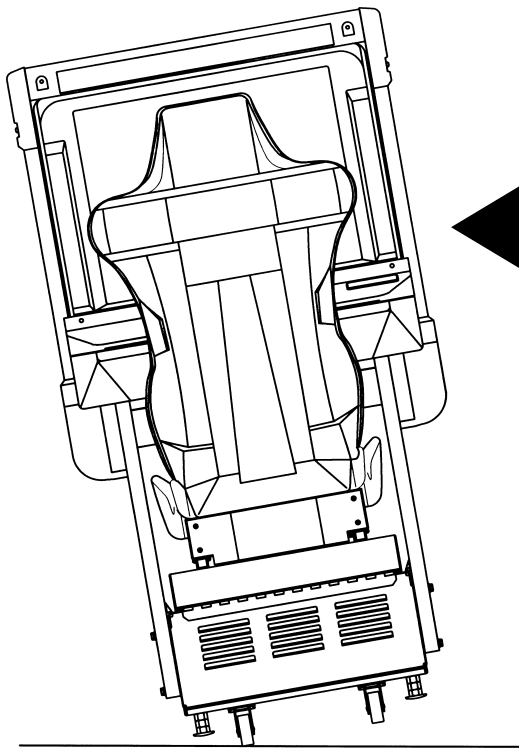
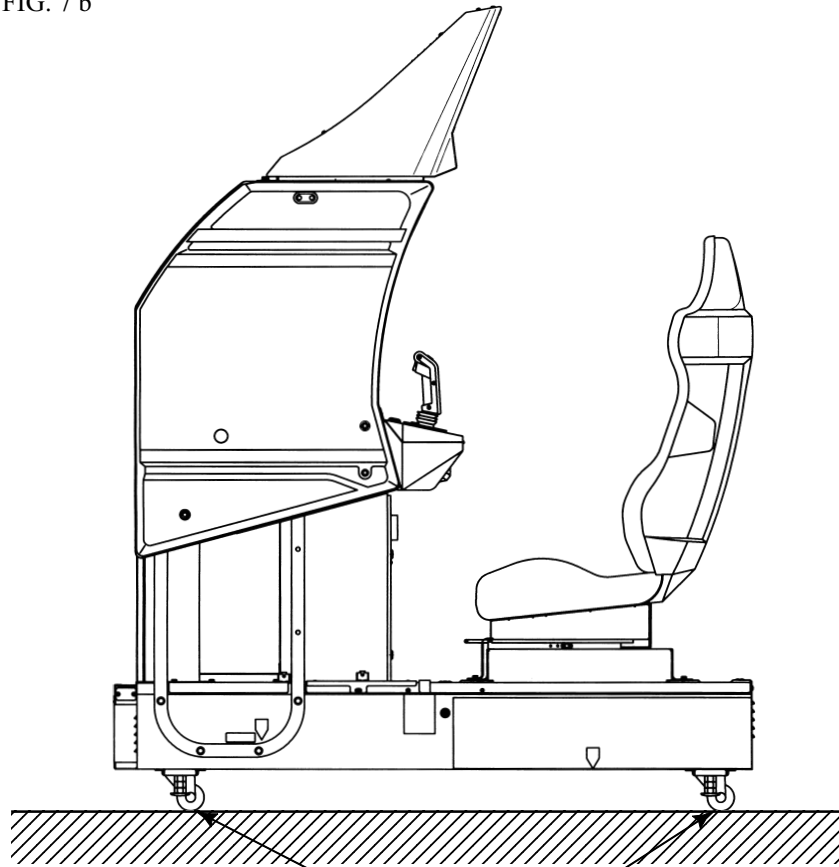


FIG. 7 a



Do not push an independent (detached) cockpit from the left/right direction.

FIG. 7 b



Have casters make contact with the floor.

FIG. 7 c

8. CONTENTS OF GAME

The following explanations apply to the case the product is functioning satisfactorily. Should there be any moves different from the following contents, some sort of faults may have occurred. Immediately look into the cause of the fault and eliminate the cause thereof to ensure satisfactory operation.

The fluorescent light in the billboard is on when the power is connected.

When the system is in an advertising mode:

- * The two cathode ray tubes in the billboard are on.

NOTE: The tubes flash or off, depending on the circumstance, when in a playing mode.

- * The screen displays demonstration images and ranking data.

- * The lights (integrated with the 4 buttons on the control panel) are off.

- * Sound is output from the speakers on the right and left of the monitor and the speakers and woofers on the seat's backrest.

NOTE: Sound is not output if you have set the function to off.

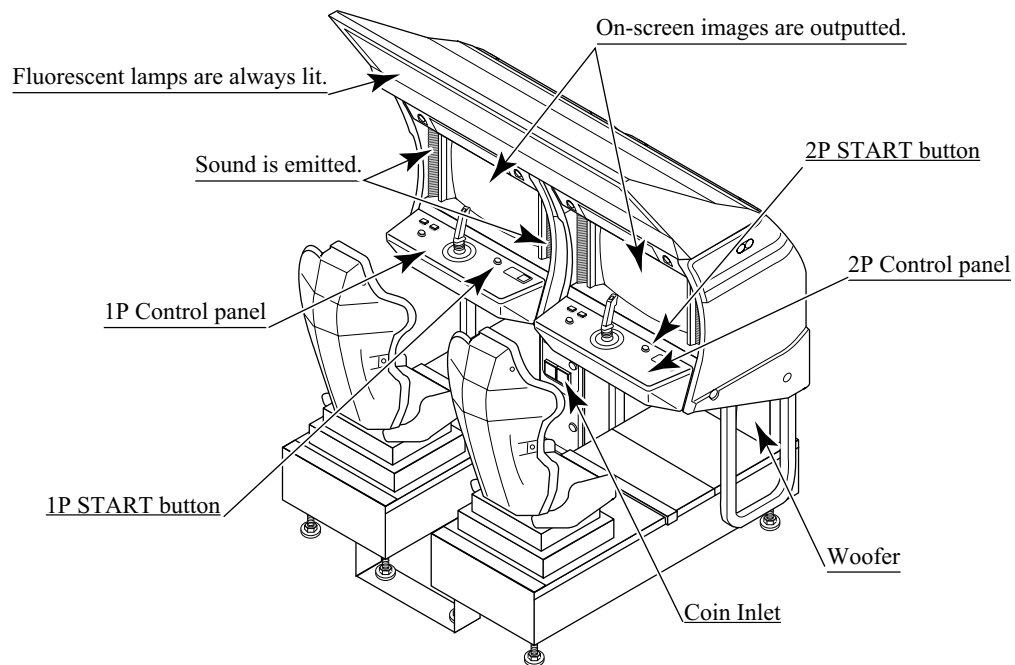


FIG. 8

How to Play

2-Player Networking Play

The PLANET HARRIERS is a 3D shooting game where a player destroys enemies with bullets and missiles and thus advances from one stage to the next. Two players can also play the game on a communication network.

Process of Game

Acting as one of the 4 characters (as illustrated below), you advance through the stages, destroying enemies who appear from stage to stage. When you destroy an enemy boss who appears at the end of a stage, you can clear the stage and move to a next stage.

Game is over when:

- (a) Your life becomes zero (0),
- (b) Time is up when fighting against an enemy boss, or
- (c) You have cleared all the 5 stages.

You can continue to play the game during a countdown period after the (a) or (b).

- ① Sit in a seat. The seat is adjustable back and forth. Facing the screen, you can find a lever on the bottom right of the seat. Pull it to unlock the seat for adjustment.
- ② Insert coins. Credits (the values converted from the inserted coins) are displayed on the bottom of the screen. Make sure that the start button flashes when you have inserted the coins enough for a play.
- ③ Press the start button to start the game.
Use the control joystick (lever) to migrate among the 4 characters. Use the bullet or missile button to choose a character.

Available Playing Characters

GLENN



X



CORY



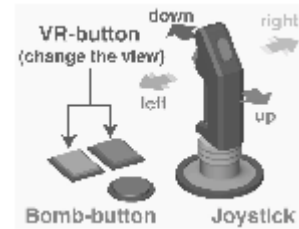
NICK



- ④ Time is being counted down on a character-choosing screen. When time is counted down to 0 (zero), the highlighted character is automatically chosen.

- ⑤ If two players are going to play together, they must decide whether to play on a communication network or not. Use the blue and red VR buttons respectively for YES and NO. If one player selects YES and the other selects NO, a networking play cannot be formed.

NOTE: If another player wants to intrude (join in) the game when you are already playing, you must also proceed to decide whether to play on a communication network or not.



- ⑥ Use the joystick to operate the character. Quickly tilt the joystick rightward or leftward to sharply turn the character. Use the bullet and missile buttons to attack an enemy.



- ⑦ The light integrated with the bomb button flashes if you have a big bomb. Press the bomb button to annihilate the enemies on the screen by shooting the big bomb.

- ⑧ Use the VR button to change a viewing angle. Press the VR button to change, while playing the game.

- ⑨ Hold down the missile button and point the lock-onto sight at an enemy to lock onto the enemy. Then release the button to discharge a lock-onto missile.

NOTE: You cannot discharge the lock-onto missile without pointing the lock-onto sight in advance.



- ⑩ You can lock onto several enemies at the same time until the lock-onto gauge indicates 0 (zero).



- ⑪ Gold marks appear on the screen when you have destroyed an enemy with a missile. The more the enemies are locked onto simultaneously, the more the gold marks appear.

NOTE: Gold mark does not appear on the screen when you have destroyed an enemy with a bullet.



- ⑫ When the two players lock onto an enemy at the same time, the gold marks appear double (a double lock-onto function). Of course this is available in a networking play.



- ⑬ You can use the obtained gold marks to buy a power-up item on the STAR SHOP screen.

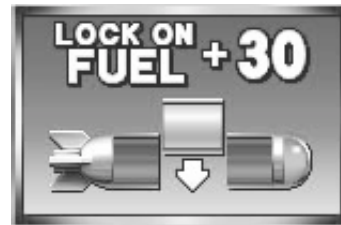
- ⑭ To buy a power-up item, migrate to a desired item with the joystick and choose it with the trigger button (bullet button). In a networking play you can send the chosen item to a companion player (100 gold each with a pressing operation).



Example of Power-up Items:



You can recover life by one heart.



You can lengthen lock-onto gauge (by 30 in this case).



You can make lock-onto sight larger.



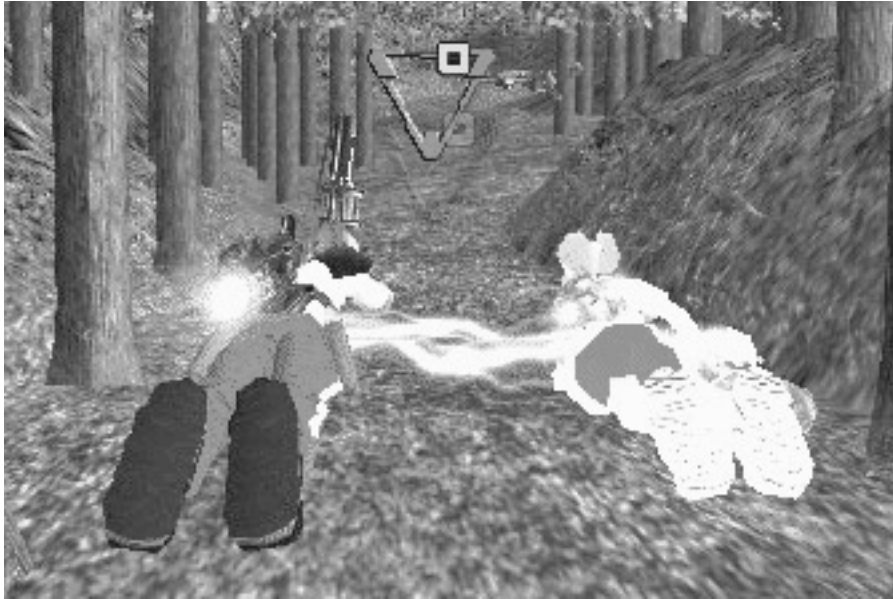
You can increase life by one heart.



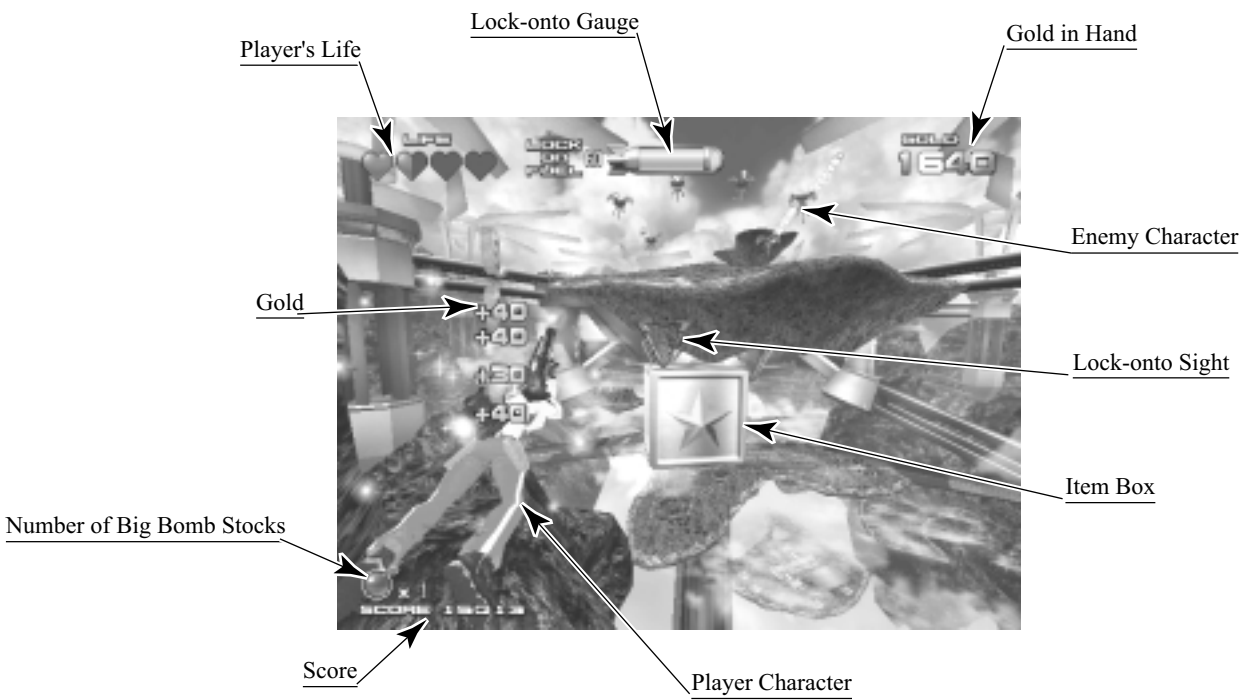
You can increase big bomb by one.

Some other power-on items are also available.

- ⑮ In a networking play, make the two characters closer to each other to dock. The characters can gradually recover life when in a docking state. To undock the characters, either of the players presses the missile button or turns quickly.

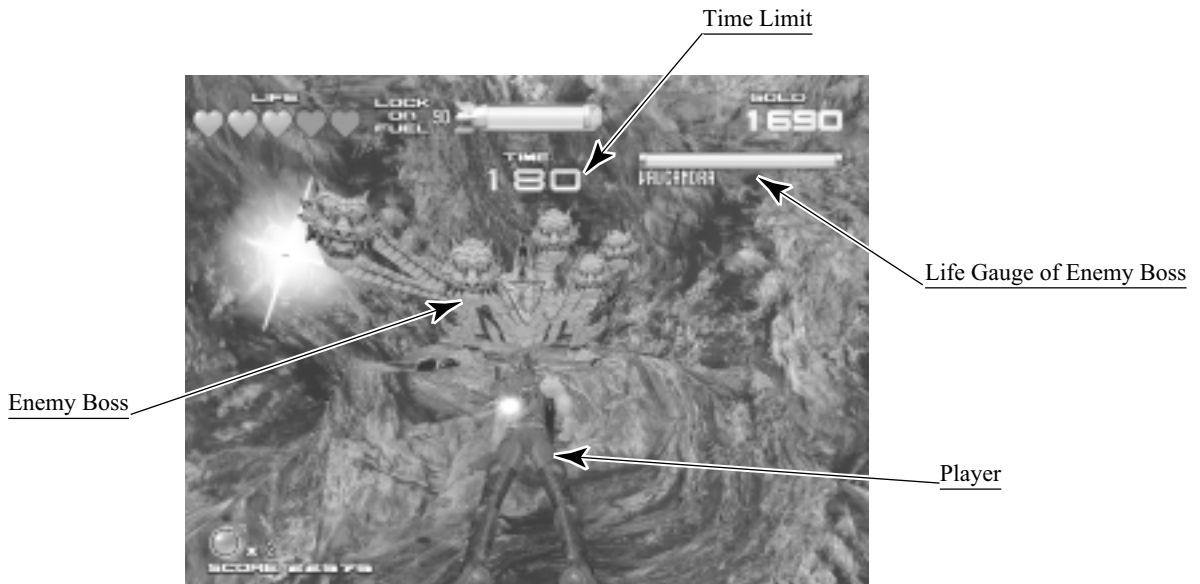


Typical Game Screen



- ①⑥ Item box, available stage by stage, contains various items (gold, invincible item, etc.). Destroy the item box with bullets to obtain.

NOTE: You cannot lock onto the item box and therefore cannot destroy it with missiles.



- ①⑦ An enemy boss appears at the end of each stage.

When the boss appears, a time limit is displayed on the screen. If you fail to destroy the boss within a time limit, the game is over.

The boss has his/her own weak spots. You cannot destroy the boss without hurting the weak spots. Checking the boss's life gauge, try to point your weapon at his/her weak spots; thereby attack him/her effectively.

- ①⑧ When the game is over, the system starts a countdown. To continue to play the game, insert coins enough for a play and press the start button, before a countdown reaches 0 (zero). Then you can return to where you were when the game was over.

9. EXPLANATION OF TEST AND DATA DISPLAY

By operating the switch unit, periodically perform the tests and data check. When installing the machine initially or collecting cash, or when the machine does not function correctly, perform checking in accordance with the explanations given in this section.

The following shows tests and modes that should be utilized as applicable.

SEGA HIKARU GAME BOARD is used for the product. The system of this game board allows another game to be played by replacing the ROM Board Case mounted on the SEGA HIKARU CASE. As such, the Test Mode of this system consists of the System Test Mode for the system to execute SELF-TEST, COIN ASSIGNMENTS, etc. used in common for the machines employing the SEGA HIKARU BOARD, and the Game Test Mode for the specific product to execute Input/Output test for the operation equipment, difficulty setting, etc.



IMPORTANT

- The contents of settings changed in the TEST mode are stored when the test mode is finished from EXIT in the menu mode. If the power is turned off before the TEST mode is finished, the contents of setting change become ineffective.
- Executing "BACKUP DATA CLEAR" in the SYSTEM TEST MODE does not clear the BOOKKEEPING data in the GAME TEST mode.
- Entering the TEST mode clears fractional number of coins less than one credit and BONUS ADDER data.

TABLE 9 EXPLANATION OF TEST MODE

ITEMS	DESCRIPTION	REFERENCE SECTIONS
INSTALLATION OF MACHINE	<p>When the machine is installed, perform the following:</p> <ol style="list-style-type: none"> 1. Check to see that each setting is as per standard setting made at the time of shipment. 2. In the INPUT TEST mode, check such input devices as each SW, V.R., etc. 3. In the OUTPUT TEST mode, check such output devices as lamps, motors, etc. 4. In the SELF-TEST mode, check ICs on the IC Board. 	<p>9-2 F,G, 9-3 D 9-2 C, 9-3 B 9-3 C 9-2 B,J</p>
MEMORY	<p>Choose MEMORY TEST in the MENU mode to allow the MEMORY test to be performed. In this test, PROGRAM RAMs, ROMs, and ICs on the IC Board are checked.</p>	9-2 B,J
PERIODIC SERVICING	<p>Periodically perform the following:</p> <ol style="list-style-type: none"> 1. MEMORY TEST 2. Ascertain each setting. 3. In the INPUT TEST mode, test the CONTROL device 4. In the OUTPUT TEST mode, check such output devices as lamps, motors, etc. 	<p>9-2 B,J 9-2 F,G, 9-3 D 9-2 C, 9-3 B 9-3 C</p>
CONTROL SYSTEM	<ol style="list-style-type: none"> 1. In the INPUT TEST mode, check such input devices as each SW, V.R., etc. 2. Adjust or replace each SW and VR. 3. If the problem can not be solved yet, check the CONTROL's moves. 	<p>9-2 C, 9-3 B 9-3 E 10</p>
MONITOR	<p>In the MONITOR ADJUSTMENT mode, check to see if the MONITOR adjustment is appropriately made.</p>	<p>9-2 E 11</p>
IC BOARD	<ol style="list-style-type: none"> 1. MEMORY TEST 2. In the SOUND TEST mode, check the sound related ROMs. 	<p>9-2 B,J 9-2 D</p>
DATA CHECK	<p>Check such data as game play time and histogram to adjust the difficulty level, etc.</p>	9-2 H, 9-3 F

9 - 1 SWITCH UNIT AND COIN METER



WARNING!

Never touch places other than those specified. Touching places not specified can cause electric shock and short circuit hazards.



IMPORTANT

- Adjust to the optimum sound volume by considering the environmental requirements of the installation location.
- If the COIN METER and the game board are electrically disconnected, game play is not /possible.

SWITCH UNIT

Open the coin chute door, and the switch unit shown will appear. The function of each SW is as follows:

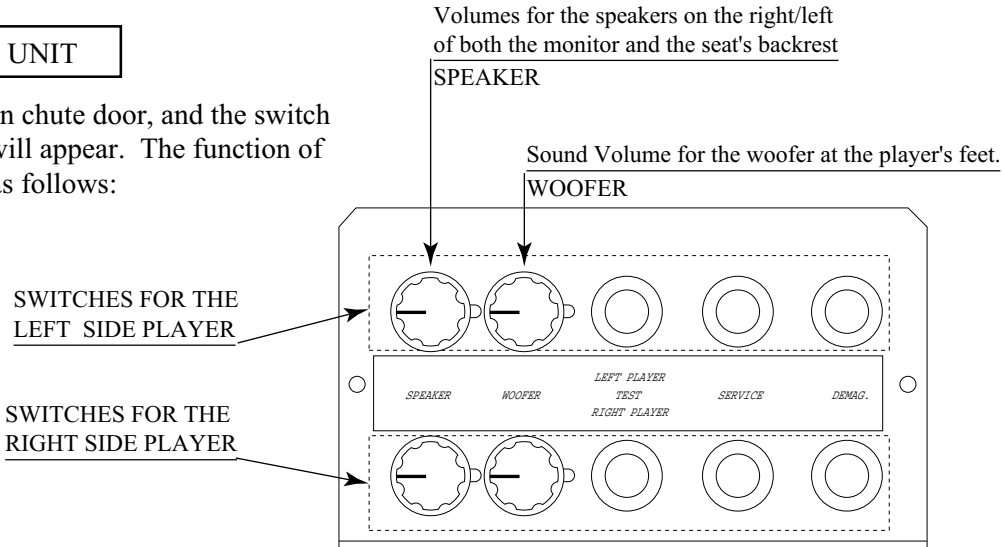


FIG. 9. 1 a SWITCH UNIT

TEST BUTTON:
TEST

For the handling of the TEST button, refer to the following pages.

SERVICE BUTTON:
SERVICE

Gives credits without registering on the coin meter.

DEMAGNETIZER BUTTON:
DEMAG.

Eliminates the on-screen color unevenness due to magnetization of CRT. First use this SW before performing the monitor's color adjustment.

COIN METER

Open the Cashbox Door by using the key to have the Coin Meter appear underneath the Cashbox.

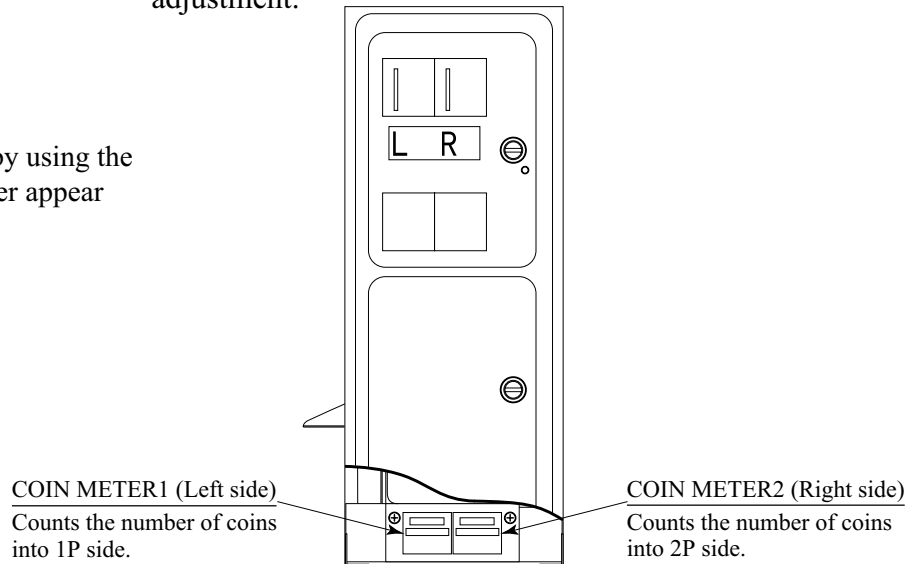


FIG. 9. 1 b

9 - 2 SYSTEM TEST MODE

A. SYSTEM TEST MODE MENU

Press TEST button to enter the TEST MODE, and the following Menu screen will be displayed.

```
SYSTEM MENU
XXXXXXXXX VERSION

RAM TEST
JVS TEST
SOUND TEST
C.R.T. TEST
SYSTEM ASSIGNMENTS
COIN ASSIGNMENTS
BOOKKEEPING
BACKUP DATA CLEAR
ROMBD TEST
CLOCK SETTING
GAME TEST MODE
> EXIT

SELECT WITH SERVICE BUTTON
AND
PRESS TEST BUTTON
```

- Press SERVICE button to move the arrow (>) to the desired item and select with TEST button.
- Bring the arrow to EXIT and press TEST button to return to the GAME Mode.

B. RAM TEST

This allows for checking the functioning of the RAM on the Game BD. In this test, IC's are checked in every row. During the test, "CHECKING" is displayed at the right-hand side of the screen. "BAD" is indicated for irregular RAMs, if any. Upon finishing the test, "PRESS TEST BUTTON TO EXIT" is displayed on the lower center of the monitor. Press TEST button to return to the MENU screen.

```
RAM TEST

IC15 IC16 IC17S IC18S GOOD
IC22 IC23 IC24S IC25S GOOD
IC28 IC29S      GOOD
IC41          GOOD
IC42          GOOD
IC44 IC45S IC46 IC47S GOOD
IC91S IC92S      GOOD
IC98          GOOD

OPTIONAL SOUND BOARD:
IC2          GOOD

OPTIONAL COMMUNICATION BOARD:
IC7 IC8 IC9 IC10 GOOD

PRESS TEST BUTTON TO EXIT
```

C. JVS TEST

In this test, Functioning of the I/O Board connected to Game Board is displayed and INPUT TEST can be performed.

```
JVS TEST
INPUT TEST
> EXIT

NODE      1/1
NAME      SEGA ENTERPRISES,LTD.;837-13741
          I/O CONTROL BD2;Ver0.15;99/06
CMD VER   1.1
JVS VER   2.0
COM VER   1.0
SWITCH    2 PLAYERS 12BITS
COIN      2 SLOTS
ANALOG    8CH
DRIVER OUT 22CH

          SELECT WITH SERVICE BUTTON
          AND
          PRESS TEST BUTTON
```

Execute EXIT to return to the MENU screen.

When INPUT TEST is selected and executed, the following screen appears.

```
JVS TEST
> DISPLAY CONFIG
EXIT

NODE      1/1
SWITCH    _____
          SYSTEM _____
          PLAYER1 _____
          PLAYER2 _____
COIN      _____
          SLOT1 0000 SLOT2 8000
ANALOG    _____
          CH1 0000 CH2 0000 CH3 0000 CH4 0000
          CH5 0000 CH6 0000 CH7 0000 CH8 0000

          SELECT WITH SERVICE BUTTON
          AND
          PRESS TEST BUTTON
```

→ With a switch input from the control panel etc., this changes into 1.

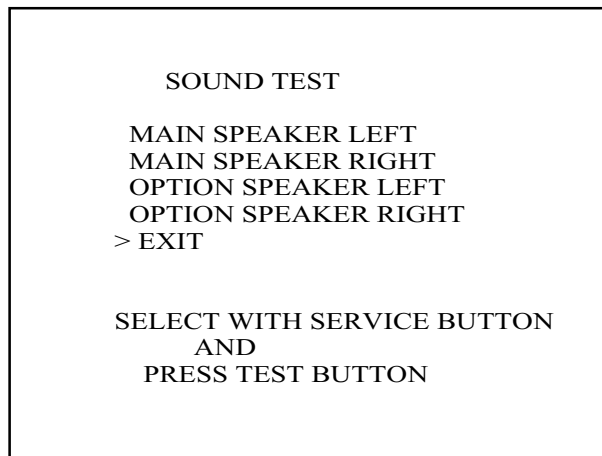
→ With a coin switch input, this accumulates. And, the coin meter counts.

→ Analogue values are displayed between 0000 and FF00.

Execute EXIT to return to the MENU screen.

D. SOUND TEST

This is a sound output test. Each speaker outputs the game's playing message in English.



- MAIN SPEAKER LEFT : Output from the front left speaker
- MAIN SPEAKER RIGHT : Output from the front right speaker
- OPTION SPEAKER LEFT : Output from the rear left speaker
- OPTION SPEAKER RIGHT : Output from the rear right speaker

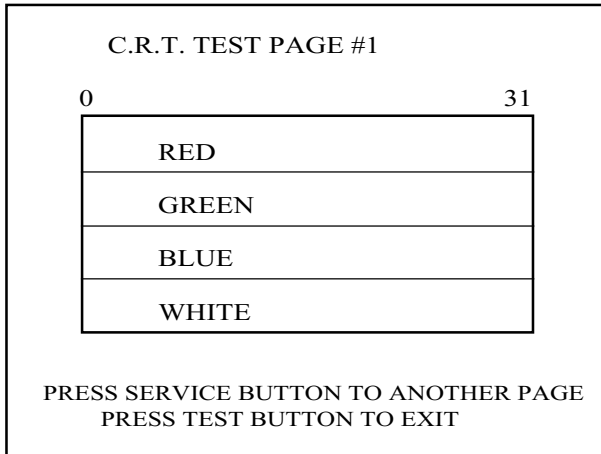
Front speakers are located either side of the monitor. Rear speakers are located in the seat's backrest.

Press the SERVICE button to move the > mark to a desired item (speaker), and press the TEST button. Make sure that the selected speaker outputs the playing message. The playing message heard indicates that the speaker and related wires are normal.

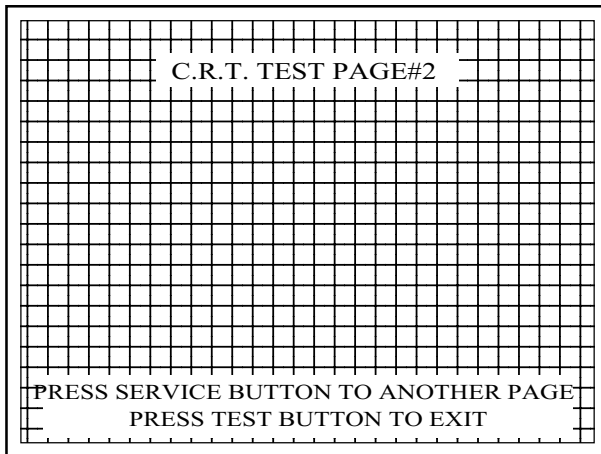
Execute EXIT to return to the MENU screen.

E. C.R.T. TEST

In this test, monitor adjustment can be performed. Periodically check to see if the monitor adjustment is appropriate in this test. This test consists of 2 screens. Use SERVICE button to change the screen displayed. Press TEST button to return to the MENU screen.



The first screen displays color bars. The color adjustment can be checked. Each of red, green, blue is the darkest at the leftmost end, and becomes brighter towards the right-hand end.



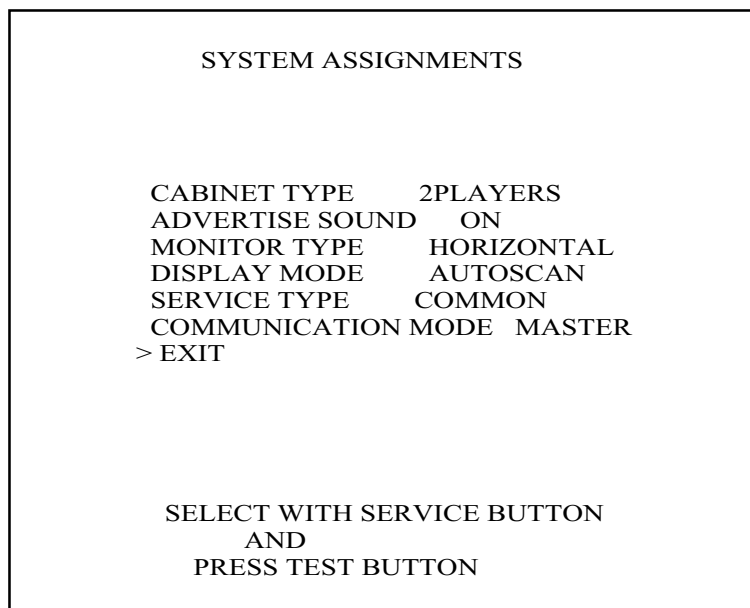
The second screen displays crosshatches. In this page, monitor size and deviation can be checked.

F. SYSTEM ASSIGNMENTS



Set the CABINET TYPE and MONITOR TYPE to a correct value according to the cabinet you use. If you fail to observe this, an error message appears when connecting the power and when exiting from a test mode; and eventually you cannot play the game.

Performs setting for the whole system. Set each item in accordance with the cabinet. Use the items except ADVERTISE SOUND and COMMUNICATION MODE as they are at the time of shipment. To change setting, bring the arrow (>) to the desired item with the SERVICE button and press the TEST button.



- CABINET TYPE (1PLAYER ~ 4PLAYERS) : Always set to 2PLAYERS.
- ADVERTISE SOUND (ON,OFF) : Set to ON or OFF (that enables to output or not an advertise sound from the speakers).
- MONITOR TYPE (HORIZONTAL,VERTICAL): Always set to HORIZONTAL.
- DISPLAY MODE (AUTOSCAN,31KHz, 24KHz) :Always set to AUTOSCAN.
- SERVICE TYPE (COMMON,INDIVIDUAL) : Always set to COMMON.
- COMMUNICATION MODE (MASTER,SLAVE,RELAY,NO LINK):
Select from among MASTER, SLAVE, NO LINK, and RELAY.
When performing setting for communication play, be careful of the following points.
MASTER : Set only one of the linked machine to MASTER for communication play.
SLAVE : Set the other linked machines to SLAVE for communication play.
RELAY : Not used.
NO LINK : Set to NO LINK when you operate the machine alone.

G. COIN ASSIGNMENTS

In this mode, the setting of incremental credit increase as against coin insertion can be changed. This test consists of 3 screens, and the following is the first screen. The setting done in the first screen will be stored when exited.

```
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
```

- COIN CHUTE TYPE sets whether Coin Chute is used in common by all players or separately allocated to each player in case 2 or more Coin Chutes are incorporated.
COMMON: Set the COIN CHUTE TYPE to COMMON.
INDIVIDUAL: As each player uses an independent coin chute, setting to INDIVIDUAL causes COIN CHUTE #2 to be disappeared.
- COIN/CREDIT SETTING is set when using one of the existing 26 settings or FREE PLAY. The selected coin rates in the COIN/CREDIT SETTING are displayed below COIN CHUTE #1 and COIN CHUTE #2. If you wish to set a coin rate rather than to select from the existing setting, select MANUAL SETTING. The display next to COIN/CREDIT SETTING indicates "MANUAL", not "#n" in this case.

○ MANUAL SETTING

When MANUAL SETTING is selected in the first screen, the following second screen appears.

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	

- COIN TO CREDIT determines how many coins are needed for one credit. (1 ~ 9)
- BONUS ADDER determines how many coins should be inserted to obtain one SERVICE COIN.
- COIN CHUTE #1 MULTIPLIER, COIN CHUTE #2 MULTIPLIER sets how many tokens one Coin represents inserted in each COIN CHUTE.

