HANGPILOT ™

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KONAMI®

ORIGINAL VIDEO GAME
OPERATOR'S MANUAL

PN.0000032527 GN685

About this product

Thank you for purchasing this Konami product. This manual explains how to operate your game machine correctly and safely.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Driver software used under license of 3Dfx interactive.

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SPATIALIZER®
3D stereo

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Contents

■ Precautions for use

OIn this manual, the precautions to be followed without fail in order to prevent damage to persons to install, use or maintain "HANG PILOT™" or other persons or to properties are shown as follows.

Be sure to read the following

•The following suggestions show the degree of danger and damage caused when the product is used improperly with the suggestions disregarded.

| ⚠ WARNING | Indicates a situation where disregarding the suggestions could result in death or serious injury. |

| ⚠ CAUTION | Indicates a situation where disregarding the suggestions could result in injury or product damage. |

•The following graphic suggestions describe the types of precautions to be followed.

| ▲ | Indicates a matter of which care should be taken. |

| ⊘ | Indicates a matter which is forbidden. |

| 🔌 | Indicates a matter which should be performed without fail. |

Setting Up

⚠ **WARNING**

•**Be sure to consult your nearest dealer when setting up, moving or transporting this product.**
-This product should not be set up, moved or transported by anyone other than industry specialists. Doing so could result in injury or product damage.
-When setting up this machine, be sure to place the 8 adjusters on the floor and make sure that the machine is stable at a level.
-In setting up the machine, be careful to keep the machine's connections and control bar free from undue force.

•**This product is an indoor game machine. Never set up the game machine outside.** 🚫
-Setting up this product outside could result in accidents or equipment failure.

•**Do not set up the game machine near emergency exits.** 🚫
-Doing so could block exits in time of emergency and could result in death or serious injury.

•**Do not set up the game machine:** 🚫
-in a place exposed to rain or moisture.
-in a place exposed to direct sunlight.
-in a place exposed to direct heat from air-conditioning and heating equipment, etc..
-near hazardous flammable substances such as thinner and kerosene.
-on an inclined or uneven floor.
-near fire extinguishing equipment.
-in a place exposed to strong vibration.
-in a place exposed to excessive dust.
-near equipment generating strong magnetism or electric waves.

•**Do not move the machine by holding and pushing or pulling the control bar.** 🚫
-Otherwise the machine may get damaged or you may get injured.

•**Do not place containers holding chemicals or water on or near the game machine.** 🚫
-Electrical shock or damage could be caused by water or foreign matter entering the inside of the machine.

•**Do not place objects near the ventilating holes.** 🚫
-Doing so could cause the internal temperature to rise excessively, resulting in equipment failure.

•**Do not bend the power cord by force or place heavy objects on it.** 🚫
-Doing so could result in electric leakage or fire.

•**Never plug or unplug the power cord with wet hands.** 🚫
-Doing so could result in electrical shock.

•**Never unplug by pulling the power cord.** 🚫
-Doing so could damage the cord, resulting in electric leakage or fire.

Setting Up

⚠ CAUTION

•Be sure to use a single-phase, AC120-volt power supply and indoor wiring with 30A or more capacity.   For extension cord, use indoor wiring of the rated capacity of 15 A or more.
-Failure to do so could result in fire or equipment failure.

•Never plug more than one cord at a time in the electrical receptacle. ⊘
-Doing so could result in fire or electrical shock.

•Do not lay the power cord where people walk through. You may tread on or ⊘
stumble over them.
-You may stumble down and get injured, or damage the cord or the cable.

•Be sure to connect a ground cable to the machine.
-Otherwise an electric shock or machine trouble may result.

•Clearances of 100mm(3.94in) or more should be created between the game
machine and walls.

•Once all the units have been coupled together, never roll the machine along over a ⊘
rugged floor.
-Otherwise you could get injured or the machine damaged.

Operation

⚠ WARNING

•The following users should not play the game. ⊘
-Doing so could cause accidents or illness.

-Under the influence of alcohol
-Feeling sick
-With high blood pressure or heart disease
-Difficult to walk alone
-Suffering from or being treated for arm, wrist or leg ailment.
-Having spinal trouble
-Using a pacemaker
-Suffering from motion sickness
-Being pregnant or probably pregnant

•This machine is designed for just one player. Ask customers never to ride double, ⊘
nor to ride anywhere but on the rudder step nor to wear an unsuitable footgear.
-An injury or accident may result.

•Ask customers not to release their hands from the control bar during play, nor to ⊘
put their hand or head into the space between the main unit and the control bar.
-An injury or accident may result.

•Ask other customers not to come close to the machine during play.
-An injury or accident may result.

•If there is any abnormality such as smoke, bad smell or abnormal noise being emitted from the machine, immediately unplug the power cord to stop operating it.
-Using the machine in abnormal conditions could result in fire or accidents.

────────── In case of abnormality: ──────────
1. Turn OFF the main power switch.
2. Unplug the power cord.
3. Contact your nearest dealer.

•Do not leave the power cord plugged improperly or covered with dust.
-Doing so could result in electrical shock or fire, so inspect the power cord periodically.

•Never disassemble, repair or modify any section other than those specified in this manual.
-Doing so could result in fire, malfunction or equipment failure. We do not assume any responsibility for any damages that would be caused by tampering with the machine.

Operation

⚠ CAUTION

•Do not plug or unplug the power cord with wet hands.
-Doing so could result in electrical shock.

•When handling the power cord, take care of the following.
-Improper handling could result in fire or electrical shock.

·Do not damage the power cord.	·Do not modify the power cord.
·Do not bend the power cord excessively.	·Do not twist the power cord.
·Do not heat the power cord.	·Do not pull the power cord.
·Do not bind the power cord.	·Do not tread on the power cord.
·Do not sandwich the power cord.	·Do not drive a nail into the power cord.

•If the power cord or power plug becomes damaged, stop using the machine immediately.
-Using a damaged power cord or power plug could result in fire or electrical shock.

•Ask other customers to keep out of the area mat during play.
-Otherwise the play may be disturbed, or an injury or accident may result.

Inspection and cleaning

⚠ WARNING

•**Before inspection or maintenance, be sure to turn OFF the main power switch and unplug the power cord.**
-An electric shock may result.

•**Never turn OFF the power switch while the machine is in the play mode. Be sure to do that while in the attract mode.**
-Otherwise the rudder step will not be locked but stay free. An injury or accident may result.

•**Some parts inside the machine have high voltage. Before opening the side door, be sure to turn OFF the main power switch. Be very careful not to touch any irrelevant parts inside. When closing the door, be sure to tighten up the two screws and put the door under lock and key.**
-An electric shock may result.

•**When replacing parts, be sure to use parts of the correct specifications. Never use parts other than the specified ones.**
-Using improper parts could result in fire or equipment failure.

•**Allow only a qualified engineer to open the back door.**
-Otherwise an accident or electric shock may result.

•**Never disassemble, repair or modify any section other than those specified in this manual.**
-Doing so could result in fire, malfunction or equipment failure. We do not assume any responsibility for any damages that would be caused by tampering with the machine.

•**To clean the game machine, wipe it with a soft cloth dampened in a neutral detergent and wrung out.**
-Using organic solvents such as thinner may decompose the material.
-Electrical shock or equipment failure could be caused by water entering the inside of the machine.

Moving and Transportation

⚠ CAUTION

•The game machine contains parts such as a projector, electronic components and precision components which are sensitive to vibration and impact. Great care therefore should be taken when moving and transporting the game machine. Be sure not to let the machine tip over.

•Before moving the machine, fully raise the 8 adjusters. Move the units on the casters. Never forget to turn OFF the main power switch and unplug the power cord.
-Failure to do so could result in accidents, damage or equipment failure.

•In moving the machine, be careful to keep the machine's connections and control bar free from undue force. Do not move the machine by holding and pushing or pulling the control bar.
-Failure to do so could cause injury, accidents or product damage.

•Before rolling the machine along on a rugged floor, be sure to separate the units.
-Failure to do so could cause injury, accidents or product damage.

PRECAUTION IN
HANDLING

•When setting up, handling, inspecting, maintaining, moving or transporting this product, follow the procedures and instructions set forth in this manual and perform such work safely.

•Do not remove labels of "WARNING", "CAUTION", etc. attached to the product.

•Do not set up, handle, inspect, maintain, move or transport this product under conditions equivalent to the condition of "WARNING" or "CAUTION" specified in this manual.

•If a new owner is to have this product as a result of transfer, etc., be sure to give this manual to the new owner.

MEMO

1 Specifications

Specifications

Dimensions	Refer to the figure above: mm (in)
Weight	Total weight: Approx. 621kg(1370lb) Main unit: Approx. 420kg(926lb), Control unit: Approx. 190kg(419lb), Billboard: Approx. 11kg(24lb)
Supply power	Single-phase, AC 120V(±10%), 60Hz
Rated power consumption	350W
Coin selector	For 25-cent coins only
Monitor	33-inch color monitor 2 units
Service condition	Temperature 10 to 35°C (50 to 95°F), Humidity 20 to 80% (No dewing is allowed.)
Attachments	·Instruction manual ....this manual ·Keys for coin door ....2 ·Keys for maintenance ....2 ·Spare fuse(10A)...1 ·Unit connection hexagon bolt (M10x30L) ....6 ·Unit connection spring washer (Nominal 10) ....6 ·Unit connection flat washer (Nominal 10) ....6 ·Billboard ....1 ·Billboard lock screw (M8x30L)...2 ·Billboard lock screw (M6x35L, black) ....2 ·Area mat ....1 ·Wing pop ....1 ·Wing pop fixture ....2 ·Wing pop mounting screw (M6x25L) ....8 ·Wing pop mounting flat washer (Nominal 8) ....4 ·Wing pop anti-vibration rubber 4

•If any part is defective or not found, contact your nearest dealer.
•The specifications of this product are subject to change without notice for reasons such as improving the performance.

