

SERVICE MANUAL



TWIN TYPE



IMPORTANT

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

Manufactured in the UK by

SEGA®



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1. BEFORE USING THIS PRODUCT

To ensure the safe usage, be sure to read the following before using the product. The following instructions are intended for the use of QUALIFIED SERVICE PERSONNEL ONLY.

If any activity is carried out on the product, this should be done only after carefully reading and sufficiently understanding the instructions.

Only qualified service personnel should carry out maintenance on the product.

Depending on the potential risk, terms such as “**WARNING!**” “**CAUTION**” and “**IMPORTANT!**” are used where an explanation is given that requires special attention. SEGA is not responsible for injury or damage caused by use in a manner contrary to the instructions given in this document.

In order to prevent accidents warning stickers and printed instructions are applied in the places where a potentially hazardous situation relating to the product could arise. Be sure to comply with these warnings.



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



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



This is cautionary information that should be complied with when handling the product. Indicates that mishandling the product by disregarding this will cause a potentially hazardous situation that may not result in personal injury but could damage the product.

Be sure to turn off the power and disconnect from the mains supply before working on the machine.

Ensure that the correct fuses are fitted to the machine. Details of these are enclosed in the Service Manual.

Ensure that only qualified Service Engineers perform any maintenance work on the machine.

Specification changes, removal of equipment, conversion and/or additions not designated by SEGA are not permitted and will invalidate this product's CE conformity.

Warning labels or safety covers for personal protection etc, are component parts of the product. A potential hazard will be created if the machine is operated while any parts have been removed. Do not operate the product if any doors, lids or protective covers become damaged or lost. SEGA is not liable in any whatsoever for any injury and/or damage caused by specification changes not designated by SEGA.

Before installing the product, check for the Electrical Specification Sticker, SEGA products have a sticker on which the electrical specifications are detailed. Ensure that the product is compatible with the power supply voltage and frequency requirements of the location in which the machine is to be installed.

Install and operate the machine only in places where appropriate lighting is available, allowing warning stickers to be clearly read.

To ensure maximum safety for customers and operators, stickers and printed instructions describing potentially hazardous situations are applied to potentially hazardous locations. Ensure that the product's operating location has sufficient lighting to allow any warnings to be read. If any sticker or printed warning is removed or defaced, do not operate the machine until an identical item has replaced it.

Exercise great care when handling the monitor (applies only to product with monitor). Some of the monitor (TV) parts are subject to high-tension voltage. Even after turning the power off some components are liable to high-tension voltage. Only qualified service engineers should perform monitor repair and replacement.

In cases where commercially available monitors and printers are used, only the items relating to this product are contained in this manual. Some commercially available equipment will have functions and reactions not referred to in this manual. This manual should be read in conjunction with the specific manufacturer's manual for such equipment.

Descriptions contained herein may be subject to change without prior notification.

The contents described herein are fully prepared with due care. However, should any question arise or errors be found please contact **SEGA AMUSEMENTS EUROPE LTD.**

Descriptions contained herein may be subject to change without prior notification.

The contents described herein are fully prepared with due care. However, should any question arise or errors be found please contact SEGA.

1.1. INSPECTIONS IMMEDIATELY AFTER TRANSPORTING THE PRODUCT TO THE LOCATION



- Only QUALIFIED SERVICE PERSONNEL should carry out inspection.

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

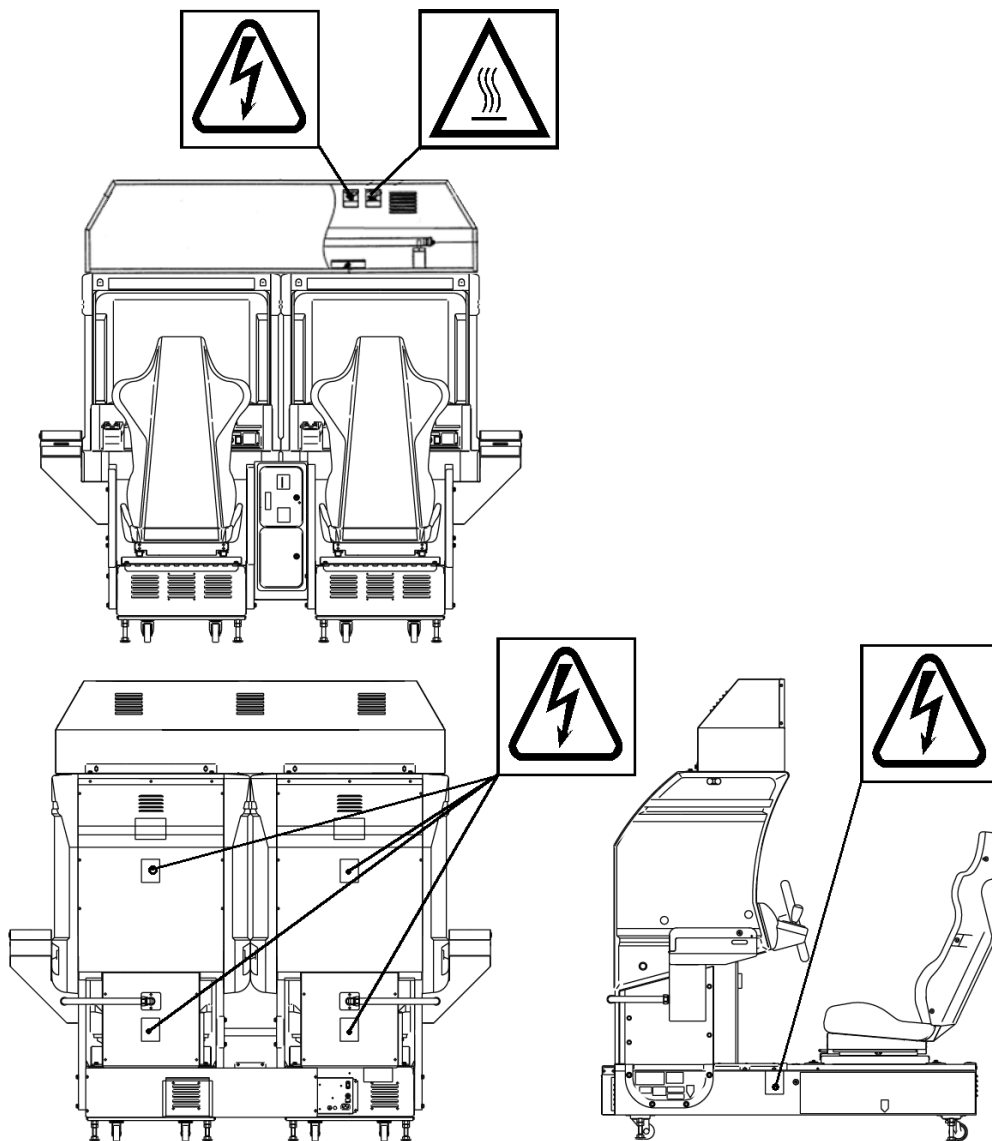
- Are there any dented parts or defects (cuts, etc.) on the external surfaces of the product?
- Are castors and leg adjusters present and undamaged?
- Do the power supply voltage and frequency requirements meet with the local supply?
- Are all wiring connectors correctly and securely connected? Unless connected in the correct direction, connector connections cannot be made successfully. Do not insert connectors forcibly.
- Are all IC's of each IC BD firmly inserted?
- Does the power cord have any cuts or dents?
- Do fuses meet the specified rating?
- Are such units such as monitors, control equipment, IC BD, etc. firmly secured?
- Are all earth wires connected?
- Are all accessories available?
- Can all doors and lids be opened with the accessory keys and/or tools?

CONCERNING THE STICKER DISPLAY

SEGA product has stickers describing the product manufacture number (Serial Number) and electrical specification. If you require service assistance you will require the Serial Number. Identical machines may have different parts fitted internally. Only by quoting the Serial Number will the correct parts be identified.