SETTING EXAMPLE 1)

Setting of 2 COINS 1 CREDIT, set to:

COIN TO CREDIT	:2
BONUS ADDER	:0
COIN CHUTE #1 MULTIPLIER	:1

SETTING EXAMPLE 2)

Setting of 5 COINS 6 CREDITS (5 COINS 1 BONUS), set to

COIN TO CREDIT	:1
BONUS ADDER	:5
COIN CHUTE #1 MULTIPLIER	:1

When exiting from MANUAL SETTING, if the identical coin rate is in the existing COIN/ CREDIT SETTING, such existing mode other than what is set in the MANUAL SETTING is confirmed.

TABLE 1 COIN/CREDIT SETTING

NAME OF 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 CREDITS	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	

Table 2: COIN/CREDIT SETTING (COIN CHUTE INDIVIDUAL TYPE)

NAME OF SETTING	EACH SEAT'S COIN CHUTE	NAME OF SETTING	EACH SEAT'S COIN CHUTE
SETTING #1	1 COIN 1 CREDIT	SETTING #21	5 COINS 1 CREDIT
SETTING #2	1 COIN 2 CREDITS	SETTING #23	2 COINS 1 CREDIT
SETTING #3	1 COIN 3 CREDITS		4 COINS 2 CREDITS
SETTING #4	1 COIN 4 CREDITS		5 COINS 3 CREDITS
SETTING #5	1 COIN 5 CREDITS	SETTING #25	1 COIN 1 CREDIT
SETTING #11	1 COIN 6 CREDITS		2 COINS 2 CREDITS
SETTING #12	2 COINS 1 CREDIT		3 COINS 3 CREDITS
SETTING #15	1 COIN 1 CREDIT		4 COINS 4 CREDITS
	2 COINS 3 CREDITS	5 COINS 6 CREDITS	
SETTING #17	3 COINS 1 CREDIT	SETTING #27	FREE PLAY
SETTING #18	4 COINS 1 CREDIT		
SETTING #19	1 COIN 1 CREDIT		
	2 COINS 2 CREDITS		
	3 COINS 3 CREDITS		
	4 COINS 5 CREDITS		

Table 3: 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 (#1 / #2) 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

○ SEQUENCE SETTING

When SEQUENCE SETTING is selected in either first or second screen, the SEQUENCE SETTING Mode (the third screen) appears.

In this mode, number of credits required for starting game can be set.

```
COIN ASSIGNMENTS
SEQUENCE SETTING

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

[XXXXXXXXXXXXXXXXXXXXXXXXXX]
[XXXXXXXXXXXXXXXXXXXXXXXXXX]
DESCRIPTION OF SEQUENCE
SEQ1 CREDIT TO 1 PLAYER START
SEQ2 CREDIT TO CONTINUE
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
```

SEQUENCE1 : Number of credits required for game start.

SEQUENCE2 : Number of credits required for CONTINUE.

Each sequence can be set between 1 ~ 5.

SEQUENCE 3 to 8 are not used. On the screen, however, the credit number is changeable.

Select EXIT to return to the first screen.

H. BOOKKEEPING

This allows such data as operating time/No. of coins inserted/ No. of credits to be checked, etc. This test consists of 2 screens. Pressing SERVICE button causes screen to be changed. Press TEST button to return to the MENU screen.

On the first screen, such data as total time, coin, and credit are displayed.

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			

Total Time is displayed as "X X H X X M X X S" and no date will be displayed after exceeding 24 hours.

On the second screen, each sequence displays the frequency of functioning.

BOOKKEEPING PAGE#2			
PLAYER1		PLAYER2	
SEQ1	1	SEQ1	0
SEQ2	0	SEQ2	1
SEQ3	1	SEQ3	1
SEQ4	0	SEQ4	0
SEQ5	0	SEQ5	0
SEQ6	0	SEQ6	0
SEQ7	0	SEQ7	0
SEQ8	0	SEQ8	0
PRESS SERVICE BUTTON TO ANOTHER PAGE			
PRESS TEST BUTTON TO EXIT			

I. BACKUP DATA CLEAR

This enables you to clear the SYSTEM TEST MODE BOOKKEEPING data (coin- and credit-related data and TOTAL TIME data).

NOTE: The same screen appears also in the GAME TEST MENU screen to clear the operating data.

BACKUP DATA CLEAR

YES (CLEAR)
> NO (CANCEL)

SELECT WITH SERVICE BUTTON
AND
PRESS TEST BUTTON

Press the SERVICE button to move the > mark to YES (CLEAR) item, and press the TEST button. When the system completes clearing, a 'COMPLETED' message appears on the screen. Press the TEST button again to return to the SYSTEM MENU screen.

Press the SERVICE button to move the > mark to NO (CANCEL) item, and press the TEST button. The system does not execute clearing, but returns to the SYSTEM MENU screen.

J. ROMBD TEST

This screen enables to check the ROM on the ROM board. When the system completes checking successfully or unsuccessfully, respectively 'GOOD' or 'BAD' message appears on the screen. For the program ROM (IC 29 and IC30), 'GOOD' or 'BAD' message does not appear.

ROMBD TEST

[XXXXXXXXXXXXXXXXXXXXXX]
[XXXXXXXXXXXXXXXXXXXXXX]

NO.	TYPE	RESULT	BYTE	WORD
IC29	32M	-----	XXXX	XXXX
IC30	32M	-----	XXXX	XXXX
IC31	32M	GOOD	XXXX	XXXX
IC32	32M	GOOD	XXXX	XXXX
IC33	32M	GOOD	XXXX	XXXX
IC34	32M	GOOD	XXXX	XXXX
IC35	32M	GOOD	XXXX	XXXX
IC36	32M	GOOD	XXXX	XXXX
IC37	128M	GOOD	XXXX	XXXX
IC38	128M	GOOD	XXXX	XXXX
•	•			
•	•			
•	•			

PRESS TEST BUTTON TO EXIT

Press TEST button to return to MENU mode.

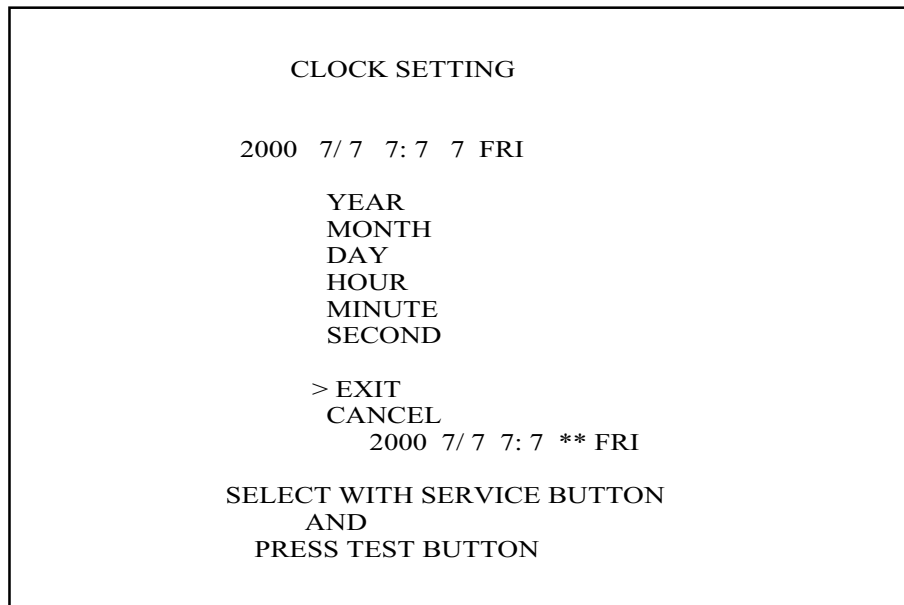
K. CLOCK SETTING

The ranking data appears during advertising. It is automatically updated weekly; therefore correctly set the clock in the CLOCK SETING screen.

YEAR, MONTH, DAY, HOUR, and MINUTE are set for SEGA HIKARU BD.

Select the desired item with SERVICE button and press TEST button to increase the value.

Bring the arrow to EXIT and press TEST button to return to MENU Mode.



L. GAME TEST MODE

Enters the TEST Mode of the game connected to SEGA HIKARU BD. The TEST Mode includes INPUT Test, GAME ASSIGNMENTS such as game difficulty, etc. Refer to 9-3 for details.

9 - 3 GAME TEST MODE

A. GAME MENU

Select the GAME TEST MODE item on the SYSTEM MENU screen, and press the TEST button. Then, the GAME TEST MODE screen appears.

The GAME TEST MODE screen looks differently seat by seat. The seat that you have set to MASTER shows the screen just as below, but the seat that you have set to SLAVE shows the screen that lacks the GAME ASSIGNMENTS item.

Operation procedure is same as in the SYSTEM TEST MODE; that is, press the SERVICE button to move the > mark to any desired item and press the TEST button to choose the item or change its setting.

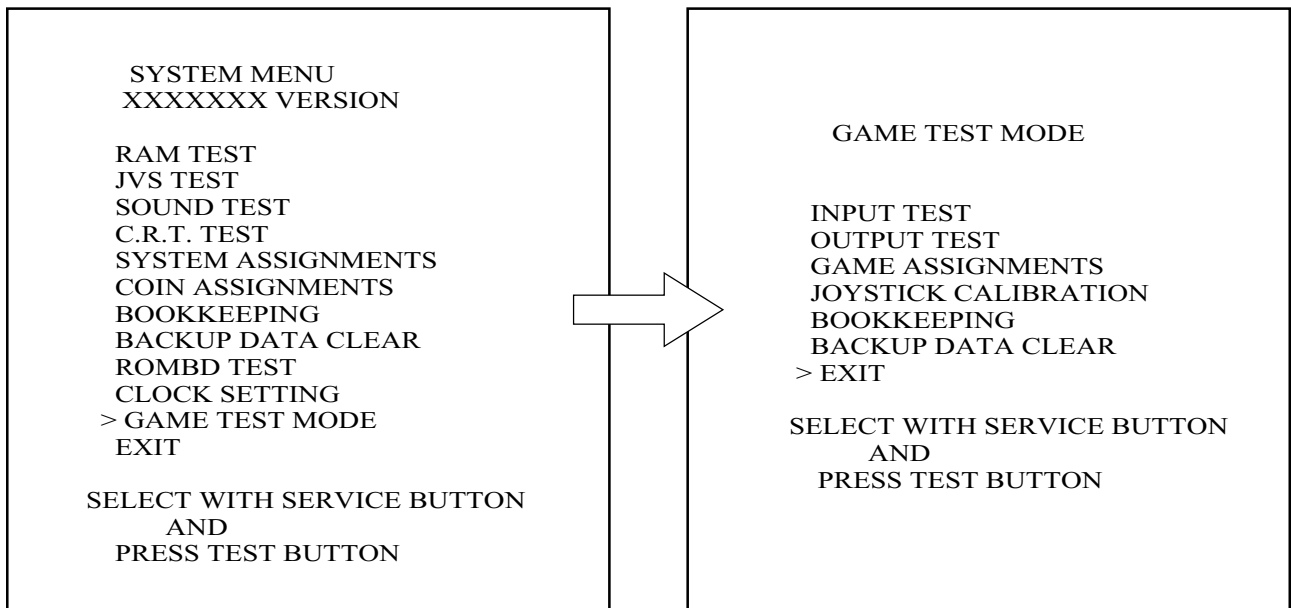


FIG.9. 3 a GAME TEST MODE screen

Select the EXIT item and press the TEST button, to return to the SYSTEM MENU screen.

B. INPUT TEST

This screen enables to test the input devices.

Press each switch or button except the joystick. Make sure that the corresponding item indicates ON instead of OFF, that is, the switch or button is normal.

Tilt the joystick. Make sure that the STICK H and STICK V items indicate a varying volume value.

After testing, press the TEST and SERVICE buttons simultaneously to return to the GAME TEST MODE screen.

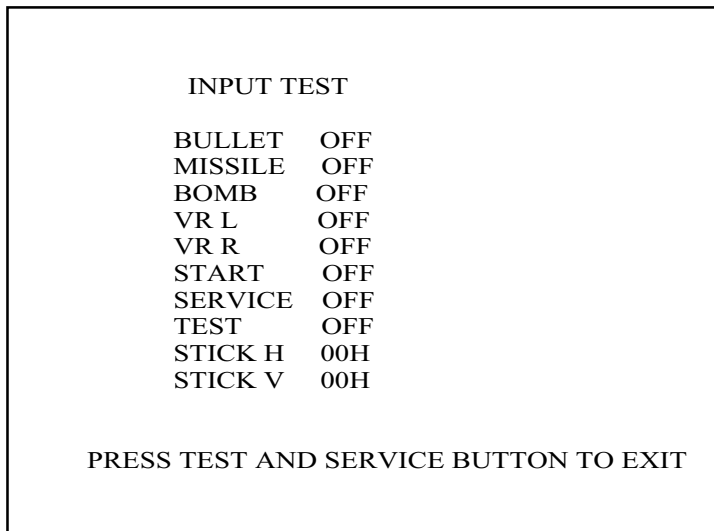


FIG. 9. 3 b a INPUT TEST screen

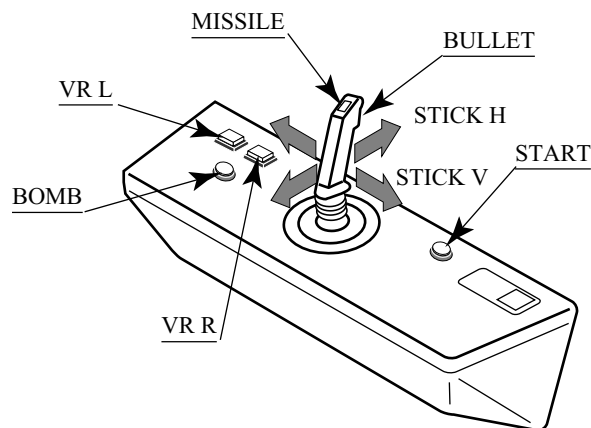


FIG. 9. 3 b b

C. OUTPUT TEST

This screen enables to test the lights.

Press the SERVICE button to move the > mark to every item one by one. Make sure that the corresponding light becomes on. When you have moved the > mark to the ALL item, make sure that all the VRL, VRR, BOMB, START, and BILLBOARD lights flash.

Select the EXIT item and press the TEST button, to extinguish the lights and to return to the GAME TEST MODE screen.

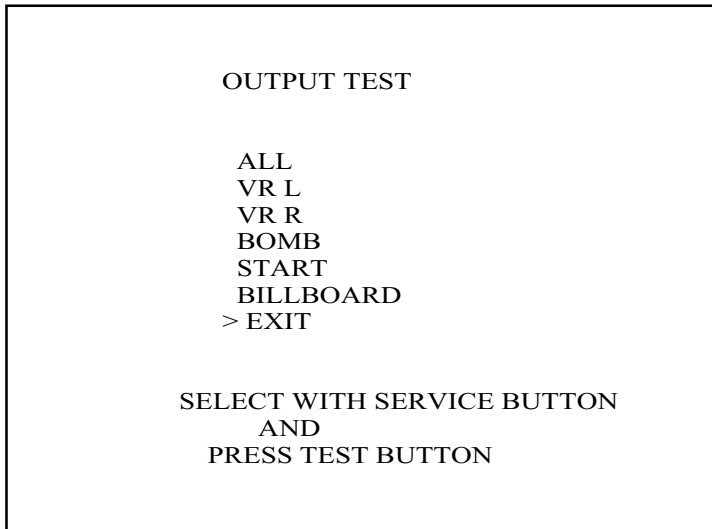


FIG. 9. 3 c OUTPUT TEST screen

D. GAME ASSIGNMENTS

This screen enables to change a difficulty level.

Press the SERVICE button to move the > mark to the DIFICULTY item and press the TEST button. Make sure that the DIFICULTY item indicates a varying setting: EASY, NORMAL, HARD, and HARDEST.

New setting becomes effective by exiting the GAME TEST MODE screen. This screen is not available for the seat that you have set to SLAVE in the SYSTEM ASSIGNMENTS screen. Select the EXIT item and press the TEST button, to return to the GAME TEST MODE screen.

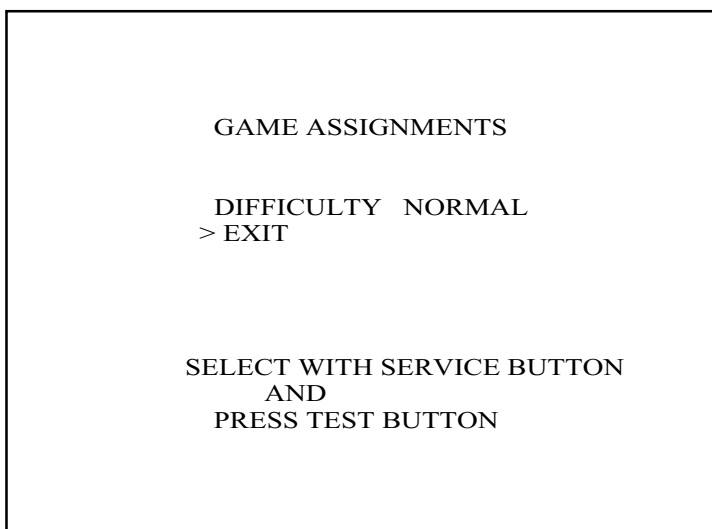


FIG. 9. 3 GAME ASSIGNMENTS screen

E. JOYSTICK CALIBRATION

This screen enables to calibrate the volume value of the joystick (lever). If operability of the joystick is not smooth, or when you have replaced the volume, use the screen to calibrate the volume value.

Rotate the joystick a few times to its movable extent on this screen.

Press the SERVICE button to move the > mark to any desired item.

After calibrating, move the > mark to the EXIT WITH SAVE item (the EXIT WITHOUT SAVE item) if you do want (do not want) to save the calibrated results. Then, press the TEST button to return to the GAME TEST MODE screen.

New setting becomes effective by exiting the GAME TEST MODE screen.

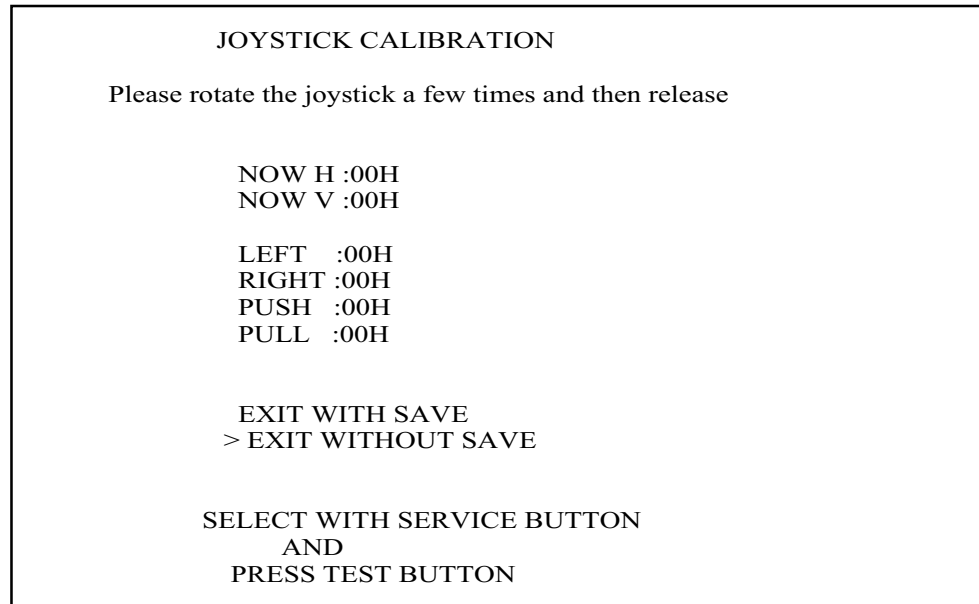


FIG. 9. 3 e JOYSTICK CALIBRATION screen

F. BOOKKEEPING

The following screens (1/2 and 2/2) display the data of a play time etc.

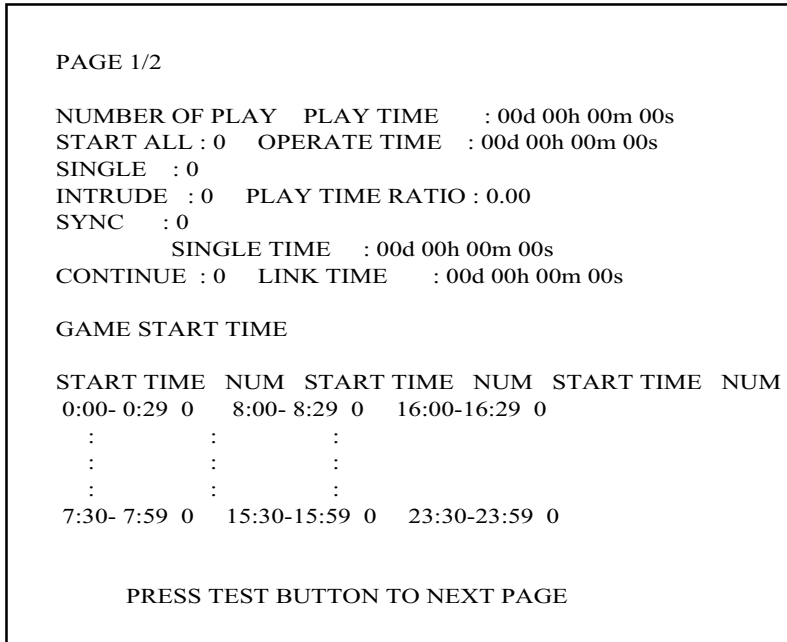


FIG. 9. 3 f a BOOKKEEPING1/2 screen

- NUMBER OF PLAY : This means the number of plays. (A breakdown follows.)
- START ALL : This indicates the number of all plays.
- SINGLE : This indicates the number of single-player plays.
- INTRUDE : This indicates the number of two-player plays with intrusion.
- SYNC : This indicates the number of two-player plays without intrusion.

- CONTINUE : This indicates the number of continuing times.

- PLAY TIME : This indicates the accumulated playing period.
- OPERATE TIME : This indicates the accumulated operating period.

- PLAY TIME RATIO : This indicates the ratio (PLAY TIME/OPERATE TIME).
- SINGLE TIME : This indicates the accumulated period of single-player plays.
- LINK TIME : This indicates the accumulated period of two-player plays.

- GAME START TIME : This indicates every 30 minutes in a day when the game was started.

Press the TEST or SERVICE button to move to the bookkeeping 2/2 screen.

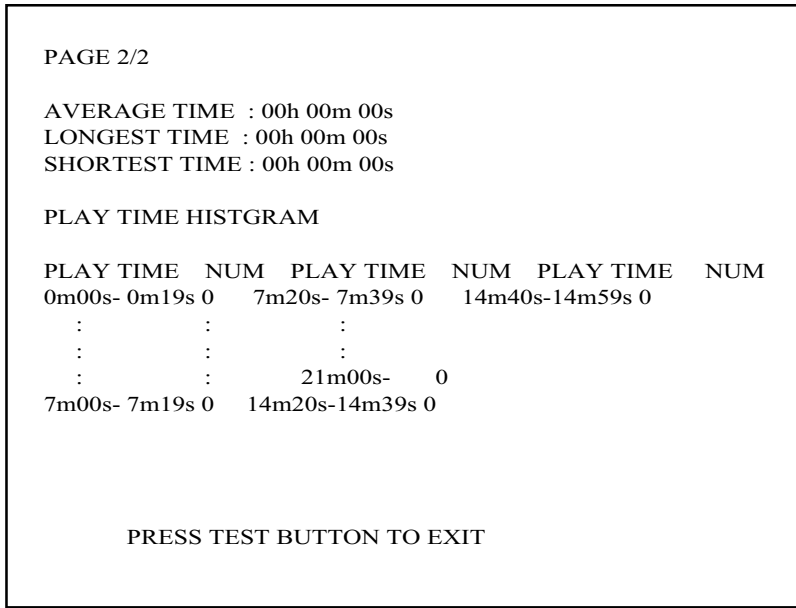


FIG. 9. 3 f b BOOKKEEPING2/2 screen

● PLAY TIME HISTGRAM : Number of Play as against Play Time

Press the SERVICE button to return to the bookkeeping 1/2 screen.
Press the TEST button to return to the GAME TEST MODE screen.

G. BACKUP DATA CLEAR

This screen enables to clear the data of bookkeeping and to initialize the high-scorer ranking data.

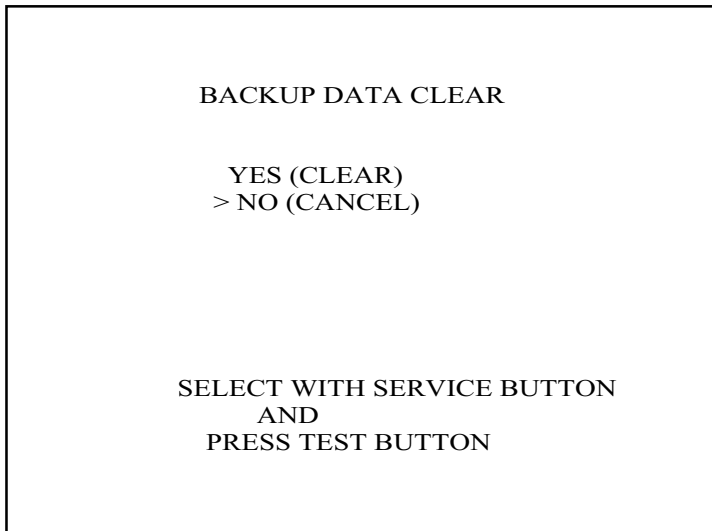


FIG. 9. 3 gÅ@BACKUP DATA CLEAR screen

* To clear the data:

Press the SERVICE button to move the > mark to YES, and press the TEST button. When clearing is finished, the COMPLETED message appears on the screen. Press the TEST button, in this instance, to return to the GAME TEST MODE screen.

* Not to clear the data:

Press the SERVICE button to move the > mark to NO, and press the TEST button. This action enables you to immediately return to the GAME TEST MODE screen.

* What you can clear on this screen is the bookkeeping data accessible from the GAME TEST MODE screen. You cannot clear the bookkeeping data and settings accessible from the SYSTEM MENU screen.

10. CONTROL PANEL



- Before starting to work, ensure that the Power SW is OFF. Failure to observe this can cause electric shock or short circuit.
- Use care so as not to damage wirings. Damaged wiring can cause electric shock or short circuit.
- Do not touch undesigned places. Touching places not designated can cause electric shock or short circuit.
- This work should be performed by the Location's Maintenance Man or Serviceman. Performing work by non-technical personnel can cause electric shock hazard.
- Do not perform work other than those specified in this Manual in order to prevent accidents during performing work and operation after performing work. Performing work not specified in this Manual may require special training for this product. If performing work other than those stated in this manual is required for repair, contact the offices herein stated in this manual or where you purchased the product from and ask for repair or inquire how to repair.
- Be very careful when soldering. Handling a soldering iron carelessly may result in a fire or a burn.
- Be careful when heating the heat-shrinkable tubing. Heating it carelessly may result in a fire or a burn.



- When opening or closing the control panel, do so slowly with using your both hands to hold it. The control panel may be closed by itself due to its own weight. If this happens, you may pinch your hands or fingers in the control panel or be bruised.
- Use care when handling the parts inside the control panel. Be careful so as not to cause damaging, missing, or deforming the parts. Damaging small portion of a part can cause malfunctioning.
- When securing the plastic-made parts, do not excessively fasten screws and nuts. Failure to observe this may damage the parts and cause injury due to fragments resulting from damage.

The control panel of each seat provides the operating and inputting devices: joystick (lever), start button, two VR buttons, and bomb button. Joystick (lever) supports a bullet button and a missile button.

Check the response of these devices when in a monthly maintenance service. If any device shows an abnormal response, or if a JOYSTICK CALIBRATION does not improve the performance of the joystick, service the device.

10 - 1 OPENING THE CONTROL PANEL

To service any input device on the control panel (adjust the volume, replace a part with a new one, grease a part, etc.), open the control panel as follows:

- ① Disconnect the power.
- ② Remove the 4 tamperproof screws.

TAMPERPROOF SCREW (4), black
M5 X 16, large flat washer used.

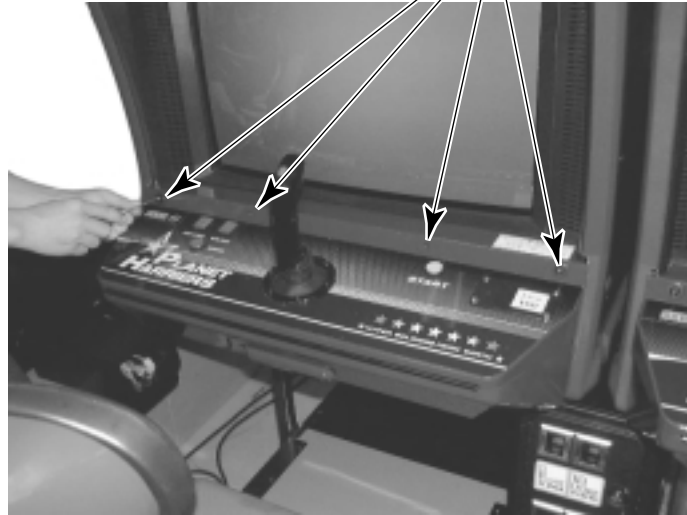


PHOTO 10. 1 a

- ③ Hold the control panel firmly with your both hands, and pull it toward you to open.
The control panel is heavy and may fall down by itself. Keep firmly holding the control panel, therefore, until it is completely opened. Be careful not to release your hands before then; otherwise you may catch the hands or fingers in the control panel or have a bruise on the hands or fingers.



PHOTO 10. 1 b

10 - 2 REPLACING THE VOLUME OF THE LEVER (an analog joystick)

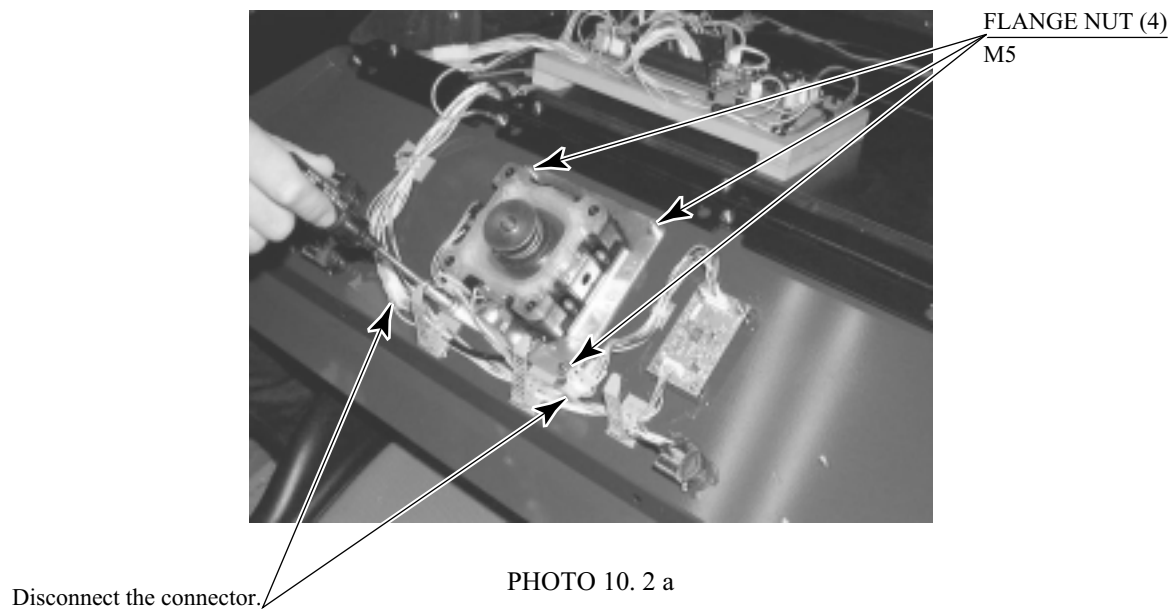
If the lever operates unsatisfactorily, reset its volume values on the VOLUME SETTING screen. If the problem is still reproduced, then replace the volume because it may be failed. Remove the lever from the control panel, and then replace the volume in the under-described procedure.

CAUTION: Remove the lever from the control panel before proceeding to replace the volume. Failure to do so may cause the wires to be damaged and the wire covers to be melted. Therefore, do not fail to observe this important instruction.

Prepare the following tools:

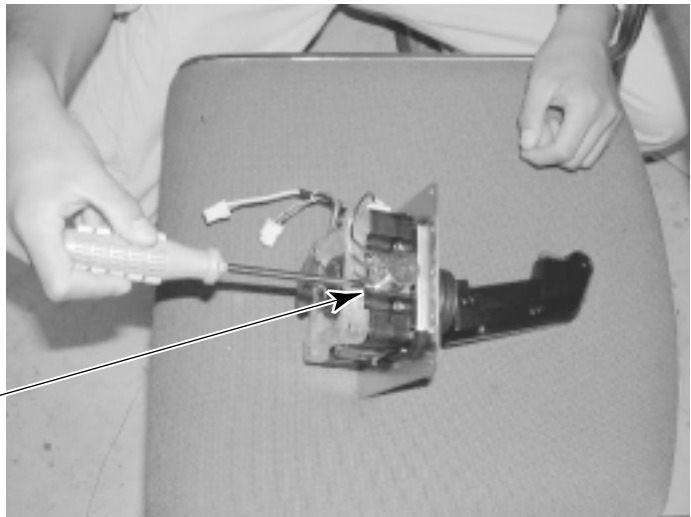
Wrench (a standard accessory) or screwdriver for tamperproof screws; Phillips head screwdriver; Wrenches or screwdrivers for hexagon nuts of 8 mm and 12 mm in width across flats; Nippers; Cutter; Wire strippers; Soldering iron; Industrial-use dryer.

- ① Disconnect the power, and open the control panel. (See the section 10-1.)
- ② Unclamp the wires around the lever. Then disconnect the control stick's 2 wire connectors.
- ③ Remove the 4 flange nuts.
- ④ Detach the lever from the control panel. Be careful not to damage the wires.



- ⑤ Remove the 2 screws. Detach the volume with the bracket from the control stick.

SCREW (2)
M3 X 30, w/spring washer



VOLUME
220-5737

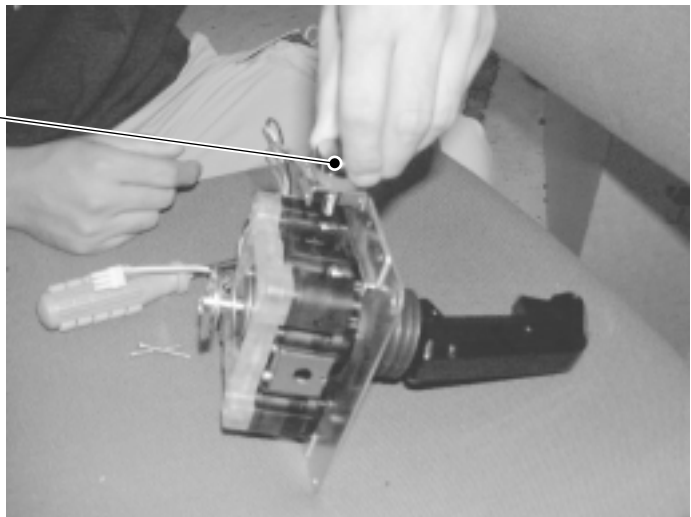


PHOTO 10. 2 b

Remove the hexagon nut.

- ⑥ Remove the hexagon nut that fixes the volume onto the bracket. Detach the volume from the bracket.

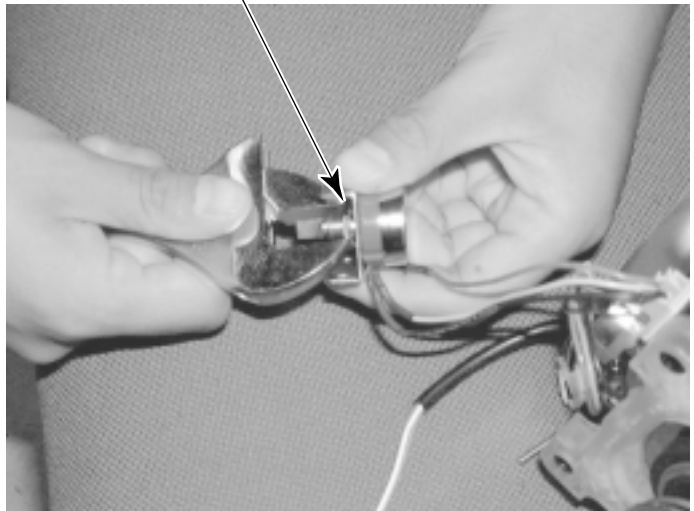


PHOTO 10. 2 c

⑦ Use the nippers to nip the wires off the volume. Select a nipping position that is as closely as possible to the volume, because the wires will be reused.

⑧ Remove the present heat-shrinkable tubings from the wires.

Nip the wires.