2 Names of parts and list of main parts

No.	Part name	Part #	Quantity	Remarks
1	Main unit	-	1	
2	Control unit	-	1	
3	Billboard	-	1	
4	Fluorescent light unit	0000003815	1	
5	Control panel	-	1	
6	Control bar	-	1	
7	33-inch color monitor	0000003821	2	
8	Monitor adjustment PCB	-	2	
9	Rudder step	0000007730	1	
10	Mat	0000009947	1	
11	Knee pad	0000009945	1	
12	Frame cover (left)	0000007151	1	
13	Frame cover (right)	0000007152	1	
14	Operator box	-	1	
15	Coin door unit	0000032414	1	Include16~20
16	Coin input port	-	1	
17	Coin return port	-	1	
18	Coin door	-	1	
19	Meintenance door	-	1	
20	Coin selector	0000032415	1	
21	Coin box	0000006850	1	
22	Coin counter	0000005100	1	
23	Service panel switch	0000005098	4	
24	AC bracket	0000007147	1	
25	AC power cord	0000004809	1	
26	Power switch	0000003197	2	
27	Fuse holder	0000005985	1	Fuse(10A)
28	Ground terminal	0000005622	1	
29	Caster	0000003806	4	For main unit
30	Caster	0000002620	6	For control unit
31	Adjuster	0000003807	6	4 pcs. for main unit
32	Adjuster	0000003808	2	For control unit
33	Switching power	0000003799	1	Main PCB(5V)
34	Switching power	0000003800	1	Main PCB(12V)
35	START/VIEW switch	0000006618	1	
36	Select button	0000003811	2	
37	Speaker	0000003809	2	
38	Game PC board	-	1	Main
39	Game PC board	-	2	C.G.
40	Wing pop	0000010143	1	Attachment
41	Area mat	0000009905	1	Attachment
42	Side door	0000014245	2	
43	Back door	0000009943	1	
44	Transformer	0000002707	1	

3 How to play

The "HANG PILOT™" is a thrilling flying game in which you can experience virtual flying. Thanks to the polygonal images (by the video technique of creating 3-dimensional images) on the top and bottom monitor screens, you can feel as if gliding in the real sky. Using the control bar and rudder step, you fly along just above the skirts of mountains toward the finish.

■ How to play ━

⚠

•The rudder step is kept locked at first.   Just when "How TO PLAY" appears on the screen, the rudder step gets unlocked.   Kneel down on the knee pad and hold the control ber tightly with both hands.

1 Put a coin in the slot and stand on the rudder step. (Press the START/VIEW switch if in the free play mode.)

2 Select a pilot on the "PLAYER SELECT" screen. To select and enter it, use the select buttons (◁ ,▷) and the START/VIEW switch.

   • BEGINNER.........For beginners (using the rudder step only)
   • AVERAGE.........For medium-level players
   • EXPERT............For advanced-level players

3 Select a course on the "COURSE SELECT" screen.   To select and enter it, use the select buttons (◁ ,▷) and the START/VIEW switch.

   • EASY...................Resort island (flying over grassland and tourist spot)
   • MEDIUM............Nightfall (flying at sunset)
   • HARD................ Wild valley (flying over the mountains)

Now the message "THE STEP WILL BE RELEASED PLEASE WATCH YOUR STEP" appears on the screen.   Kneel down on the knee pad and hold the control bar tightly with both hands.   There are the following courses.

4 The "HOW TO PLAY" screen then comes up.   Watching the instructions on the top and bottom monitor screens, move the control bar and the rudder step to get used to the feeling. (Note that the rudder step is now unlocked.)
Then the numbers on the screen start being counted down and you start flying.
If you do not need the instructions, press the START/VIEW switch.   The instructions are interrupted.

5 Proceed in the following way.
Just after the game gets started, the hang glider will fly over the skirts of mountains, gathering speed.

- Control bar ....Used to accelerate and decelerate the hang glider.
  - ·Pull the control bar toward yourself to speed up and fly lower closer to the ground.
  - ·Push the control bar farther to slow down and fly higher.
- Rudder step ....Used to turn the hang glider to the left or right.
  - ·Swing the step to the left to turn to the right.
  - ·Swing the step to the right to turn to the left.

Tips for clearing high cliffs and bluffs

•When facing a high cliff or bluff in the course, it is not advisable to fly through the usual way: the hang glider will lower down slowly.   In such case, pull the control bar toward yourself and the hang glider will nose-dive and speed up. It can fly through fast closer to the ground.

---

6 The rules of this game are as follows.
- Each time the hang glider has passed the check point along each course, the remaining play time is added.
- The game is over when the hang glider has reached the finish (goal points) of each course or the play time becomes zero (0).

7 The results are displayed on the screen.
(The ranking, remaining time, total time and lap time at each check point are all displayed.)

8 When the game is over, make sure the rudder step gets tightly locked.   The safety instruction "PLEASE WATCH YOUR STEP WHEN YOU RIDE OFF" will appear on the screen at the end of the game.   Now get off the rudder step.

4 Opening and closing the doors

4-1 Opening and closing the maintenance door

■ How to open the maintenance door ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━

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•Take care not to apply any load or impact to the maintenance door when it is open.

1 Insert the accompanying maintenance key into the keyhole of the door and turn it clockwise.
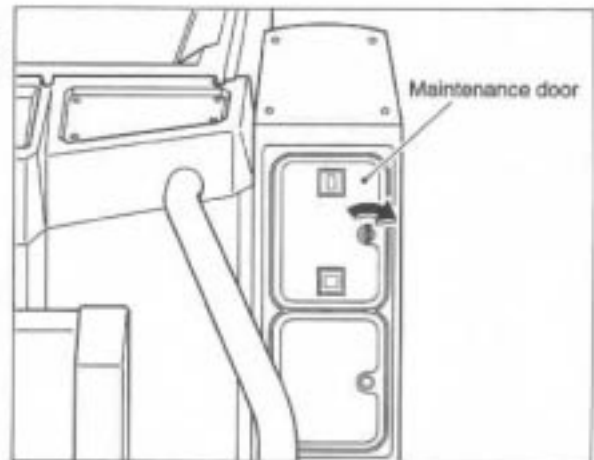
Maintenance door

2 Open the maintenance door.
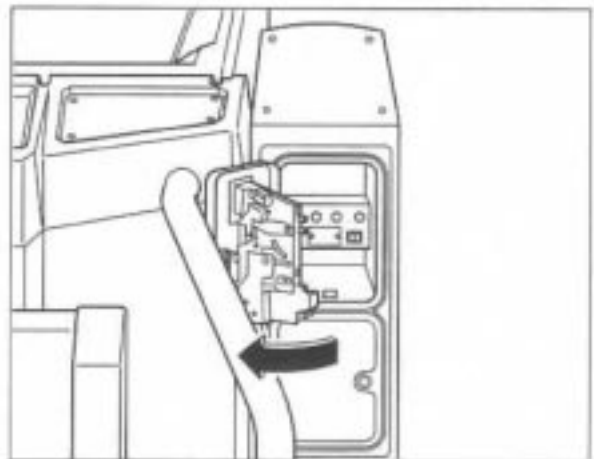
■ How to close the maintenance door ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━

1 Close the maintenance door.

2 Turn the maintenance key counterclockwise.

4-2 Opening and closing the coin door

■ How to take out the coin box ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━

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•Securely lock the door for protection against burglaries.
•Note that the coin box is considerably heavy to take out if it is full of
 coins.

1 | Insert the attached coin box key in the coin box door and turn it clockwise.

2 | Open the coin door and take out the coin box .
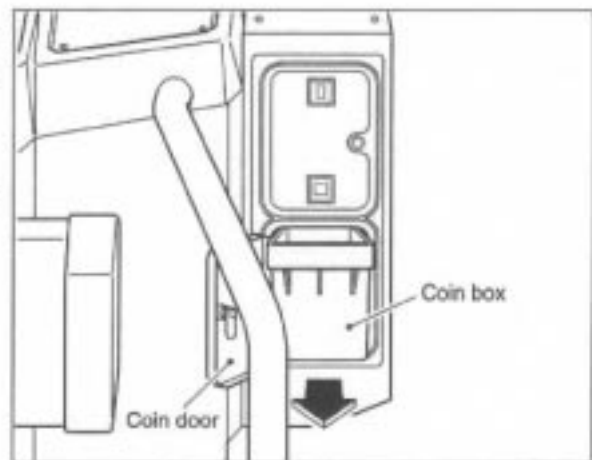
Coin box

Coin door

■ Coin counter ━

You will find the coin box when the coin door is opened. The coin counter is located under the coin box.

Coin counter
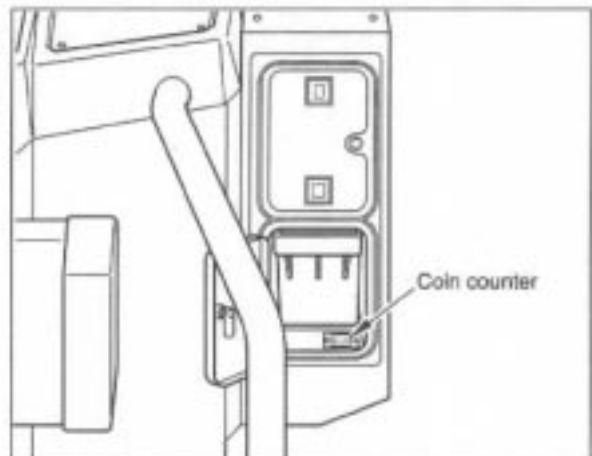
4-3 Opening and closing the side door

■ How to open the side door ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━

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•Before opening the side door, be sure to turn OFF the sub-power switch on the service panel first and then the main power switch on the AC bracket. If the sub-power switch is OFF but the main power switch is ON, some internal parts are still energized.