CONCERNING WARNING STICKERS

SEGA product has warning displays on stickers, labels or printed instructions adhered/attached to or incorporated in the places where hazardous situations can arise. The warning displays are intended for the accident prevention of customers and service personnel.



SPECIFICATIONS

Installation Space (cm): 202 x 170

Height (cm): 190

Weight (kg): 492

Power consumption (max):	Rated Voltage (V.AC):	230 $\pm$ 10%
	Rated Current (A):	2.75

Note: Descriptions in this manual are subject to change without prior notice.

2. INTRODUCTION TO THIS SERVICE MANUAL

SEGA ENTERPRISES LTD. supported by its experience in electronic high technology of VLSI's, microprocessors etc. and with a wealth of experience, has for more than 30 years been supplying various innovative and popular games to the world market. This Service Manual is intended to provide detailed descriptions together with all the necessary information covering the general operation of electronic assemblies, electro-mechanicals, servicing controls, spare parts, etc. as regards this new SEGA product. This manual is intended for those who have knowledge of electricity and technical expertise especially in IC's, CRT's, microprocessors etc. Carefully read this manual to acquire sufficient knowledge before working on the machine. Should there be any malfunction, non-technical personnel should under no circumstances touch the internal systems. Should such a situation arise contact our head office.

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3. INSTALLATION AND SERVICE INSTRUCTIONS



- Only QUALIFIED SERVICE PERSONNEL should carry out installation and commissioning.

3.1. HANDLING AND INSTALLATION PRECAUTIONS

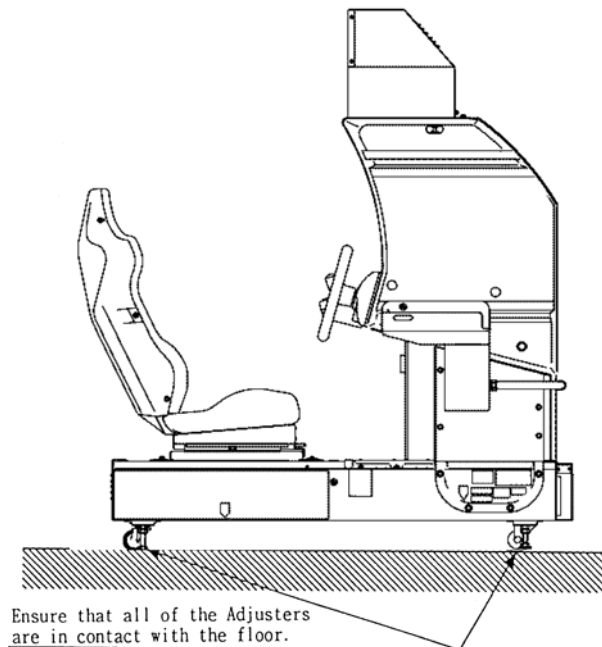
When installing or inspecting the machine, be very careful of the following points and pay attention to ensure that the player can enjoy the game safely.

The game must NOT be installed under the following conditions:

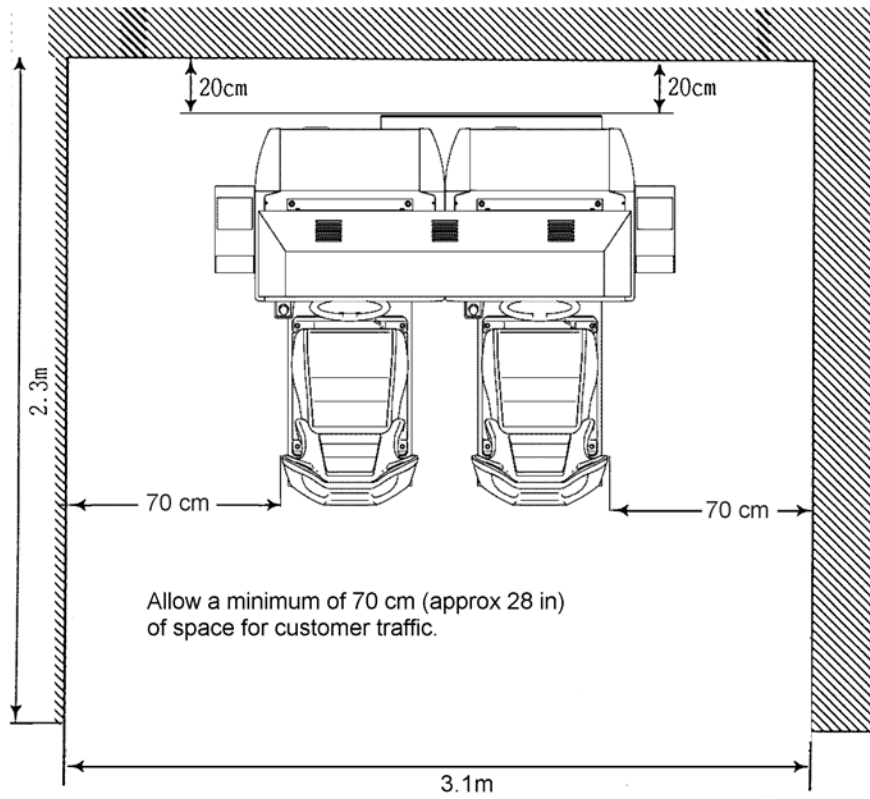
- Outside, the game is designed for indoor use only.
- In areas directly exposed to sunlight, high humidity, dust, excessive heat, or extreme cold.
- In locations that would present an obstacle in the case of an emergency i.e. near fire equipment or emergency exits.
- On unstable surfaces or surfaces subject to vibration.
- Where liquids, other than routine cleaning, may come into contact with the game.

Important:

- Only Qualified Service Personnel should install this machine.
- Be sure to switch the supply power OFF and remove the mains supply plug from the machine before any work is carried out on the machine.
- Do not attempt to repair the PCB's (Printed Circuit Boards) yourself. This will void the warranty. The PCB's contain static sensitive devices that could be damaged.
- Always return a faulty part to your distributor with adequate packaging and protection.
- When removing the plug from the mains always grasp the plug not the cable.
- Do not use a fuse that does not meet the specified rating.
- Make sure all connections are secure before applying power.



Installation Space





- Ensure that the mains lead is not damaged. If the mains lead is damaged in any way there could be a danger of electric shock or a fire hazard.
- Ensure that the power supply is fitted with circuit protection. Using the power supply without circuit protection is a fire hazard.