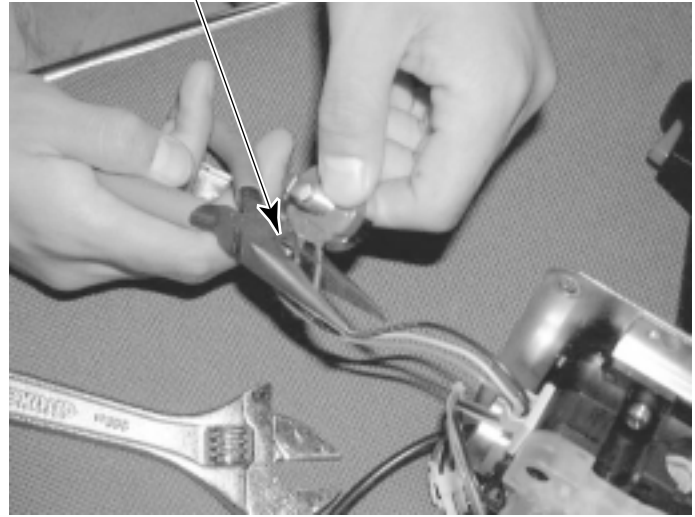


PHOTO 10. 2 d

⑨ Use the wire strippers to strip the covers of the wires. Expose the end of the conductors about 5 mm.

Strip the covers.

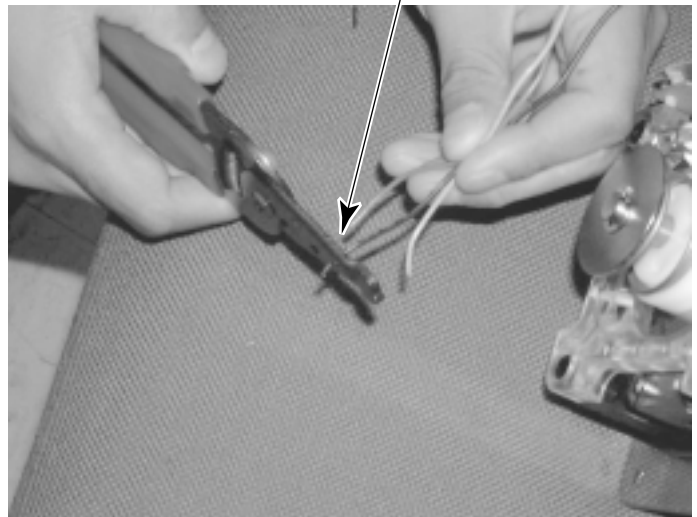
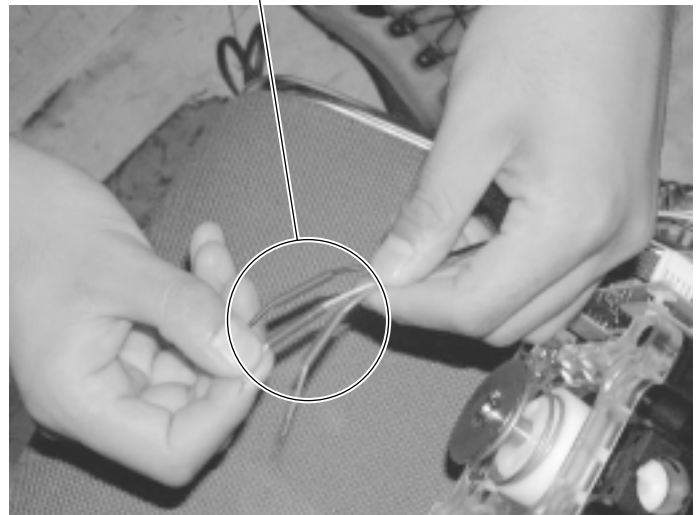


PHOTO 10. 2 e

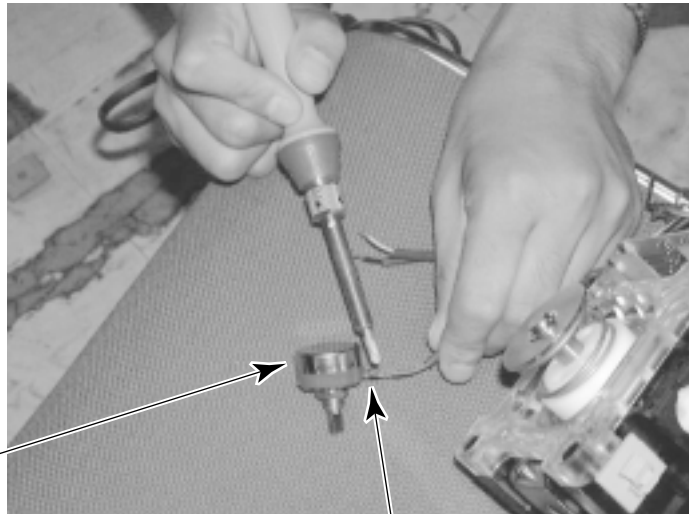
⑩ Insert each wire into a heat-shrinkable tubing (a standard accessory).

Insert the wires into heat-shrinkable tubings.



- ⑪ Solder the wires onto the new volume's terminals. Carefully read the wiring connection diagram and thereby solder correctly.

VOLUME
220-5737



Solder the wires.

PHOTO 10. 2 g

- ⑫ Heat the heat-shrinkable tubings, with the industrial-use dryer, so that they can closely cover the soldered sections.



PHOTO 10. 2 h

- ⑬ Attach the volume onto the bracket. Fasten the 2 screws to mount the volume with the bracket onto the control stick body.
- ⑭ Attach the lever onto the control panel.
- ⑮ Connect the power, and set the volume on the JOYSTICK CALIBRATION screen. (See the Section 9-3.)
- ⑯ Test the volume on the INPUT TEST screen, and make sure that the volume values change smoothly according to the operation of the control stick. (See the Section 9-3.)

10 - 3 REPLACING THE LEVER'S MICROSWITCH

If the bullet button or missile button operates unsatisfactorily, replace the microswitch in the lever because it may be failed.

Remove the lever from the control panel, and then replace the microswitch (and any other parts inside the lever's grip, too) in the under-described procedure.

CAUTION: Remove the lever from the control panel before proceeding to replace the microswitch. Failure to do so may cause some parts to be lost and the replacement work to be harder. Therefore, observe this 'troublesome' but important instruction.

Prepare the following tools:

Wrench (a standard accessory) or screwdriver for tamperproof screws; Phillips head screwdriver; Wrench or screwdriver for hexagon nuts of 8 mm in width across flats; Soldering iron.

- ① Disconnect the power, open the control panel, and detach the lever. (See the section 10-2.)
- ② Push down the rubber cover on the lever's root.

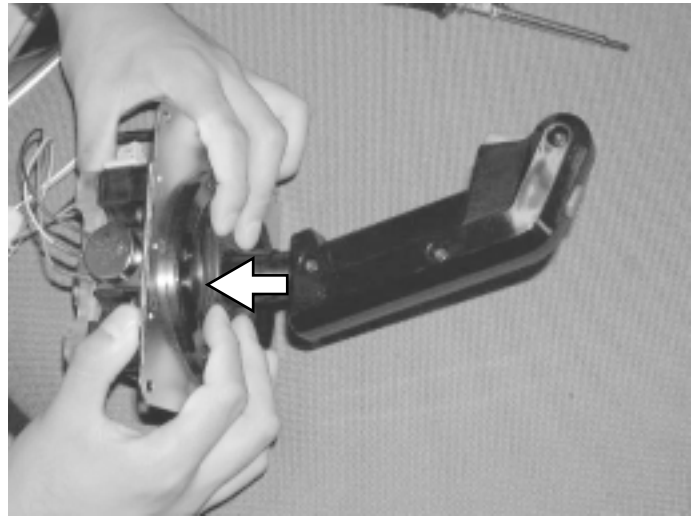
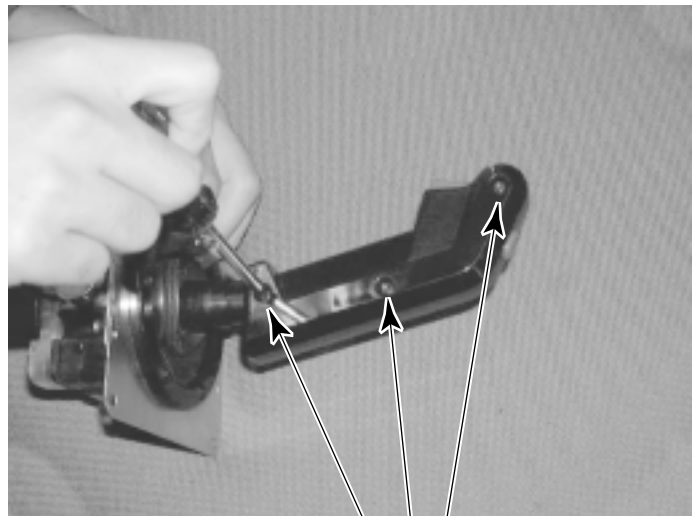
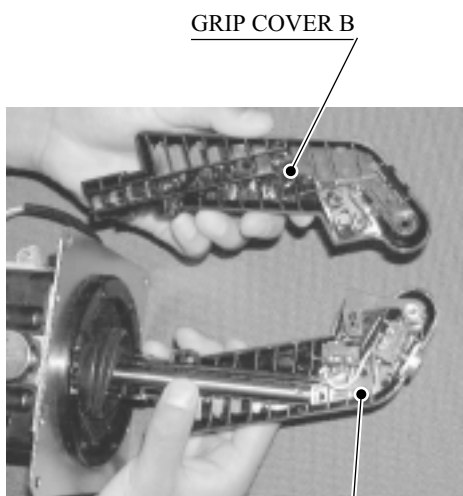


PHOTO 10. 3 a

- ③ Remove the 3 tamperproof screws to detach the grip cover B. Be careful not to lose the parts inside the grip because they are now detachable.

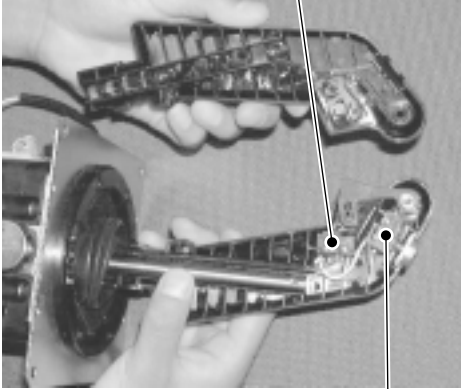


TAMPERPROOF SCREW (3)
M4 X 8, spring washer used.

GRIP COVER A PHOTO 10. 3 b

- ④ Remove the tapping screws, 2 each for a microswitch, to detach the 2 microswitches from grip cover A.

Bullet Button with an Actuator
509-5975



Missile Button without an Actuator
509-5974

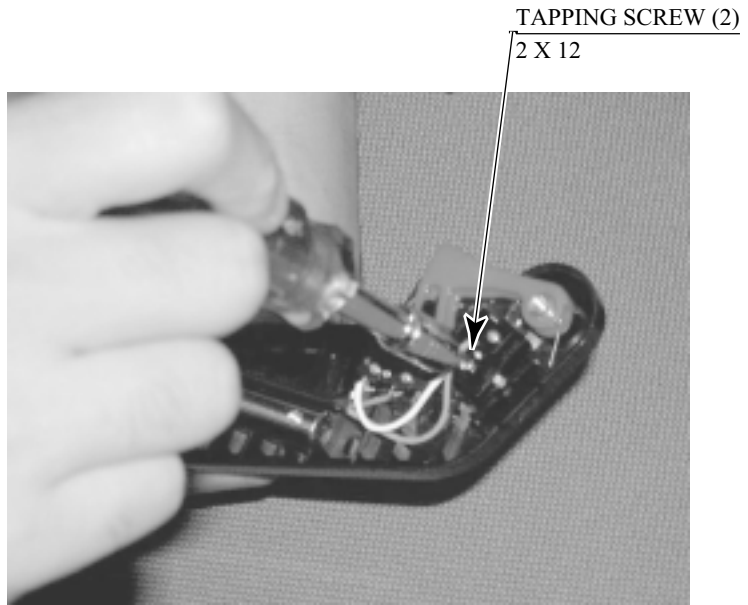


PHOTO 10. 3 c

- ⑤ Use the soldering iron to unsolder the wires from the present microswitch's terminals.
- ⑥ Solder the wires onto the new microswitch's terminals.
- ⑦ Fasten the tapping screws, 2 each for a microswitch, to attach the 2 microswitches onto grip cover A. Be careful not to fasten them too tightly because doing so may damage the microswitches and/or the screw holes of the grip cover A.
- ⑧ Fasten the 3 tamperproof screws to attach the grip cover B. Be careful not to fasten them too tightly.
- ⑨ Attach the lever on the control panel.
- ⑩ Connect the power. Test the gun and missile buttons on the INPUT TEST screen (See the Section 9-3.), and make sure that they can operate normally.

10 - 4 GREASING

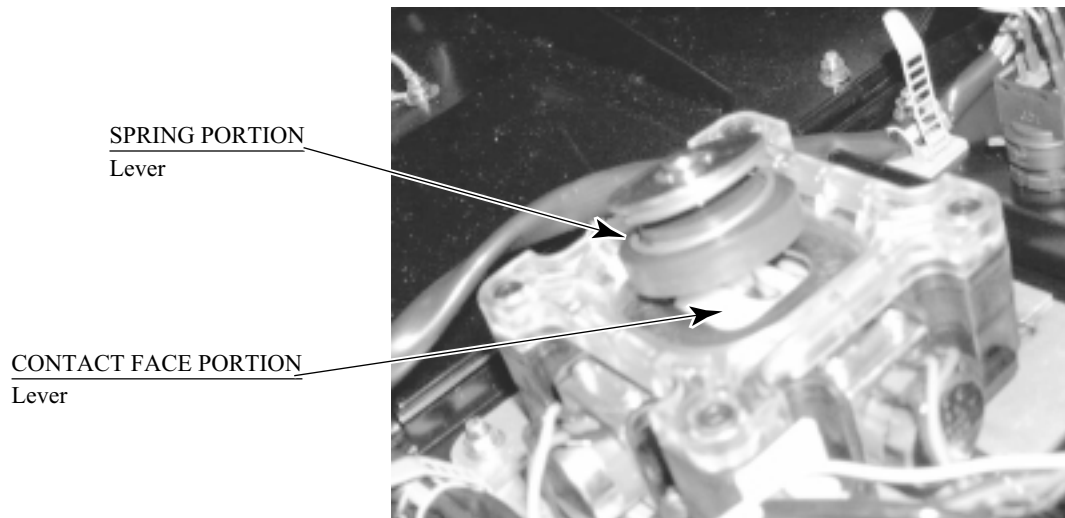


- Be sure to use the designated grease. Using undesignated grease can cause parts damage.
- Do not apply greasing to undesignated places. Failure to observe this can cause malfunctioning or quality deterioration of parts.
- The period for greasing specified herein is a standard. Apply greasing to the specified portions as occasion arises.

Every 3 months grease on the following sections:

Lever : the contacting surfaces and the spring.

Use the spray-type grease: either the Grease Mate (part number: 090-0066) or the Grease 248 (part number: 090-0070) specified by the Sega. If these are not available, use the alternative one that is applicable for heat-resistant and cold-resistant plastics.



SPRING PORTION
Lever

CONTACT FACE PORTION
Lever

PHOTO 10. 4

10 - 5 REPLACING THE GUIDE PLATE OF THE LEVER

If the lever operates unsatisfactorily, replace the guide plate because it may be worn or scratched.

Replace the guide plate in the under-described procedure.

Prepare the following tools:

Wrench (a standard accessory) or screwdriver for tamperproof screws; Wrench for hexagon socket head screws of 4 mm in width across flats.

- ① Disconnect the power, and open the control panel. (See the section 10-1.)
- ② Remove the 4 hexagon socket head screws that fix the guide plate, and replace the guide plate.

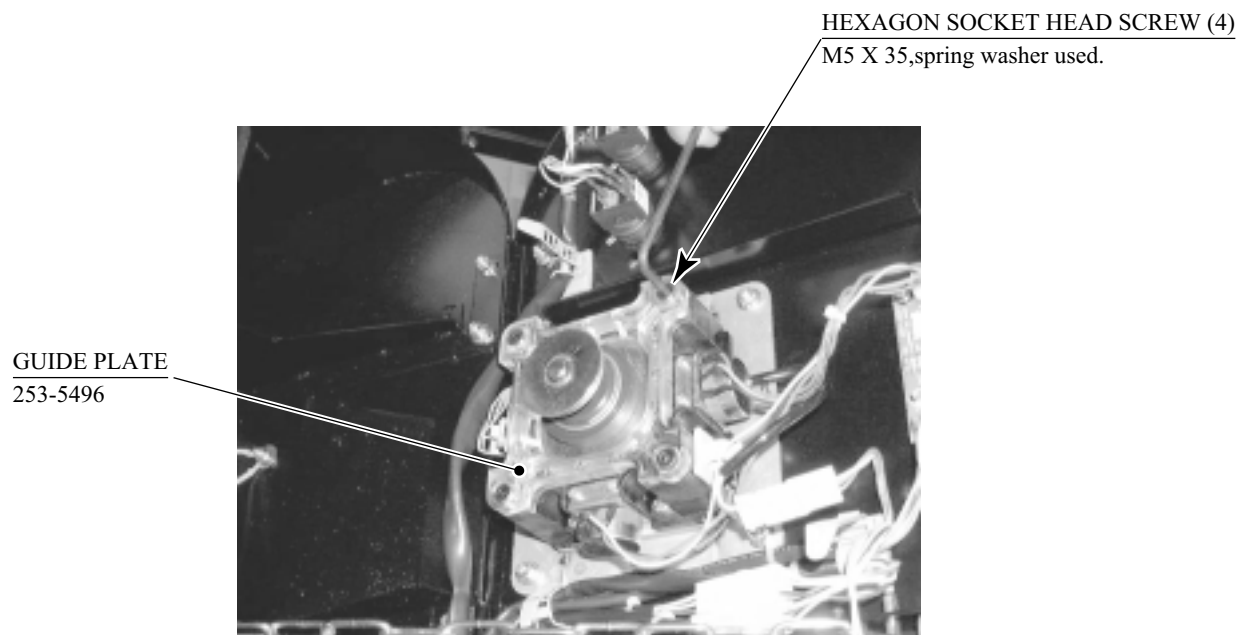


PHOTO 10. 5

11. MONITOR

11 - 1 CAUTIONS AND WARNINGS CONCERNING THE SAFETY FOR HANDLING THE MONITORS

Before handling the monitors, be sure to read the following explanations and comply with the caution/warning instructions given below. Note that the caution/warning symbol marks and letters are used in the instructions.



WARNING!

Indicates that handling the monitors erroneously by disregarding this warning may cause a potentially hazardous situation, which could result in death or serious injury.



CAUTION!

Indicates that handling the monitors by disregarding this caution may cause a potentially hazardous situation, which could result in personal injury and or material damage.



Indicates that access to a specific part of the equipment is forbidden.



Indicates the instruction to disconnect a power connector or to unplug.



WARNING!

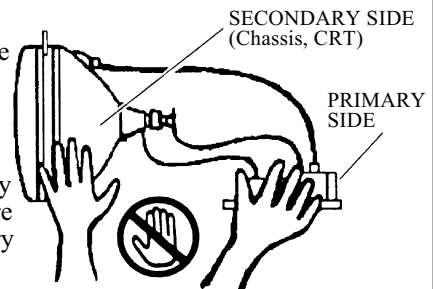
- When performing such work as installing and removing the monitor, inserting and disconnecting the external connectors to and from monitor interior and the monitor, be sure to disconnect the power connector (plug) before starting the work. Proceeding the work without following this instruction can cause electric shock or malfunctioning.
- Using the monitor by converting it without obtaining a prior permission is not allowed. SEGA shall not be liable for any malfunctioning and accident caused by said conversion.



WARNING!

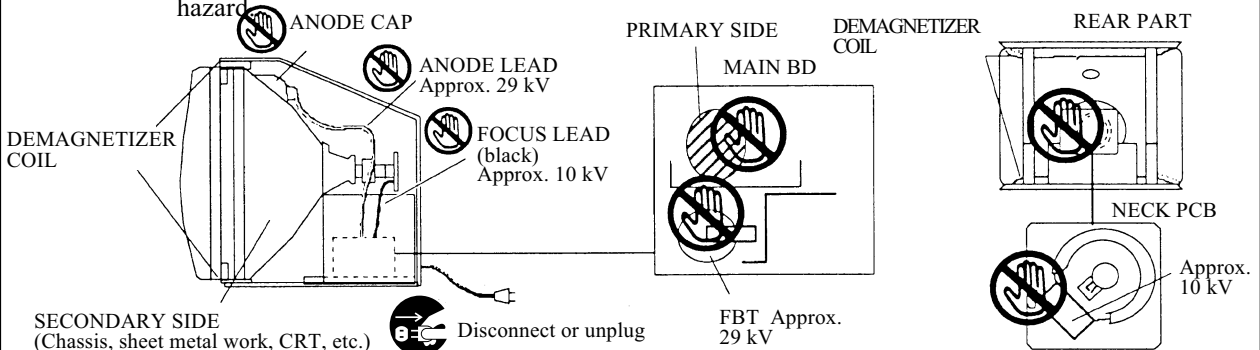
● Primary side and Secondary side

The monitor's circuit which is divided into the Primary side and Secondary side, is electrically isolated. Do not touch the primary side, or do not touch both the primary side and the secondary side simultaneously. Failing to observe the instruction can cause electric shock and this is very dangerous. When making monitor adjustments, use a non-conductive driver and make adjustment without touching any part other than the Adjustment V. R. and knob. Also, be sure not to cause a short-circuit to the Primary side and Secondary side. If short-circuited, it can cause electric shock or malfunctioning, which is very dangerous.



● High-tension Voltage

Some of the parts inside monitor are subject to high-tension voltage in excess of 20,000 volts and very dangerous. Therefore, do not touch the monitor interior. Should soldering & paper wastes, etc. be mixed in the monitor interior, turn the power off so as not to cause malfunctioning or fire hazard.



● Connecting the CRT and PCB

For combining the CRT and PCB, use the specified part No. to maintain the status of adjustments made at the factory. The anode of the CRT itself will be accumulatively charged as time elapses, generating high-tension voltage which is very dangerous. The monitor should be used with the Chassis, CRT and PCB assembled. When repair, etc. is required at the time of malfunctioning, be sure to send it in an "as is assembled" condition. If these are disassembled, what's charged to said high tension voltage can be discharged, causing a very hazardous situation. Therefore, under no circumstances should it be disassembled.



CAUTION!

- **Static Electricity**

Touching the CRT surface sometimes causes you to slightly feel electricity. This is because the CRT surfaces are subject to static and will not adversely affect the human body.

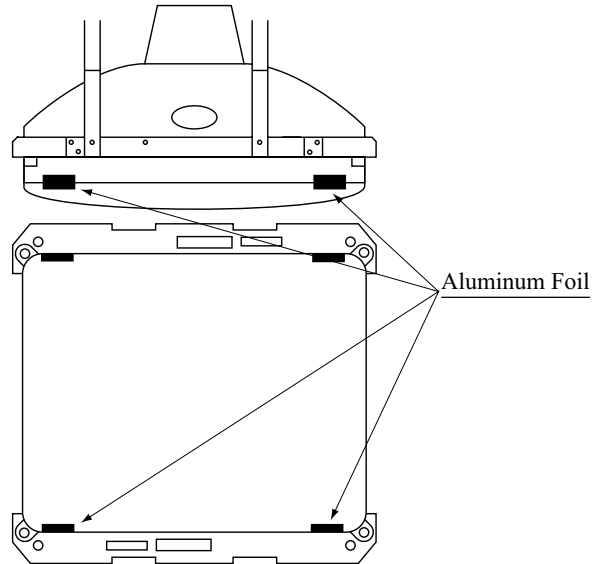
- **Installation and removal**

Ensure that the Magnetizer Coil, FBT (Fly-Back Transformer), Anode Lead and Focus Lead are not positioned close to the sheet metal work's sharp edges, etc. and avoid damaging the insulated portions so as not to cause electric shock and malfunctioning. (For the name of parts, refer to the above Figures).



For the purpose of static prevention, special coating is applied to the CRT face of this product. To protect the coating, pay attention to the following points. Damaging the coating film can cause electric shock to the customers.

- Do not apply or rub with a hard item (a rod with pointed edge, pen, etc.) to or on the CRT surfaces.
- Avoid applying stickers, seals, etc. on the CRT face.
- Do not remove aluminum foils from the CRT corners. Removing the aluminum foils can cause static prevention effects to be lowered.



11 - 2 CAUTIONS TO BE HEHEDED WHEN CLEANING THE CRT SURFACES



Static preventive coating is applied to the CRT surfaces. When cleaning, pay attention to the following points. Peeling off of static preventive coat can cause electric shock.

- Remove smears by using a dry, soft cloth (flannels, etc.). Do not use a coarse gauze, etc.
- For smear removing solvent, alcohol (ethanol) is recommended. When using chemical detergent, be sure to follow instructions below:
 - Dilute chemical detergent with water and dip a soft cloth in and then thoroughly wring it to wipe smears off.
 - Do not use a chemical detergent containing an abradant, powder or bleaching agent.
 - Do not use alkaline chemical detergents such as "glass cleaner" available on the market or solvents such as thinner, etc.
- Do not rub or scratch the CRT face with hard items such as brushes, scrub brush, etc.

Clean the CRT surfaces once a week. When cleaning, pay attention to the above caution so that the antistatic coating will not come off.

11 - 3 ADJUSTMENT METHOD



- Monitor adjustments have been made at the time of shipment. Therefore, do not make further adjustment without a justifiable reason. Adjusting the monitor which contains high tension parts is a dangerous work. Also, an erroneous adjustment can cause deviated synchronization and image fault, resulting in malfunctioning.
- When making adjustment, utilize a resinous Alignment Rod. Servicing with bare hand or using conductive tools can cause electric shock.
- Be sure to perform appropriate adjustment of the monitor (projector). For operation of this machine, do not leave monitor's flickering or deviation as is. Failure to observe this can have a bad influence upon the players' or the customers' physical conditions.

To make monitor adjustment, take off the 2 Truss Screws from CRT ADJUST PANEL portion. The Adjustment BD appears when the screws are removed.

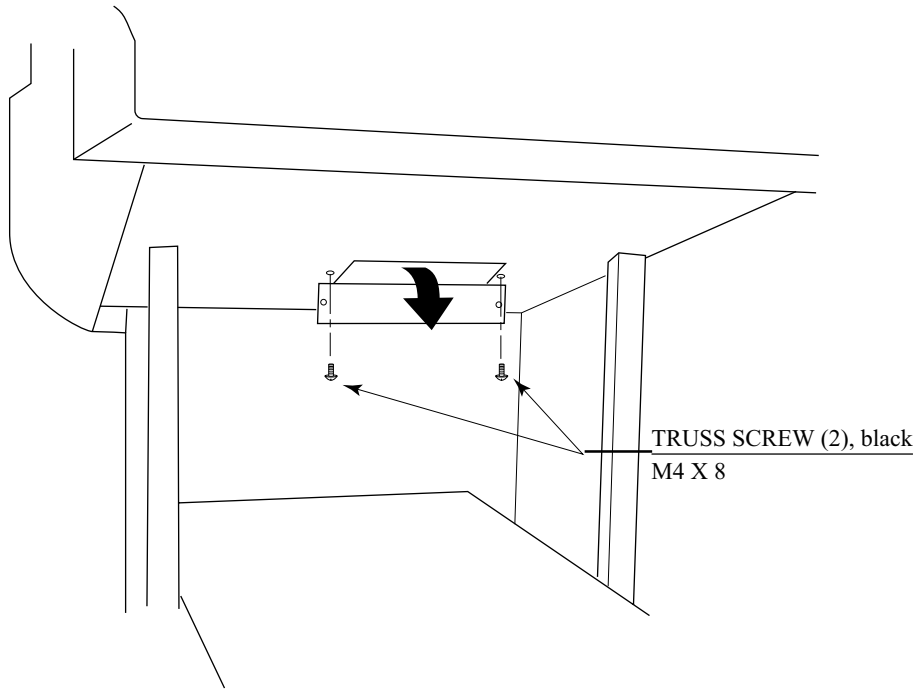
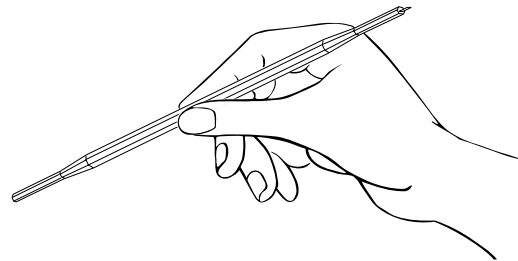


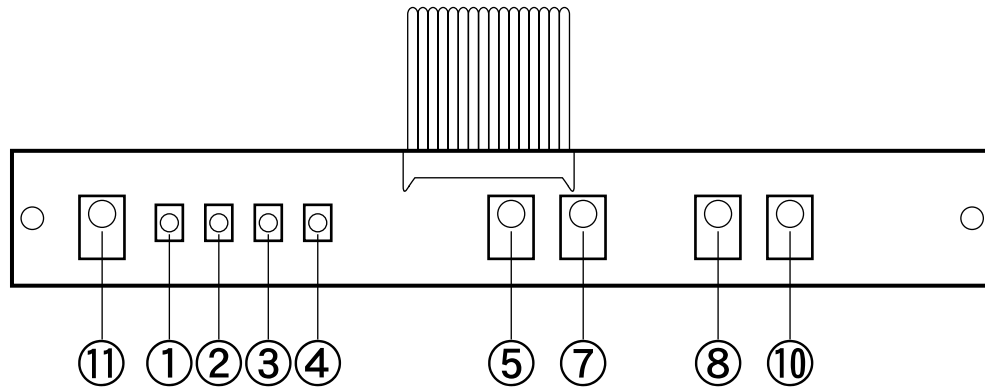
FIG. 11. 3 a



For adjustment, use the Resinous Adjustment Rod.

FIG. 11. 3 b

NANAO monitor: 2 0 0 - 5 7 8 7 (31K mode)



- ① R-GAIN
- ② G-GAIN Controls colors.
- ③ B-GAIN
- ④ BRIGHT Controls screen brightness.
- ⑤ H. SIZE Controls horizontal screen size.
- ⑦ H. POSI Controls horizontal display position on screen.
- ⑧ V. SIZE Controls vertical screen size.
- ⑩ V. POSI Controls vertical display position on screen.
- ⑪ CONTRAST Adjusts image contrast.

12. COIN SELECTOR

HANDLING THE COIN JAM

If the coin is not rejected when the REJECT button is pressed, open the coin chute door and open the selector gate. After removing the jammed coin, put a normal coin in and check to see that the selector correctly functions.

CLEANING THE COIN SELECTOR



- Remove and clean smears by using a soft cloth dipped in water or diluted chemical detergent and then squeezed dry.
- Never apply machine oil, etc. to the Coin Selector.
- After cleaning the Coin Selector, insert a regular coin in the normal working status and ensure that the Selector correctly functions.

The coin selector should be cleaned once every 3 months. When cleaning, follow the procedure below:

- ① Turn the power for the machine OFF. Open the coin chute door.
- ② Open the gate and dust off by using a soft brush (made of wool, etc.).
- ③ Remove and clean smears by using a soft cloth dipped in water or diluted chemical detergent and then squeezed dry.
- ④ Remove the CRADLE.
When removing the retaining ring (E ring), be very careful so as not to bend the rotary shaft.
- ⑤ Remove stain from the rotary shaft and shaft receiving portions by wiping off with a soft cloth, etc.
- ⑥ After wiping off as per ⑤ above, further apply a dry cloth, etc. to cause the coin selector to dry completely.

COIN INSERTION TEST

Once every month, when performing the Coin SW Test, simultaneously check the following:

- Does the Coin Meter count satisfactorily?
- Does the coin drop into the Cashbox correctly?
- Is the coin rejected when inserted while keeping the Reject Button pressed down?

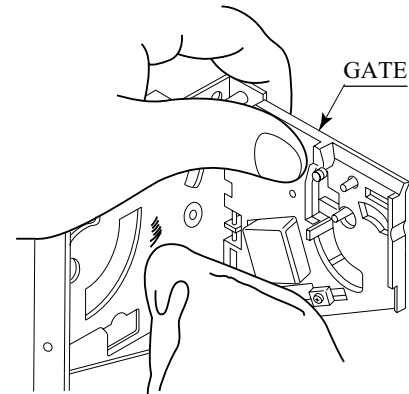


FIG. 12 a

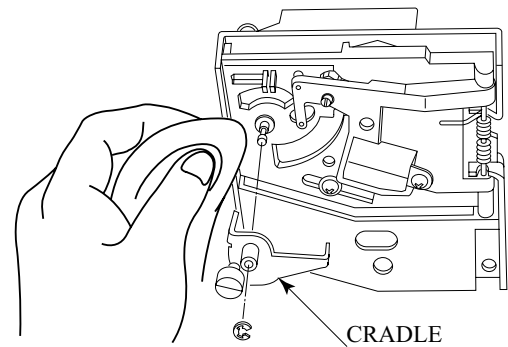


FIG. 12 b

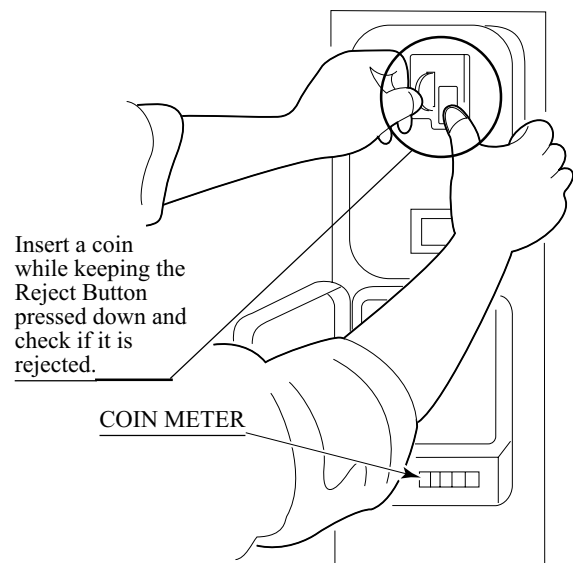


FIG. 12 c

13. REPLACING THE FLUORESCENT LAMP, AND LAMPS



- When performing work, be sure to turn power off. Working with power on can cause electric shock and short circuit hazards.
- The Fluorescent Lamp, when it gets hot, can cause burn. Be very careful when replacing the Fluorescent Lamp.
- Be sure to use lamps of the designated rating. Using lamps of undesignated rating can cause a fire or malfunctioning.



- To perform work safely and securely, be sure to prepare a step which is in a secure and stable condition. Performing work without using the step can cause violent falling down accidents.
- Be careful when handling the plastic made parts. Failure to observe this may cause injury due to damage or fragments resulting from damage.

INSIDE THE BILLBOARD

- ① Remove the 3 screws which secure the upper sash of the Billboard's upper part.
- ② Pull out the Billboard upward to replace the Fluorescent Lamp (40W).