1 The side doors are located each on the main unit's right and left sides.

Right side(operator box)
Monitor adjustment PCBs
Side door
Side door
Left side
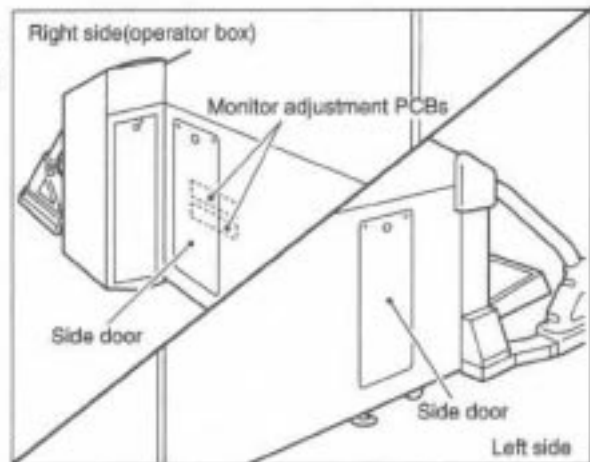
2 Remove the screws and insert the accompanying maintenance key in the side door and turn it clockwise.
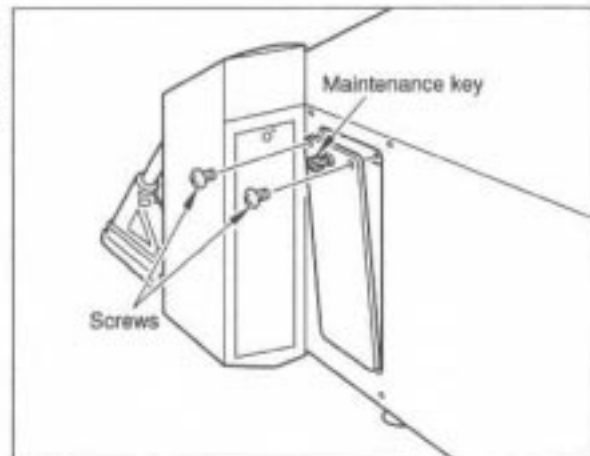
Maintenance key

3 Lift and take out the side door.

Screws

■ How to close the side door ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━

1 Fit the side door in position and turn the maintenance key counterclockwise.

2 Tighten up the screws.

5 PCB settings

5-1 PCB start-up check (self test)

When the power switch is turned ON after the installation of the machine, the performance of the game Printed Circuit Boards(PCB) is checked automatically.

> ⚠️
>
> •Be sure to perform the self test before using the machine. If an abnormality persists or the machine does not operate properly, turn OFF the main power switch immediately to stop operating the machine.
> •Before turning ON the power switch, make sure there is nobody else around the machine.
> •If the machine shows anything unusual or fails to function, immediately turn OFF the main power switch and contact your nearest dealer.

■ Result of test ━

If the test is okay

•First the EEP-ROM and then the machine's performance are checked. The control bar and the rudder step are also automatically repositioned. The message "MACHINE INITIALIZE PLEASE DO NOT RIDE THIS MACHINE DURING INITIALIZE" appears on the screen. Never touch the control bar and the rudder step. When everything is okay, the machine goes to the game mode started.

If there is anything unusual

The check results are displayed as follows on the screen.

•**EEP-ROM in trouble**

The message "EEP-ROM BAD" appears on the screen.

Remedy...Turn OFF the power switch. While holding down the test switch, turn ON the power switch again. (The settings in the manual test will be back to the factory settings.)

•**Wrong control bar setting**

The message "PLEASE ADJUST THE BAR MECHANICALLY. XXXX" appears on the screen.

Remedy...If the XXXX setting is out of the 501-699 range, it means the setting cannot be adjusted. Immediately turn OFF the main power switch and contact your nearest dealer.

•**Wrong rudder step setting**

The message "PLEASE ADJUST THE RUDDER MECHANICALLY. XXXX" appears on the screen.

Remedy...If the XXXX setting is out of the 496-554 range, it means the setting cannot be adjusted. Immediately turn OFF the main power switch and contact your nearest dealer.

If the machine still shows anything unusual or fails to function, immediately turn OFF the main power switch and contact your nearest dealer.

5-2 Adjusting the game environment (manual test)

Manually check and change the settings for the screen displays and game contents.

■ Starting the manual test mode ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━

1 Turn ON the power switch.
2 While the attract is on, press the test switch on the service panel. (Do not turn ON the power switch with the test switch held down. Otherwise the current settings will be erased and the machine will have the factory settings.)
·The manual test mode is called and the main menu appears on the screen.

■ Quitting the manual test mode ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━

1 Select "GAME MODE" on the main menu screen.
2 Press the START/VIEW switch.
·The screen goes back to the game mode.

■ Main menu screen (basic items) ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━


```
MAIN MENU

I/O CHECK ─────────────────      · Checks each control.
SCREEN CHECK ──────────────        ─> Page 19
COLOR CHECK ───────────────      · Adjusts screen distortion.
MASK ROM CHECK ────────────        ─> Page 20
DIP SWITCH SETTINGS ───────      · Adjusts on-screen color.
C.G. BOARD CHECK ──────────        ─> Page 20
SOUND OPTIONS ─────────────      · Checks the mask ROMs.
GAME OPTIONS ──────────────        ─> Page 20
COIN OPTIONS ──────────────      · Checks the DIP switch settings.
BOOKKEEPING ───────────────        ─> Page 21
GAME MODE ─────────────────      · Checks the C.G. board function.
                                   ─> Page 21
                                 · Settings the sound volume.
                                   ─> Page 22
                                 · Sets the game's difficulty level.
                                   ─> Page 22
                                 · Sets the coin settings.
                                   ─> Page 23
SELECT LEFT/RIGHT = SELECT OPTION · Checks and erases the game play time
START/VIEW SWITCH = DO CHECK       and other data.
                                   ─> Page 20
                                 · Returns to the game mode.
```

■ Selecting modes on the main menu ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━

How to select each mode from the main menu.

• Select --> Use the select buttons ($\triangleleft$, $\triangleright$).

• Set --> Press the START/VIEW switch.

When a mode has been called, refer to the details on the page of the mode.

5-3 Mode descriptions

The original factory settings are displayed in green; the changed settings are displayed in red.

·After the settings have been modified, select the "SAVE AND EXIT" and press the START/VIEW switch. The new settings are saved automatically and the screen returns to the main menu.

·If "EXIT" is selected after the settings have been changed, the message "YOU DID NOT SAVE, DO YOU WANT TO SAVE? YES/NO" will appear. Using the select buttons, select "YES" or "NO" and press the START/VIEW switch.

If "YES" is selected, the message "NOW SAVING" will appear, the modified settings will be saved, and the screen will return to the main menu. If "NO" is selected, the message "NO MODIFICATION" will appear and the modified settings will not be saved.

•If "FACTORY SETTINGS" is selected and the START/VIEW switch is pressed, all the settings will return to the factory settings.
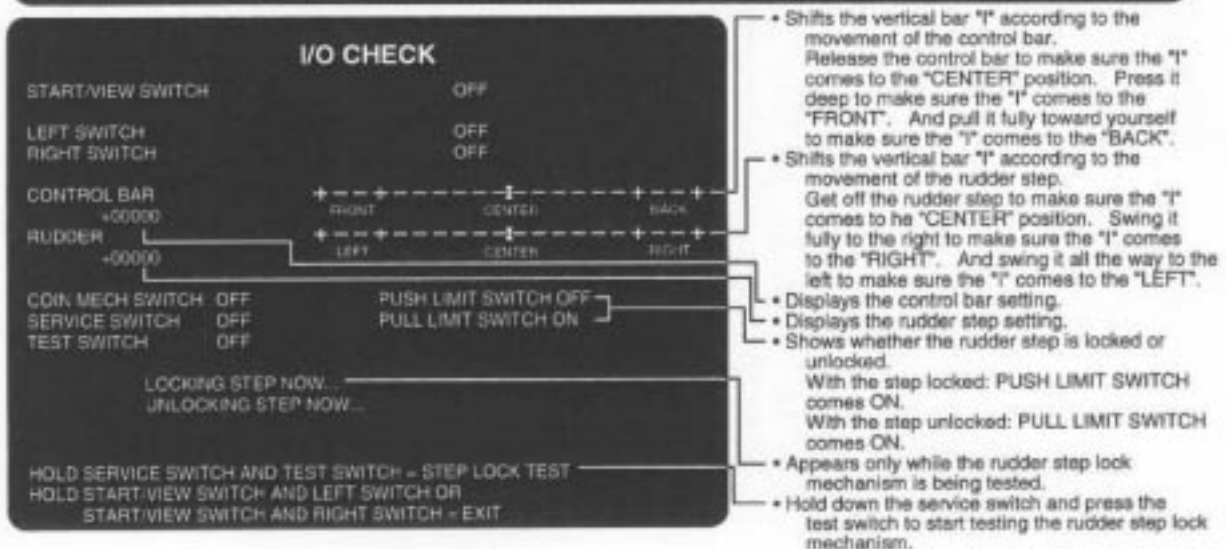
MEMO

I/O CHECK

Checking the controls

■ Mode for checking the performance of each control

To return to the main menu screen, hold down the START/VIEW switch and press either of the select buttons.

In this mode, the START/VIEW switch lamp is flashing.

⚠

•Before selecting the "I/O CHECK" mode, make sure there is nobody else around the machine. This is because the rudder step unlocks itself.

•If any of the sensors shows an unusual value or fails to function, immediately turn OFF the main power switch and contact your nearest dealer.

```
                    I/O CHECK
START/VIEW SWITCH                    OFF

LEFT SWITCH                          OFF
RIGHT SWITCH                         OFF

CONTROL BAR             +--+----+-------+----+--+
  +00000                FRONT     CENTER      BACK
RUDDER          L       +--+----+-------+----+--+
  +00000                LEFT      CENTER      RIGHT

COIN MECH SWITCH  OFF        PUSH LIMIT SWITCH OFF
SERVICE SWITCH    OFF        PULL LIMIT SWITCH ON
TEST SWITCH       OFF

            LOCKING STEP NOW...
            UNLOCKING STEP NOW...

HOLD SERVICE SWITCH AND TEST SWITCH = STEP LOCK TEST
HOLD START/VIEW SWITCH AND LEFT SWITCH OR
     START/VIEW SWITCH AND RIGHT SWITCH = EXIT
```

• Shifts the vertical bar "I" according to the movement of the control bar.
Release the control bar to make sure the "I" comes to the "CENTER" position. Press it deep to make sure the "I" comes to the "FRONT". And pull it fully toward yourself to make sure the "I" comes to the "BACK".

• Shifts the vertical bar "I" according to the movement of the rudder step.
Get off the rudder step to make sure the "I" comes to he "CENTER" position. Swing it fully to the right to make sure the "I" comes to the "RIGHT". And swing it all the way to the left to make sure the "I" comes to the "LEFT".

• Displays the control bar setting.
• Displays the rudder step setting.
• Shows whether the rudder step is locked or unlocked.
With the step locked: PUSH LIMIT SWITCH comes ON.
With the step unlocked: PULL LIMIT SWITCH comes ON.

• Appears only while the rudder step lock mechanism is being tested.
• Hold down the service switch and press the test switch to start testing the rudder step lock mechanism.

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•If the control bar setting or the rudder step setting is not proper, readjust it referring to "7-5 Replacing and adjusting the potentiometer" on pages 36 and 37. For adjusting the control bar control, contact your nearest dealer.