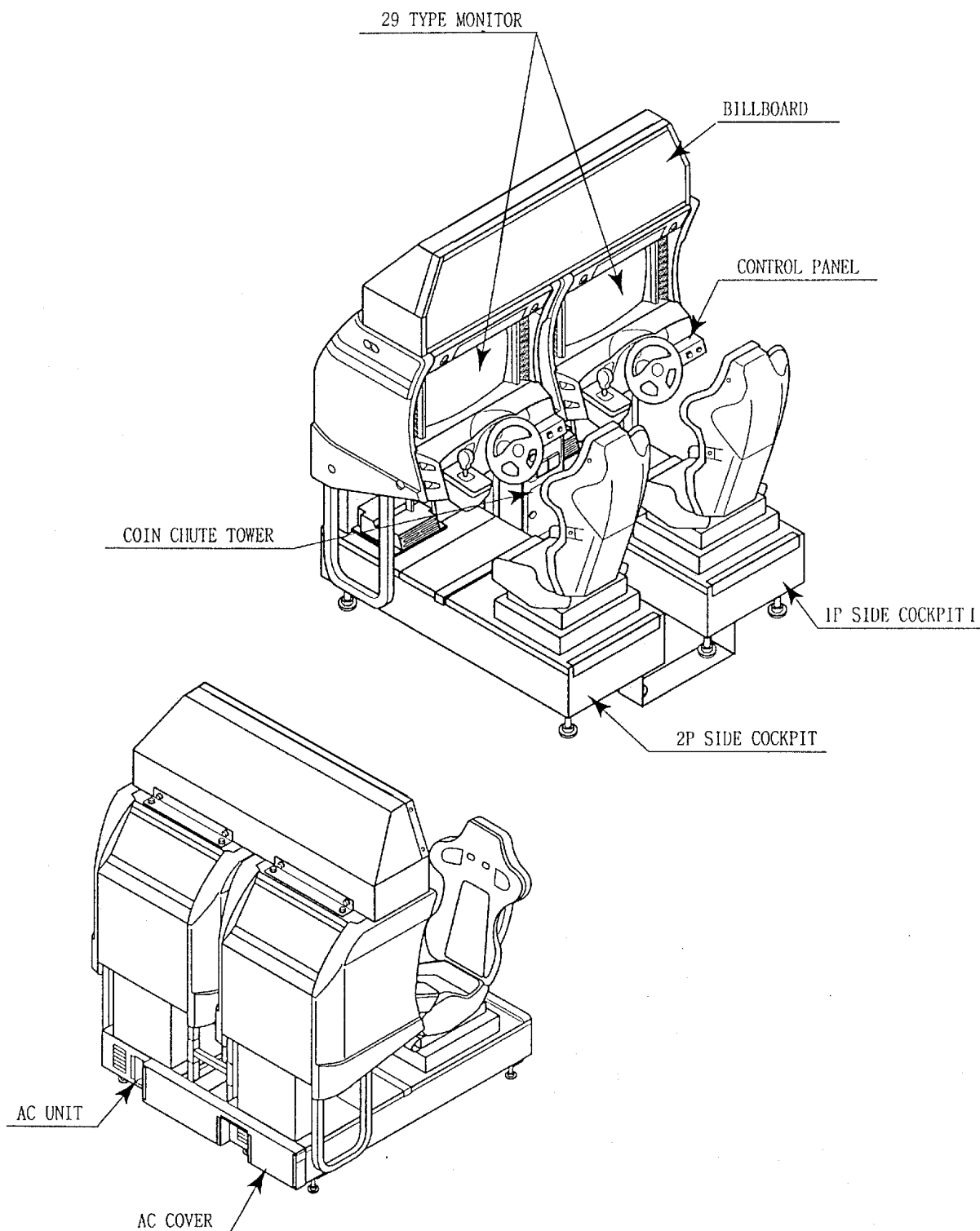
3.2. COIN HANDLING

Standard Sega machines are fitted with a SR3 coin mechanism, however, as a service to our customers Sega machines can be supplied with no coin mechanism or door allowing the customer to fit a coin handling option from the approved list. Fit only the coin handling arrangements detailed below and follow the instructions provided in Section 3.7.6. Failure to fit the coin handling options detailed or failure to follow the installation instructions will render the machine, under the CE marking directive, void.

Approved coin handling options:

- Coin controls SR3
- Generic mechanical
- Mars (MS111B1 and ME115)
- SECI RM4-G20

3.3. NAME OF PARTS

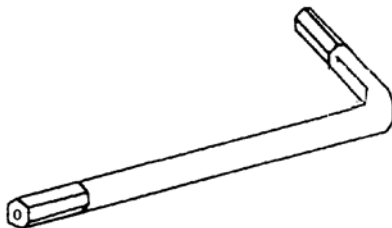


	Width (cm)	Length (cm)	Height (cm)	Weight (kg)
*COCKPIT (EACH)	101	165	152	224
COIN CHUTE TOWER	27	33	57	15
BILLBOARD	161	36	39	25
When Assembled	202	170	190	492 approx

*** WITH CARD READ/ WRITE UNIT (NOT SHOWN)**

3.4. ACCESSORIES

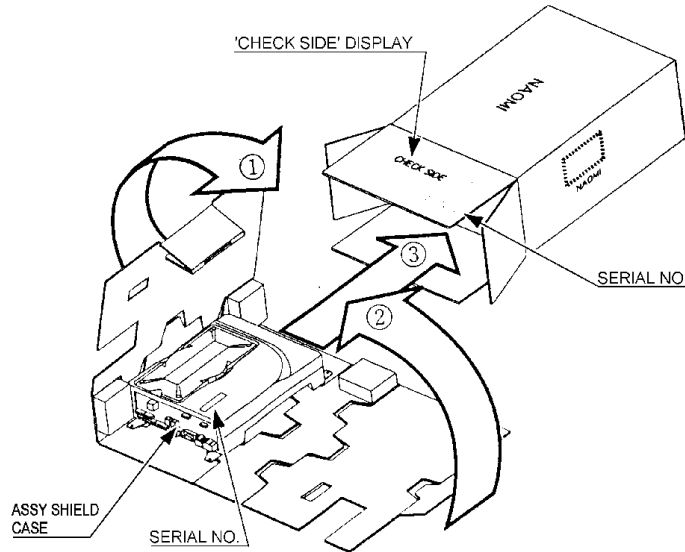
The machine is supplied with an installation kit. Please ensure the following parts are supplied:

ITEM	PART NO.	QTY	DESCRIPTION
1	TOS-0200UK	1	ASSY BILLBOARD
2	FRI-0300UK	1	ASSY COINCHUTE TOWER FRI
3	SPG-0500UK	1	ASSY WIRE COVER SPG TWIN
4	DYN-0013	1	JOINT PIPE
5	DYN-0006XUK	1	AC COVER B
6	SRT-0018UK	1	AC COVER C
7	DYN-0019UK	1	AC COVER D
9	SPG-0008	2	BILLBOARD HOLDER
10	422-0924UK	2	PLAY INSTR SH TOS MULTI
13	PK0358	1	INST KIT BOX TOS TWIN
14	TOS-0004UK	2	STICKER CARD SLOT TOF A MULTI
15	TOT-0005UK	2	STICKER CARD SLOT TOF B MULTI
16	601-11358-01	3	CARD PACKAGE TOS ENG
17	601-11050-91	1	CLEANING KIT(30SHT)
18	220-5753	1	VOL CONT B-5K OHM (TOCOS)
101	440-CS0186UK	2	STICKER C EPILEPSY MULTI
201	030-000825-SB	20	M8X25 BLT W/S BLK
202	068-852216-0B	20	M8 WSHR 22OD FLT BLK
203	000-P00412-WB	15	M4X12 MSCR PAN W/FS BLK
204	050-F00400	3	M4 NUT FLG SER PAS
205	068-441616	3	M4 WSHR 16OD FLT PAS
401	420-5827	1	SERVICE MANUAL SANWA 31K
402	420-6799-02UK	1	SERVICE MANUAL TOS TWIN
403	OS1019	2	SELF SEAL BAG 9X12.3/4
404	540-0006-01	1	WRENCH M4 TMP PRF
405	540-0007-01	1	WRENCH M5 TMP PRF
406	540-0009-01	1	WRENCH M8 TMP PRF
407	220-5484	1	VOL CONT B-5K OHM
408	SAECE-xxx	1	DECLARATION OF CONFORMITY
409	514-5078-5000	2	FUSE 5X20 CERAMIC SB 5000mA
411	420-6620UK	1	SERVICE MANUAL GD ROM SYSTEM
416	509-5704	1	SW MICRO TYPE (OMRON K3L13)
Item 404-406 - Tamper-proof TORX wrench.			
			

3.5. SHIPPING THE GAME BOARD



- When returning the GAME BOARD for repair or replacement, be sure to package the entire ASSY SHIELD CASE in the original card transit box - THERE ARE NO USER-SERVICEABLE PARTS INSIDE.
- Failure to return the GAME BOARD in this manner may invalidate the warranty.