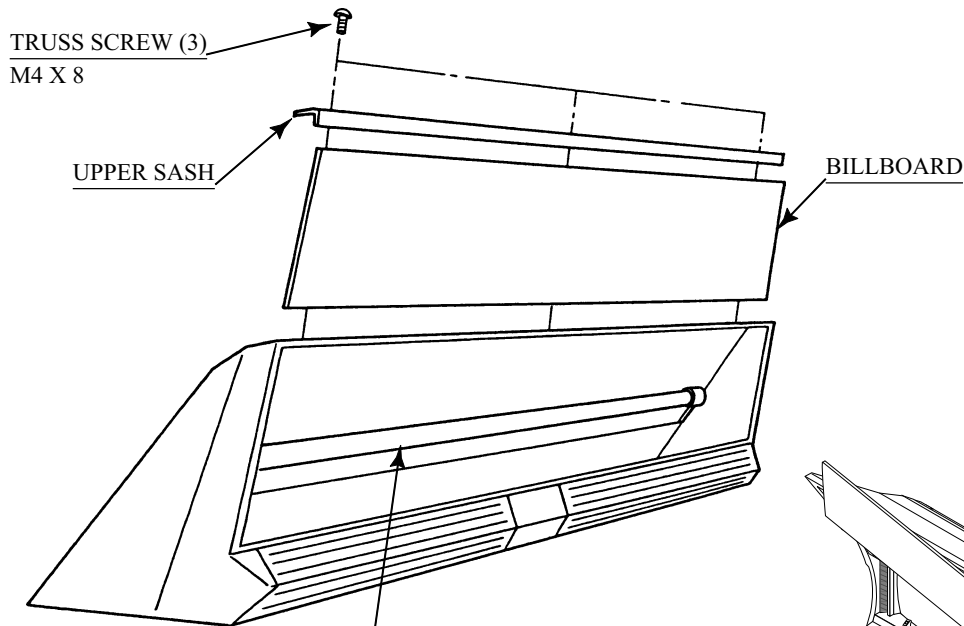
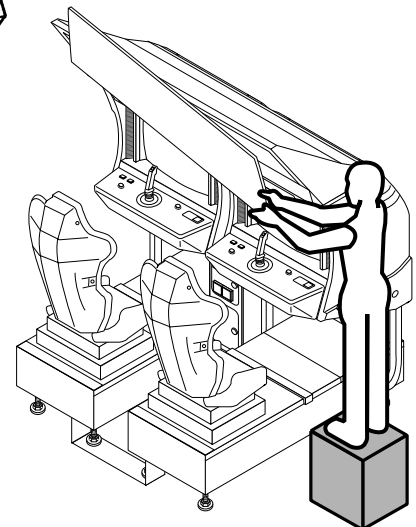


FIG. 13 a

FLUORESCENT LAMP 40W: 390-5251-40-01
GLOW LAMP: 390-5638-4P

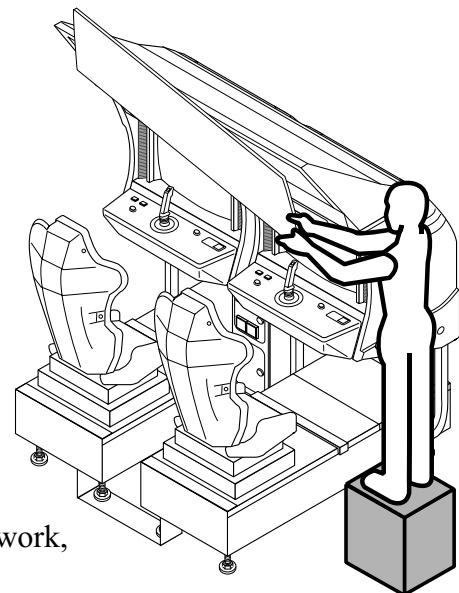
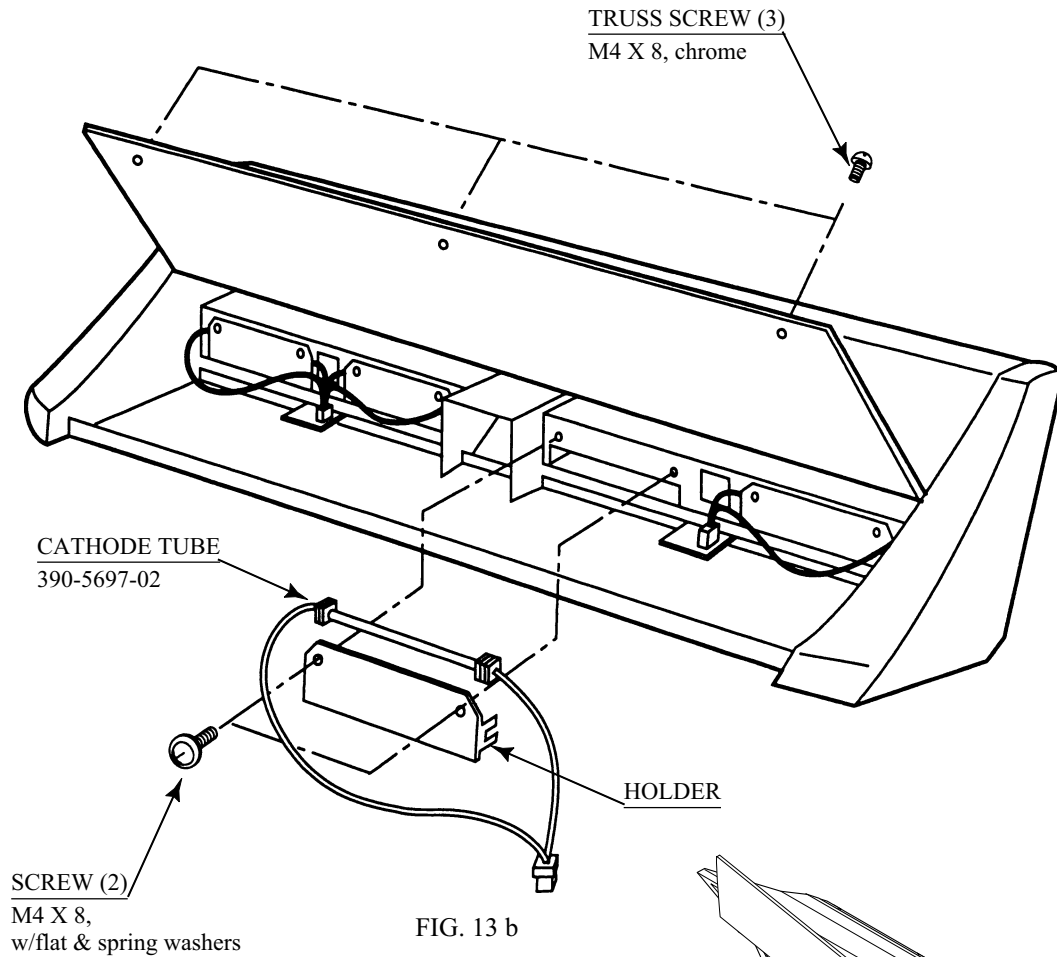
When performing work,
prepare a step.



INSIDE THE CATHODE TUBE

Open the Lid and take out the 2 screws to replace the Leader Lamp.

- ① Take out the 3 screws to open the Lid.
- ② Disconnect the connector.
- ③ Take out the 2 screws to remove the Holder.
- ④ Remove the Cathode Tube to replace the Leader Lamp.



When performing work,
prepare a step.

START BUTTON, VR BUTTON

The start button and the VR button consist of a button section and a switch section. The light is located on the switch section.

- ① Disconnect the power.
- ② Open the control panel. (See Section 10-1.)
- ③ Turn a fitting on the side of the button to unlock. Separate the switch section from the button section.
- ④ Press the light and turn it counterclockwise, and thus remove it.

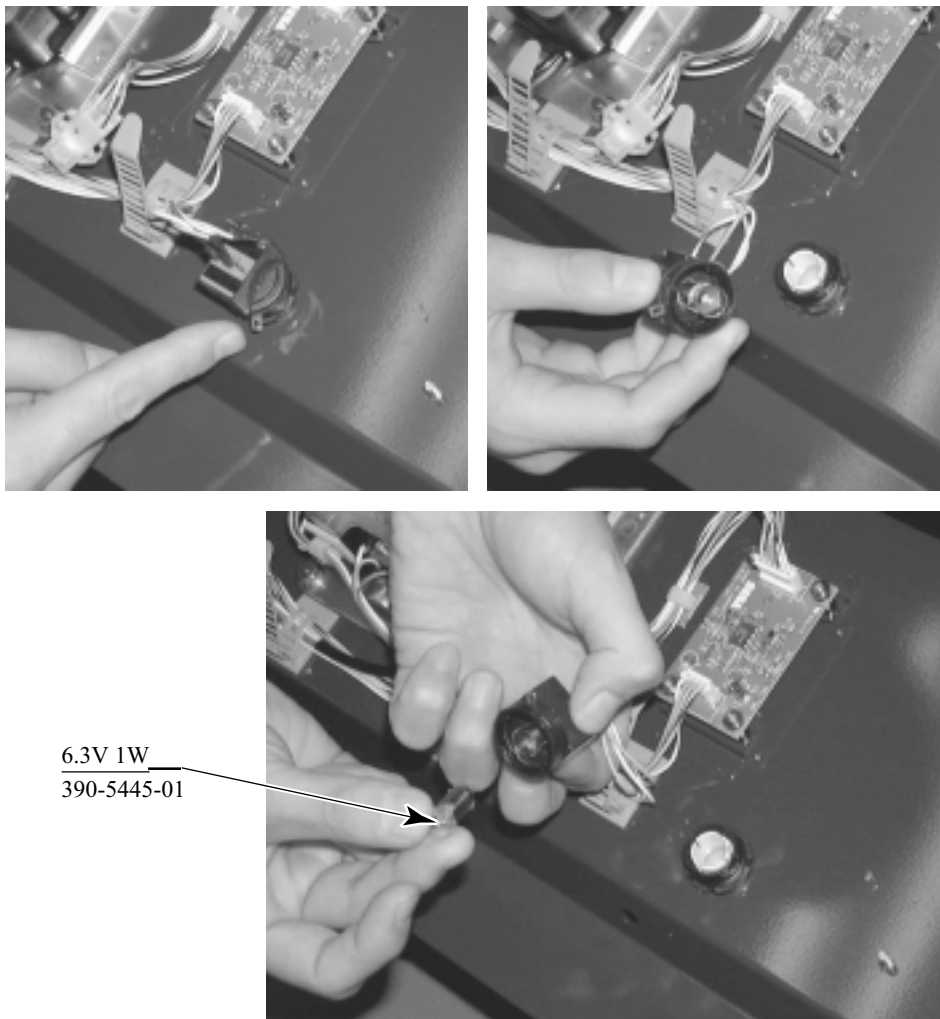


PHOTO 13

14. PERIODIC INSPECTION TABLE

The items listed below require periodic check and maintenance to retain the performance of this machine and to ensure safe business operation.



- Be sure to check once a year to see if Power Cords are damaged, the plug is securely inserted, dust is accumulated between the Socket Outlet and the Power Plug, etc. Using the product with dust as is accumulated can cause fire and electric shock hazards.
- Periodically once a year, request the place of contact herein stated or the Distributor, etc. where the product was purchased from, as regards the internal cleaning. Using the product with dust as is accumulated in the interior without cleaning can cause a fire or accident. Note that cleaning the interior parts can be performed on a pay-basis.

TABLE 14

ITEMS	DESCRIPTION	PERIOD	REFERENCE
CABINET	Check Adjusters' contact with surface.	Daily	3
CONTROL PANEL	Check SW.	Monthly	9
	Check VOLUME value.	Monthly	9
	GREASING	Trimonthly	10 - 4
COIN CHUTE DOOR	Check COIN SWes.	Monthly	9
	Coin insertion test.	Monthly	12
	COIN SELECTOR cleaning.	Trimonthly	12
MONITOR	Cleaning CRT face	Weekly	11 - 2
	Check adjustments.	Monthly or when moving	6, 9, 11
SEAT	Antistatic measures	Bimonthly	5
	Greasing to the seat rail	Trimonthly	See FIG. 14
GAME BD	MEMORY TEST.	Monthly	9
	Setting check		
INTERIOR	Cleaning	Annually	See above.
POWER PLUG	Inspection and cleaning		
Cabinet surfaces	Cleaning	As occasion arises.	See below.

CLEANING THE CABINET SURFACES

If the Cabinet is badly stained, use a cloth which is dipped in the chemical detergent liquid diluted with water and then squeezed dry. Do not use thinner, benzine, alcohol or chemical dustcloth as they can damage the Cabinet surfaces.

SEAT (Greasing to Seat Rail Portion)

Move the Seat to the rearmost portion and apply spray greasing to the portion shown at the right once every 3 months by using NOK KLUBER L60 or GREASE MATE SEGA PART No. 090-0066. After greasing, move the Seat a few times forward and backward so as to allow the grease to be applied all over uniformly. Be sure to wipe grease which attaches to the surfaces of the PROTECT RUBBER on the Seat Rail, or any excess grease.

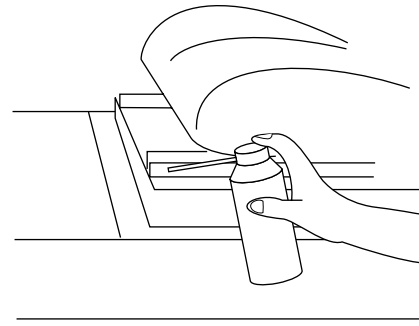


FIG. 14

15. TROUBLESHOOTING



- In order to prevent electric shock and short circuit, be sure to turn power off before performing work.
- Be careful so as not to damage wirings. Damaged wiring can cause electric shock or short circuit.
- After removing the cause of the functioning of the Circuit Protector, reinstate the Circuit Protector. Depending on the cause of the functioning, using the Circuit Protector as is without removing the cause can cause generation of heat and fire hazard.

In case a problem occurs, first check wiring connector connections.

15 - 1 TABLE OF TROUBLESHOOTING

TABLE 15 a

PROBLEMS	CAUSE	COUNTERMEASURES
With Main SW ON, no activation.	Power is not supplied.	Securely insert the power plug into the plug socket.
	Power supply/voltage is not correct.	Make sure that power supply/voltage is correct.
	The Circuit Protector functioned due to the momentary overload.	After eliminating the cause of overload, reinstate the AC Unit's Circuit Protector (see 5, Section 6, Refer to the following).
	The Connect BD Fuse is blown due to momentary overload.	Replace fuse (see PHOTO. 15. 1). 514-5036-5000 FUSE 6.4 X 30A@5000mA 125V
The color of image on MONITOR screen is incorrect.	Incorrect monitor adjustment.	Make appropriate adjustments (see 11-3).
The on-screen image of the monitor sways and or shrinks.	The power source and voltage are not correct.	Make sure that the power supply and voltage are correct (see Sec.2).

CIRCUIT PROTECTOR

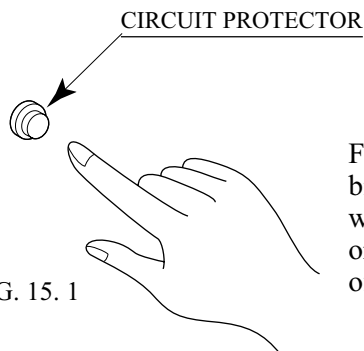


FIG. 15. 1

Functions due to the activation of bimetal. To restore the function, wait for approximately one minute or longer until the bimetal cools off. (Press the Button.)

TABLE 15 b

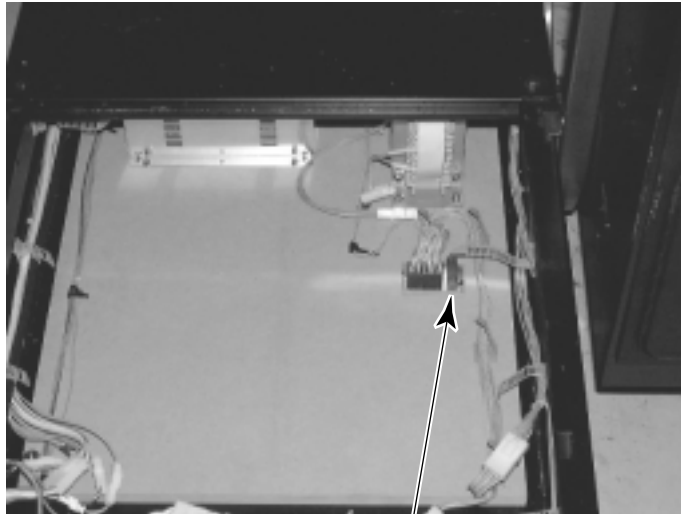
PROBLEMS	CAUSE	COUNTERMEASURES
No sound is emitted.	<p>Sound volume adjustment is not appropriate.</p> <p>Board and Amplifier malfunctioning.</p>	<p>Adjust sound volume (see Sec. 9).</p> <p>Perform the sound test and confirm (see Sec. 9).</p>
Operability of the Control Panel is poor.	<p>Volume is set wrongly.</p> <p>Connectors are connected loosely or wrongly.</p> <p>Volume has failed.</p> <p>Microswitch has failed.</p> <p>Amplifier board has failed.</p>	<p>Calibrate the volume (see 9-3).</p> <p>Check the connectors inside the control panel.</p> <p>Replace the volume (220-5737). (see 10-2)</p> <p>Replace the microswitch (see 10-3).</p> <p>Contact where you purchased the product from.</p>
The Fluorescent lamp does not light up.	The Fluorescent tube is burnt out.	Replace the Fluorescent tube (see Sec. 13).
Lights (integrated with the start, VR, and/or bomb buttons) fail to flash.	The lamp is burnt out.	Replace the lamp (see Sec.13).

REPLACEMENT OF FUSE



- Fuse replacements other than those specified can cause accidents and are strictly forbidden. In case fuse replacements other than those stated in this manual are necessary, contact where you purchased the product from for inquiries regarding this matter.
- In order to prevent an electric shock, be sure to turn power off and unplug from the socket outlet before performing work by touching the internal parts of the product.
- Be careful so as not to damage wirings. Damaged wiring can cause electric shock and short circuit accidents.
- Be sure to use fuses meeting specified rating. Using fuses exceeding the specified rating can cause fire and electric shock accidents.
- After eliminating the cause of the blowing of fuse, replace the fuse. Depending on the cause of fuse blowing, continued use with the fuse as is blown can cause generation of heat and fire hazard.

Incline the Seat and remove Base Lid F to view the Base interior. The composition of the Base interior is as shown below. (See Section 16-1). There is a fuse on each of the Connect BD. When replacing the fuse, be sure to use the specified one.



FUSE 125V 5A
514-5036-5000

PHOTO 15. 1

15 - 2 SYSTEM ERROR MESSAGES

When you have connected the power or exited the GAME TEST MODE screen, the system may display an error message as listed below, if:

- A system-related failure is detected, or
- A setting does not conform to the specifications of the product.

If this is the case, you cannot play the game.

ERROR 1

Main board's serial ID is incorrect or unrecognizable. For repairing, ship it to a distributor from which you purchased the product.

ERROR 2

ROM board's serial ID is incorrect or unrecognizable. For repairing, ship it to a distributor from which you purchased the product.

ERROR 3

Serial ID cannot be set correctly on the main board. Reset the system by disconnecting and reconnecting the power. If the problem is still reproduced, ship it to a distributor, for repairing, from which you purchased the product.

ERROR 4

Monitor type is set incorrectly. Open the SYSTEM ASSIGNMENTS screen, select the MONITOR TYPE item, and reset it correctly.

ERROR 5

Display mode is set incorrectly. Open the SYSTEM ASSIGNMENTS screen, select the DISPLAY MODE item, and reset it correctly.

ERROR 6

Area code is not compatible between the main board and the game software saved in the ROM board. You cannot solve the problem by resetting.

ERROR 7

Cabinet type is set incorrectly. Open the SYSTEM ASSIGNMENTS screen, select the CABINET TYPE item, and reset it correctly.

ERROR 8

Jumper is set incorrectly on the ROM board. For repairing, ship it to a distributor from which you purchased the product.

Usually, no error message is displayed except a setting error on the SYSTEM MENU screen. System error may occur when you have replaced a system-related part (game board etc.) with the one used by other games.

16. GAME BOARD



WARNING!

- In order to prevent electric shock and short circuit hazards, be sure to turn power off before performing work.
- Be careful so as not to damage wirings. Damaged wiring can cause fire, electric shock and short circuit hazards.
- Do not expose the Game BD, etc. without a good reason. Failure to observe this can cause electric shock hazard or malfunctioning.



CAUTION!

The electronic parts on the IC Board could be damaged due to human body's static electricity. Before performing IC Board related work, be sure to discharge physically accumulated statics by touching grounded metallic surfaces, etc.



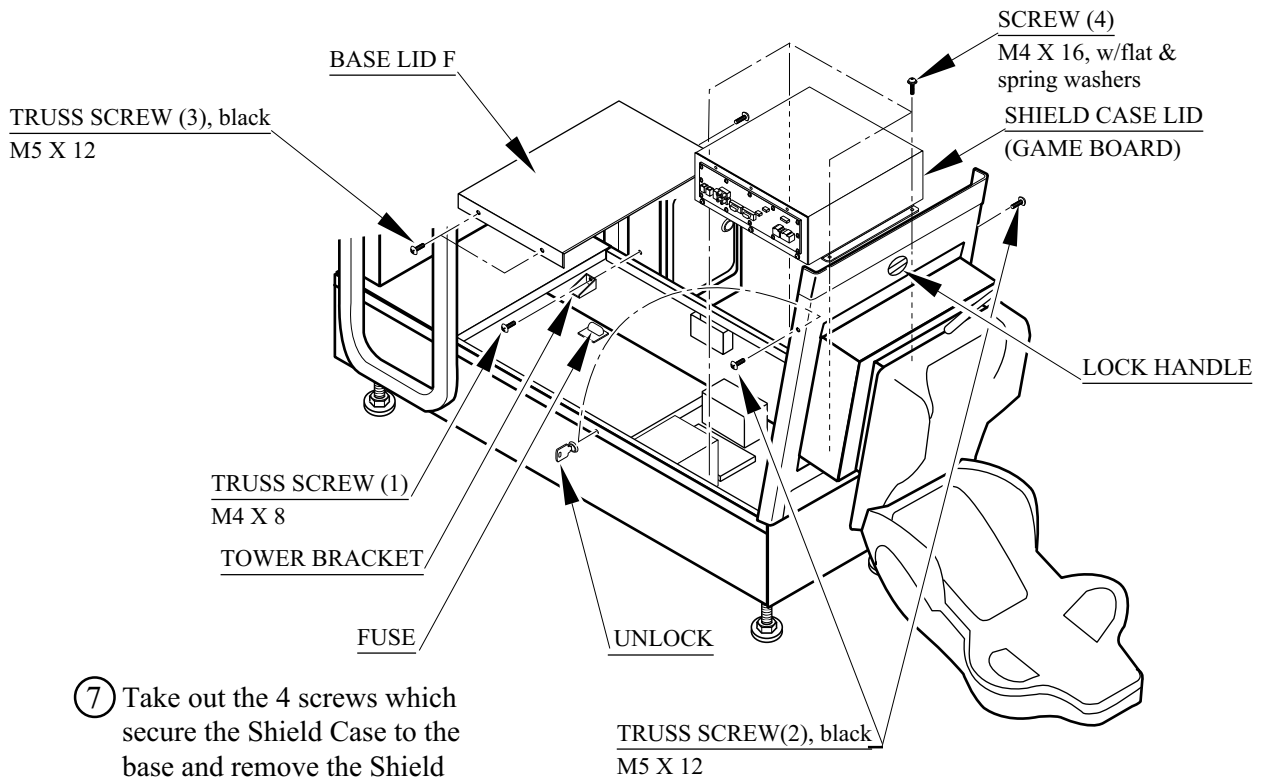
IMPORTANT

Put the Game Board in the Carton Box (an accessory) together with the Shield Case when requesting for the replacement or repair. Transporting the Game Board in an undesignated status for replacement/repair is unacceptable. In this manual, how to remove the Game Board is explained for convenience. However, this work should be performed by SEGA SERVICEMAN.

16 - 1 REMOVING THE GAME BOARD

The Shield Case containing the GAME BOARD is inside the base in each Cockpit.

- ① Turn off power.
- ② Take out the screw for each from the base left and right.
- ③ Unlock with the Master Key.
- ④ Turn the Lock Handle on the Base Lid to unlock.
- ⑤ Incline the seat backwards. By using care so as not to damage the seat parts, cause the backrest portion of the seat to come into contact with the floor. If the floor has hard surfaces, protect the seat from damage by using a cloth, etc. on the floor surfaces.
- ⑥ Disconnect all connectors connected to the Shield Case.



- ⑦ Take out the 4 screws which secure the Shield Case to the base and remove the Shield Case from the base.

FIG. 16. 1 a

Take out the 3 screws to remove the Shield Case Lid, and the Game Board appears. However, those other than Sega Serviceman should never perform this work.

- ⑧ Take out the 2 screws to remove the 2 Shield Case Brackets from the Shield Case. Pack up the Shield Case with packing materials, put it into a carton box, and request service.

- ⑨ With the seat as is inclined, take off the Truss screw to remove the Tower Bracket.
- ⑩ Take off a total of 3 screws from the sides of the base, and the Base Lid F can be removed. Remove the Base Lid F to replace the fuse.

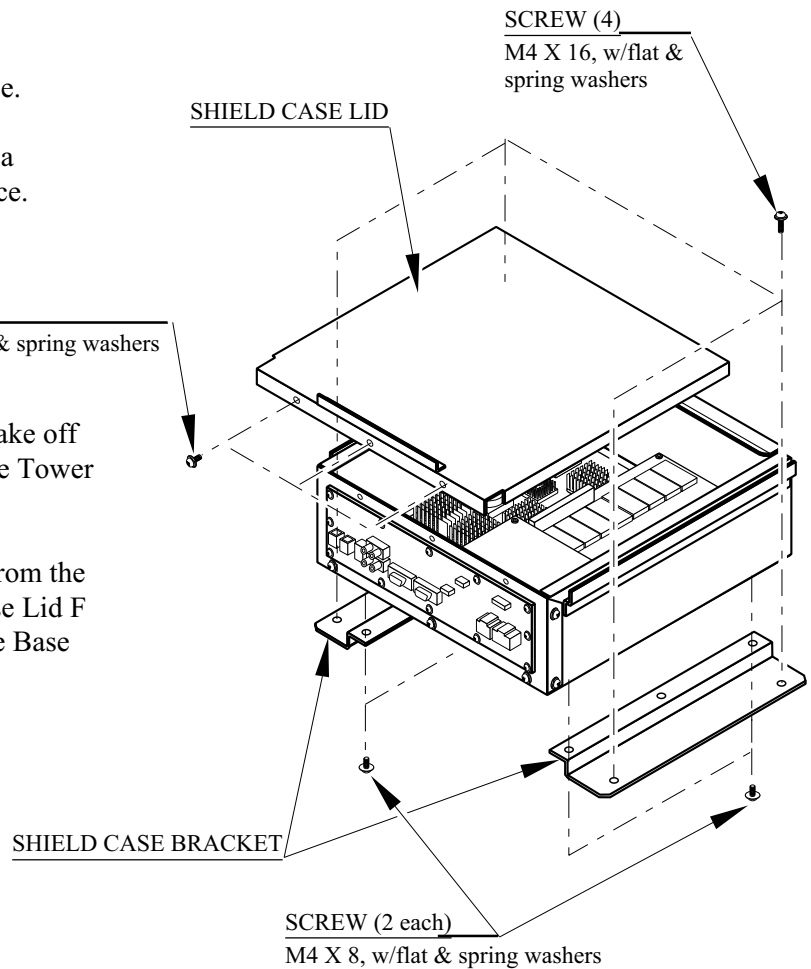


FIG. 16. 1 b

16 - 2 COMPOSITION OF GAME BOARD

GAME BD HRT (833-14145)

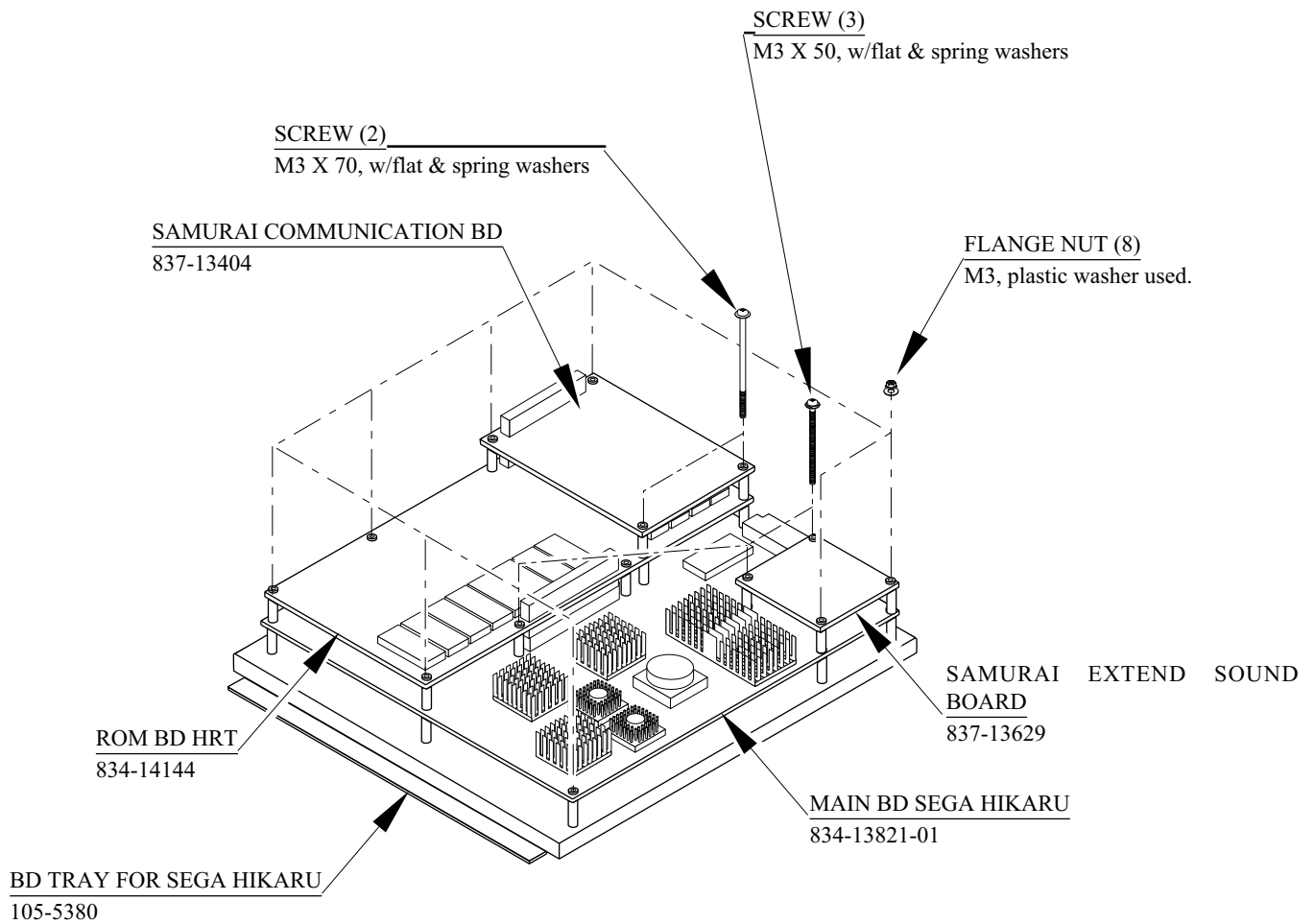


FIG. 16. 2

ROM BD JUMPER SETTING	
JP3	2-3
JP4	2-3
JP5	2-3
JP6	2-3

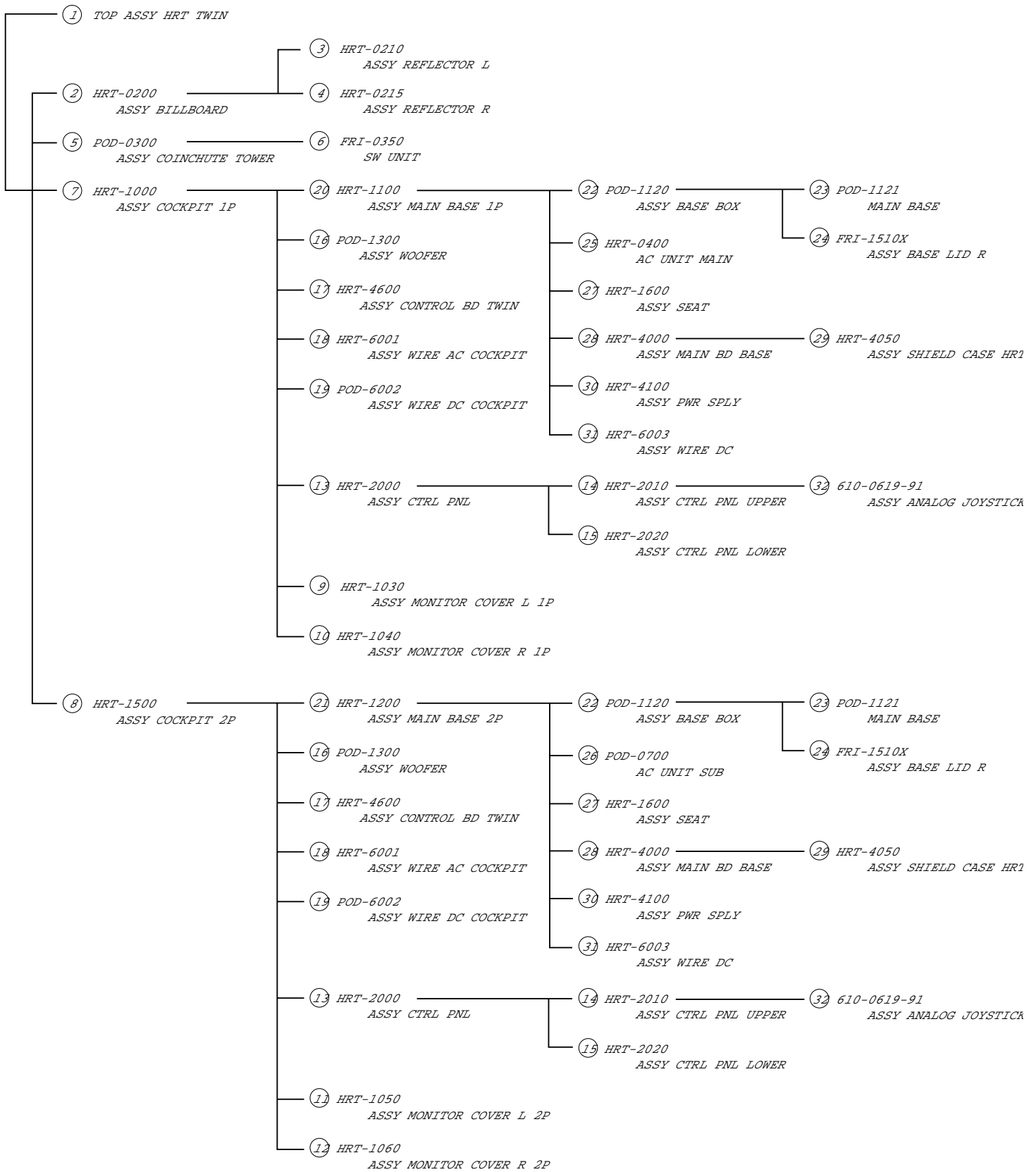
MAIN BD JUMPER SETTING	
JP4	1-2
JP5	1-2
JP6	1-2
JP7	1-2
JP8	2-3
JP9	2-3
JP10	1-2
JP11	2-3

17. DESIGN RELATED PARTS

For the Warning Display stickers, refer to Section 1.