MEMO

SCREEN CHECK

Adjusting the screen distortion

■ Mode for checking the screen display.
Adjust the focus, distortion and size of the top and bottom monitor screens while watching the crosshatch pattern. Use the monitor adjustment PCBs (see page 38) to make the adjustment. To return to the main menu, press the START/VIEW switch.

COLOR CHECK

Adjusting the display color

■ Mode for checking the display color.
Make the adjustment using the top and bottom monitor adjustment PCBs (see page 38) so that the colors of the color bars should appear properly graduated. To return to the main menu, press the START/VIEW switch.

MASK ROM CHECK

Checking the mask ROMs

■ The mask ROMs are checked one by one. If the ROM is not in trouble, "OK" is displayed. If anything unusual is found, "BAD" appears. To return to the main menu, press the START/VIEW switch.

BOOKKEEPING

Checking the game play time

■ Mode for checking the game play time of each course.
Refer to this time setting in changing the difficulty level of the game. Press the test switch and service switch on the service panel at once to delete all the data (including the score data) in memory.

⚠️

•Keep in mind that if the power switch is turned OFF during play, the contents of the data may be affected. If by any chance the data is affected, hold down the test switch on the service panel and turn ON the power switch. The target point will be repositioned again.

DIP SWITCH SETTINGS

Checking the DIP switch settings

■ Mode for checking the DIP switch settings.
Keep all the DIP switches at the OFF position.
Wrong setting may cause the machine to malfunction.

C.G. BOARD CHECK

Checking the C.G. board function

■ Mode for checking the function of the C.G. board.
Observe the top and bottom monitor screens in this mode to make sure the C.G. board is functioning well.
To return to the main menu, press the START/VIEW switch.
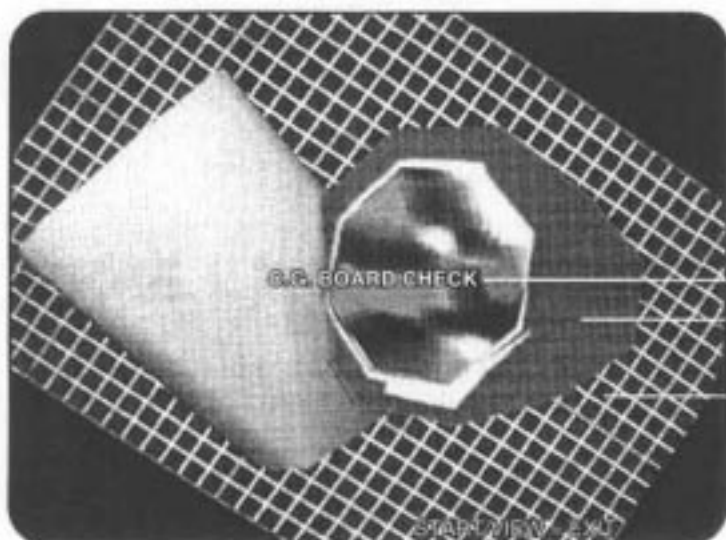
•The "C.G. BOARD CHECK" characters are shown before the objects.

•Two objects are rotating transformed and entangled with each other.

•The crosshatch pattern behind the objects is rotating.

SOUND OPTIONS

Adjusting the sound volume

■ In this mode, the following appears on the screen.
To return to the main menu, press the START/VIEW switch.

```
                    SOUND OPTIONS

SOUND IN ATTRACT MODE          ALL THE TIME ──────────── •Turns on and off the demo play sound.
                                                          •ALL THE TIME ──── Sound always on.
SOUND SCALE CHECK ──────────────────────────────         •ONCE EVERY 4 CYCLES ─── Sound on
                                                            every 4 cycles.
SOUND VOLUME UP       20 ███████████████████████ ──       •COMPLETELY OFF ──── Sound always off.
          DOWN                                          ─•You will hear a do-re-mi musical scale from
                                                            the left speaker first and then from the right
                                                            speaker, which is repeated twice.
FACTORY SETTINGS ────────────────────────────           •Adjusts the volume from the level 0 (no sound)
SAVE AND EXIT                                              to 30 (max.).
EXIT                                                      •Returns all the settings to the factory settings.



        SELECT LEFT/RIGHT   = SELECT OPTION
        START/VIEWE SWITCH = MODIFY SETTING
```

GAME OPTIONS

Setting the game options

■ In this mode, the following appears on the screen.
To return to the main menu, press the START/VIEW switch.

```
                                                        • Sets a difficulty level. (from the 8 levels)
                 GAME OPTIONS
                                                          1/EASIEST           Easier
EASY COURSE                                               2/VERY EASY           ⇑
  DIFFICULTY LEVEL              4/MEDIUM ───────          3/EASY
                                                          4/MEDIUM ────────Medium
MEDIUM COURSE                                             5/MEDIUM HARD
  DIFFICULTY LEVEL              4/MEDIUM                   6/HARD              ⇓
                                                          7/VERY HARD
HARD COURSE                                               8/HARDEST          Harder
  DIFFICULTY LEVEL              4/MEDIUM
                                                        • Changes the speed unit for the
SPEEDMETER DISPLAY             km/h ────────               speedometer. ("km/h"or "MPH")
COURSE RECORD SAVING           ENABLE ──────            • Sets course record saving enable/disable.
                                                          ENABLE:  The time of each course is
FACTORY SETTINGS ───────────────────────                           saved when the power switch
SAVE AND EXIT                                                       is turned off.
EXIT                                                      DISABLE: The course record is not
                                                                   saved.
        SELECT LEFT/RIGHT = SELECT OPTION                          Top 5 records can be saved
        START/VIEW SEITCH = WODIFY SETTING                         for each course.

                                                        •Returns all the settings to the factory settings.
```

22

COIN OPTIONS

Setting the coin options

■ In this mode, the following appears on the screen.
To return the main menu, press the START/VIEW switch.

⚠

•Note that the coin setting options are not displayed when FREE PLAY is set to "YES".

COIN OPTIONS

FREE PLAY   NO

COIN MECHANISM   INDEPENDENT ———————— •Always keep this at "INDEPENDENT".

COIN SLOTS   3 COIN 1 CREDIT ———————
                                                                              •Sets the relation between the number of coins and the number of credits.

FACTORY SETTINGS ————————————————————————— •Returns all the settings to the factory settings.
SAVE AND EXIT
EXIT

SELECT LEFT/RIGHT = SELECT OPTION
START/VIEW SWITCH = MODIFY SETTING

■ The relationship between the number of coins and the number of credits ▬ ▬ ▬ ▬

SETTING	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
COIN(S)	1	1	1	1	1	1	1	2	2	2	3	3	3	4	4	4	5	5	6	6
CREDIT(S)	1	2	3	4	5	6	7	1	3	5	1	2	4	1	3	5	1	2	1	5

SETTING	21	22	23	24	25	26	27	28	29	30	31	32
COIN(S)	7	7	8	8	9	10	11	12	13	14	15	16
CREDIT(S)	1	2	1	3	1	1	1	1	1	1	1	1

5-4 Troubleshooting the on-screen error message

If an error happens, its message appears on the screen. In such case, take the corrective measure.

> ⚠
>
> •If the corrective measure fails or any trouble not covered in this book occurs, stop using the machine and immediately turn OFF the main power switch. Then contact your nearest dealer.

Trouble	"LIMIT SENSOR ERROR" appears on the screen.

LIMIT SENSOR ERROR

CALL THE CLARK

■ Possible causes and measures to be taken ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬

Possible causes	Measures
•LIMIT SENSOR ERROR The rudder step lock system sensor is activated by detecting the locked and unlocked states at once.	
•LOCK ERROR The motor unit gets out of position and fails to get the rudder step locked. Or the lock sensor breaks down.	•Ask your nearest dealer for inspection and repair.
•UNLOCK ERROR The motor unit gets out of position and fails to get the rudder step unlocked. Or the unlock sensor breaks down.	

6 Setting up the game machine

6-1 Connecting the units

■ How to connect the units ━━ ━━ ━━ ━━ ━━ ━━ ━━ ━━ ━━ ━━ ━━ ━━

⚠

•In moving the machine, be careful to keep the machine's connections free from undue force. Do not move the machine by holding the control bar.
•Do not move the machine by grasping and pulling the bundled cables or the connectors coming out of the control unit or the main unit.
•When coupling the control unit, be very careful not to get the bundled cables caught.

1 Using nippers or the like, cut the clamp that holds the connectors together.
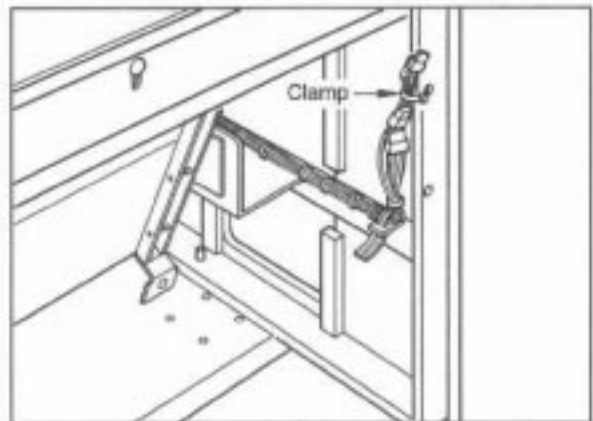
2 Detach the right and left side doors off the main unit. (See page 16.)

3 Fit the control unit to the main unit with care not to get the bundled connector cables caught. Temporarily interconnect them with the accompanying hexagon bolts, flat washers and spring washers (6 locations).
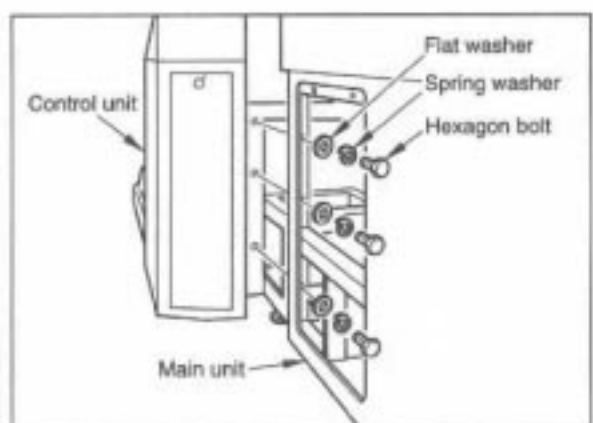
•Use a wrench (17 mm wide across flat) to tighten up the bolts.