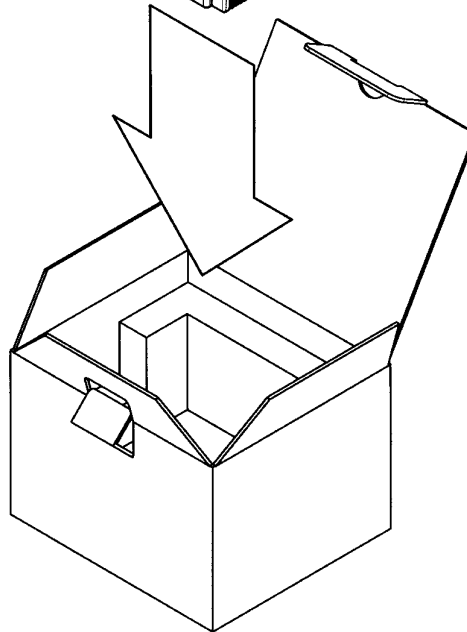
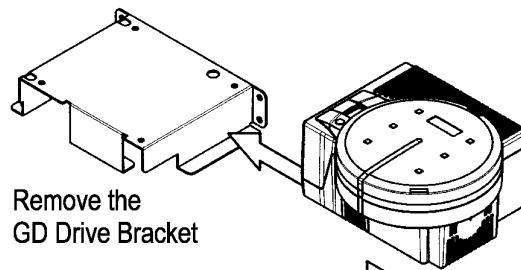


Pack the ASSY SHIELD CASE in the original transit box as shown. Putting it upside down or packing otherwise in the manner not shown can damage the GAME BOARD and other parts.

3.6. SHIPPING THE GD-ROM DRIVE



- When returning the GD-ROM DRIVE for repair or replacement, be sure to package it in the original card transit box - THERE ARE NO USER-SERVICEABLE PARTS INSIDE.
- Ensure the GD-ROM Disk is removed and the GD-ROM Drive Lid is replaced on the unit, with fixing screw, before packaging. Also, remove the GD-ROM Drive Bracket and store with the four screws for reuse.
- Failure to return the GD-ROM DRIVE in this manner may invalidate the warranty.



3.7. ASSEMBLY INSTRUCTIONS



- Perform the assembly by following the procedure herein stated. Failure to comply with the instructions, for example, inserting the plug into an outlet at a stage not mentioned in this manual can cause an electric shock
- Assembling should be performed as per this manual. Since this is a complex machine, erroneous assembling can cause damage to the machine, or malfunction to occur.
- Do not attempt to complete this work alone, a minimum of 2 people are required.



- Only QUALIFIED SERVICE PERSONNEL should carry out assembly.

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

STEP 1 ASSEMBLING THE COCKPIT

STEP 2 SECURING IN PLACE (LEG ADJUSTER ADJUSTMENT)

STEP 3 BILLBOARD INSTALLATION

STEP 4 INSTALLING THE AC COVERS (WIRE COVERS)

STEP 5 COIN HANDLING INSTALLATION

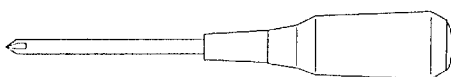
STEP 6 CONNECTION TO POWER SUPPLY

STEP 7 ASSEMBLY CHECK

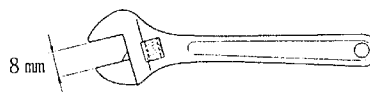
Note that the parts contained within the installation kit are required for the assembly work.



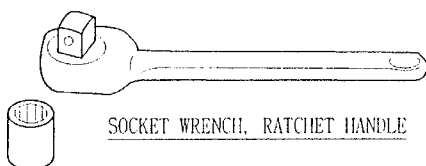
- Fit all fixings loosely first as detailed in step 1, then position all components before finally tightening fixings at step 6.



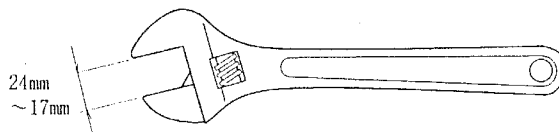
Phillips type screwdriver



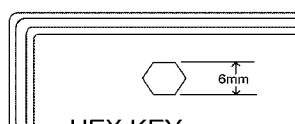
WRENCH (for M5 hexagon bolt)



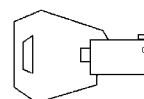
SOCKET WRENCH, RATCHET HANDLE



WRENCH (for M16~M10 hexagon bolt)



HEX KEY



Keys

3.7.1. APPLYING THE PLAY INSTRUCTIONS



IMPORTANT

- Only QUALIFIED SERVICE PERSONNEL should carry out this operation.

Supplied in the installation kit are 4 sets of play instructions in 5 languages. Select the language of your choice and apply in the following areas:

1. 422-00924UK: Instructions (on Monitor Mask)
2. TOT-0005UK: Card Slot
3. TOS-0004UK: Card Instructions (on Card R/W Lid)



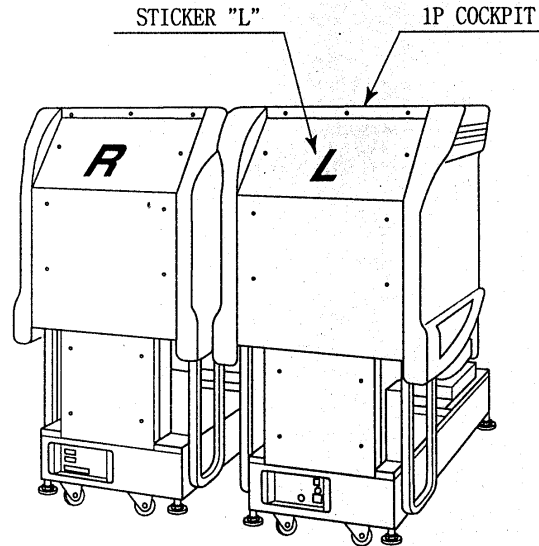
N.B.: Product appearance may differ slightly.

3.7.2. ASSEMBLING THE COCKPIT

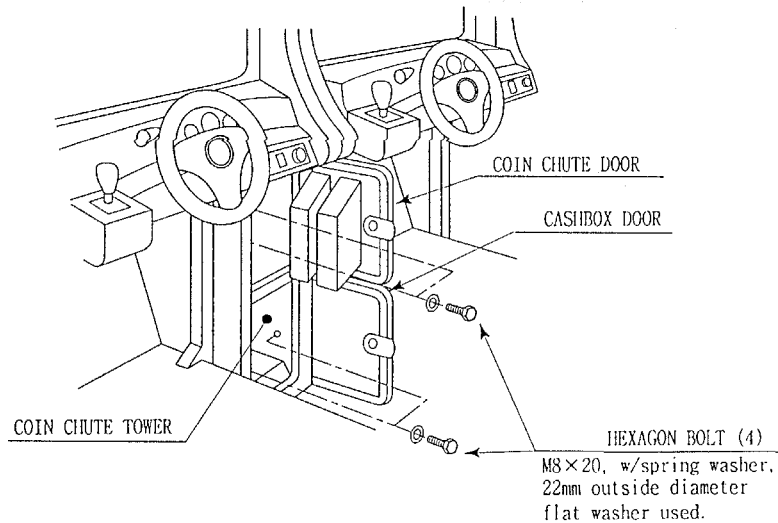


- Only QUALIFIED SERVICE PERSONNEL should carry out this operation.

1. Place the two cockpits side by side. Position the 1P cabinet, which has the IEC inlet at the left hand side when viewed facing the monitor. STICKER L is attached to the back of the 1P cabinet and STICKER R on the back of the 2P cabinet

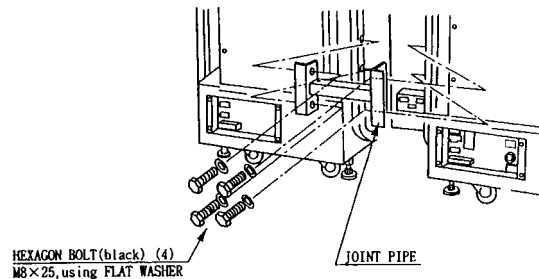


2. Install the coin chute tower in between both cabinets. Open the coin chute door and the cash door and secure with the 4 hexagon bolts from inside the doors. At this time, make sure the bolts are only loosely fitted.