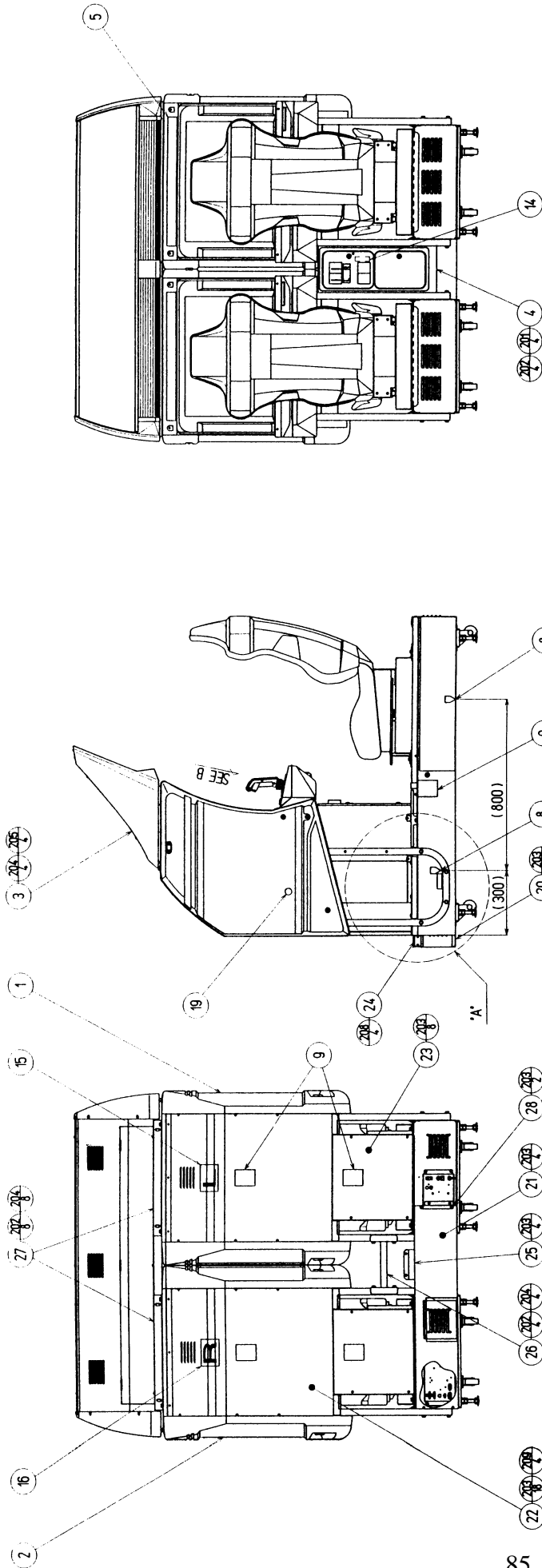


18. PARTS LIST



① TOP ASSY HRT TWIN

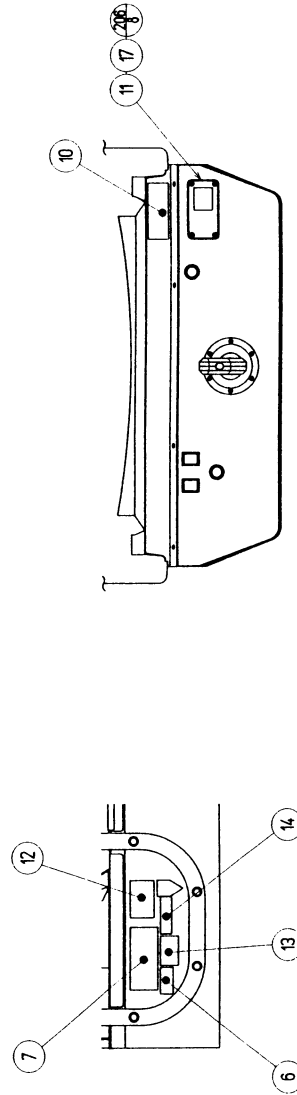
(D-1/3)



TORQUE

M8 19.5N•m

M4(M SCR) Under 1.0N•m



SEE B

Details of PART A

① TOP ASSY HRT TWIN

(D-2/3)

ITEM NO.	PART NO.	DESCRIPTION
1	HRT-1000	ASSY COCKPIT 1P
2	HRT-1500	ASSY COCKPIT 2P
3	HRT-0200	ASSY BILLBOARD
4	POD-0300	ASSY COINCHUTE TOWER
5	422-0840-01	SUB INSTR SH HRT TWIN ENG
8	421-8885	STICKER CAUTION FORK
9	440-WS0002XEG	STICKER W POWER OFF ENG
10	440-CS0186-EG	STICKER C EPILEPSY 40 ENG
11	DYN-0011	DENOMI PLATE W/O ORIGINAL
15	421-8543	STICKER CABINET L
16	421-8544	STICKER CABINET R
17	421-7308- ~	DENOMI SH ~
18	SGM-3863	POLTHN COVER 950 X 1800 X 1700
19	HRT-0001	BLIND CAP
20	POD-0006X	AC COVER A
21	DYN-0006Y	AC COVER B
22	INY-0004X	BACK LID INY
23	DYN-0008	BACK LID B
24	ECA-0010	HOLE LID
25	POD-0007	AC COVER LID
26	DYN-0013	JOINT PIPE
27	SPG-0008	BILLBOARD HOLDER
28	POD-0008	AC COVER C
101	600-6275-0200	ASSY FIBER CABLE 5 0200CM
102	280-5009-01	CORD CLAMP 21
103	601-0460	PLASTIC TIE BELT 100 MM
201	030-000820-S	HEX BLT W/S M8 X 20
202	068-852216-0B	FLT WSHR BLK 8.5-22 X 1.6
203	000-P00408-WB	M SCR PH W/FS BLK M4 X 8
204	030-000825-SB	HEX BLT W/S BLK M8 X 25
205	SLC-0006	FLAT WASHER 8.4-25 X 2
206	000-T00412-0C	M SCR TH CRM M4 X 12
207	000-T00512-0B	M SCR TH BLK M5 X 12
208	000-P00308-WB	M SCR PH W/FS BLK M3 X 8
209	010-P00408-F	S-TITE SCR PH W/F M4 X 8
210	008-T00412-0B	TMP PRF SCR TH BLK M4 X 12
211	050-H00400	HEX NUT M4
212	060-F00400	FLT WSHR M4
213	060-S00400	SPR WSHR M4
301	POD-61051	WIRE HARN EXT AC UNIT 1P
302	POD-61052	WIRE HARN EXT AC UNIT 2P
303	POD-61053	WIRE HARN EXT VOL 1P
304	POD-61054	WIRE HARN EXT VOL 2P
305	POD-61055	WIRE HARN EXT AC LINE

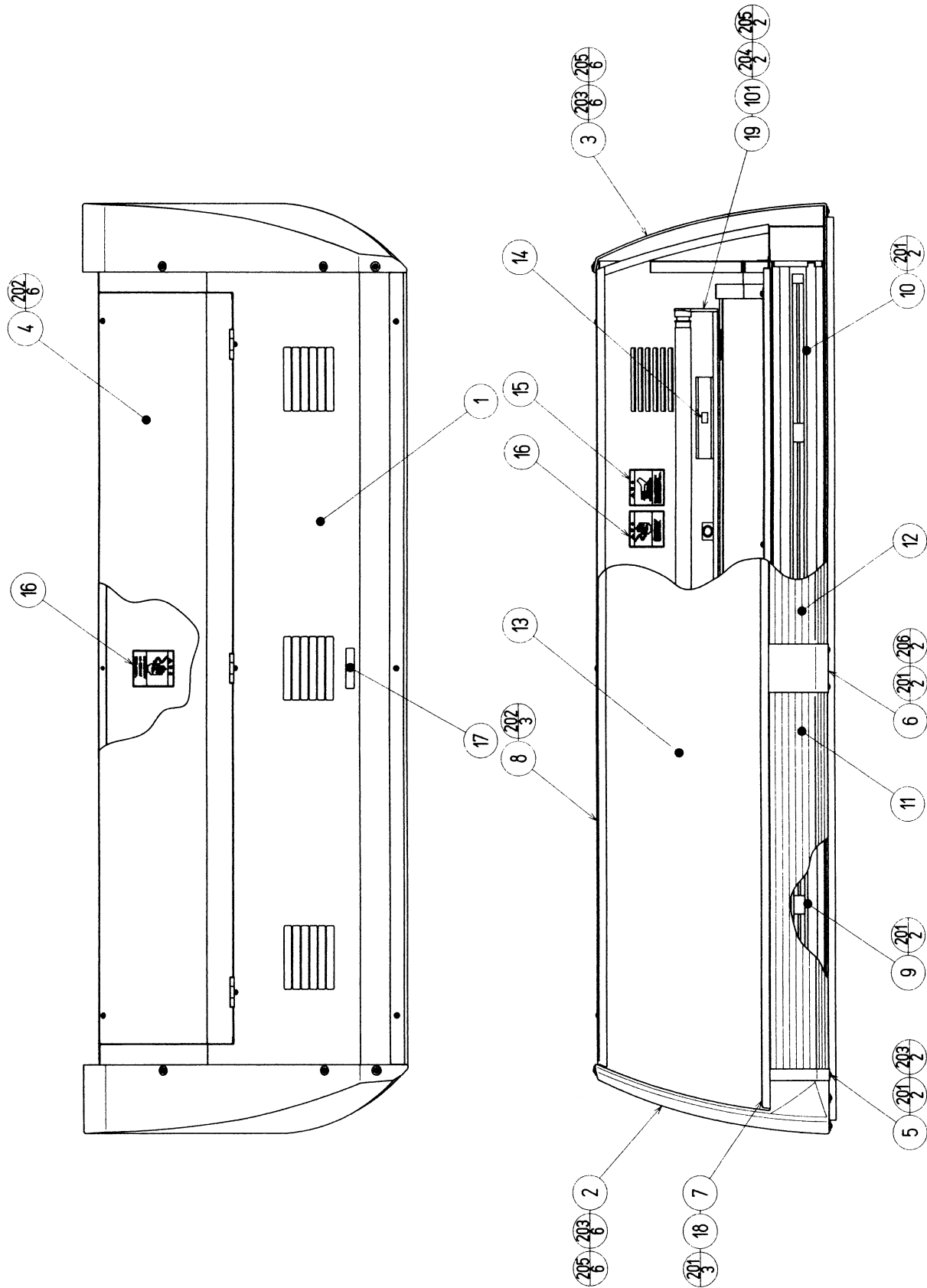
① TOP ASSY HRT TWIN

(D-3/3)

ITEM NO.	PART NO.	DESCRIPTION	NOTE
401	601-6604-70	CARTON BOX 70	
402	420-6604-01	OWNERS MANUAL HRT TWIN ENG	
403	SGM-2675	POLYETHYLENE BAG, 240 X 370	
404	220-5576	KEY MASTER FOR 220-5575	
405	SGM-4111	KEY BAG (SGB-1035X)	
407	540-0007-01	WRENCH M5 TMP SCR	
408	DYN-0020	JOINT PLATE	
409	600-6664-02	WIRE HARN EARTH W/LUG M6 NOT USED	TAIWAN OTHERS
410	514-5036-5000	FUSE 6.4 X 30 5000MA 125V	
411	600-6729	AC CABLE CONNECT TYPE 15A	1 2 3 TAIWAN OTHERS HONG KONG
	600-7228	AC CABLE CONNECT TYPE 15A	
	600-6618	AC CABLE CONNECT TYPE FOR EXP	
	600-6619	AC CABLE CONNECT TYPE FOR UK	
412	280-5009-01	CORD CLAMP 21	
413	220-5737	VOL CONT B-5K	
414	509-5974	SW MICRO TYPE SS-5	
415	509-5975	SW MICRO TYPE SS-5GL	
416	310-5029-F20	SUMITUBE F F 20MM	
/	421-6690-05	STICKER 240V	AC 240V AREA
/	421-6690-03	STICKER 220V	AC 220V AREA
/	421-6690-06	STICKER 110V	AC 110V AREA

② ASSY BILLBOARD (HRT-0200)

(D-1/2)



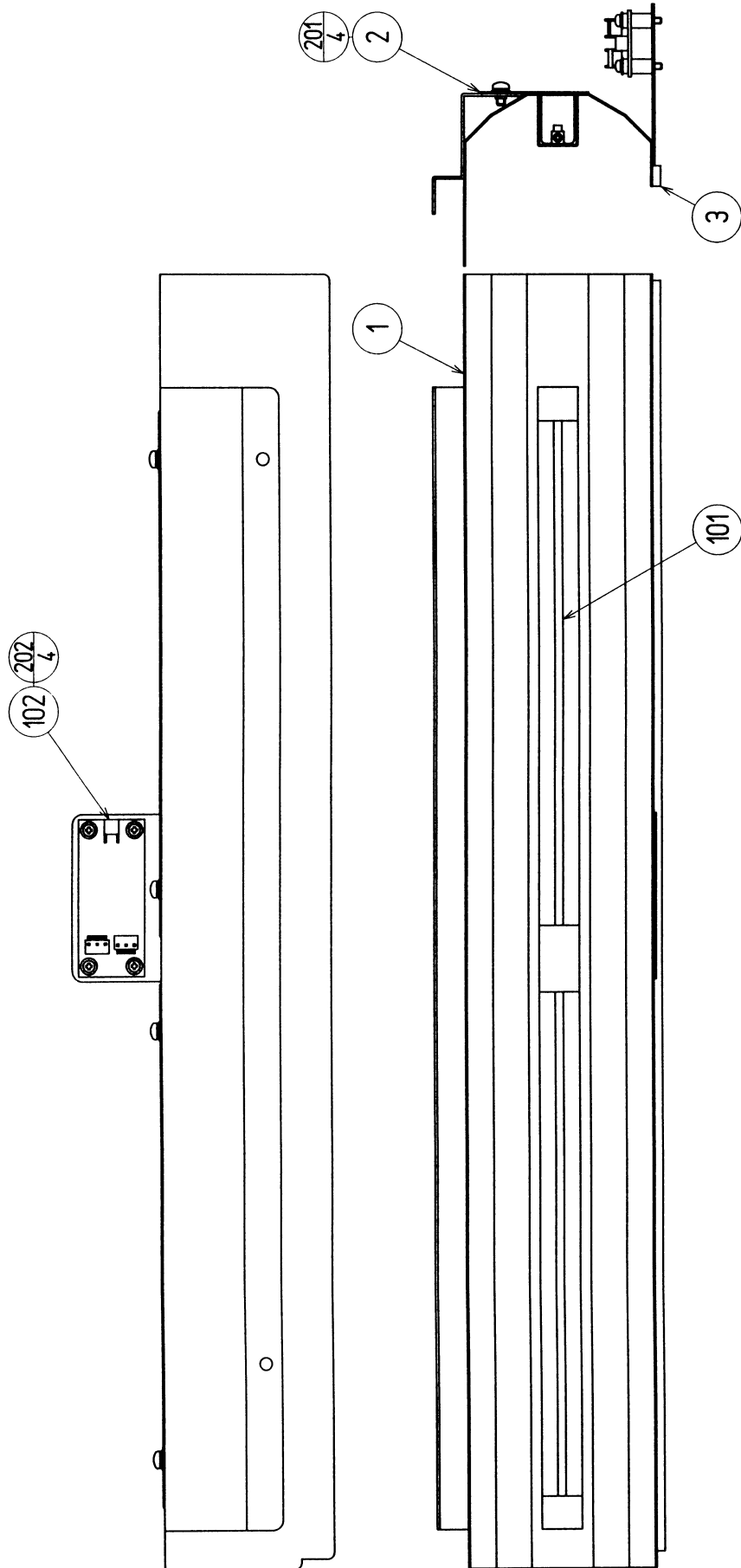
② ASSY BILLBOARD (HRT-0200)

(D-2/2)

ITEM NO.	PART NO.	DESCRIPTION
1	HRT-0201	BILLBOARD BOX
2	HRT-0202	SIDE COVER L
3	HRT-0203	SIDE COVER R
4	HRT-0204	BILLBOARD LID
5	HRT-0205	HOLDER PLATE A
6	SPG-0206	HOLDER PLATE B
7	SPG-0207	LOWER SASH
8	HRT-0206	UPPER SASH
9	HRT-0210	ASSY REFLECTOR L
10	HRT-0215	ASSY REFLECTOR R
11	423-0343	BILLBOARD PLATE LOWER L
12	423-0344	BILLBOARD PLATE LOWER R
13	423-0345	BILLBOARD PLATE UPPER
14	421-7501-10	STICKER FL 40W
15	440-WS0012XEG	STICKER W HIGH TEMP ENG
16	440-WS0002XEG	STICKER W POWER OFF ENG
18	SPG-0209	CENTER CUSHION
19	253-5457	FL HOLDER
101	390-6659-40EX	ASSY FL40W EX W/CONN HIGH S CE
102	280-5009-01	CORD CLAMP 21
103	280-5275-SR10	CORD CLAMP SR10
201	000-P00412-W	M SCR PH W/FS M4 X 12
202	000-T00408-0C	M SCR TH CRM M4 X 8
203	000-T00412-0C	M SCR TH CRM M4 X 12
204	000-P00430-S	M SCR PH W/S M4 X 30
205	068-441616-0C	FLT WSHR CRM 4.4-16 X 1.6
206	000-T00412-0B	M SCR TH BLK M4 X 12
207	000-P00408	M SCR PH M4 X 8
208	060-S00400	SPR WSHR M4
209	060-F00400	FLT WSHR M4
301	600-6873-067	WIRE HARN INVERTER
302	600-6873-068	WIRE HARN FL

③ ASSY REFLECTOR L (HRT-0210)

(D-1/2)



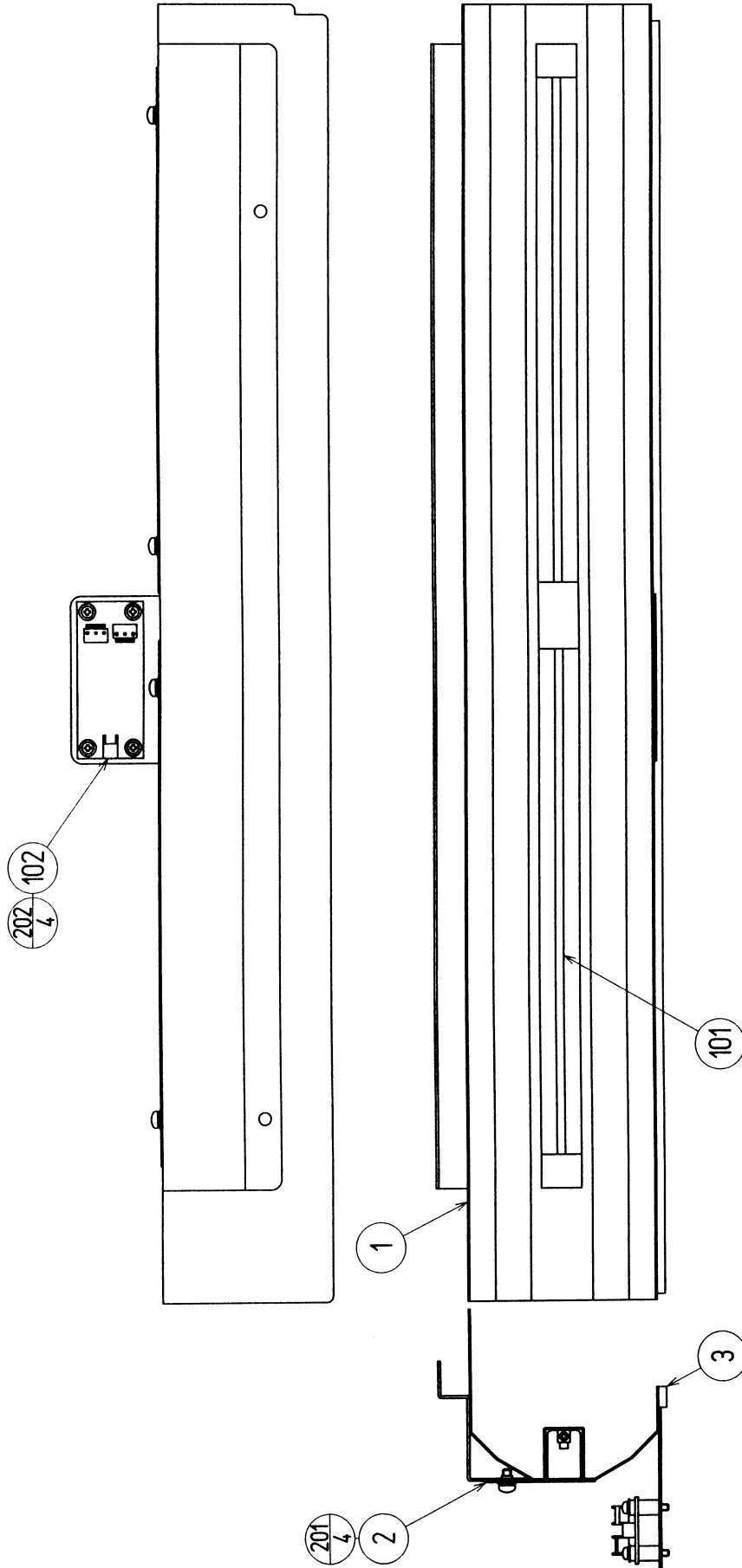
③ ASSY REFLECTOR L (HRT-0210)

(D-2/2)

ITEM NO.	PART NO.	DESCRIPTION	NOTE
1	SPG-0211	REFLECTOR L	
2	SPG-0212	HOLDER	
3	SPG-0213	CUSHION	
101	390-5697-02	CATHODE TUBE YELLOW W/CONN	
102	838-13038	CATHODE TUBE INVERTER 12V	
103	280-5275-SR10	CORD CLAMP SR10	
104	601-0460	PLASTIC TIE BELT 100 MM	
201	000-P00408-W	M SCR PH W/FS M4 X 8	
202	000-P00320-W	M SCR PH W/FS M3 X 20	

④ ASSY REFLECTOR R (HRT-0215)

(D-1/2)



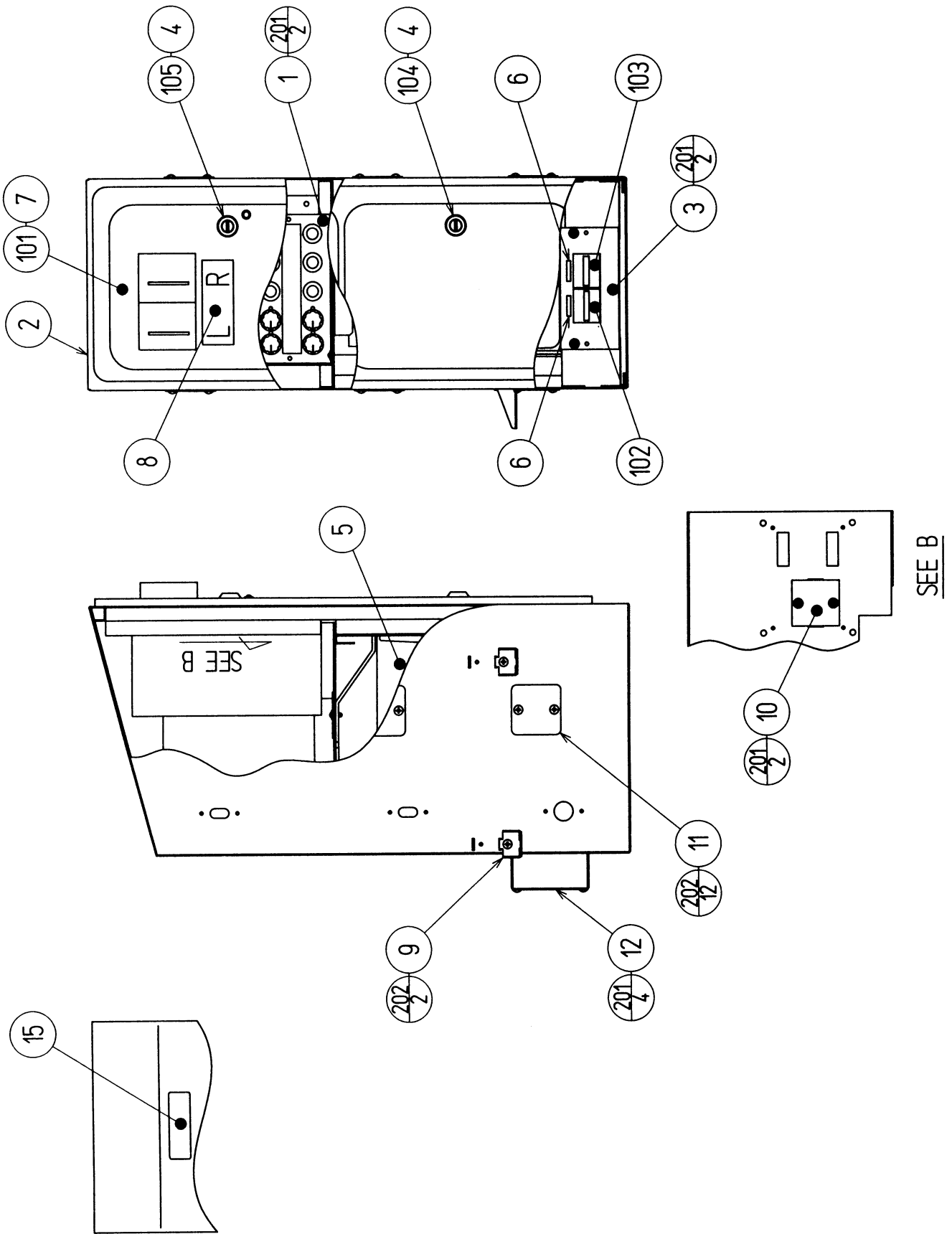
④ ASSY REFLECTOR R (HRT-0215)

(D-2/2)

ITEM NO.	PART NO.	DESCRIPTION	NOTE
1	SPG-0216	REFLECTOR R	
2	SPG-0212	HOLDER	
3	SPG-0213	CUSHION	
101	390-5697-02	CATHODE TUBE YELLOW W/CONN	
102	838-13038	CATHODE TUBE INVERTER 12V	
103	280-5275-SR10	CORD CLAMP SR10	
104	601-0460	PLASTIC TIE BELT 100 MM	
201	000-P00408-W	M SCR PH W/FS M4 X 8	
202	000-P00320-W	M SCR PH W/FS M3 X 20	

5 ASSY COINCHUTE TOWER (POD-0300)

(D-1/2)

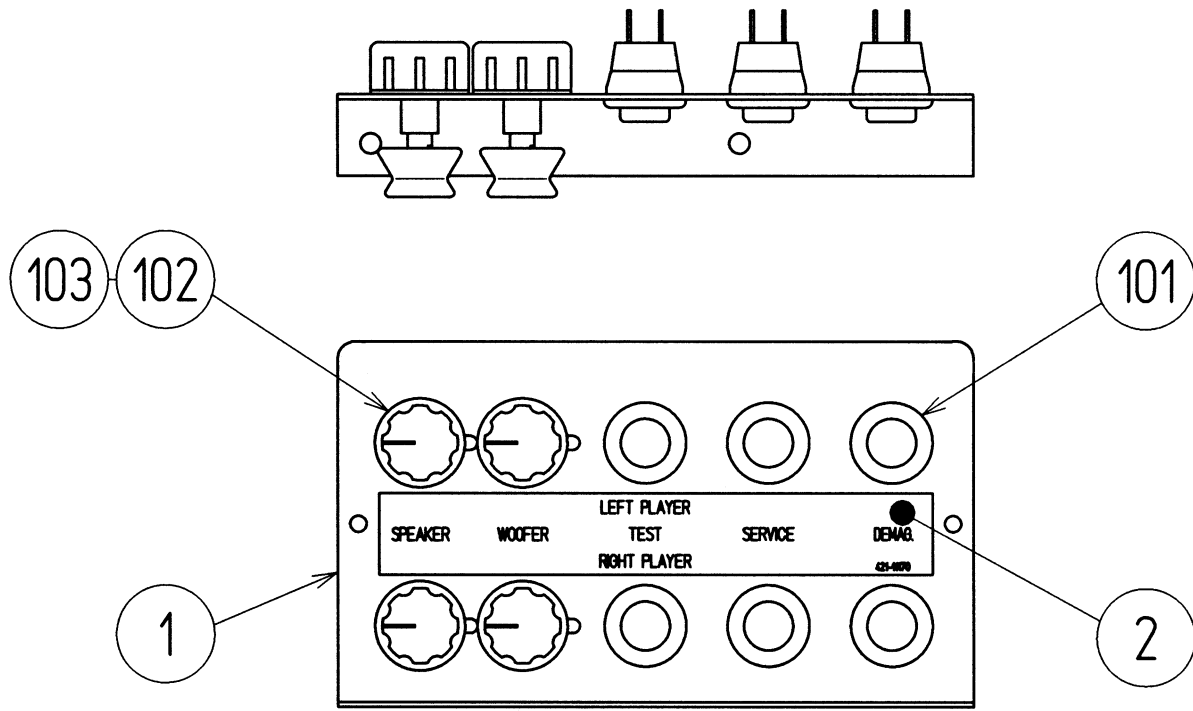


⑤ ASSY COINCHUTE TOWER (POD-0300)

(D-2/2)

ITEM NO.	PART NO.	DESCRIPTION
1	FRI-0350	SW UNIT
2	APC-0301X	COINCHUTE TOWER
3	DRT-0301X	COIN METER BRKT
4	DP-1167	TNG LKG
5	253-5366	CASH BOX
6	421-6591-01	STICKER COIN METER
7	421-7501-02	STICKER 6.3V 0.15A
8	DYN-0303X	STICKER COIN ENTRY
9	DYN-0305	TOWER BRKT
10	105-5202	HOLE COVER
11	DYN-0304	HOLE COVER
12	POD-0301	CONN PNL TOWER
15	421-9107-92-015	STICKER UNIT WEIGHT 15KG
101	220-5237-92- ~ 220-5482-91- ~	ASSY C.C. 2DR ~ ASSY C.C. 2DR ~
102	220-5643-01	MAG CNTR DC5V 6P WH MZ-674-D04
103	220-5643-02	MAG CNTR DC5V 6P YE MZ-674-D05
104	220-5574	CAM LOCK W/KEYS
105	220-5575	CAM LOCK MASTER W/O KEY
106	280-5009-01	CORD CLAMP 21
107	280-5275-SR10	CORD CLAMP SR10
108	601-0460	PLASTIC TIE BELT 100 MM
109	310-5029-F20	SUMITUBE F F 20MM
110	601-5962-045	BUSH 3.2T
201	000-P00412-W	M SCR PH W/FS M4 X 12
202	000-T00408-0B	M SCR TH BLK M4 X 8
203	010-P00408-F	S-TITE SCR PH W/F M4 X 8
204	000-P00408	M SCR PH M4 X 8
205	060-S00400	SPR WSHR M4
206	060-F00400	FLT WSHR M4
301	600-6373-50	WIRE HARN COIN LEFT
302	600-6373-51	WIRE HARN COIN RIGHT
304	600-7076-073	WIRE HARN EARTH COIN CHUTE
305	600-6972-0130	WIRE HARN EARTH ID5 0130MM
312	FRI-61054	WIRE HARN EXT WOOFER VR L C
313	FRI-61055	WIRE HARN EXT WOOFER VR R C
314	FRI-61056	WIRE HARN EXT COIN L D
315	FRI-61057	WIRE HARN EXT COIN R D
316	FRI-61058	WIRE HARN EXT COIN L E
317	FRI-61059	WIRE HARN EXT COIN R E

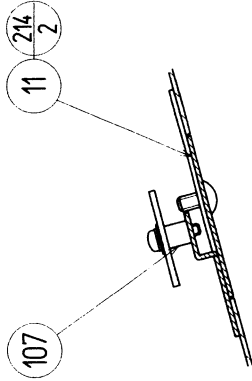
⑥ SW UNIT (FRI-0350)



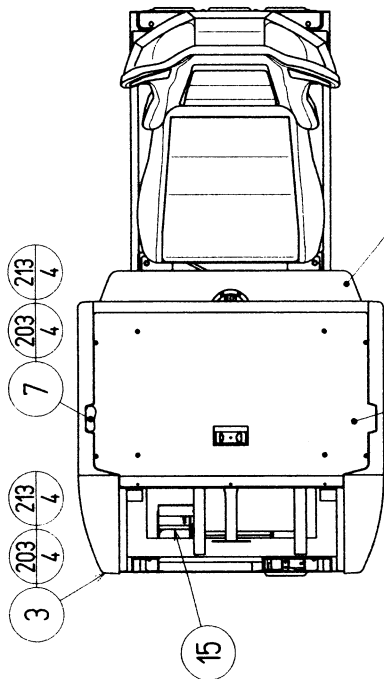
ITEM NO.	PART NO.	DESCRIPTION
1	SPG-0351X	SW BRKT
2	421-11170	STICKER SW UNIT FRI
101	509-5028	SW PB 1M
102	220-5179	VOL CONT B-5K OHM
103	601-0042	KNOB 22 MM
104	601-0460	PLASTIC TIE BELT 100 MM
105	310-5029-F20	SUMITUBE F F 20MM
301	600-6373-53	WIRE HARN TEST & SERVICE LEFT
302	600-7076-055	WIRE HARN VOL LEFT YE
303	600-6373-67	WIRE HARN TEST & SERVICE RIGHT
304	600-7076-065	WIRE HARN VOL RIGHT BL
305	600-6873-064	WIRE HARN S.VOLUME 1P
306	600-6873-065	WIRE HARN S.VOLUME 2P

⑦ ASSY COCKPIT 1P (HRT-1000)

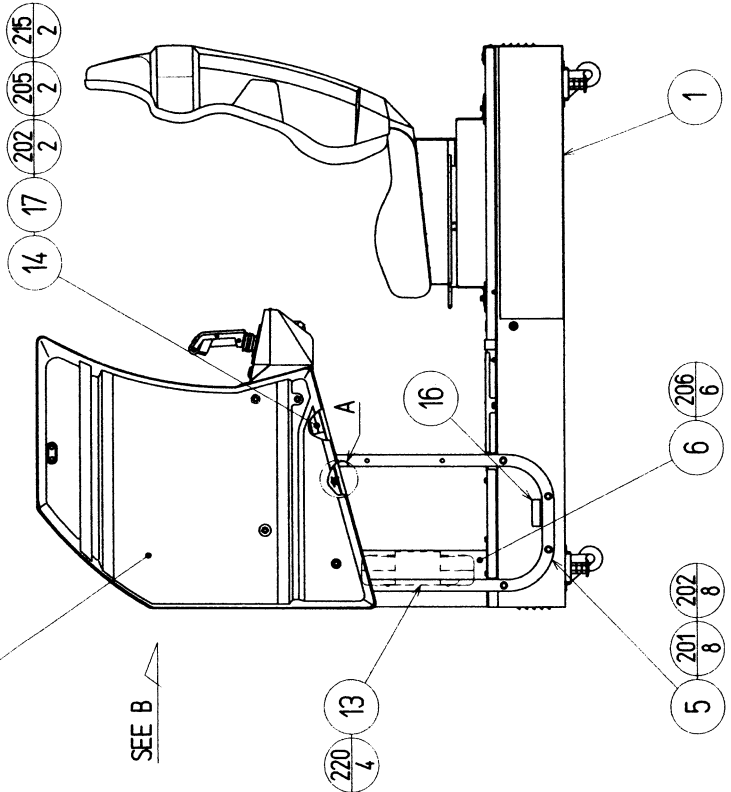
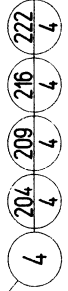
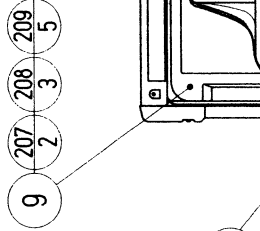
(D-1/2)



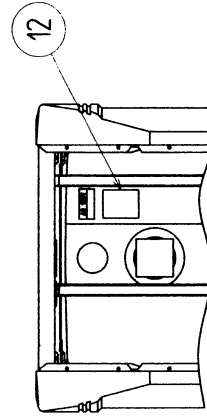
Details of PART A



⑩① ⑩④ ⑩⑤ ⑩⑥ ⑩⑨ ⑩⑩ ⑩⑪ ⑩⑫
(For ADJUSTMENT)



SEE B



SEE B

TORQUE
M8 19.5N•m
M4(M SCR) Under 1.0N•m

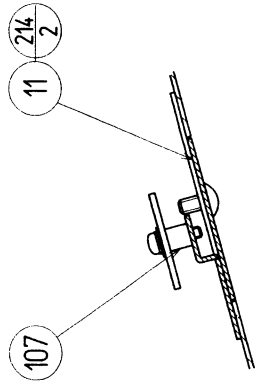
7 ASSY COCKPIT 1P (HRT-1000)

(D-2/2)