━ MEMO ━

4 Be careful not to confuse the symbols and colors of the 6 connectors.
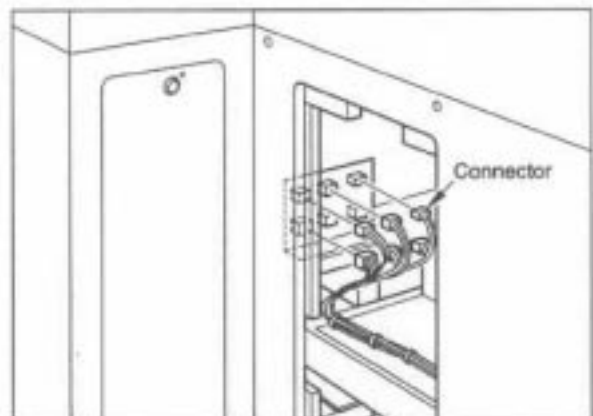
6-2 Fastening the adjusters

■ **How to fasten the adjusters** ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬

⚠

•Adjust the adjusters so that the casters do not touch the floor.   Take care not to exceed the maximum adjusting height of the adjuster.
•When fastening the adjusters, make sure the rudder step is at its center position.
•Make sure the 8 adjusters are evenly on the floor and that the machine is stable.   Tighten up the hexagon nuts upward.

1 | Fix the adjusters as shown below.

Maximum adjusting height: 60mm
(Min. 55mm)   (2.36in)
(Min. 2.17in)
Hexagon nut

Maximum adjusting height: 115mm
(Min. 85mm)   (4.53in)
(Min. 3.35in)
Hexagon nut
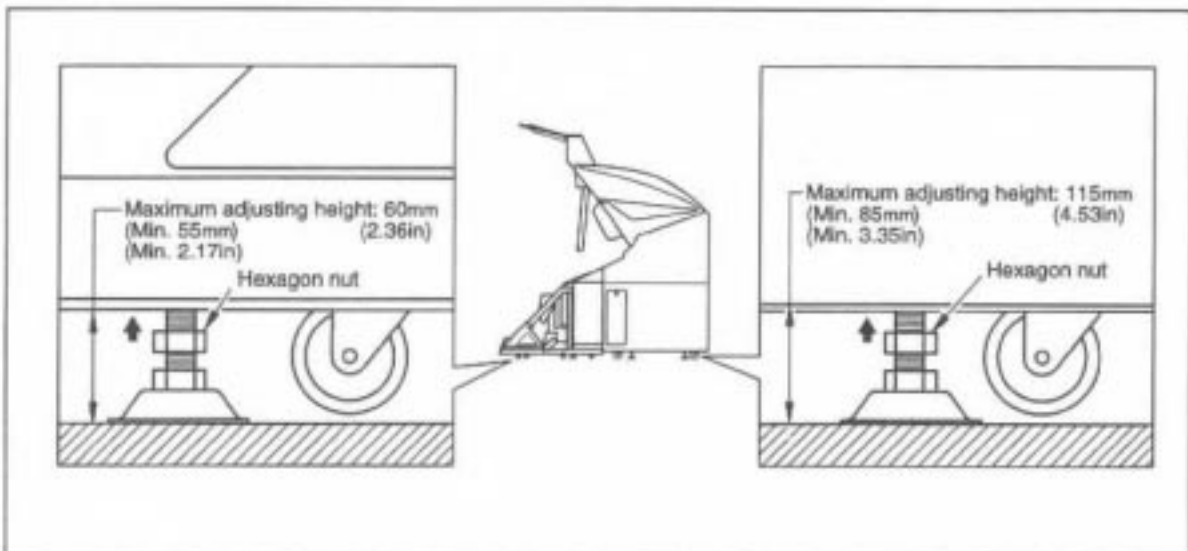
2 | Place the accompanying area mat so that its notches fit the adjusters.   See the figure at right.

3 | Peel the sheet off the back of the area mat and fix the mat in position.

4 | Place the side doors of the main unit back into position.

Area mat

Notch for the adjuster
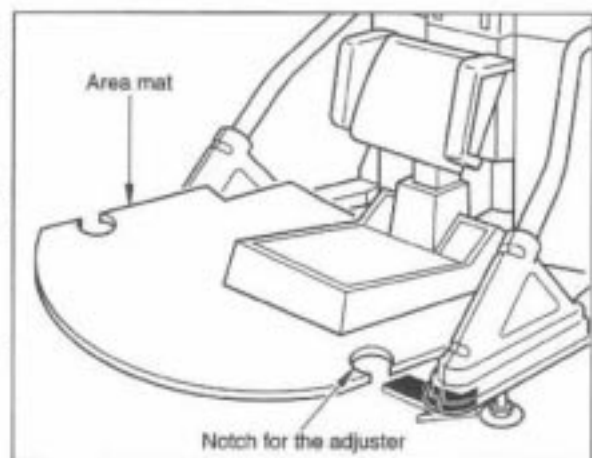
6-3 Attaching the wing pop

■ How to attach the wing pop ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━

1 Fix the wing pop fixtures on the wing pop as shown at right.

Wing pop
Wing pop fixtures
Wing pop anti-vibration rubber
Wing pop mounting flat washer
Wing pop mounting screw
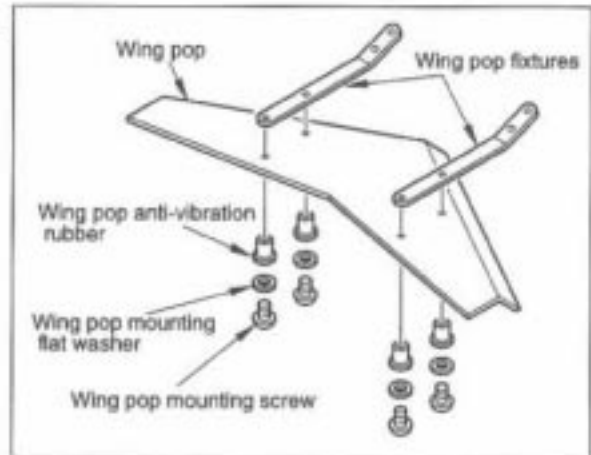
2 Attach the wing pop on top of the billboard.

Wing pop mounting screw
Billboard
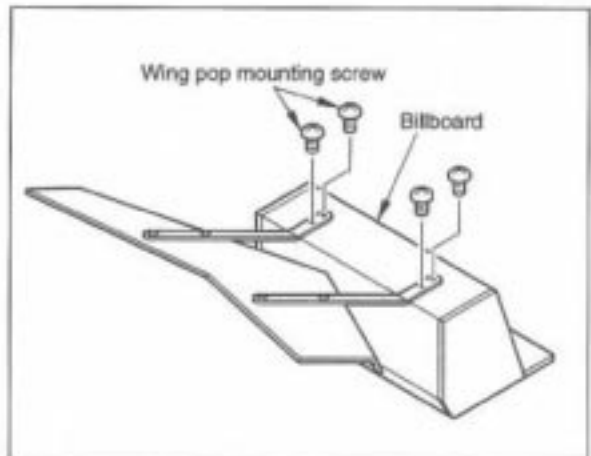
6-4 Attaching the billboard

■ How to attach the billboard ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━

⚠

•Before setting up the billboard, be sure to lock the adjusters to fix the units. (Refer to "6-2 Fastening the adjusters" on page 26.)
•Install the billboard with 2 or more people by using a stool or the like.

1 Draw the connector out of the billboard bottom.

Billboard bottom   Connector
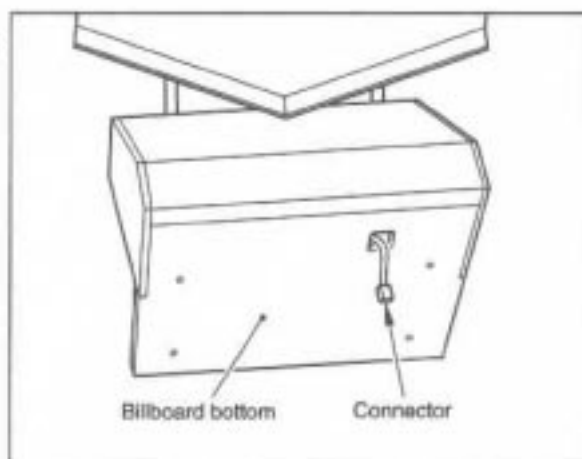
2 Lift the billboard and connect the connector to the counterpart of the main unit. Place the billboard in position, being careful not to get the bundled cables caught.
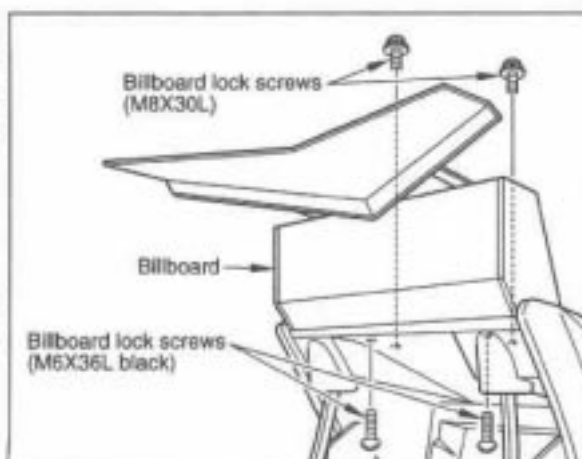
3 Tighten up the accompanying billboard lock screws to fix the billboard.

Billboard lock screws
(M8X30L)

Billboard

Billboard lock screws
(M6X36L black)

6-5 AC bracket

■ AC bracket ━

The AC bracket is located on the back of the main unit.