Note: Door may open in opposite way to that shown above

3. Install the joint pipe on the rear-side of both cabinets by securing with 4 hexagon bolts, at this time loosely.



3.7.3. SECURING IN PLACE (LEG ADJUSTER ADJUSTMENT)

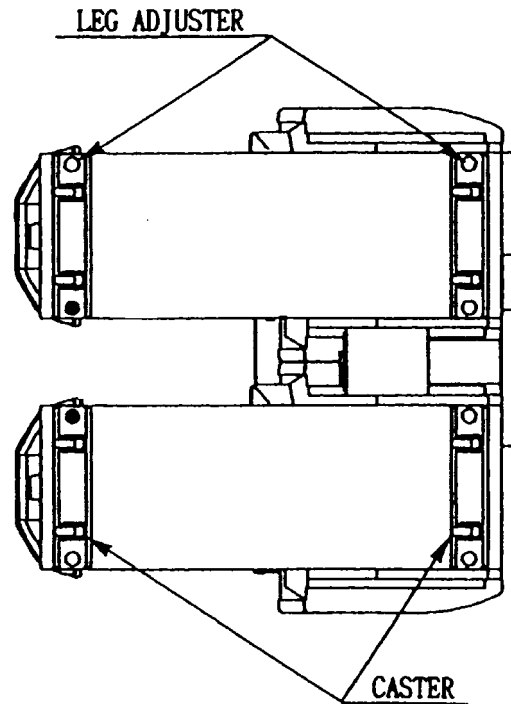
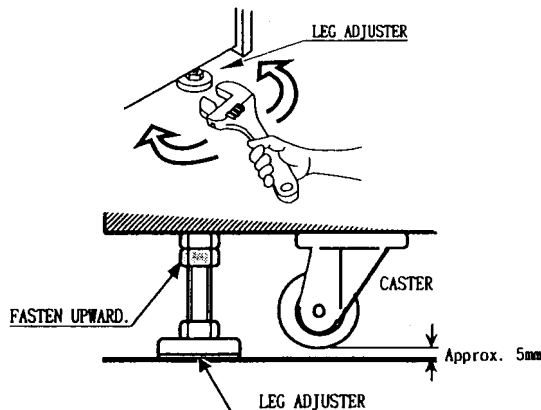


- Make sure all of the leg adjusters are in contact with the floor. If they are not the machines may move and cause injury. This operation requires 2 people.

- Only QUALIFIED SERVICE PERSONNEL should carry out this operation.

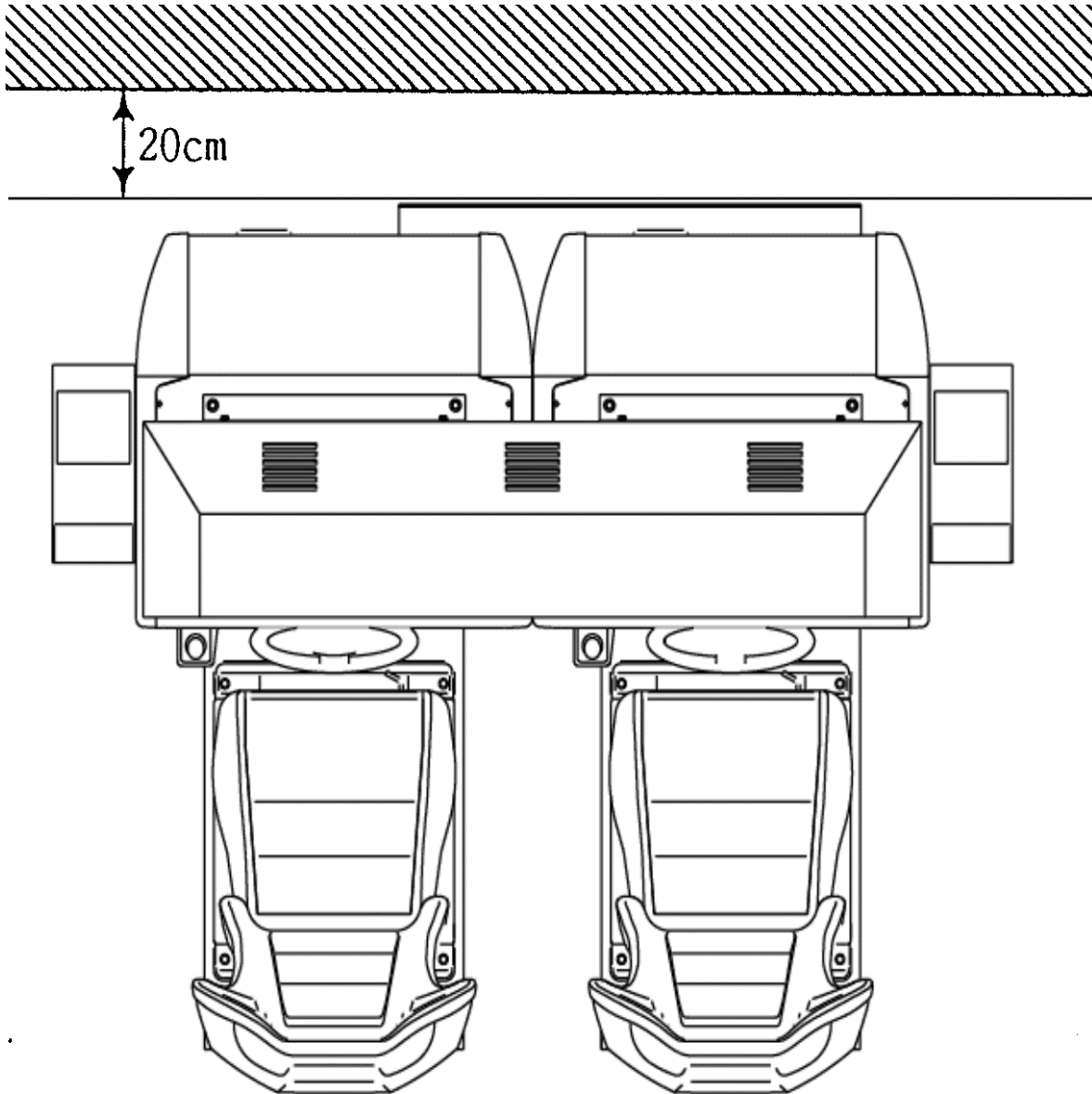
This machine has eight castors and eight leg adjusters. When the installation position is decided, unscrew the leg adjusters so that they raise each caster a minimum of 5mm from the floor. Make sure the machine is level.

1. Move the machine to the installation position. When installing against or close to a wall, be sure to allow an adequate space to allow the player access to the machine.
2. Make the leg adjusters contact the floor. Adjust using a spanner as shown below so that a minimum of 5mm exists between the casters and the floor. Make additional adjustment so that the machine is level.



After securing the leg adjuster bolts, fully tighten all bolts temporarily attached in STEP 1 above.