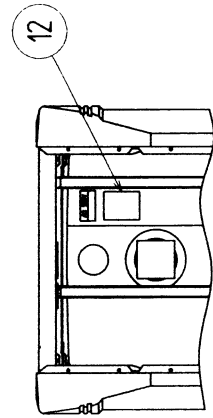
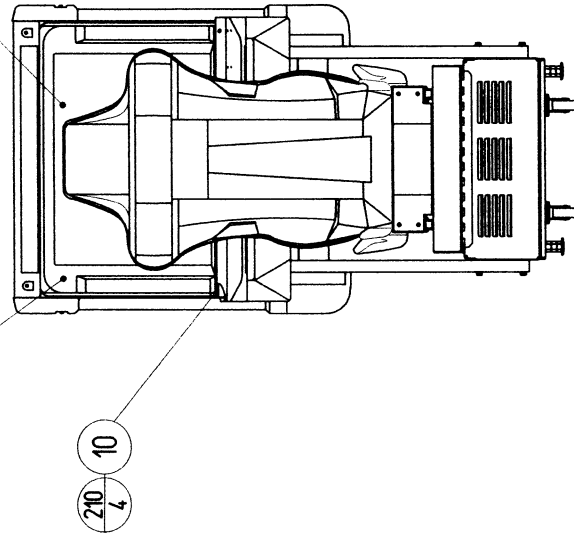
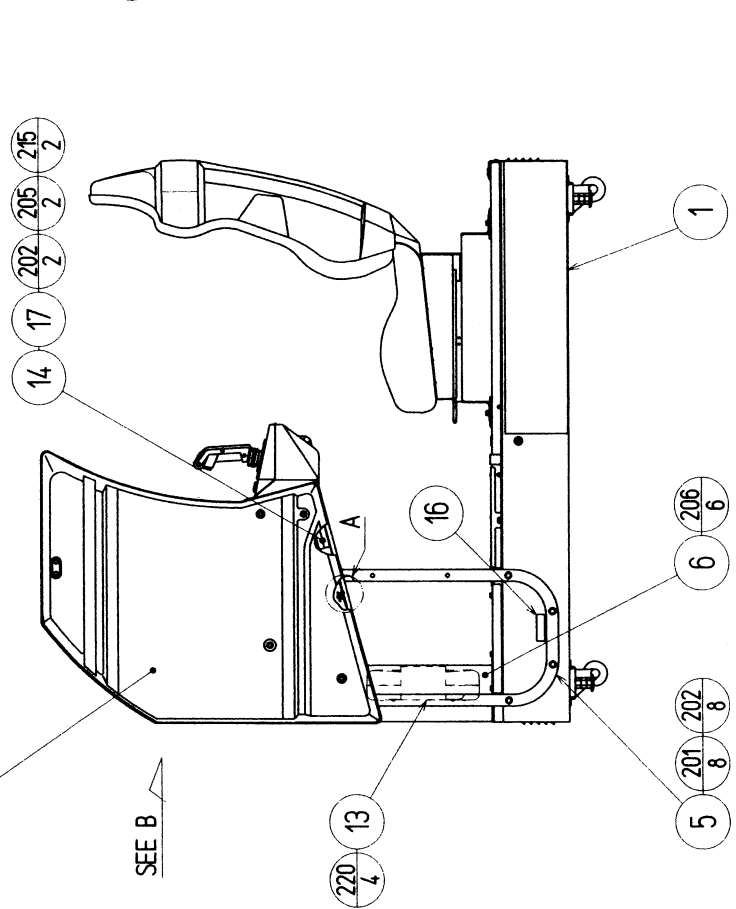
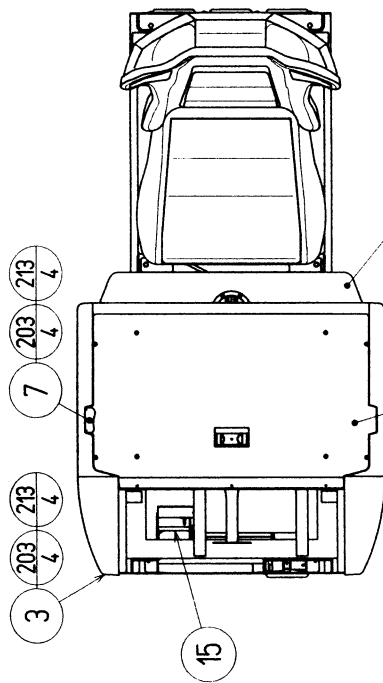
ITEM NO.	PART NO.	DESCRIPTION
1	HRT-1100	ASSY MAIN BASE 1P
2	HRT-1030	ASSY MONITOR COVER L 1P
3	HRT-1040	ASSY MONITOR COVER R 1P
4	HRT-2000	ASSY CTRL PNL
5	POD-1023	MONITOR STAND
6	POD-1024	WIRE COVER BOX
7	POD-1021	MONITOR SUPPORT
8	SPG-1008X	ROOF LID
9	POD-1022	MONITOR MASK
10	GWS-1001	MASK HOLDER
11	INY-1015	CRT ADJUST PANEL
12	440-DS0013XEG	STICKER D MONITOR ENG
13	POD-1300	ASSY WOOFER
14	HRT-4600	ASSY CONTROL BD TWIN
15	POD-1025	CUSHION SPONGE
17	MRF-1015	CTRL BD INGRESS COVER
101	200-5927	ASSY CLR DSPL 29TYPE 31K 2934
102	280-5009-01	CORD CLAMP 21
103	280-5275-SR10	CORD CLAMP SR10
104	280-5112	BUSH FOR TV
105	280-5113	COLLAR FOR TV
106	280-5114	SPACER 6.4-25Å~2
107	280-5185-6	SPACER TUBE L=6
108	601-6231-C100	EDGING NEW TYPE
109	270-5117	FERRITE CORE
110	270-5155	FERRITE CORE
111	270-5052-04	L.FILTER D
112	601-0460	PLASTIC TIE BELT 100MM
113	601-0459	TIE-BELT 150MM
201	030-000850-SB	HEX BLT W/S BLK M8 X 50
202	068-852216-0B	FLT WSHR BLK 8.5-22 X 1.6
203	030-000840-SB	HEX BLT W/S BLK M8 X 40
204	060-F00800-0B	FLT WSHR BLK M8
205	FAS-290017	HEX SKT SCR BH BLK M8 X 30
206	000-P00408-WB	M SCR PH W/FS BLK M4 X 8
207	000-T00530-0B	M SCR TH BLK M5 X 30
208	000-T00512-0B	M SCR TH BLK M5 X 12
209	068-552016-0B	FLT WSHR BLK 5.5-20 X 1.6
210	000-F00508	M SCR FH M5 X 8
211	050-F00600	FLG NUT M6
212	000-P00312-WB	M SCR PH W/FS BLK M3 X 12
213	DYN-1019	FLT WASHER M8
214	000-T00408-0B	M SCR TH BLK M4 X 8
215	060-S00800-0B	SPR WSHR BLK M8
216	030-000820-SB	HEX BLT W/S BLK M8 X 20
217	050-H00400	HEX NUT M4
218	060-S00400	SPR WSHR M4
219	060-F00400	FLT WSHR M4
220	050-F00500	FLG NUT M5
221	000-P00408	M SCR PH M4 X 8
222	008-T00516-0B	TMP PRF SCR TH BLK M5 X 16
301	HRT-6001	ASSY WIRE AC COCKPIT
302	HRT-6002	ASSY WIRE DC COCKPIT

8 ASSY COCKPIT 2P (HRT-1500)

(D-1/2)



Details of PART A



SEE B

TORQUE
M8 19.5N•m
M4(M.SCR) Under 1.0N•m

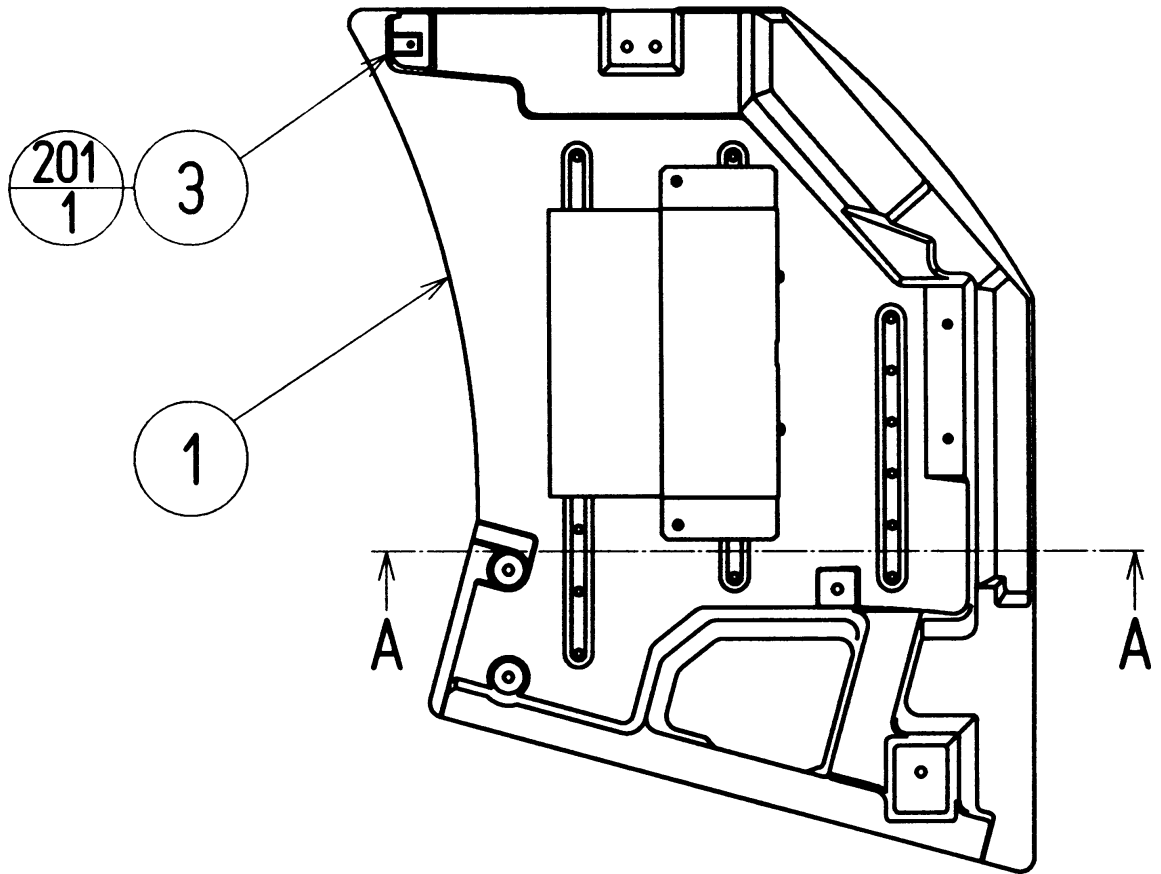
SEE B

⑧ ASSY COCKPIT 2P (HRT-1500)

(D-2/2)

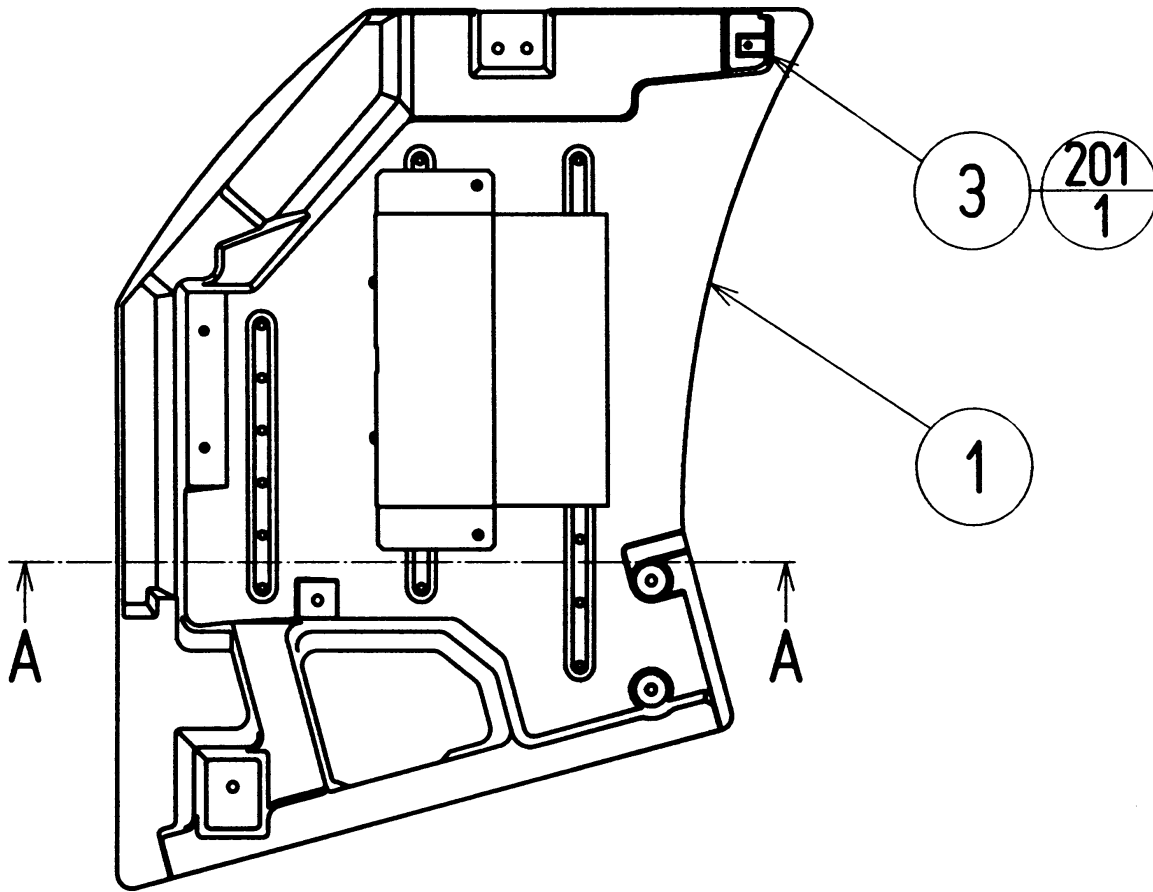
ITEM NO.	PART NO.	DESCRIPTION
1	HRT-1200	ASSY MAIN BASE 2P
2	HRT-1050	ASSY MONITOR COVER L 2P
3	HRT-1060	ASSY MONITOR COVER R 2P
4	HRT-2000	ASSY CTRL PNL
5	POD-1023	MONITOR STAND
6	POD-1024	WIRE COVER BOX
7	POD-1021	MONITOR SUPPORT
8	SPG-1008X	ROOF LID
9	POD-1022	MONITOR MASK
10	GWS-1001	MASK HOLDER
11	INY-1015	CRT ADJUST PANEL
12	440-DS0013XEG	STICKER D MONITOR ENG
13	POD-1300	ASSY WOOFER
14	HRT-4600	ASSY CONTROL BD TWIN
15	POD-1025	CUSHION SPONGE
17	MRF-1015	CTRL BD INGRESS COVER
101	200-5927	ASSY CLR DSPL 29TYPE 31K 2934
102	280-5009-01	CORD CLAMP 21
103	280-5275-SR10	CORD CLAMP SR10
104	280-5112	BUSH FOR TV
105	280-5113	COLLAR FOR TV
106	280-5114	SPACER 6.4-25Å~2
107	280-5185-6	SPACER TUBE L=6
108	601-6231-C100	EDGING NEW TYPE
109	270-5117	FERRITE CORE
110	270-5155	FERRITE CORE
111	270-5052-04	L.FILTER D
112	601-0460	PLASTIC TIE BELT 100MM
113	601-0459	TIE-BELT 150MM
201	030-000850-SB	HEX BLT W/S BLK M8 X 50
202	068-852216-0B	FLT WSHR BLK 8.5-22 X 1.6
203	030-000840-SB	HEX BLT W/S BLK M8 X 40
204	060-F00800-0B	FLT WSHR BLK M8
205	FAS-290017	HEX SKT SCR BH BLK M8 X 30
206	000-P00408-WB	M SCR PH W/FS BLK M4 X 8
207	000-T00530-0B	M SCR TH BLK M5 X 30
208	000-T00512-0B	M SCR TH BLK M5 X 12
209	068-552016-0B	FLT WSHR BLK 5.5-20 X 1.6
210	000-F00508	M SCR FH M5 X 8
211	050-F00600	FLG NUT M6
212	000-P00312-WB	M SCR PH W/FS BLK M3 X 12
213	DYN-1019	FLT WASHER M8
214	000-T00408-0B	M SCR TH BLK M4 X 8
215	060-S00800-0B	SPR WSHR BLK M8
216	030-000820-SB	HEX BLT W/S BLK M8 X 20
217	050-H00400	HEX NUT M4
218	060-S00400	SPR WSHR M4
219	060-F00400	FLT WSHR M4
220	050-F00500	FLG NUT M5
221	000-P00408	M SCR PH M4 X 8
222	008-T00516-0B	TMP PRF SCR TH BLK M5 X 16
301	HRT-6001	ASSY WIRE AC COCKPIT
302	HRT-6002	ASSY WIRE DC COCKPIT

⑨ ASSY MONITOR COVER L 1P (HRT-1030)



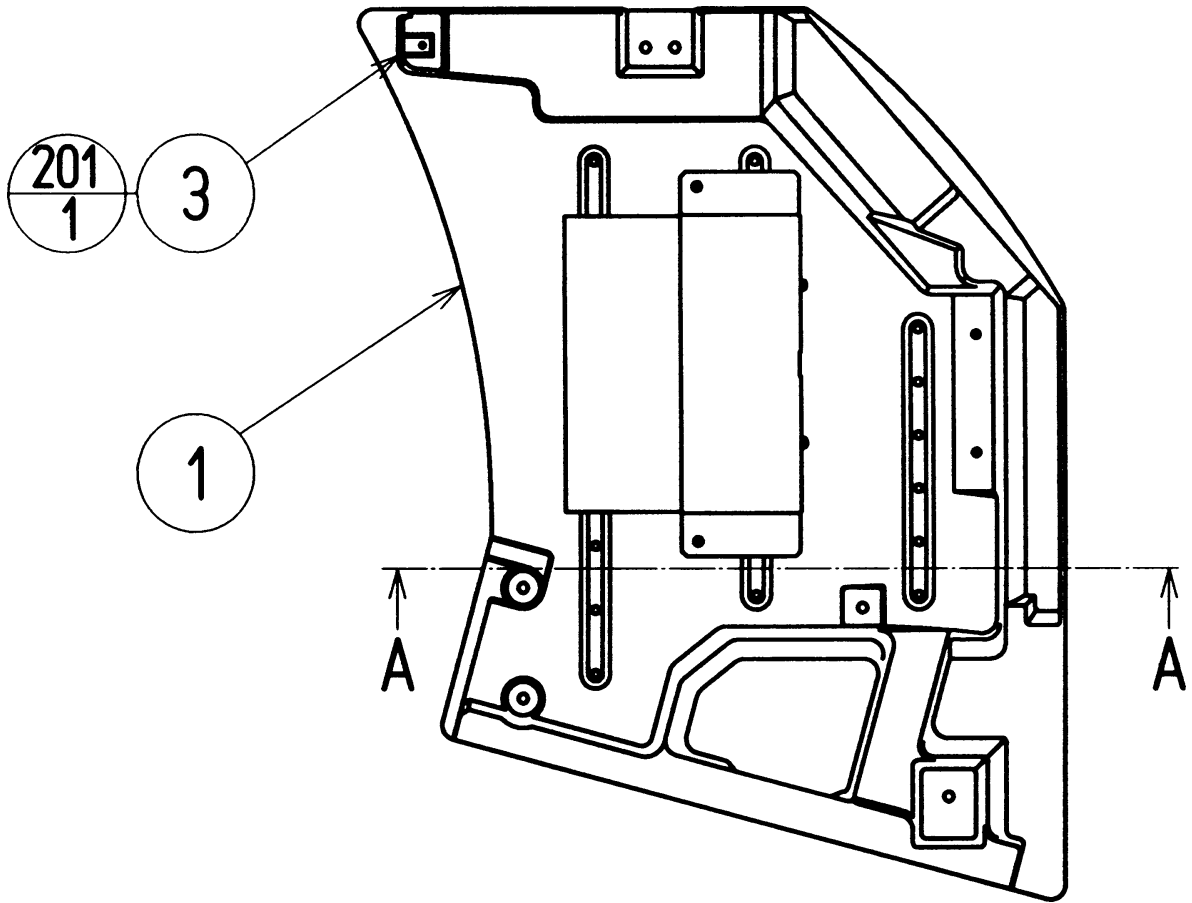
ITEM NO.	PART NO.	DESCRIPTION
1	HRT-1031	COVER PANEL L 1P
3	DYN-1032	MASK BRKT
201	000-P00408-W	M SCR PH W/FS M4 X 8

⑩ ASSY MONITOR COVER R 1P (HRT-1040)



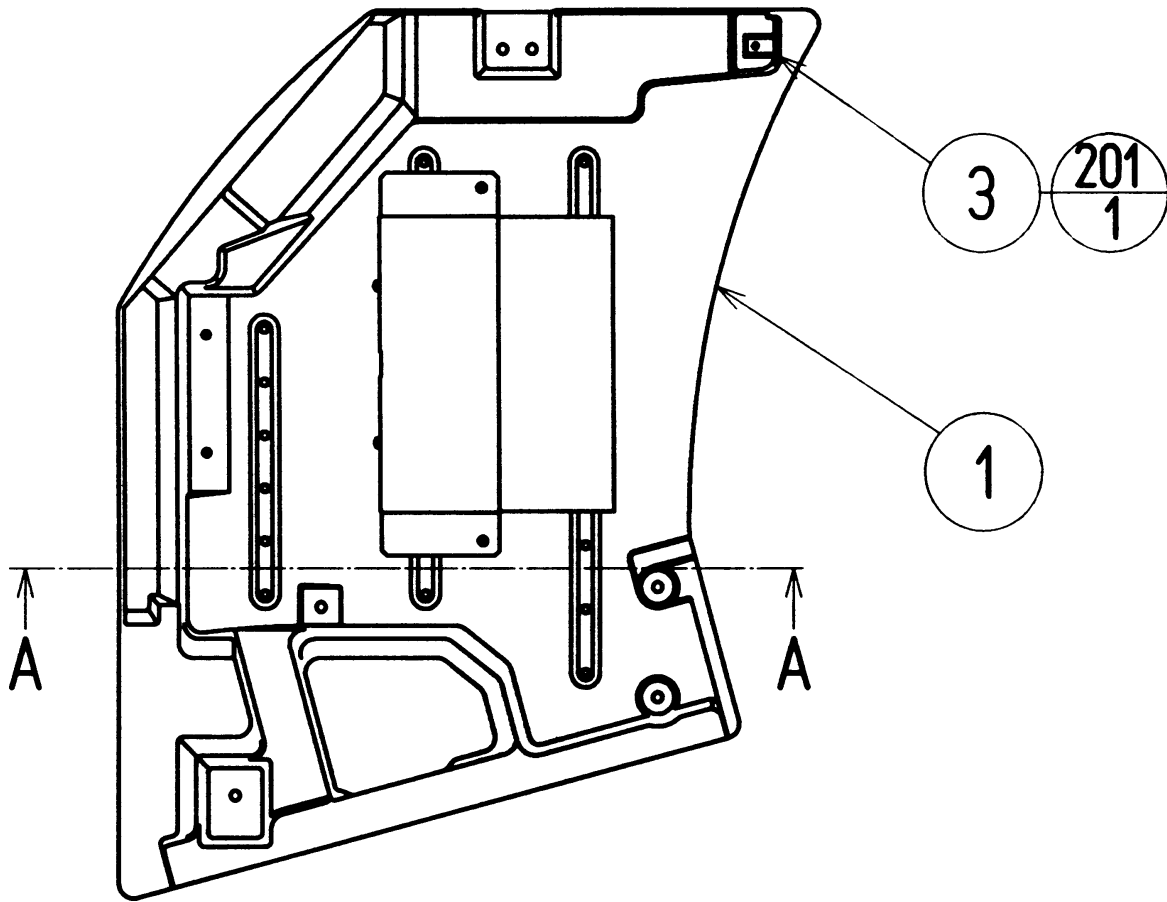
ITEM NO.	PART NO.	DESCRIPTION
1	HRT-1041-A	COVER PANEL R BLANK
3	DYN-1032	MASK BRKT
201	000-P00408-W	M SCR PH W/FS M4 X 8

⑪ ASSY MONITOR COVER L 2P (HRT-1050)



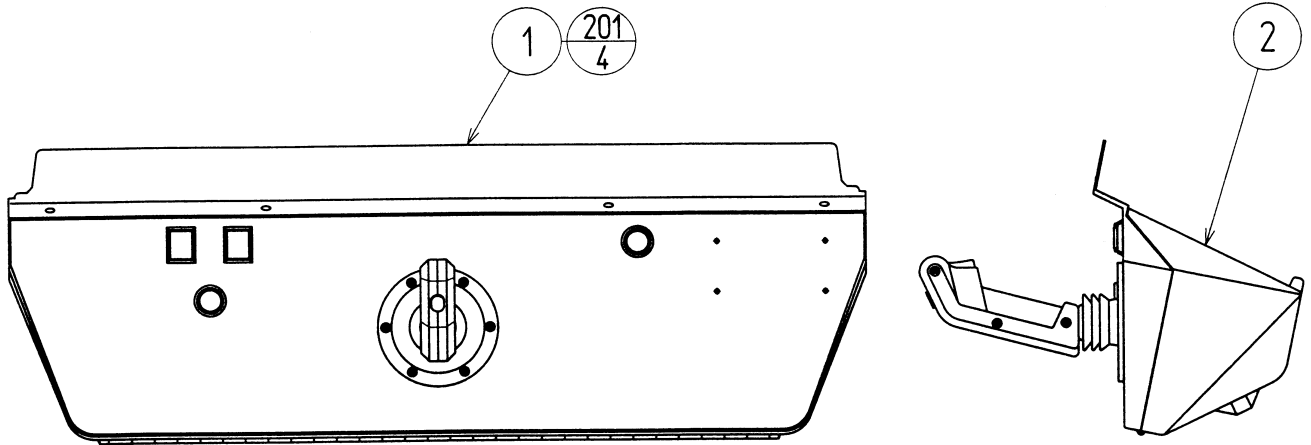
ITEM NO.	PART NO.	DESCRIPTION
1	HRT-1031-A	COVER PANEL L BLANK
3	DYN-1032	MASK BRKT
201	000-P00408-W	M SCR PH W/FS M4 X 8

⑫ ASSY MONITOR COVER R 2P (HRT-1060)



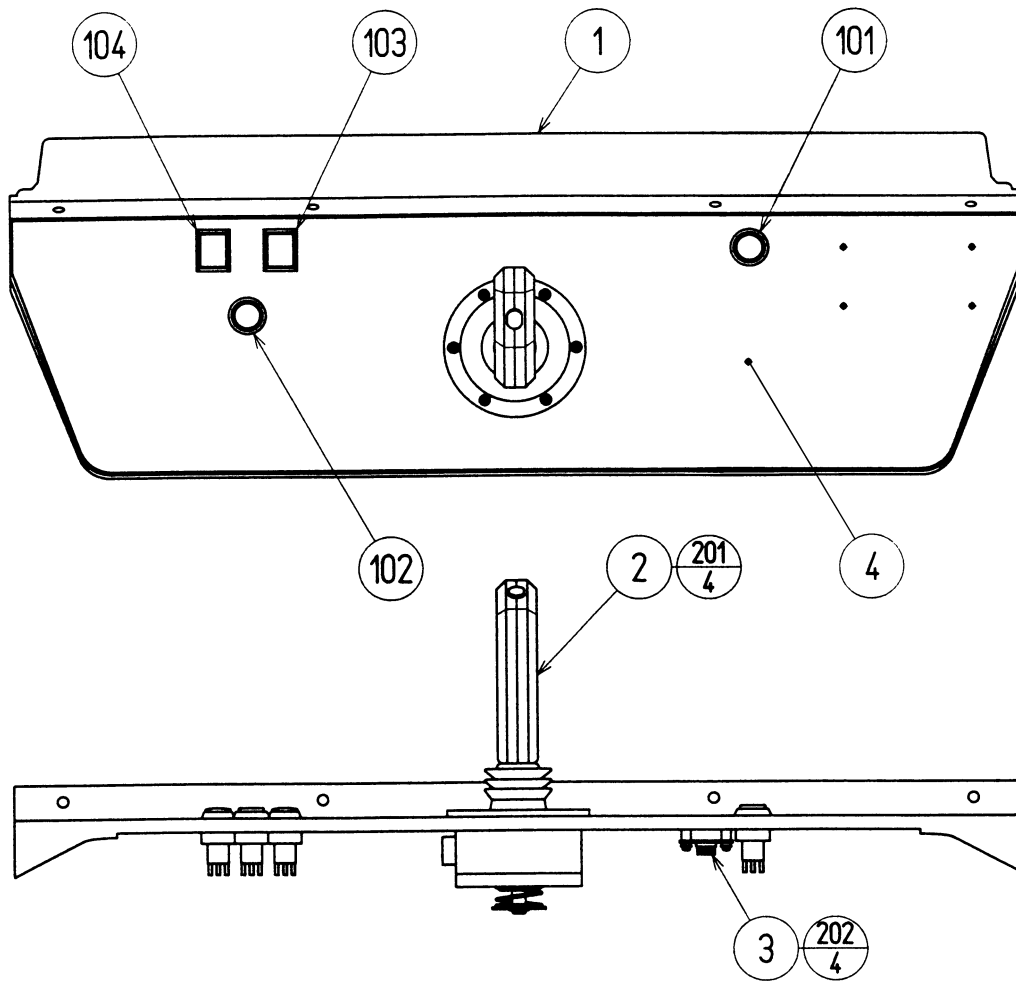
ITEM NO.	PART NO.	DESCRIPTION
1	HRT-1041	COVER PANEL R 2P
3	DYN-1032	MASK BRKT
201	000-P00408-W	M SCR PH W/FS M4 X 8

⑬ ASSY CTRL PNL (HRT-2000)



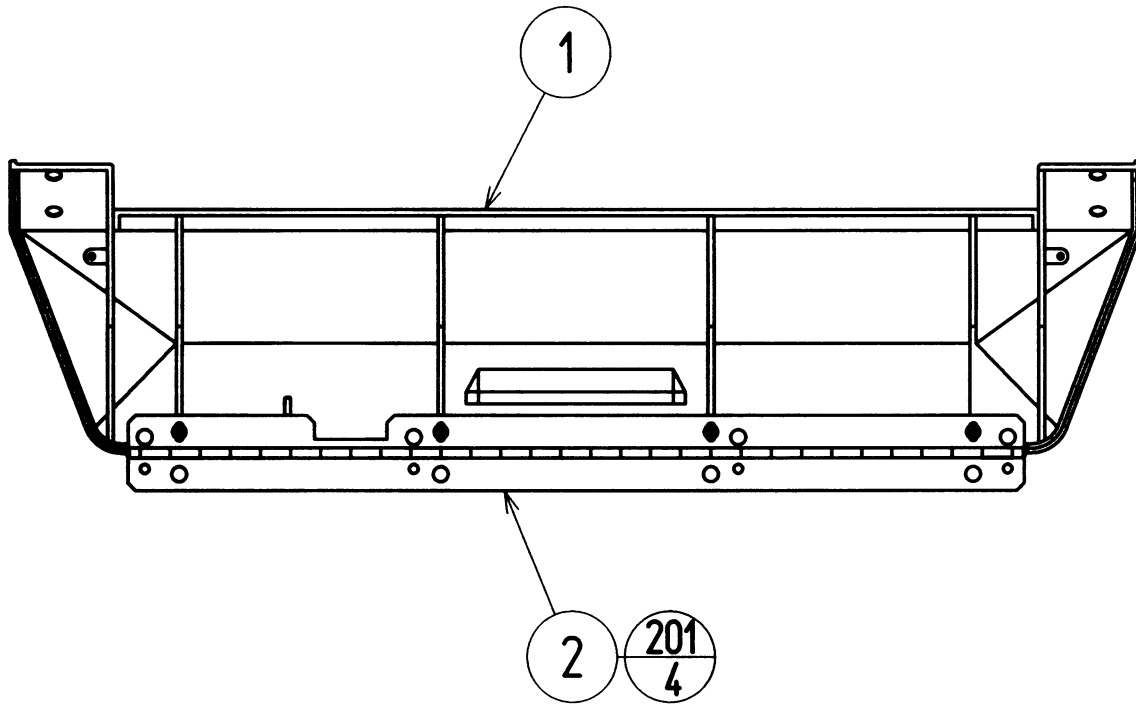
ITEM NO.	PART NO.	DESCRIPTION
1	HRT-2010	ASSY CTRL PNL UPPER
2	HRT-2020	ASSY CTRL PNL LOWER
101	280-5009-01	CORD CLAMP 21
102	310-5033-15-020	SPIRAL TUBE 15 020CM
201	000-P00410-W	M SCR PH W/FS M4 X 10
202	050-H00400	HEX NUT M4
203	060-S00400	SPR WSHR M4
204	060-F00400	FLT WSHR M4
301	600-6972-0150	WIRE HARN EARTH ID5 0150MM

⑭ ASSY CTRL PNL UPPER (HRT-2010)



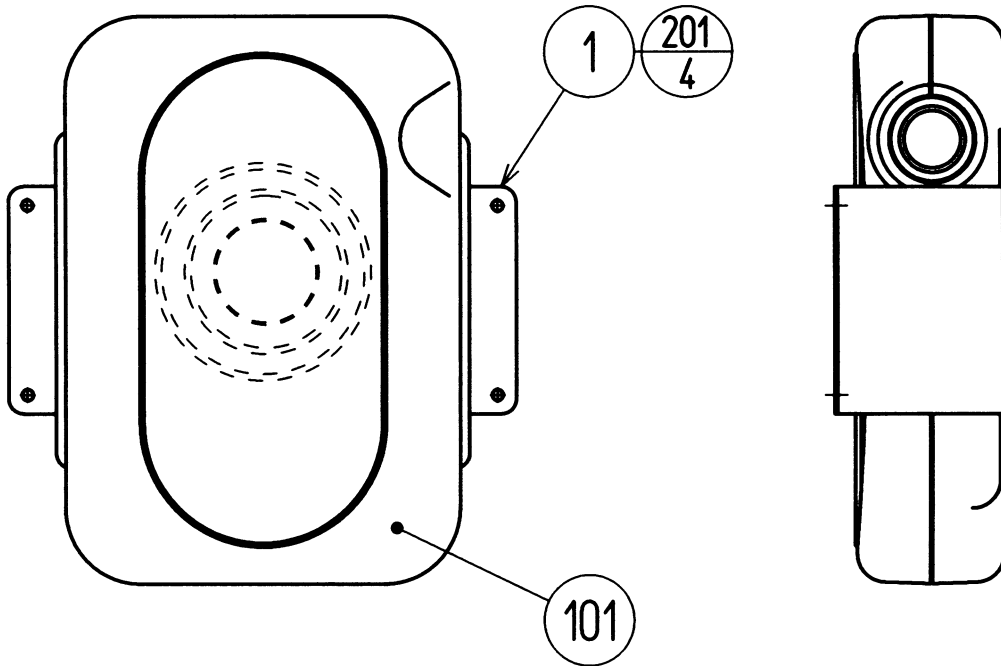
ITEM NO.	PART NO.	DESCRIPTION
1	HRT-2011-A	CTRL PNL UPPER BLANK
2	610-0619-91	ASSY ANALOG JOYSTICK MRF
3	839-1187	AMP BD FOR ANALOG JOYSTICK
4	HRT-2011-B	CTRL PNL SH HRT TWIN
101	509-5838-Y	SW PB LW1L-15Y-TK1670
102	509-5838-R	SW PB LW1L-15R-TK1670
103	509-5495-04	PUSH BUTTON RED
104	509-5495-05	PUSH BUTTON BLUE
105	280-5009-01	CORD CLAMP 21
106	280-5275-SR10	CORD CLAMP SR10
107	601-0460	PLASTIC TIE BELT 100 MM
201	050-F00500	FLG NUT M5
202	000-P00320-W	M SCR PH W/FS M3 X 20
301	HRT-60051	WH SW&LAMP
302	HRT-60052	WH ANALOG BD IN
303	HRT-60053	WH ANALOG BD OUT

⑮ ASSY CTRL PNL LOWER (HRT-2020)



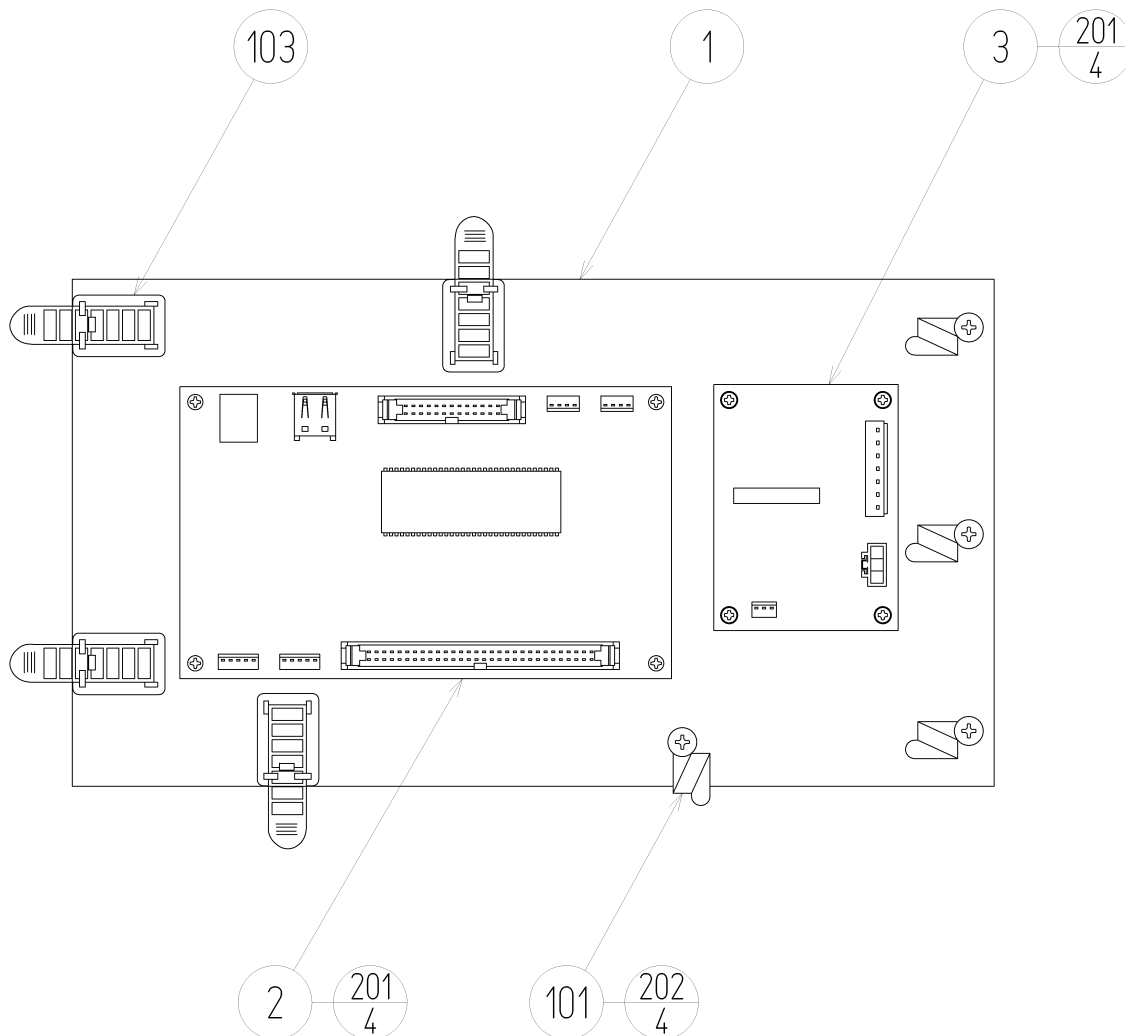
ITEM NO.	PART NO.	DESCRIPTION
1	HRT-2021	CTRL PNL LOWER
2	MSB-2022Y	HINGE 600
201	000-P00410-W	M SCR PH W/FS M4 X 10

①⑥ ASSY WOOFER (POD-1300)



ITEM NO.	PART NO.	DESCRIPTION
1	POD-1301	WOOFER BRKT
101	130-5218	SUB WOOFER 4OHM 40W
201	012-P00412	TAP SCR #2 PH 4 X 12

①⑦ ASSY CONTROL BD TWIN (HRT-4600)



ITEM NO.	PART NO.	DESCRIPTION
1	MRF-4401	CTRL BD BASE
2	837-13551-92	I/O CONTROL BD FOR JVS
3	839-1073-03	SSR BD 1 DC 2A
101	280-5207	HARNESS LUG CC-1005
102	601-0460	PLASTIC TIE BELT 100 MM
103	280-6600	CORD CLAMP TL-20W
201	011-P00325	TAP SCR PH 3 X 25
202	011-T03512	TAP SCR TH 3.5 X 12
301	HRT-60021	WH INPUT OUTPUT
302	HRT-60022	WH ANALOG IN
303	HRT-60023	WH SSR IN DC12V
304	HRT-60024	WH SSR OUT DC12V
305	POD-61022	WIRE HARN I/O BD PWR

⑱ ASSY WIRE AC COCKPIT (HRT-6001)

ASSY WIRE AC COCKPIT (HRT-6001) is comprised of the following wire harnesses.
An ASSY DRG. is unavailable.