Ground terminal Main power swich

Fuse holder(10A)
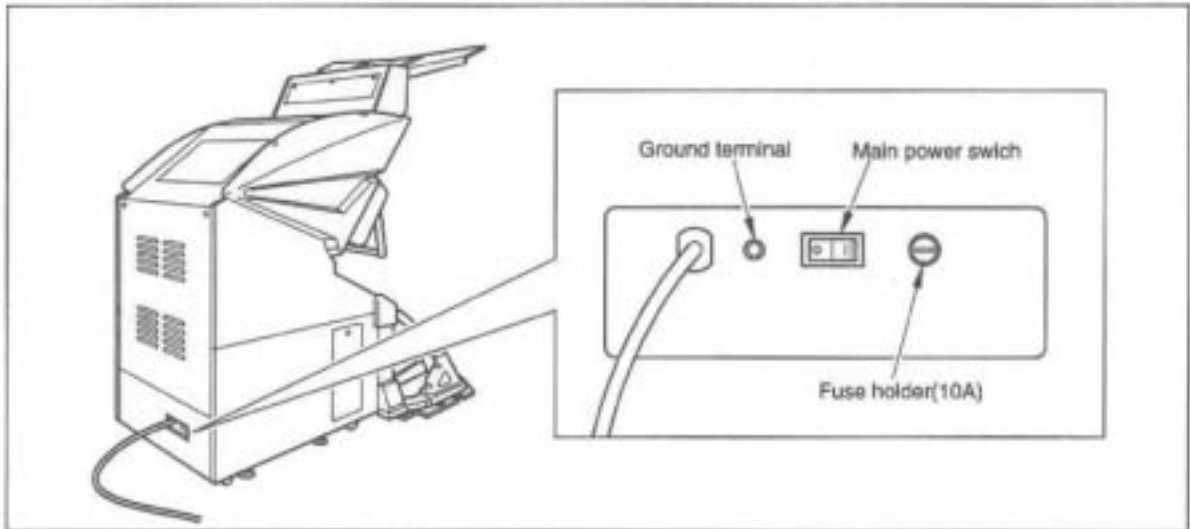
6-6 Service panel

■ Service panel ━

You will find the service panel when the maintenance door is opened.

⚠

•Before opening the side door, be sure to turn OFF the sub-power switch on the service panel first and then the main power switch on the AC bracket. If the sub-power switch is OFF but the main power switch is ON, some internal parts are still energized.

Test switch   Service switch   Top monitor degaussing switch

Bottom monitor degaussing switch

Coin counter compartment   Sub-power switch
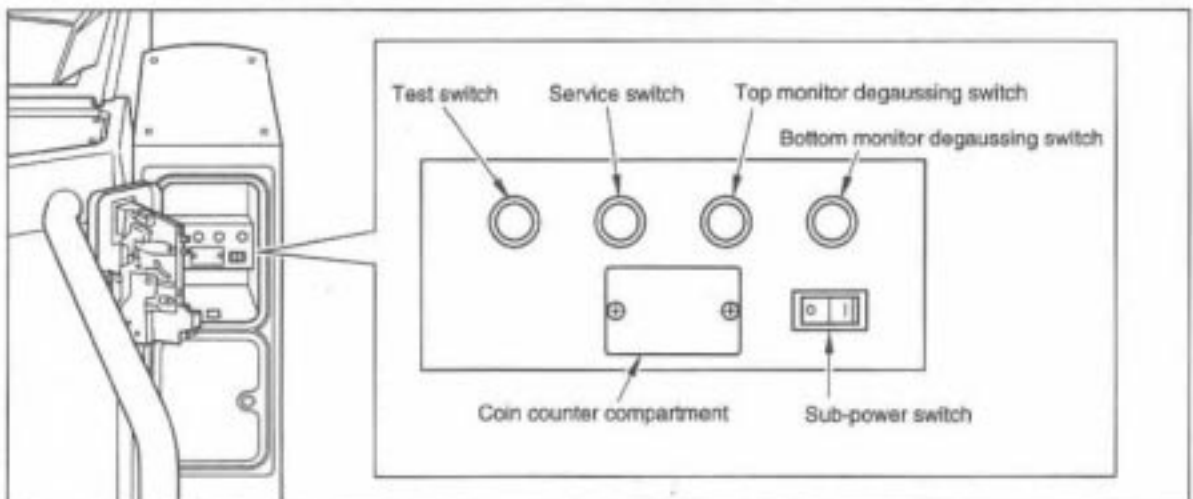
6-7 Separating and moving the units

■ How to remove the units ━━ ━━ ━━ ━━ ━━ ━━ ━━ ━━ ━━ ━━ ━━ ━━ ━━ ━━ ━━ ━━

The machine can be divided into the units.

⚠️

- •Before rolling the machine along on a rugged floor, be sure to divide the machine into the units.
- •Before separating the units from each other, be sure to turn OFF the main power switch and unplug the power cord.
- •Separate the billboard from the main unit, when needed, before loosening the adjusters.
- •In moving the machine, be careful to keep the machine's connections and control bar free from undue force. Do not move the machine by holding and pushing or pulling the control bar.
- •Before moving the machine, fully raise the 8 adjusters and roll the machine on the casters.
- •When connecting the separated units, take care not to catch the wiring and your hand between the units.

1 | Turn OFF the main power switch on the AC bracket and unplug the power cord.

2 | Remove the side door. (See page 16.)

3 | Disconnect the connector from between the main unit and the control unit. Remove the hexagon bolts.

4 | Loosen the 8 adjusters and move the units on the casters.
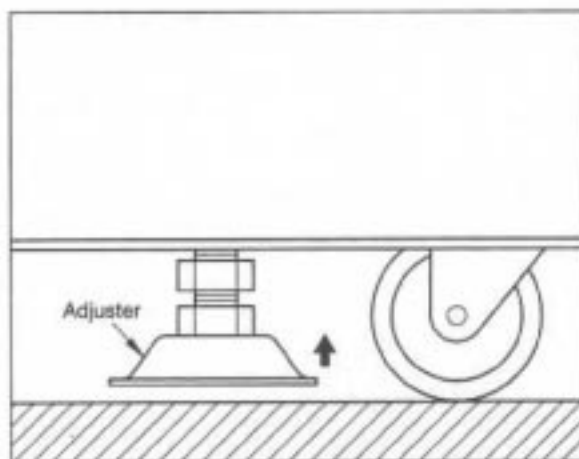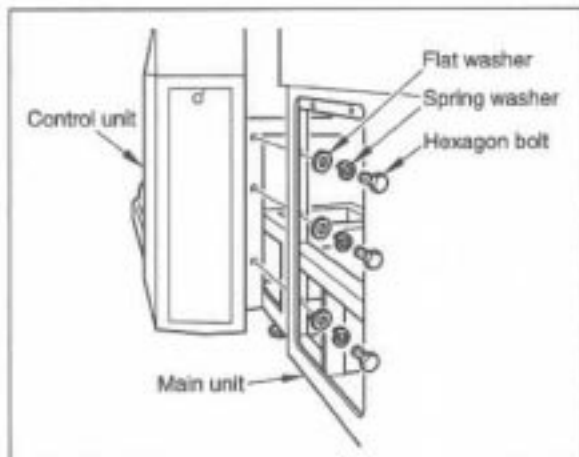
6-8 Moving the coin counter

■How to move the coin counter━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━

The coin counter was installed in the coin box when the machine left the factory, but it can be moved onto the service panel.
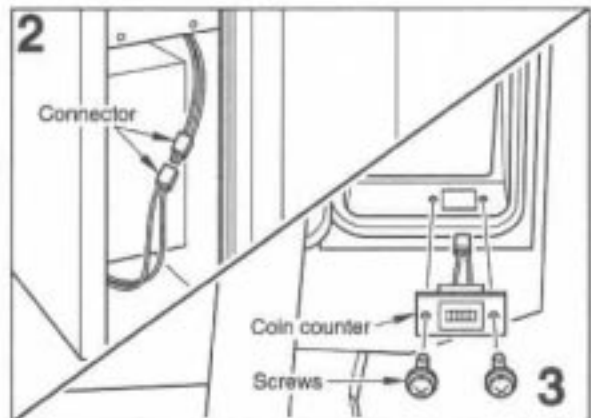
⚠

•Before moving the coin counter, be sure to turn OFF the main power switch and unplug the power cord.
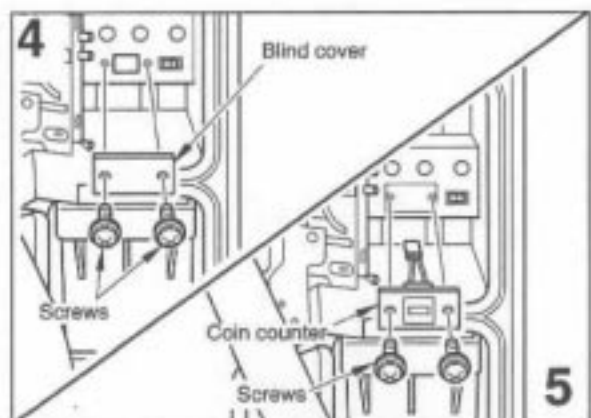
1 Remove the screw. Using the accompanying maintenance key, detach the operator box cover.

Screw

Operator box cover
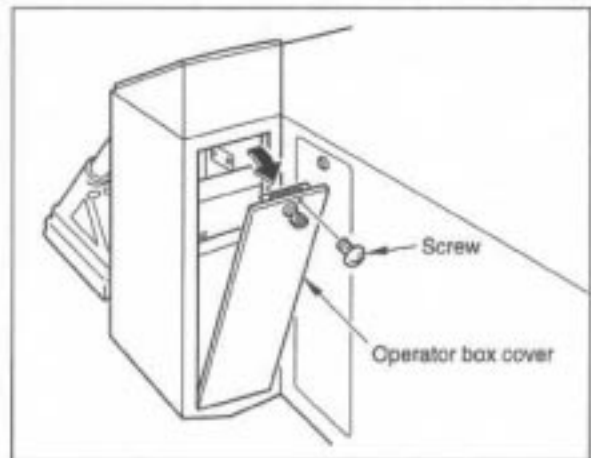
2 Disconnect the coin counter connector.