Ensure adequate ventilation is maintained as detailed below



3.7.4. BILLBOARD INSTALLATION

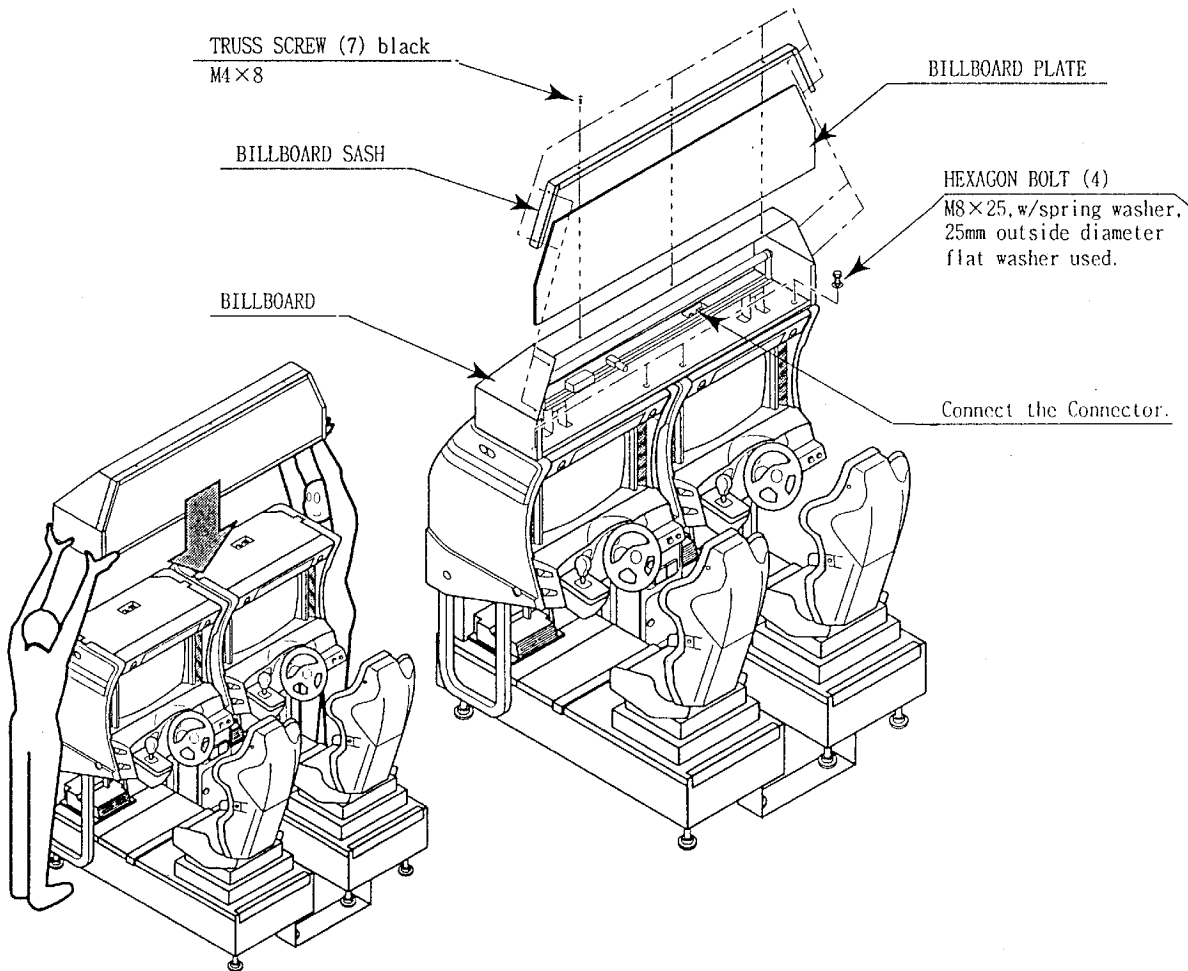


IMPORTANT

- One person alone cannot perform the installation of the billboard assembly. Seek assistance before attempting this operation

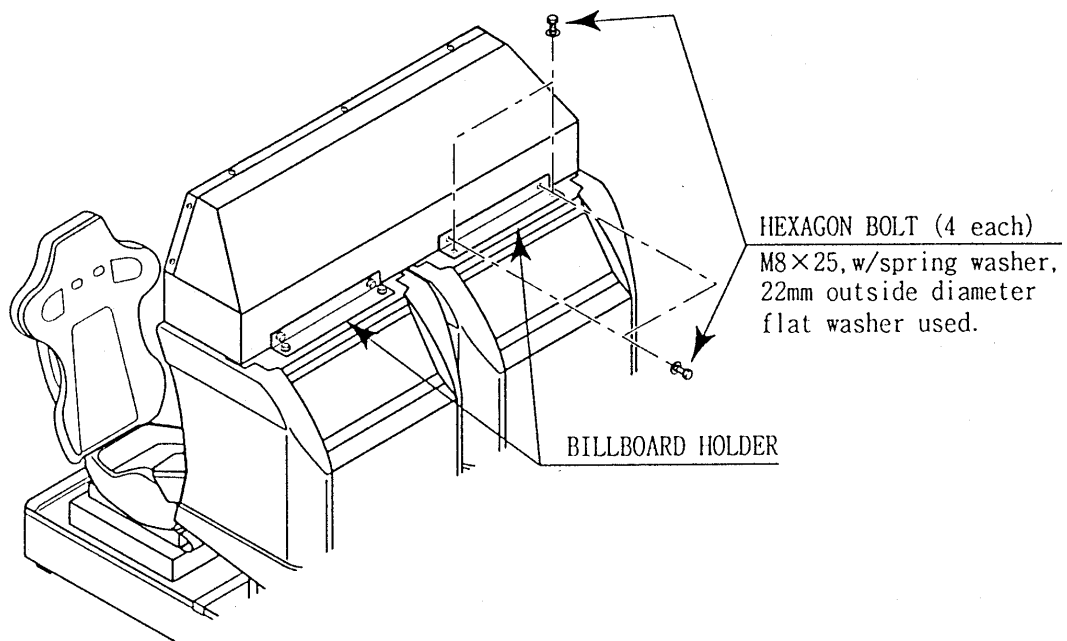
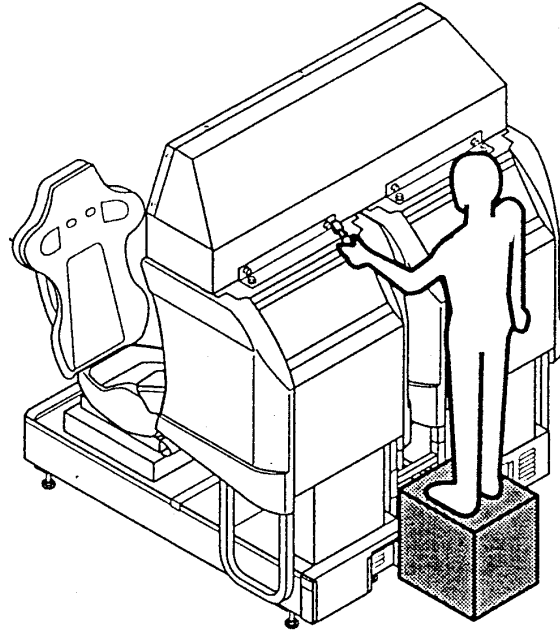
- Only QUALIFIED SERVICE PERSONNEL should carry out this operation.

1. Install the Billboard over the two cockpits using two or more workers to lift it into position.



2. Remove seven truss screws and take off the Billboard Sash. Withdraw the Billboard Plate.
3. Fasten the four M8x25 hex bolts to secure the Billboard to the cabinets.
4. Connect the wire connectors from the billboard box to the connectors on the cabinet

5. Install the two Billboard Holders to the rear of the Billboard, and secure using four M8x25 hex bolts for each.
6. Complete installation by reinserting the Billboard Plate and replacing the Billboard Sash.