ITEM NO.	PART NO.	DESCRIPTION
101	601-0460	PLASTIC TIE BELT 100 MM
301	HRT-60011	WH AC100V EXT
302	600-6972-0300	WIRE HARN EARTH ID5 0300MM
303	600-6972-1250	WIRE HARN EARTH ID5 1250MM
304	POD-61056	WIRE HARN EARTH COCKPIT

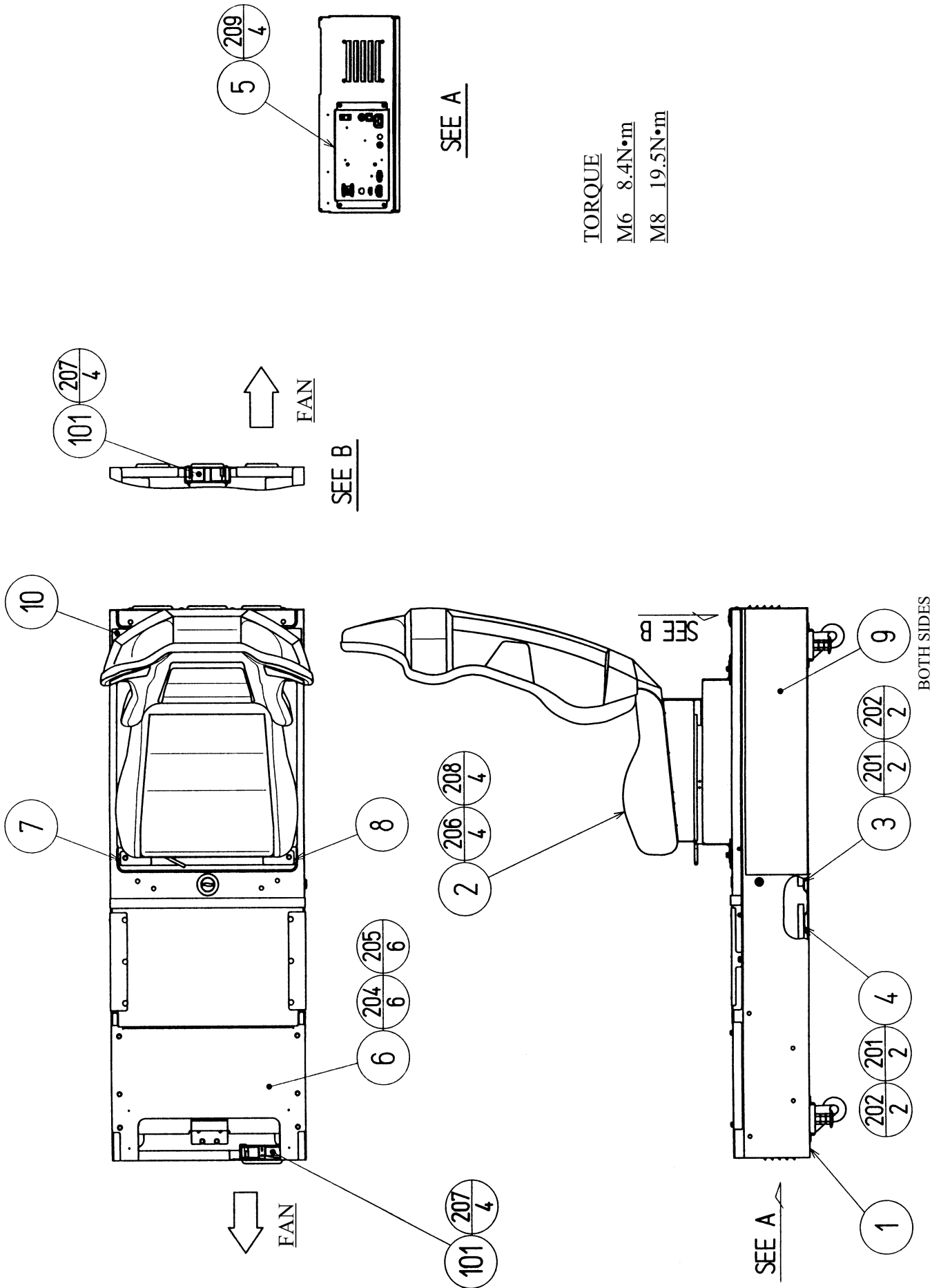
⑲ ASSY WIRE DC COCKPIT (HRT-6002)

ASSY WIRE DC COCKPIT (HRT-6002) is comprised of the following wire harnesses.
An ASSY DRG. is unavailable.

ITEM NO.	PART NO.	DESCRIPTION
101	601-0460	PLASTIC TIE BELT 100 MM
301	HRT-60012	WH FRONT SPEAKER EXT
302	HRT-60013	WH BILLBOARD CONTROL
303	POD-61015	WIRE HARN DC PWR EXT B
304	POD-61016	WIRE HARN COIN CHUTE EXT
305	600-6972-1050	WIRE HARN EARTH ID5 1050MM
306	600-6972-1600	WIRE HARN EARTH ID5 1600MM

②0 ASSY MAIN BASE 1P (HRT-1100)

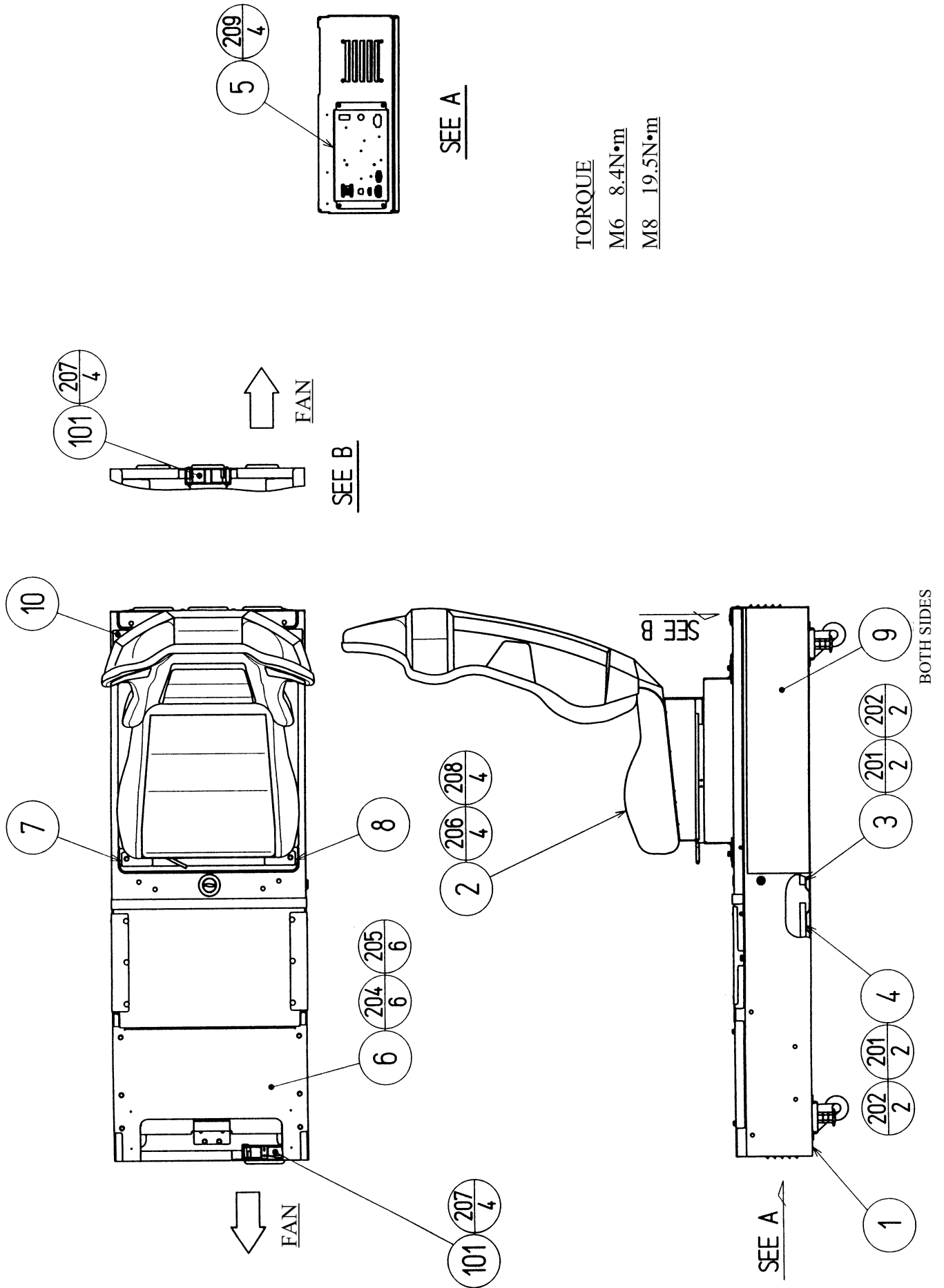
(D-1/2)



②0 ASSY MAIN BASE 1P (HRT-1100)

(D-2/2)

ITEM NO.	PART NO.	DESCRIPTION
1	POD-1120	ASSY BASE BOX
2	HRT-1600	ASSY SEAT
3	HRT-4000	ASSY MAIN BD BASE
4	HRT-4100	ASSY PWR SPLY
5	HRT-0400	AC UNIT MAIN
6	VOT-1101X	FOOT BASE
7	RAL-2007	RUBBER HOLDER R TWIN
8	RAL-2008	RUBBER HOLDER L TWIN
9	HRT-1101	STICKER BASE BOX
10	HRT-1102	STICKER BASE LID
101	260-0011-02	AXIAL FLOW FAN AC100V 50-60HZ
102	280-5009-01	CORD CLAMP 21
103	280-5275-SR10	CORD CLAMP SR10
104	280-5169	CORD CLAMP TL-20S
201	000-P00425-W	M SCR PH W/FS M4 X 25
202	068-441616	FLT WSHR 4.4-16 X 1.6
203	050-H00500	HEX NUT M5
204	030-000616-SB	HEX BLT W/S BLK M6 X 16
205	060-F00600-0B	FLT WSHR BLK M6
206	060-F00800-0B	FLT WSHR BLK M8
207	000-P00350-W	M SCR PH W/FS M3 X 50
208	030-000825-SB	HEX BLT W/S BLK M8 X 25
209	000-P00408-WB	M SCR PH W/FS BLK M4 X 8
210	060-S00500	SPR WSHR M5
211	060-F00500	FLT WSHR M5
301	600-6972-0150	WIRE HARN EARTH ID5 0150MM
302	600-6275-0200	ASSY FIBER CABLE 5 0200CM
303	HRT-60002	WH AC100V EXT
304	HRT-6003	ASSY WIRE DC



TORQUE

M6 8.4N•m

M8 19.5N•m

SEE A

SEE B

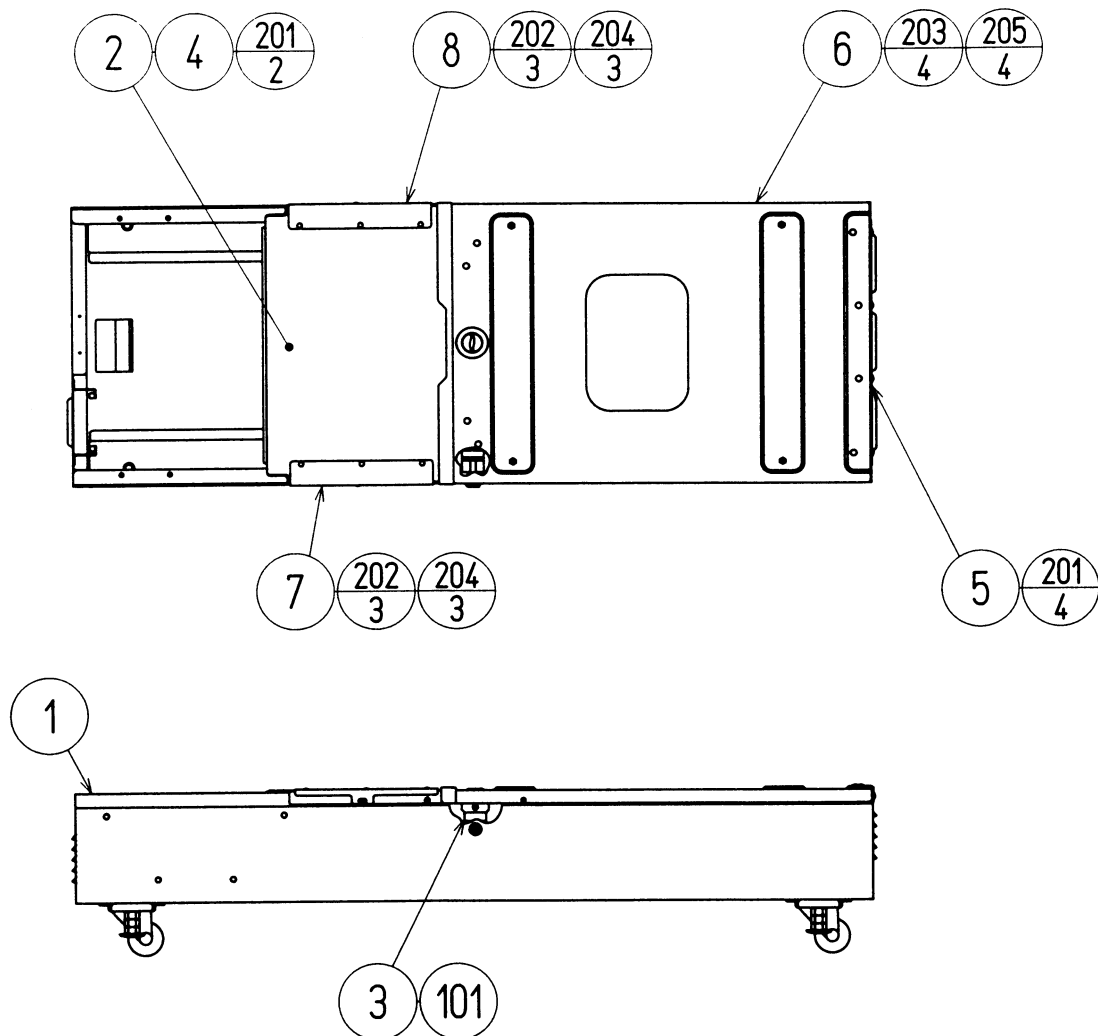
BOTH SIDES

②1 ASSY MAIN BASE 2P (HRT-1200)

(D-2/2)

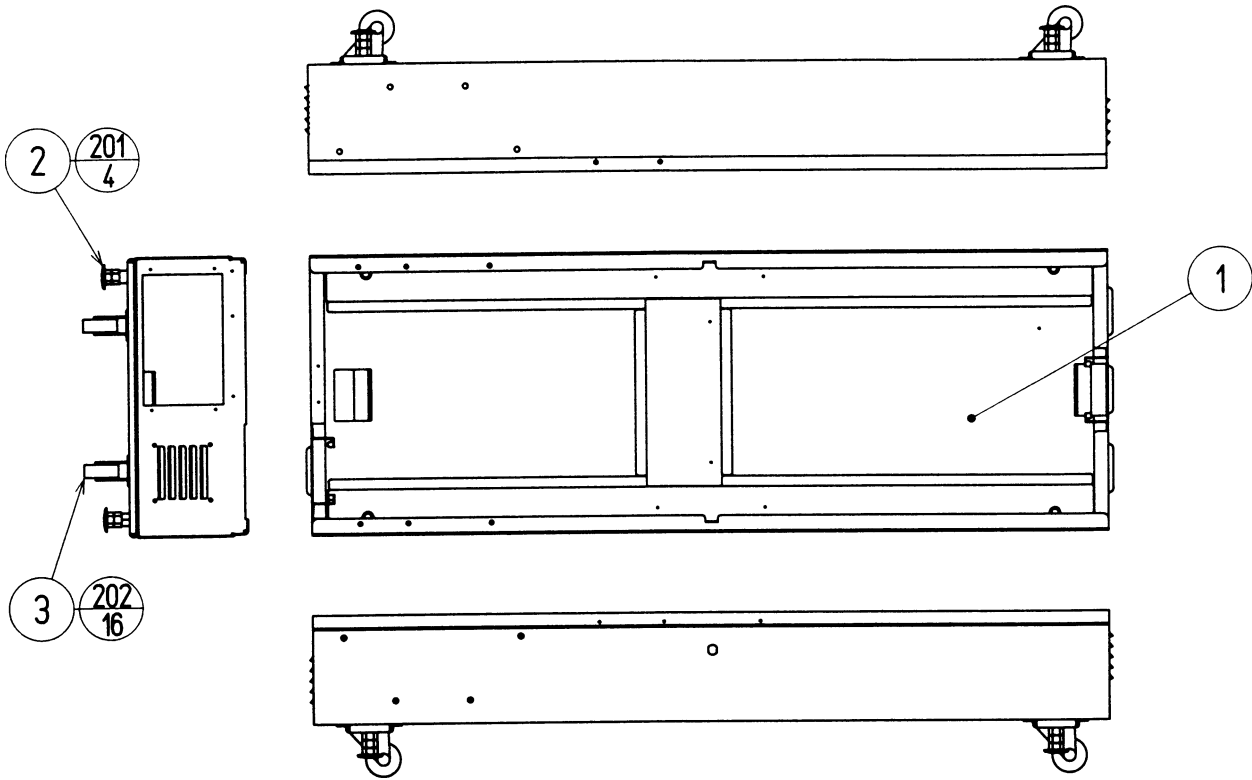
ITEM NO.	PART NO.	DESCRIPTION
1	POD-1120	ASSY BASE BOX
2	HRT-1600	ASSY SEAT
3	HRT-4000	ASSY MAIN BD BASE
4	HRT-4100	ASSY PWR SPLY
5	POD-0700	AC UNIT SUB
6	VOT-1101X	FOOT BASE
7	RAL-2007	RUBBER HOLDER R TWIN
8	RAL-2008	RUBBER HOLDER L TWIN
9	HRT-1101	STICKER BASE BOX
10	HRT-1102	STICKER BASE LID
101	260-0011-02	AXIAL FLOW FAN AC100V 50-60HZ
102	280-5009-01	CORD CLAMP 21
103	280-5275-SR10	CORD CLAMP SR10
104	280-5169	CORD CLAMP TL-20S
201	000-P00425-W	M SCR PH W/FS M4 X 25
202	068-441616	FLT WSHR 4.4-16 X 1.6
203	050-H00500	HEX NUT M5
204	030-000616-SB	HEX BLT W/S BLK M6 X 16
205	060-F00600-0B	FLT WSHR BLK M6
206	060-F00800-0B	FLT WSHR BLK M8
207	000-P00350-W	M SCR PH W/FS M3 X 50
208	030-000825-SB	HEX BLT W/S BLK M8 X 25
209	000-P00408-WB	M SCR PH W/FS BLK M4 X 8
210	060-S00500	SPR WSHR M5
211	060-F00500	FLT WSHR M5
301	600-6972-0150	WIRE HARN EARTH ID5 0150MM
302	600-6275-0200	ASSY FIBER CABLE 5 0200CM
303	HRT-60002	WH AC100V EXT
304	HRT-6003	ASSY WIRE DC

②② ASSY BASE BOX (POD-1120)



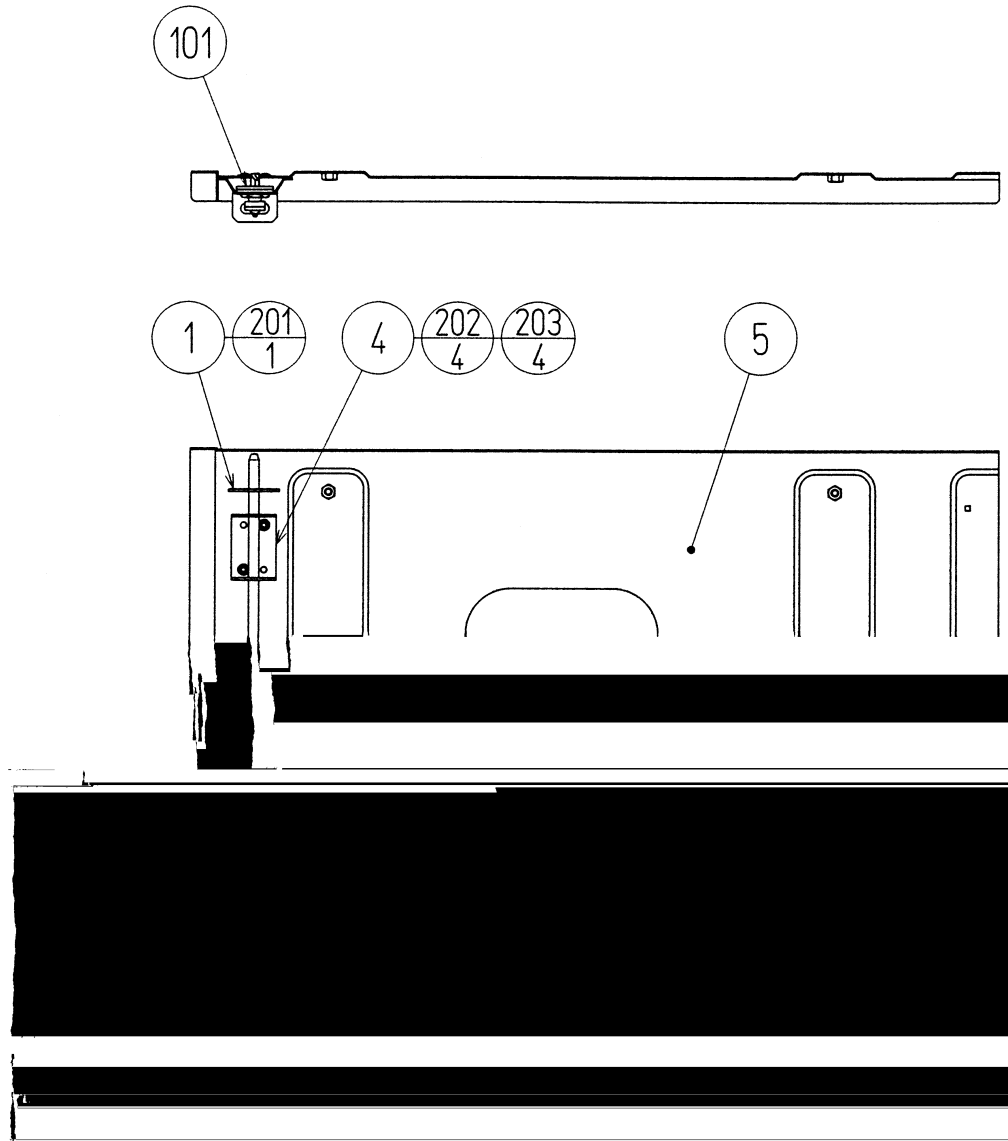
ITEM NO.	PART NO.	DESCRIPTION
1	POD-1121	MAIN BASE
2	DYN-2003	BASE LID F
3	DYN-2004	LOCK TNG
4	SDW-1102X	FLOOR MAT
5	DYN-2006	HINGE 480
6	FRI-1510X	ASSY BASE LID R
7	DYN-2007X	LID EDGE L
8	DYN-2009X	LID EDGE R
101	220-5575	CAM LOCK MASTER W/O KEY
201	000-T00512-0B	M SCR TH BLK M5 X 12
202	031-000414-0C	CRG BLT CRM M4 X 14
203	031-000514-0B	CRG BLT BLK M5 X 14
204	050-F00400	FLG NUT M4
205	050-F00500	FLG NUT M5

23 MAIN BASE (POD-1121)

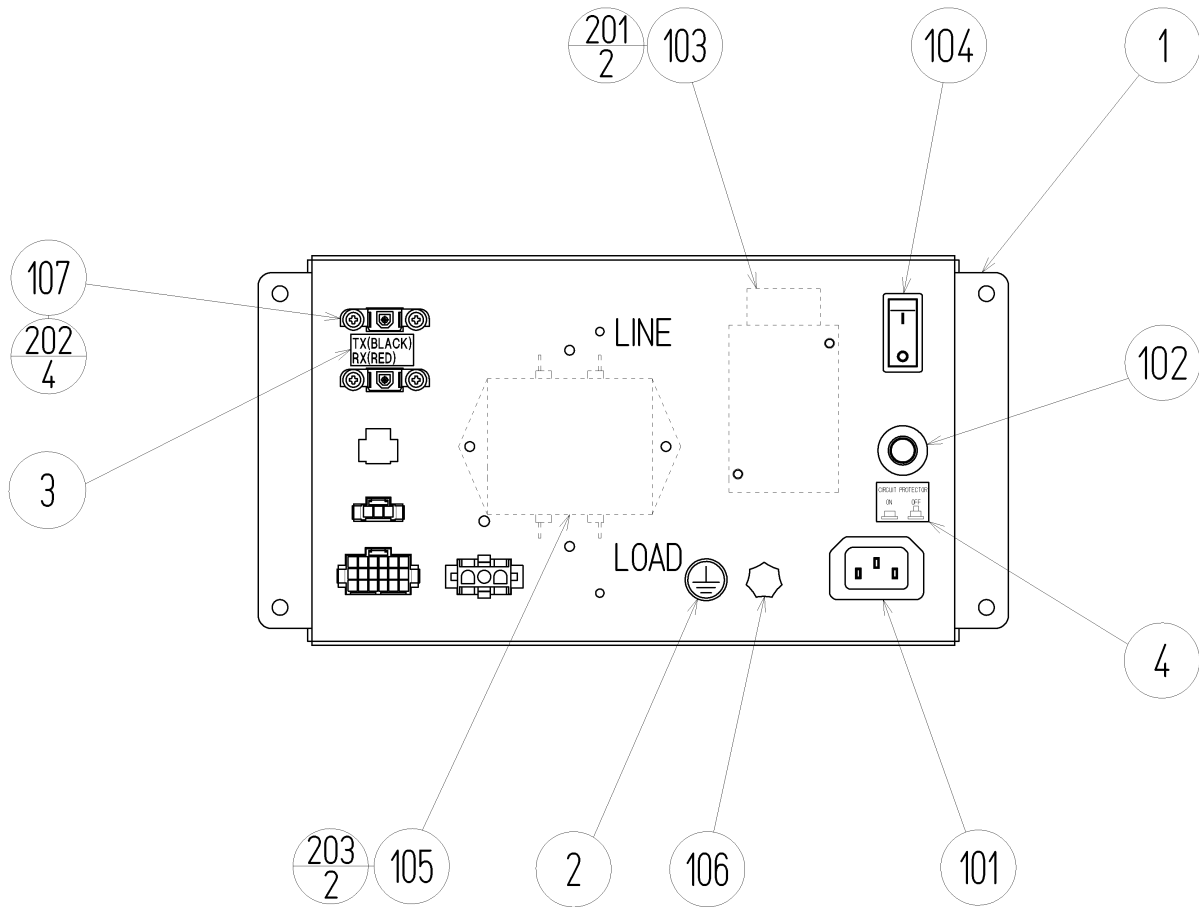


ITEM NO.	PART NO.	DESCRIPTION
1	FRI-1501-A	MAIN BASE BLANK
2	601-5699X	LEG ADJUSTER BOLT M16 X 75
3	601-5471	CASTER
201	050-H01600-0B	HEX NUT BLK M16
202	030-000816-S	HEX BLT W/S M8 X 16

②④ ASSY BASE LID R (FRI-1510X)



ITEM NO.	PART NO.	DESCRIPTION
1	DYN-2011	LOCK ROD A
2	DYN-2012	LOCK ROD B
3	DYN-2013	LOCK ARM
4	DYN-2014	ROD HOLDER
5	FRI-1511X	BASE LID R
101	601-7551	LOCK HANDLE
103	280-5008	CORD CLAMP 15
201	045-C02520	COT PIN 2.5 X 20
202	031-000510-0B	CRG BLT BLK M5 X 10
203	050-F00500	FLG NUT M5

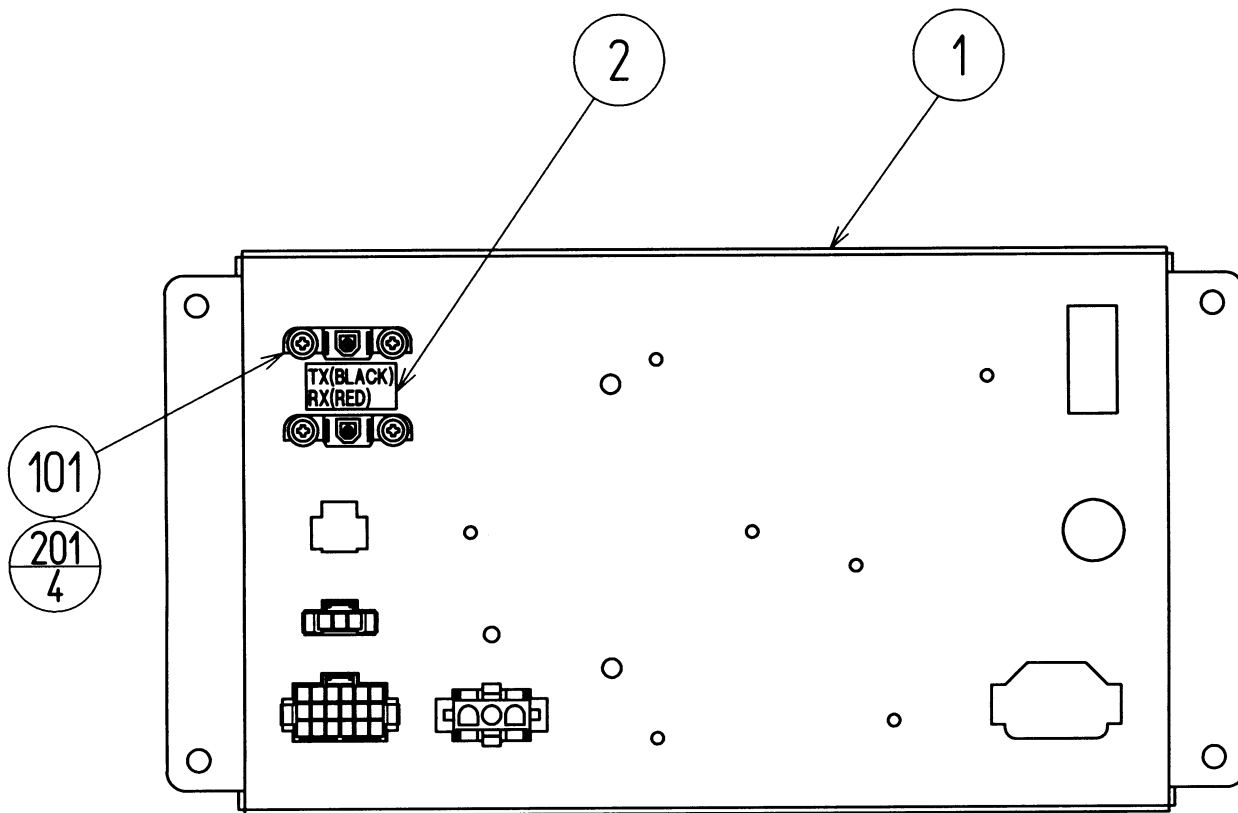


(25) AC UNIT MAIN (HRT-0400)

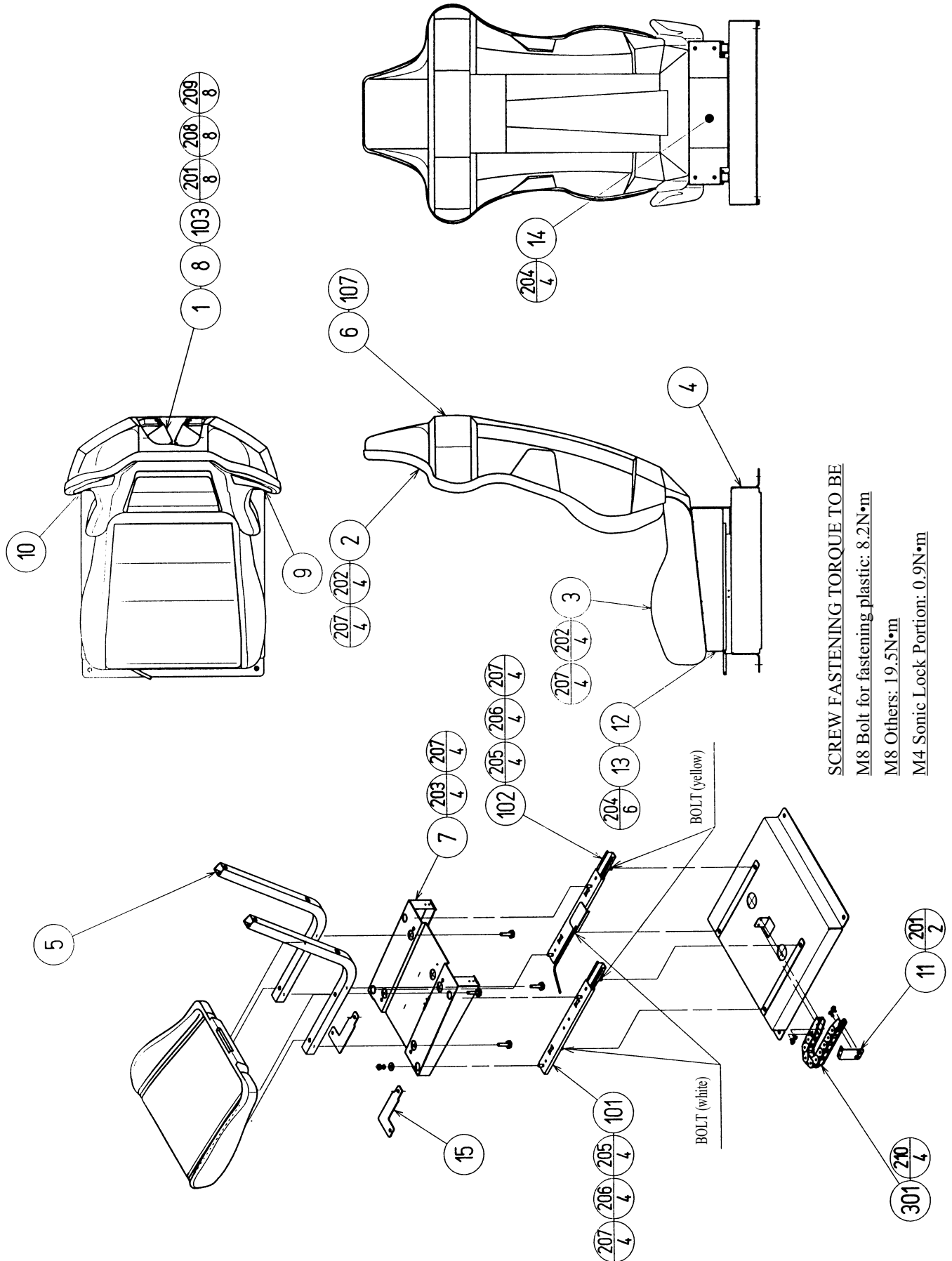
(D-2/2)