3 Open the coin door, remove the coin counter lock screws, and take out the coin counter.

Connector

Coin counter

Screws

4 Open the maintenance door and unscrew the blind cover to remove it from the service panel.

5 Fit and fix the coin counter on the service panel with the screws.

Blind cover

Screws

Coin counter

Screws

6 | Remove the switch cover from behind the service panel.
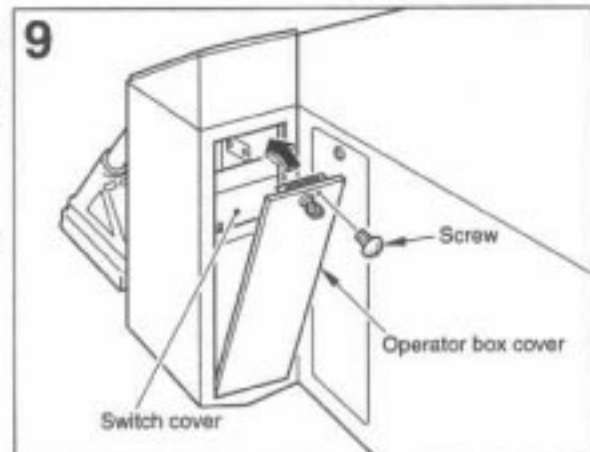

Switch cover

Screws
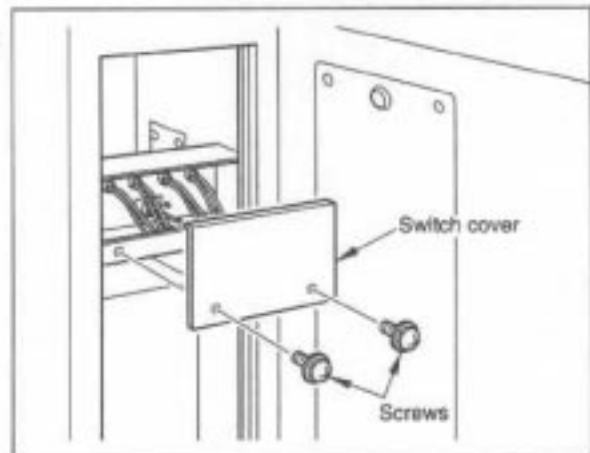
7 | Draw the coin counter connector out of the opening in the bottom of the service panel. Reconnect this connector to its counterpart.
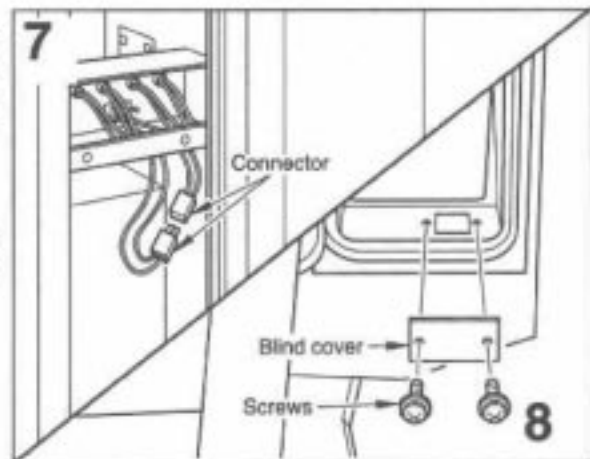
8 | Install the blind cover over the coin counter opening inside the coin box.

7

Connector

Blind cover

Screws

8

9 | Fit the switch cover into position behind the service panel. Place and lock the operator box cover with the maintenance key.

10 | Apply the screw into the operator box cover and tighten it up.

9

Screw

Operator box cover

Switch cover

7 Maintenance and annex

7-1 Replacing the coin selector

⚠️

•Be sure to turn OFF the main power switch and unplug the power cord before replacing the coin selector.

1 Open the maintenance door.

2 Remove the bolts (2 each) off the coin selectors. Slide the coin selectors to the right to taken them out. See the sketch at right.

**3** When mounting the coin selector, push up the lever and follow the procedure in the reverse order.

Lever

Coin selector

Bolts
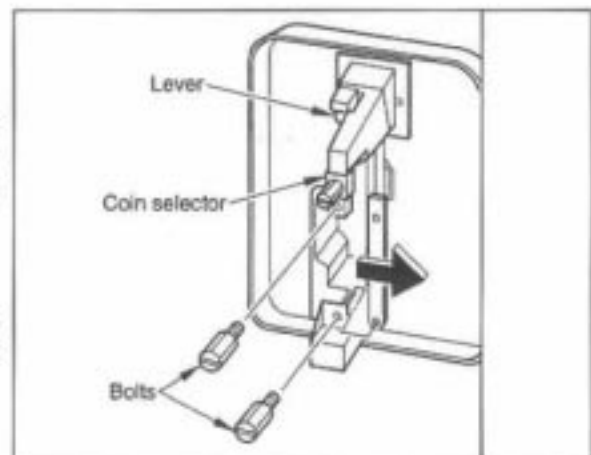
7-2 Replacing the fuse

⚠️

•Be sure to turn OFF the main power switch and unplug the power cord before replacing fuse.
•Replace the fuse with new one of the specified capacity.
•If the new fuse blows off soon, however, immediately turn OFF the main power switch and contact your nearest dealer.

■ How to replace the fuse (10A, 1 pc.)━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━

1 Turn the fuse holder cap counterclockwise using a bladed screwdriver.

2 Take out the fuse and set a new one in position. Tighten up the cap.
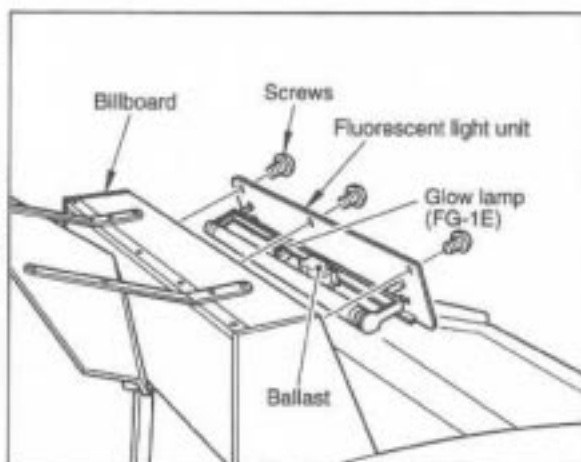

Fuse10A

Cap

Fuse holder

AC bracket
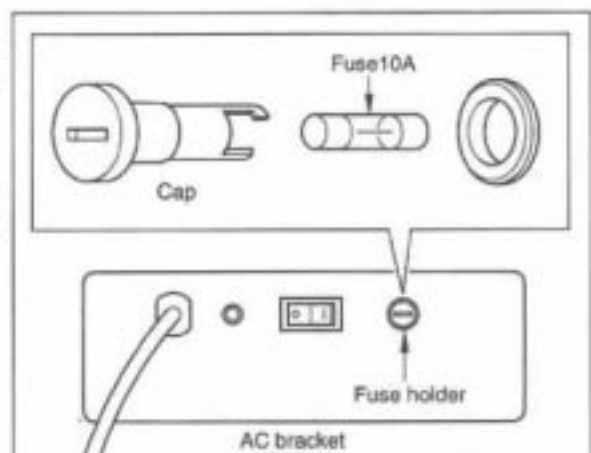
7-3 Replacing the fluorescent light

⚠️

• Be sure to turn OFF the main power switch and unplug the power cord plug from the receptacle before replacing the fluorescent light.
• The fluorescent light is hot just after it is put off. Wait until it cools down and then replace it with a new one of the same type (straight tube 32 W/100V).
• When removing or installing the fluorescent light unit, take care not to catch the wiring between the fluorescent light unit and the main unit.

1 | Remove the fluorescent light unit lock screws.

2 | Lift the fluorescent light unit off position. Be careful not to hit against the ballast.

Billboard Screws Fluorescent light unit Glow lamp (FG-1E) Ballast

3 | Press one end of the fluorescent light in the direction of the socket. The other end of the fluorescent light will be detached from the opposite socket.

4 | Install a new fluorescent light in the reverse order.

Press in this direction
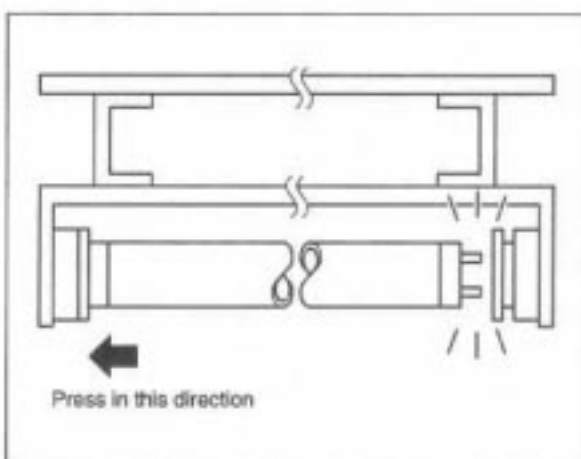
• It is recommended that the glow lamp should be also replaced.

MEMO

7-4 Replacing the press-button

■ How to replace the press-button ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━

⚠️
•Be sure to turn OFF the main power switch and unplug the power cord before replacing the press-button.
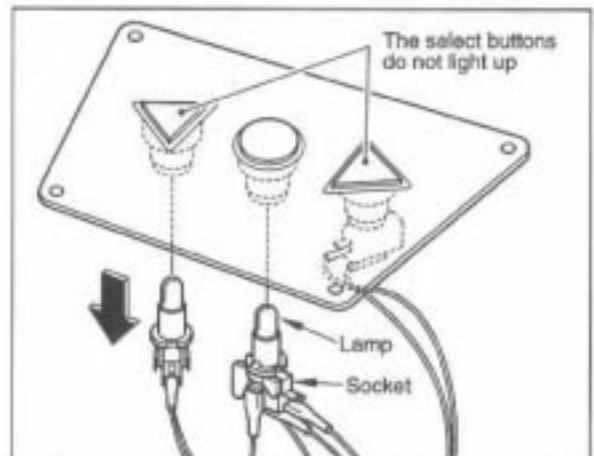
1 ┃ Remove the screws off the press-button mounting plate.

Screws   Press-button mounting plate
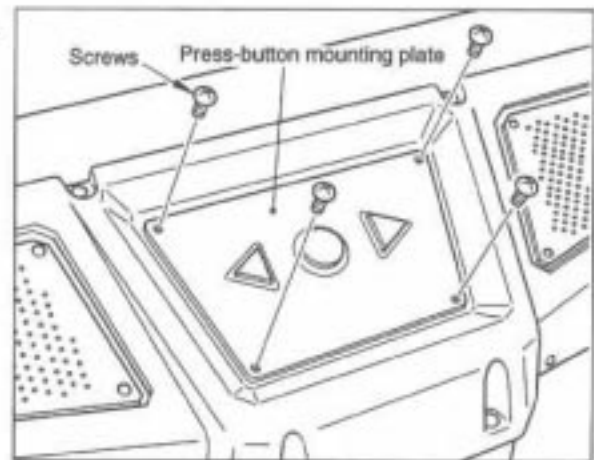
2 ┃ Pull out the sockets.

•When replacing the START/VIEW switch lamp, pull the lamp out of the socket.