3.7.5. INSTALLING THE AC COVERS (WIRE COVERS)

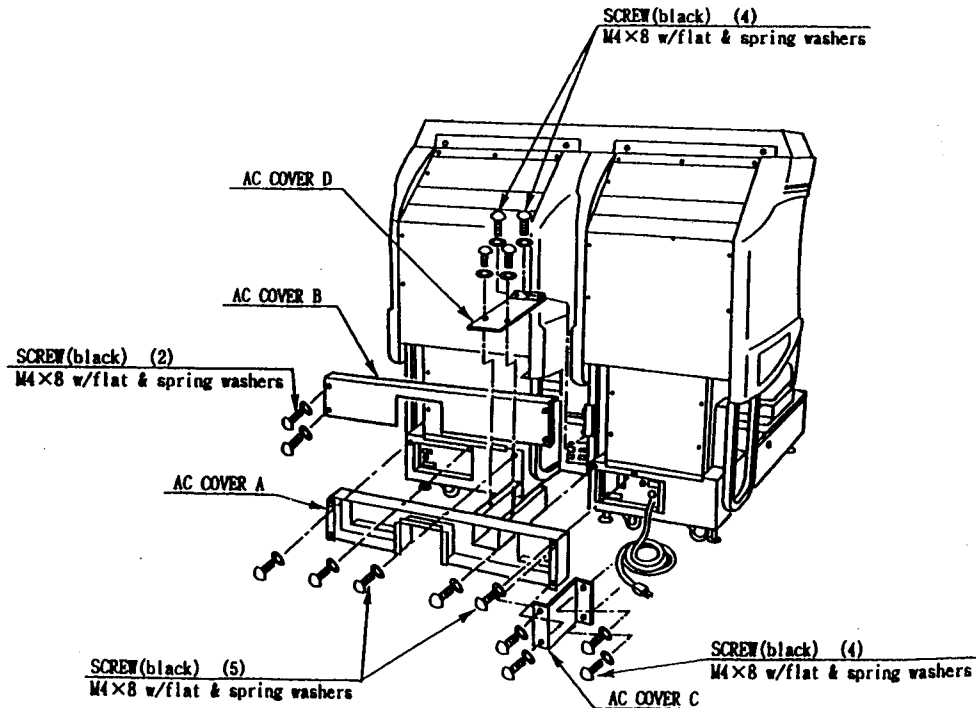


- Be sure that the machine is not connected to the mains supply before attempting this operation

- Only QUALIFIED SERVICE PERSONNEL should carry out this operation.

The AC Wire Covers are used for protecting the interconnecting wiring and the fibre optic cables. When carrying out this operation be very careful so as not to trap any wire between the covers. Pay attention when handling the fibre optic cables as excessive bending may cause damage.

1. Attach AC Cover A to the rear of the cabinet using 5 screws.
2. Make all the wiring connections between the two cockpits and the Coin Chute Tower. The wiring connectors are colour coded and cannot be fitted into the wrong size connectors. Do not force any connectors together.
3. Connect the earth wires between the two AC Brkts, the AC Covers and the Coin Chute Tower.
4. Insert the fibre optic cables into the fibre optic connectors. Ensure that the "RX" connection on the 1P cockpit is connected to the "TX" connector on the 2P cockpit. The other fibre optic connects the "TX" connector of the 1P cockpit to the "RX" connector of the 2P cockpit.
5. Insert AC Cover B into AC Cover A from above and secure using 2 screws. Be sure not to trap any cables.
6. Secure AC Cover C and AC Cover D using 4 screws each.

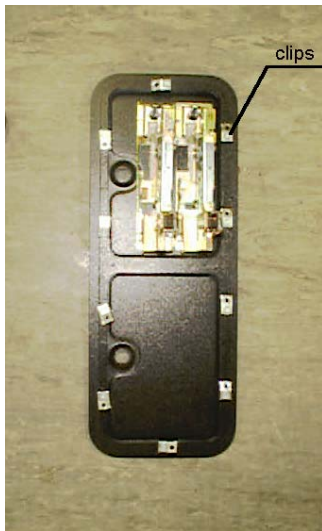


3.7.6. COIN HANDLING INSTALLATION



- Only QUALIFIED SERVICE PERSONNEL should carry out this operation.

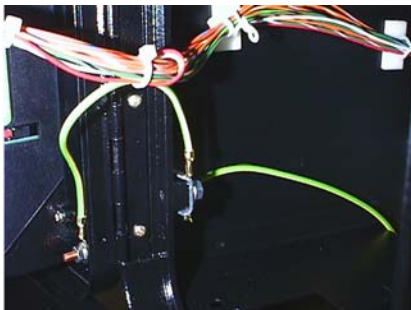
When fitting the coin mechanism to the door please refer to the specific manufacturers installation instructions for that coin mechanism. To fit the door to the machine, follow the procedure below.



- Loosen all of the bolts on the frame, which secure the clips.
- Turn all clips in towards the door.



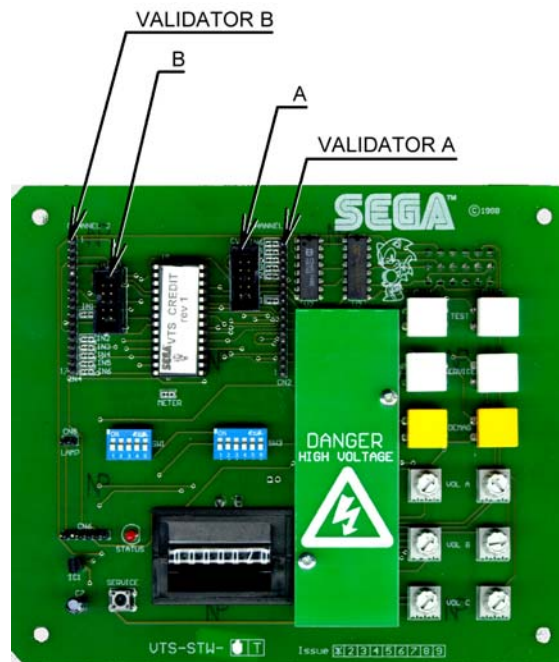
- Position the door into the aperture in the machine.
- Turn the clips around so that they will hold the door in the machine.
- Tighten all of the bolts.



- Ensure that the door is earthed to the frame and the frame is earthed to either the VTS bracket or the coin chute tower.

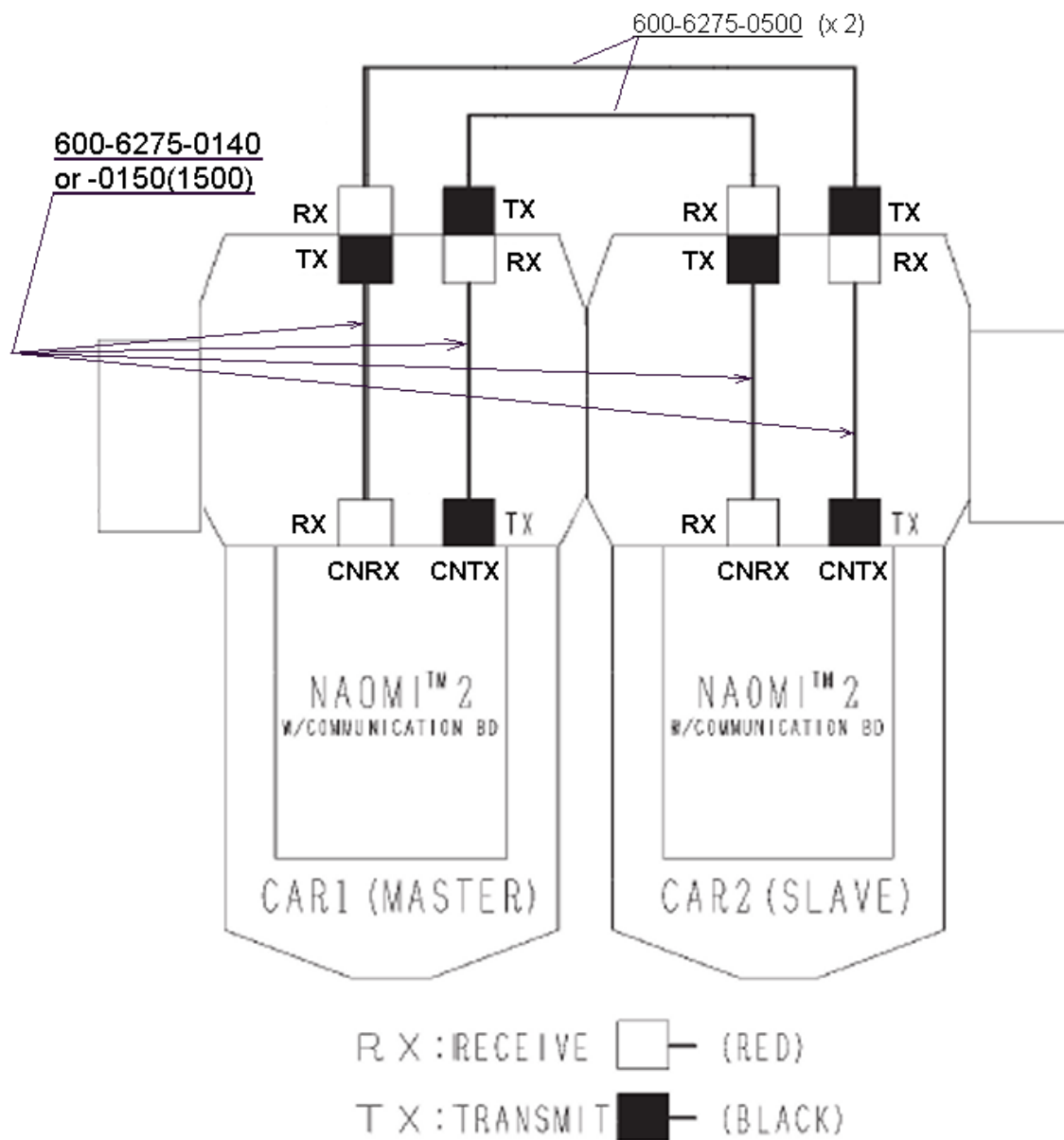
3.7.6.1.WIRING CONNECTIONS.