ITEM NO.	PART NO.	DESCRIPTION	NOTE
1	APC-1531X	AC BRKT	
2	421-8202	STICKER EARTH MARK	
3	421-11282	STICKER OPT CONN	
4	421-7468-01	STICKER C.P W/PIC	
101	214-0202	AC INLET PANEL TYPE	
102	512-5046-10000	C.P 10000MA CE UL	TAIWAN
	512-5046-5000	C.P 5000MA CE UL	AC 220 ~ 240V AREA
103	450-5126	MAGNET CONTACT S-NIOCX	TAIWAN
	450-5134	MAGNET CONTACT S-NIOCX AC 230V	AC 220 ~ 240V AREA
	450-5133	MAGNET CONTACT S-NIOCX AC 200V	KOREA
104	509-5453-91-V-B	SW ROCKER J8 V-B	
105	270-5022-01	NOISE FILTER 20A GA1B-20	
106	280-0417	TERMINAL BINDING POST BLACK	TAIWAN
		NOT USED	AC 220 ~ 240V AREA
107	211-5479-01	CONN OPT JOINT	
108	310-5029-K20	SUMITUBE F K 20MM	
109	280-5009-01	CORD CLAMP 21	
110	601-0460	PLASTIC TIE BELT 100 MM	
201	000-P00416-WB	M SCR PH W/FS BLK M4 X 16	
202	000-P00312-W	M SCR PH W/FS M3 X 12	
203	000-P00408-WB	M SCR PH W/FS BLK M4 X 8	
204	050-H00400	HEX NUT M4	
205	060-S00400	SPR WSHR M4	
206	060-F00400	FLT WSHR M4	
301	FRI-61020	WIRE HARN AC UNIT IN	
302	FRI-61021	WIRE HARN MAIN SW	
303	HRT-60001	WH NOISE FILTER IN	
304	FRI-61023	WIRE HARN AC UNIT OUT	
305	FRI-61024	WIRE HARN N.FILTER & XFMR	
306	FRI-61025	WIRE HARN EARTH INLET	
307	FRI-61026	WIRE HARN EXT AC UNIT	
308	POD-61057	WIRE HARN EARTH AC UNIT	

②⑥ AC UNIT SUB (POD-0700)



ITEM NO.	PART NO.	DESCRIPTION
1	APC-1531X	AC BRKT
2	421-11282	STICKER OPT CONN
101	211-5479-01	CONN OPT JOINT
201	000-P00312-W	M SCR PH W/FS M3 X 12
202	050-H00400	HEX NUT M4
203	060-S00400	SPR WSHR M4
204	060-F00400	FLT WSHR M4
301	FRI-61026	WIRE HARN EXT AC UNIT
302	POD-61001	WIRE HARN SUB AC UNIT
303	POD-61057	WIRE HARN EARTH AC UNIT



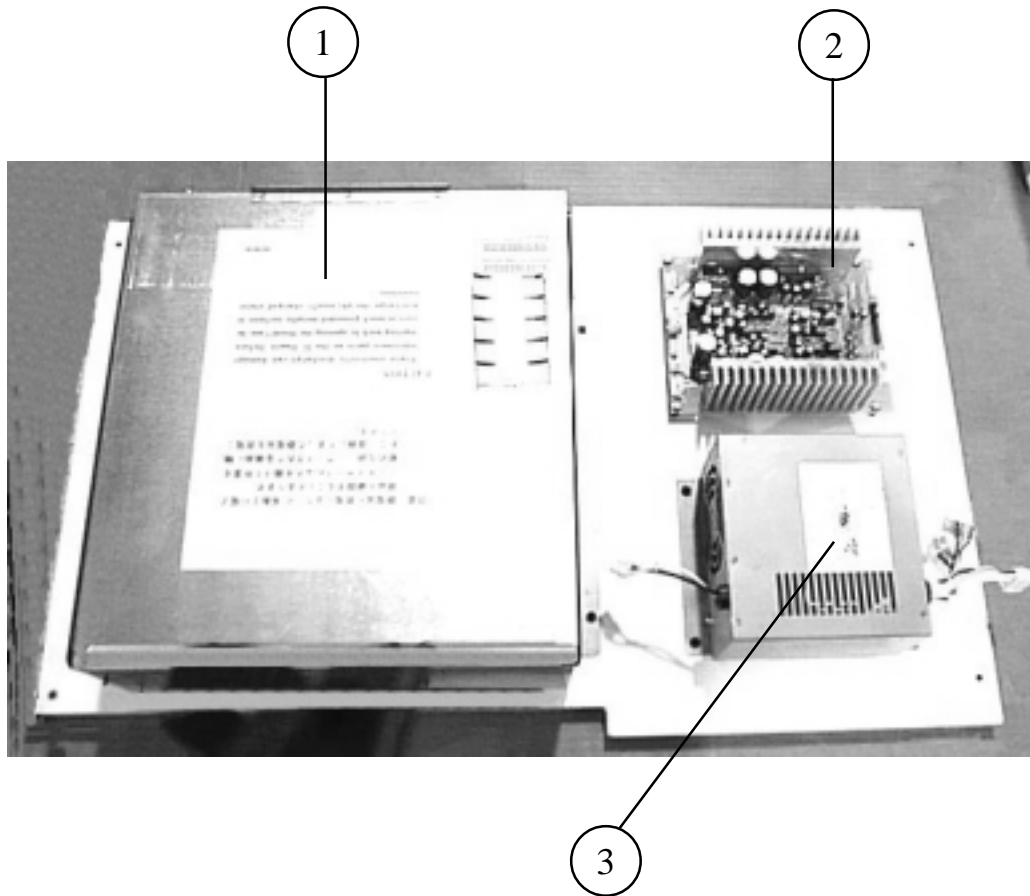
SCREW FASTENING TORQUE TO BE
 M8 Bolt for fastening plastic: 8.2N•m
 M8 Others: 19.5N•m
 M4 Sonic Lock Portion: 0.9N•m

27 ASSY SEAT (HRT-1600)

(D-2/2)

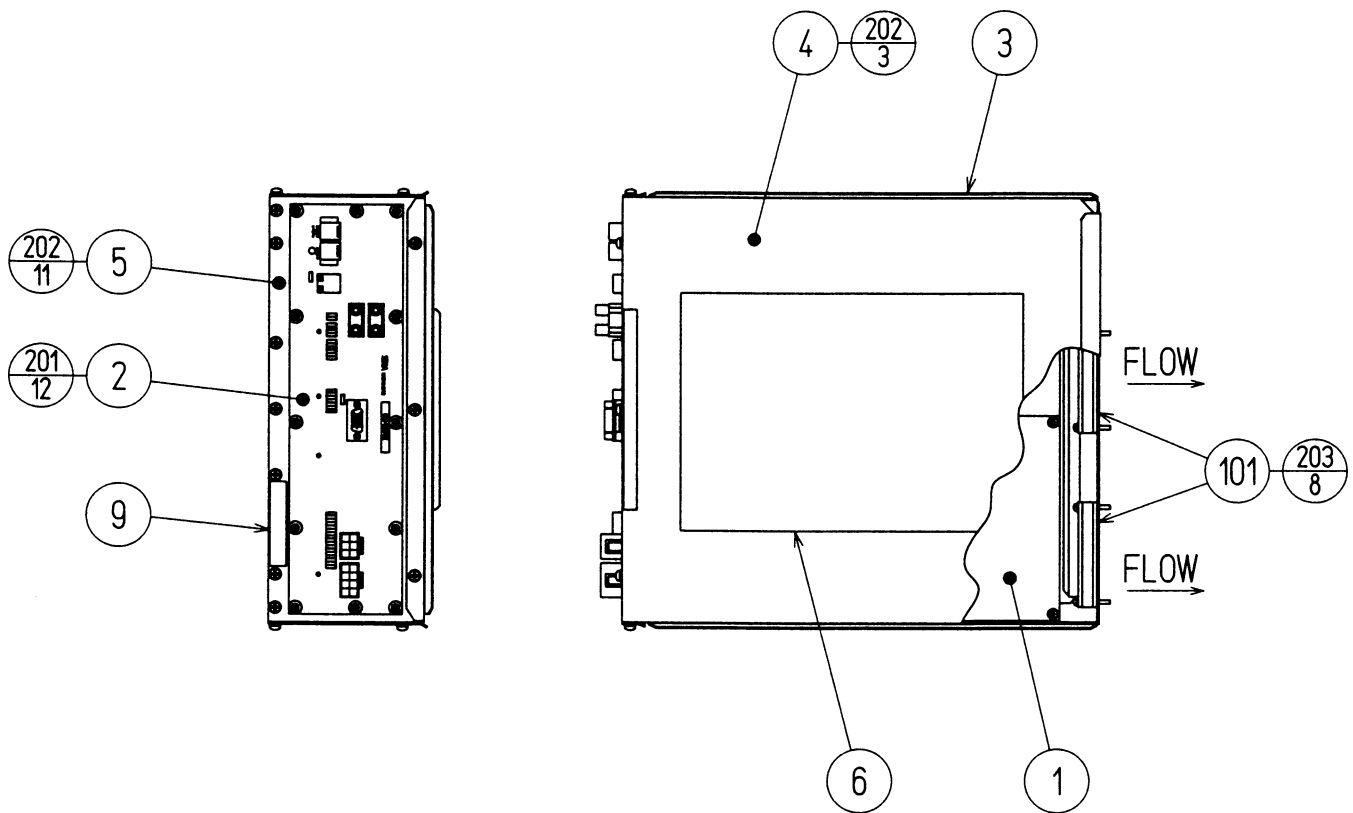
ITEM NO.	PART NO.	DESCRIPTION
1	INY-1302-B	MASK CUSHION SIDE
2	HRT-1602	UPPER SEAT
3	HRT-1603	LOWER SEAT
4	POD-1653	SEAT BASE
5	STC-1604	SEAT FRAME
6	HRT-1601	SEAT REAR COVER
7	VON-1602	INCLINED SEAT TRAY
8	STC-1607	SP MOUNT BRKT
9	STC-1608	SPEAKER NET L
10	STC-1609	SPEAKER NET R
11	VON-1603	INCLINED C BEAR BRKT
12	VON-1604	FRONT TRAY COVER A
13	VON-1605	FRONT TRAY COVER B
14	VON-1606	REAR TRAY COVER
15	STC-1612	PROTECT RUBBER
101	601-9059-91	SEAT RAIL L
102	601-9060-91	SEAT RAIL R
103	130-5162	GULL BOX SPEAKER 8OHM 8W
104	280-5009-01	CORD CLAMP 21
105	601-6563-130	BUSH 2.4T
106	601-6563-100	BUSH 2.4T
107	280-5297	SCRIVET 8 1K31
108	280-5275-SR10	CORD CLAMP SR10
201	000-P00410-W	M SCR PH W/FS M4 X 10
202	030-000850-S	HEX BLT W/S M8 X 50
203	030-000816-S	HEX BLT W/S M8 X 16
204	000-T00408-0B	M SCR TH BLK M4 X 8
205	050-H00800	HEX NUT M8
206	060-S00800	SPR WSHR M8
207	068-852216	FLT WSHR 8.5-22 X 1.6
208	012-P00412	TAP SCR #2 PH 4 X 12
209	060-F00400	FLT WSHR M4
210	000-T00616-0B	M SCR TH BLK M6 X 16
211	060-S00400	SPR WSHR M4
212	050-H00400	HEX NUT M4
213	000-P00408	M SCR PH M4 X 8
301	HRT-60061	WH SEAT EXT
302	HRT-60062	WH SPEAKER EXT

②⑧ ASSY MAIN BD BASE



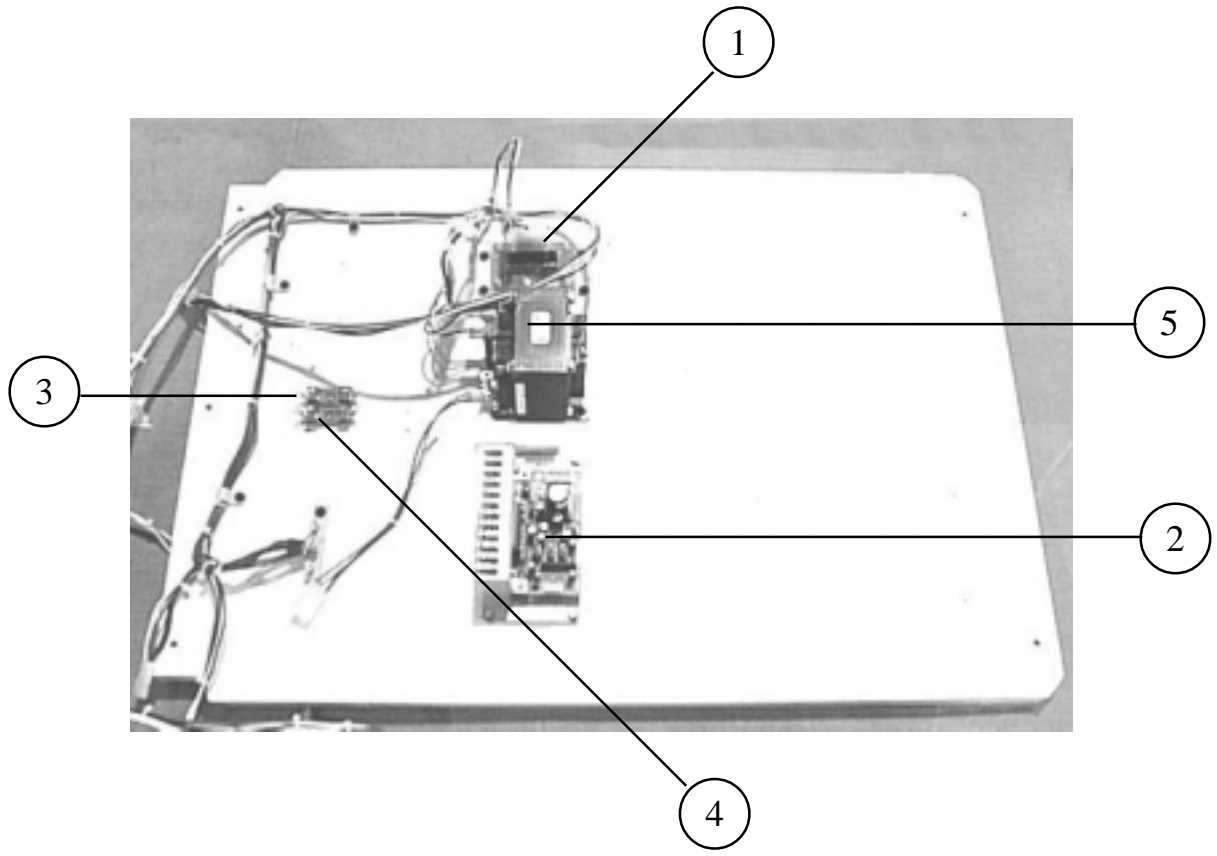
ITEM NO.	PART NO.	DESCRIPTION
1	HRT - 4050	ASSY CASE HRT
2	838 - 13475	POWER AMP 4 CH & MIXER
3	400 - 5397 - 01	SW. REG FOR JVS

②9 ASSY SHIELD CASE HRT (HRT-4050)



ITEM NO.	PART NO.	DESCRIPTION
1	833-14145	GAME BD HRT
2	839-1079-02	FLT BD SEGA HIKARU NCR
3	105-5378	SHIELD CASE FOR SEGA HIKARU
4	105-5379	SHIELD CASE LID FOR SEGAHIKARU
5	105-5381	FLT BD BRKT FOR SEGA HIKARU
6	421-9174	STICKER CAUTION ANTISTATIC
7	421-10023-AAB	STICKER BD SERIAL NUMBER AAB
8	421-10023-BCN	STICKER BD SERIAL NUMBER BCN
9	441-314145	STICKER 833-14145
10	601-10642	CARTON BOX SEGA HIKARU
101	260-0064	FAN MOTOR DC12V
102	280-5275-SR10	CORD CLAMP SR10
201	010-P00310-F	S-TITE SCR PH W/F M3 X 10
202	000-P00408-W	M SCR PH W/FS M4 X 8
203	000-P00325-W	M SCR PH W/FS M3 X 25
301	FRQ-60037	WIRE HARN FAN SHIELD CASE

③⑩ ASSY PWR SPLY

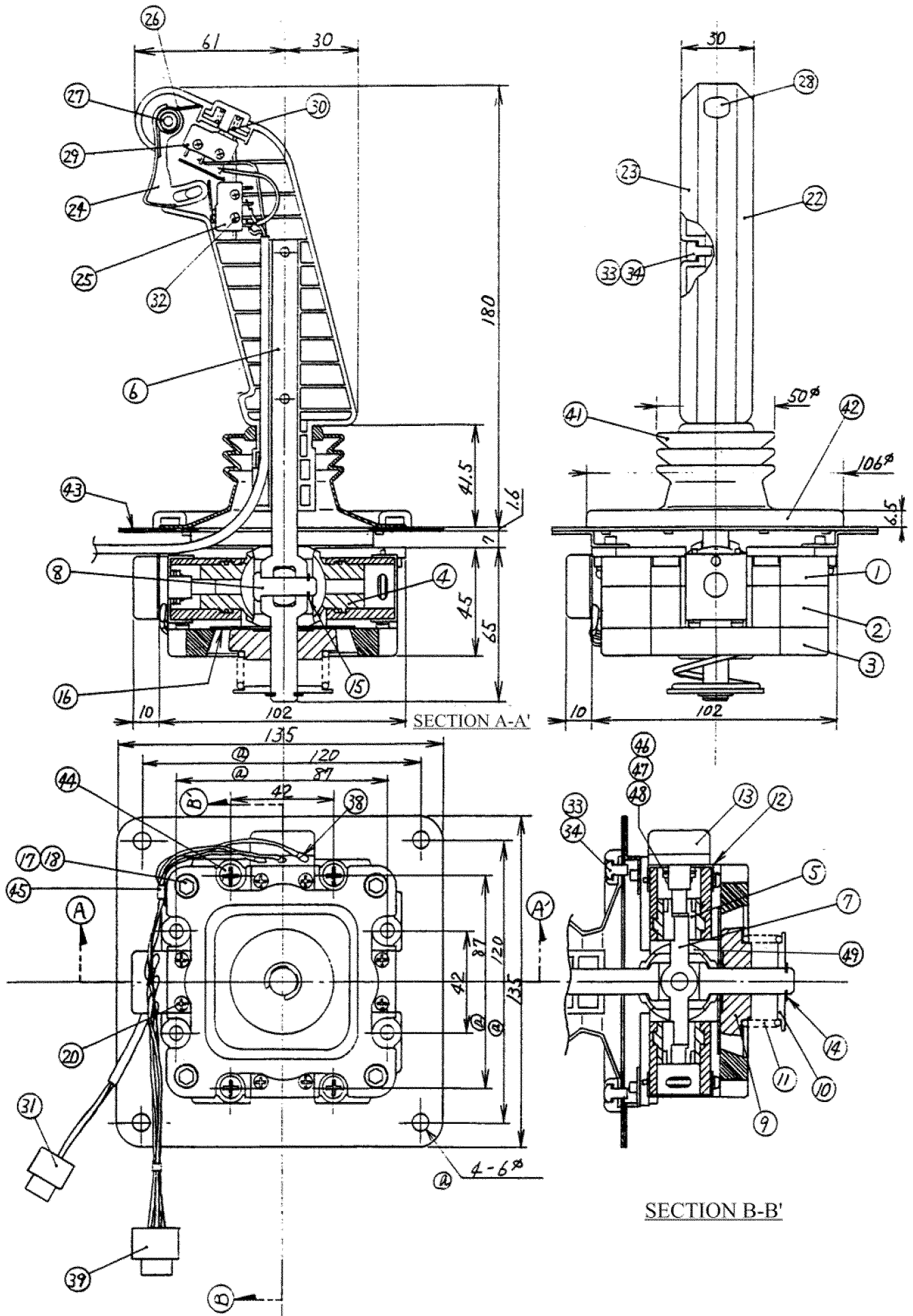


ITEM NO.	PART NO.	DESCRIPTION
1	998 - 0053	SOLID STATE RELAY
2	838 - 11651 - 01	LOW PASS AMP w/LARGE HEAT SINK
3	LOCAL PURCHASE	FUSE HOLDER - LITTLE FUSE #354
4	LOCAL PURCHASE	10 AMP SLOW BLOW (ATTACHED TO ITEM 3)
5	998 - 0145	TRANSFORMER MCI - 4 - 49 - 7028 (18 V - 0 - 18V)

③1 ASSY WIRE DC (HRT-6003)

ASSY WIRE DC (HRT-6003) is comprised of the following wire harnesses.
An ASSY DRG. is unavailable.

ITEM NO.	PART NO.	DESCRIPTION
101	601-0460	PLASTIC TIE BELT 100 MM
301	HRT-60006	WH REAR SPEAKER EXT
302	POD-61003	WIRE HARN VOL EXT
305	POD-61004	WIRE HARN COIN CHUTE EXT
307	HRT-60004	WH FRONT SPEAKER EXT
308	HRT-60005	WH DC PWR EXT
309	600-6972-1250	WIRE HARN EARTH ID5 1250MM
310	600-7009-2500	ASSY RGB CA D-SUB 15P 2500MM
311	600-7141-250	CABLE JVS TYPE A-B 250CM



32 ASSY ANALOG JOYSTICK MRF (610-0619-91)

(D-2/2)

ITEM NO.	PART NO.	DESCRIPTION
3	253-5496	GUIDE PLATE
5	250-5657	SPACER ASSY
9	253-5495	SPR STOPPER 15DEG FOR 610-0619
11	125-5212	SPRING
13	220-5737	VOL CONT B-5K
14	065-E00700	E RING 7MM
15	065-E00500	E RING 5MM
22	253-5497	GRIP COVER A
23	253-5498	GRIP COVER B
24	253-5499	TRIGGER BUTTON
25	509-5975	SW MICRO TYPE SS-5GL
26	125-5213	SPRING TRIGGER
28	253-5500	TOP BUTTON
29	509-5974	SW MICRO TYPE SS-5
30	125-5214	SPRING TOP
31	600-7241	WH ANALOG JOYSTICK
33	008-P00408-0B	TMP PRF SCR PH BLK M4 X 8
34	060-S00400	SPR WSHR M4
41	280-6624	RUBBER COVER
43	117-5420	BASE PLATE FOR 610-0619
49	117-5422	SHAFT WASHER

19. WIRE COLOR CODE TABLE

THE WIRE COLOR CODE is as follow:

- A PINK
- B SKY BLUE
- C BROWN
- D PURPLE
- E LIGHT GREEN

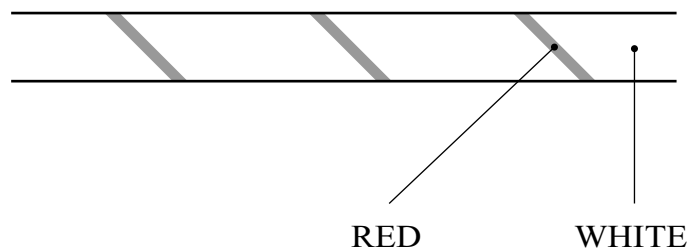
Wires other than those of any of the above 5 single colors will be displayed by 2 alphanumeric characters.

- 1 RED
- 2 BLUE
- 3 YELLOW
- 4 GREEN
- 5 WHITE
- 7 ORANGE
- 8 BLACK
- 9 GRAY

If the right-hand side numeral of the code is 0, then the wire will be of a single color shown by the left-hand side numeral (see the above).

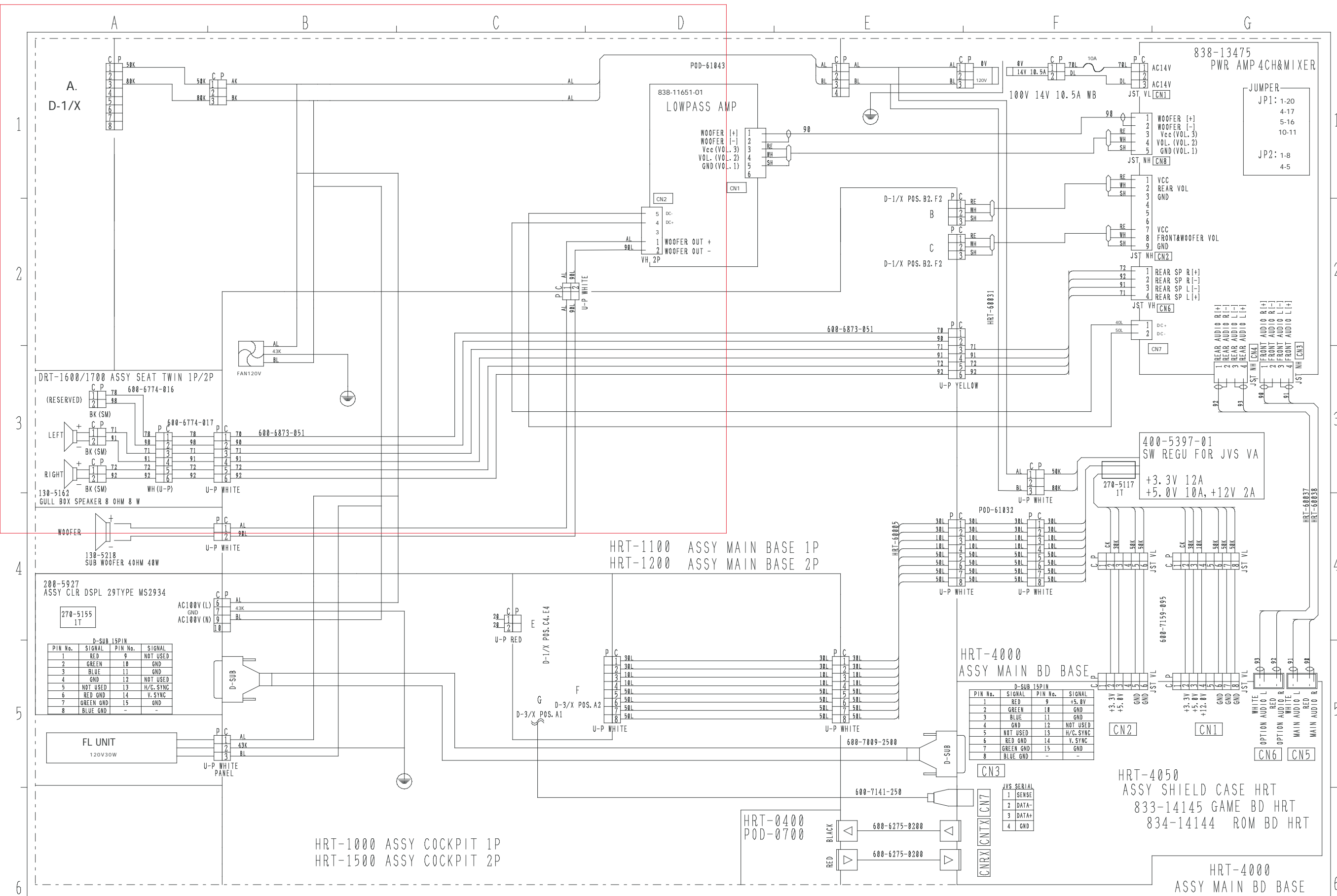
Note 1: If the right-hand side alphanumeric is not 0, that particular wire has a spiral color code. The left-hand side character shows the base color and the right-hand side one, the spiral color.

<Example> 51 WHITE / RED



Note 2: The character following the wire color code indicates the size of the wire.

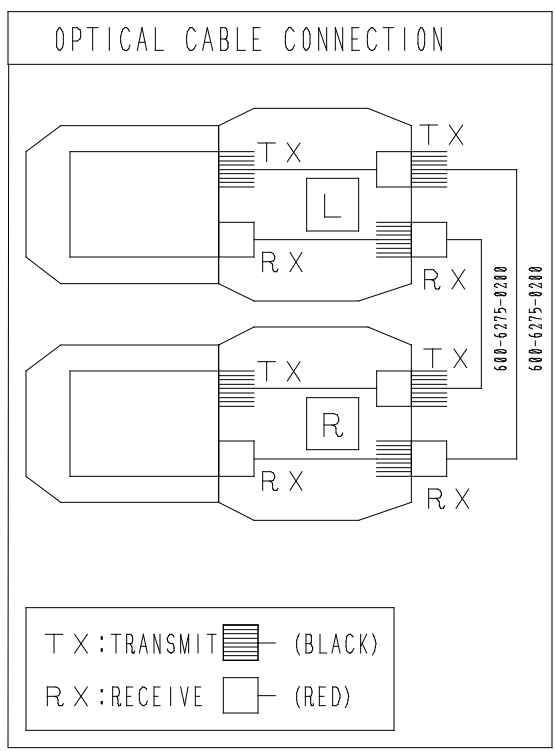
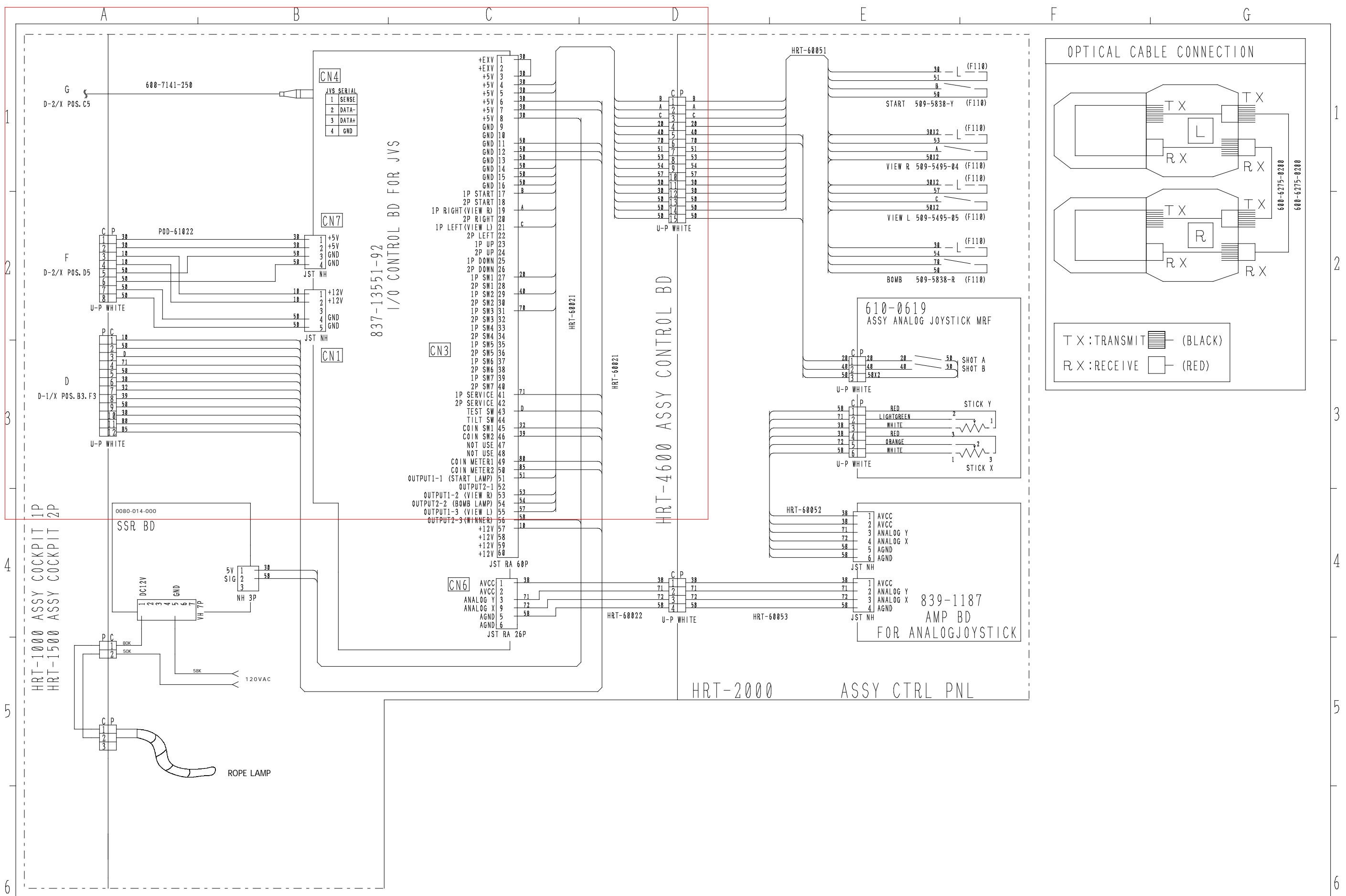
- U: AWG16
- K: AWG18
- L: AWG20
- None: AWG22



8	BLACK	F	LIGHT GREEN	43	EARTH WIRE
7	ORANGE	E	PURPLE	U	ANG16 UL1015
5	WHITE	D	BROWN	X	ANG18 UL1015
4	GREEN	C	BROWN	L	ANG28 UL1007
3	YELLOW	B	SKY BLUE	L	ANG28 UL1007
2	BLUE	A	PINK	9	GRAY
1	RED	9	GRAY	ANG22 UL1007	

乙種電気用品		設計	製 図	検 査	承 認
型式の適用		森	森	後藤	小山
HRT-000		11/14-'00	11/14-'00	11/14-'00	11/14-'00
TOP-ASSY					

SEGA SEGA CORPORATION		THIS DRAWING WILL IN NO WAY BE COPIED, 許可なく複写 TO BE TURNED ON DEMAND. 複製等厳禁	
PLANET HARRIERS		DGM-0104 (2/3)	
DESCRIPTION		DIAGRAM NO.	



<table border="1"> <tr><td>8</td><td>BLACK</td><td>F</td><td>LIGHT GREEN</td></tr> <tr><td>7</td><td>ORANGE</td><td>D</td><td>PURPLE</td></tr> <tr><td>5</td><td>WHITE</td><td>C</td><td>BROWN</td></tr> <tr><td>4</td><td>GREEN</td><td>B</td><td>SKY BLUE</td></tr> <tr><td>3</td><td>YELLOW</td><td>A</td><td>PINK</td></tr> <tr><td>2</td><td>BLUE</td><td>9</td><td>GRAY</td></tr> <tr><td>1</td><td>RED</td><td></td><td></td></tr> </table>		8	BLACK	F	LIGHT GREEN	7	ORANGE	D	PURPLE	5	WHITE	C	BROWN	4	GREEN	B	SKY BLUE	3	YELLOW	A	PINK	2	BLUE	9	GRAY	1	RED			<table border="1"> <tr><td>43</td><td>EARTH WIRE</td></tr> <tr><td>U</td><td>ANG16 UL1015</td></tr> <tr><td>K</td><td>ANG18 UL1015</td></tr> <tr><td>L</td><td>ANG20 UL1007</td></tr> <tr><td></td><td>ANG22 UL1007</td></tr> </table>		43	EARTH WIRE	U	ANG16 UL1015	K	ANG18 UL1015	L	ANG20 UL1007		ANG22 UL1007	乙種電気用品 型式の適用 HRT-0000 TOP-ASS'Y		設計 森	製図 森	検図 後藤	承認 小山	SEGA SEGA CORPORATION PLANET HARRIERS	THIS DRAWING WILL IN NO WAY BE COPIED. 許可なく複写 TO BE TURNED ON DEMAND. 複製等厳禁	DGM-0104 (3/3)
8	BLACK	F	LIGHT GREEN																																															
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L	ANG20 UL1007																																																	
	ANG22 UL1007																																																	
ALTERATION		WIRE COLOR		TOP-ASS'Y		DESCRIPTION		DIAGRAM NO.																																										

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The screenshot shows a Netscape browser window displaying the SegaService.com website. The browser's address bar shows the URL <http://www.segaservice.com/>. The website's navigation menu on the left includes links for 'what's new', 'manuals', 'bulletins', 'assy pages', 'staff', 'Darl's Office', 'corporate info', 'technical service', 'warranty Policy', 'plug-ins', 'home page', 'non-framed page', and 'seu mailing list'. The main content area features a large 'SEGA SERVICE' logo and a list of search criteria: 'parts', 'boards', 'monitors', and 'distributors'. Below the logo, there is a list of links: 'Darl's Office', 'What's New', 'Game Manuals', and 'Bulletin'. A statistics box indicates that 5661 people have accessed the page since June 9th. Contact information for Darl Davidson and Dave Cantrelle is provided. The footer includes the copyright notice for Sega Enterprise Inc., USA, and a banner for WebSTAR 3 powered by Mac OS and Webula.

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If you have any questions or comments about this Home Page please E-Mail to:
darl.davidson@seu.sega.com OR dave.cantrelle@seu.sega.com

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