━━━ **MEMO** ━━
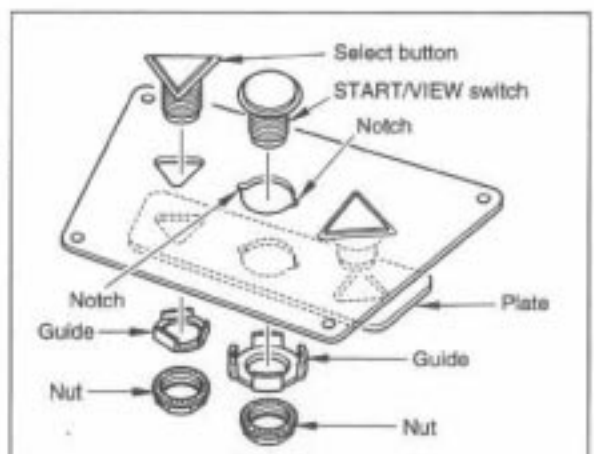

The select buttons do not light up
Lamp
Socket

3 ┃ Loosen the nut and take out the press-button.

4 ┃ Take the reverse procedure to fit a new press-button.

•In mounting the START/VIEW switch, fit it to the notches of the press-button mounting plate.

━━━ **MEMO** ━━

Select button
START/VIEW switch
Notch
Notch
Guide
Nut
Plate
Guide
Nut

35

7-5 Replacing and adjusting the potentiometer

■ How to replace the rudder step potentiometer ━ ━ ━ ━ ━ ━ ━ ━ ━ ━

⚠

•Be sure to turn OFF the main power switch and unplug the power cord
 before replacing the potentiometer.
•Be careful not to touch the internal parts of the machine.   Some of
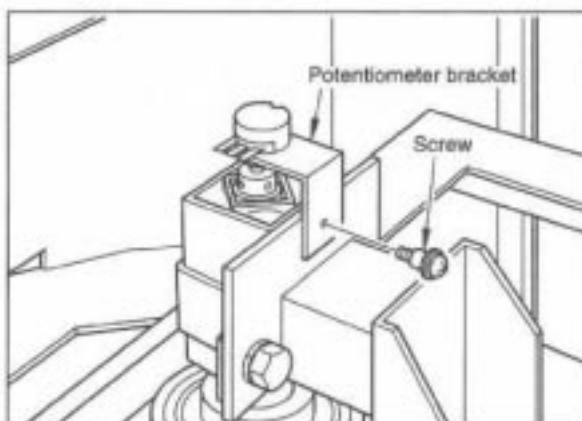 them have high voltage.

1 Separate the units from each
 other. (See page 30.)

2 Disconnect the 3 bundled wires
 and loosen the 2 lock screws.

•If any of the lock screws is too
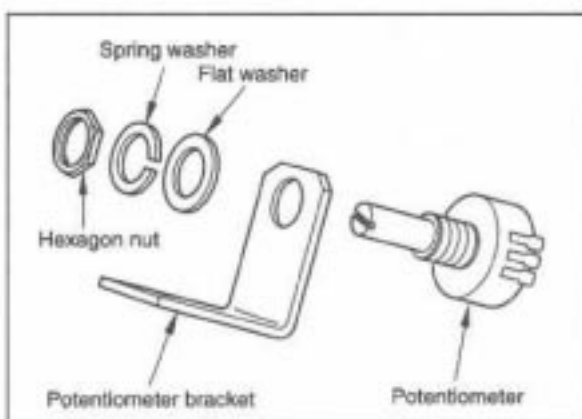 tight to loosen, move the rudder
 step for easy removal of the
 screw.
━━━━━ **MEMO**
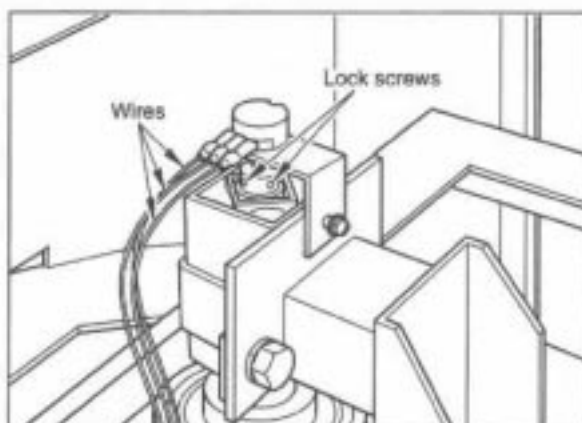
3 Remove the screw off the
 potentiometer bracket.   Take out
 the potentiometer and the bracket
 together.

4 Remove the hexagon nut
 fastening the potentiometer
 bracket and the potentiometer.

•When replacing the potentiometer
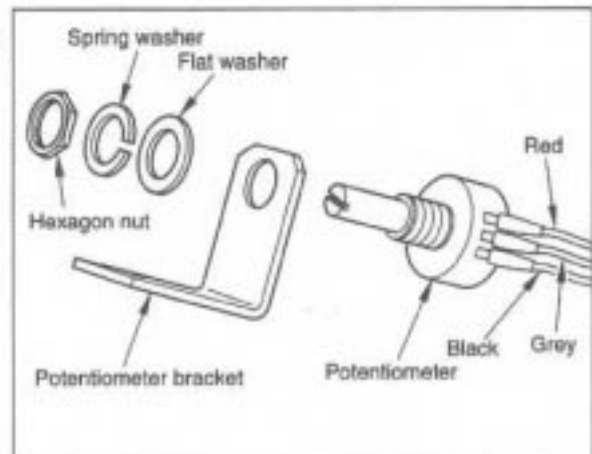 with new one, be sure to take the
 adjustment procedure on page
 37.
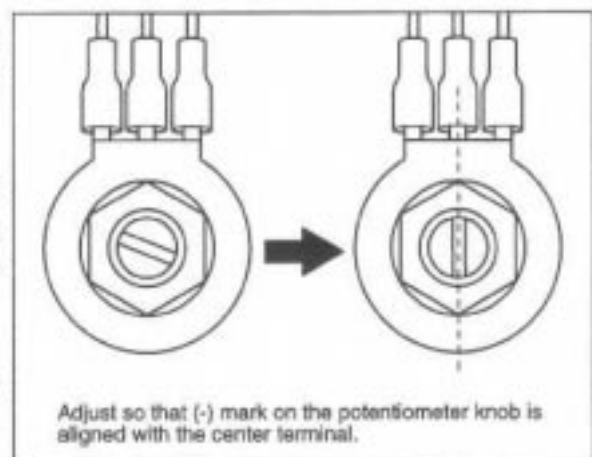━━━━━ **MEMO**

■ How to adjust the rudder step potentiometer ━ ━ ━ ━ ━ ━ ━ ━ ━ ━ ━

1 ┃ Attach a new potentiometer to the potentiometer bracket.

2 ┃ Connect the wires properly.

Spring washer
Flat washer
Hexagon nut
Potentiometer bracket
Red
Black   Grey
Potentiometer

3 ┃ Grasp the potentiometer tip with your fingers and adjust it as shown in the figure.

4 ┃ Make sure the rudder step is at its center position.   Place the control bracket back into position and tighten up the lock screws.

• When the fixing screws are tightened up, it is normal that the bracket still has some play. It cannot be fixed tightly.

━ MEMO ━

Adjust so that (-) mark on the potentiometer knob is aligned with the center terminal.

5 ┃ Carry out the checking as described in "5-1 PCB start-up check (Self test)" in page 17.

7-6 Adjusting the monitor

The monitor is properly adjusted before shipment.
However, it is possible to adjust, if necessary.

⚠

**•The monitor contains high-voltage components inside it.
Exercise due care not to touch them.**

■ Monitor adjustment PCB ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬

The monitor adjustment PCBs are located inside the main unit.   For adjusting
them, remove the side door on the machine's right. (See page 16.)
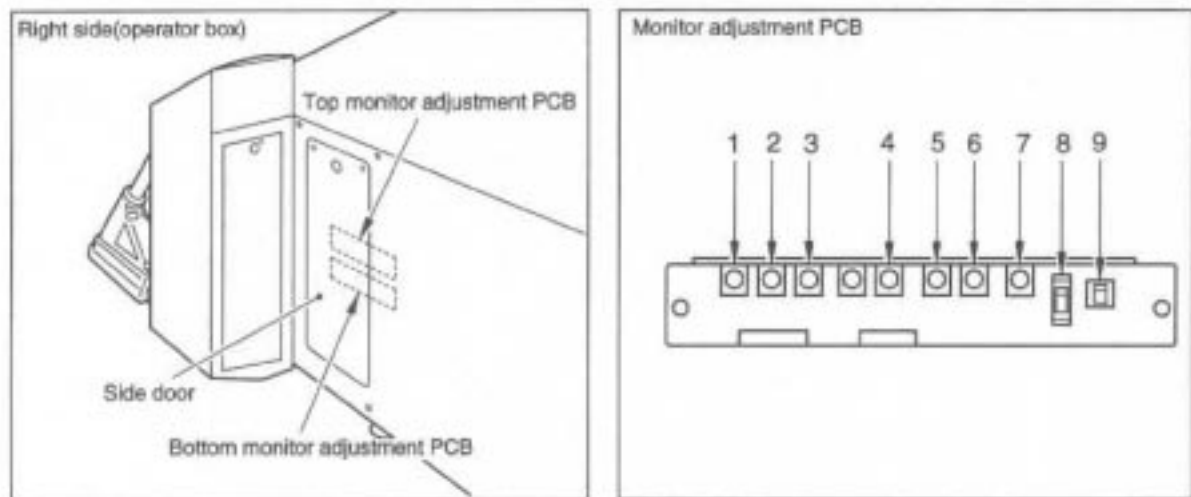
1	BRIGHT	**Brightness adjustment** Changes brightness. Turning it clockwise will make the image brighter.
2	CONTRAST	**Contrast adjustment** Used to change the contrast.
3	H.SIZE	**Horizontal size adjustment** Used to change the horizontal screen size.
4	H.POSI	**Horizontal image position adjustment** Changes the image position in the horizontal direction.
5	V.SIZE	**Vertical size adjustment** Used to change the vertical screen size.
6	V.POSI	**Vertical image position adjustment** Changes the image position in the vertical direction.
7	ROTATION	**Rotation** Used to correct the entire screen tilt.
8	S.S.SW	**S.S. switch** Used to adjust the screen sharpness. ON: at J378
9	DEGAUSS	**Degaussing** Used to correct possible color shift and unevenness.

7-7 Wiring diagram

CODE	COLOR
0	BLACK
1	BROWN
2	RED
3	ORANGE
4	YELLOW
5	GREEN
6	BLUE
7	PURPLE
8	GRAY
9	WHITE
E	GREEN/YELLOW