COIN MECH C220B	LOOM LM1006IDC LM1006LAMP-0.1	INSTALLATION • Attach the lamp holder to the bracket on the coin return button. • Attach one 15-way connector to the C220 coin mech. • Attach the other 15-way connector to Validator A on the credit board. • Attach the 2-way connector to 'LAMP' on the VTS board.
GENERIC MECHANICALS	LM1008 LM1008-LAMP	• Fit the two lamp holders behind the coin return buttons. • Attach the blue cable and orange cable to one mech's microswitch switch. • Attach the blue/green cable and orange/green cable to the other mech's microswitch. • Attach the 2-way mate and lok plug to the 2-way mate and lok cap provided. • Attach one 15-way connector to Validator A and the other to Validator B on the credit board
MARS MS111B1 MARS ME115	LM1007 LM1008-LAMP	• Fit the lamp holder to the bracket behind the coin return button. • Fit one of the 13-way connectors to the coin mech. • Fit the other 13-way connector to Validator A on the credit board. Note the 13-way connector is keyed and this key must coincide with the key on the credit board.
SECI, C120, SR3	OWN LOOM AND LM1006LAMP-0.1	• Attach the lamp holder to the bracket on the coin return button. • Attach the 2- connector to 'LAMP' on the VTS board. • Attach the validator's own loom to position A on the credit board



VTS credit board assembly

3.7.7. COMMUNICATION CABLES



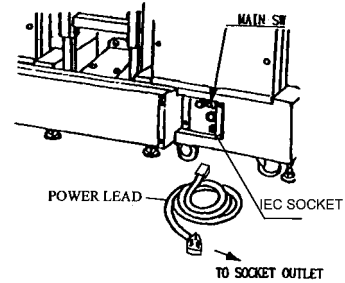
3.7.8. CONNECTION TO THE POWER SUPPLY



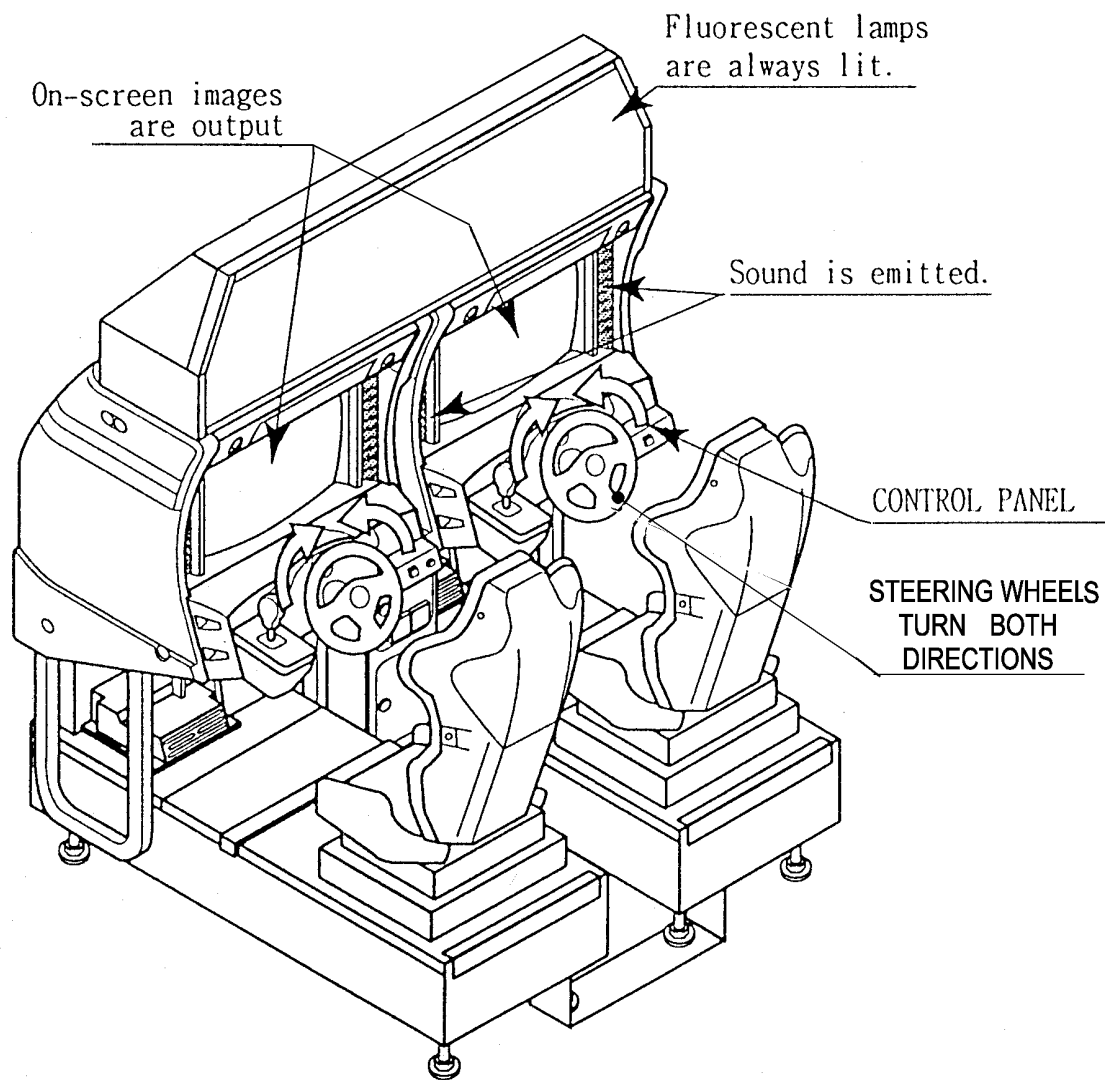
- This operation may only be carried out once the machine has been completely assembled.
- Only QUALIFIED SERVICE PERSONNEL should carry out this operation.

The AC Unit is located on the rear of the 1P cockpit. Using the power lead supplied connect this to the mains socket at the wall.

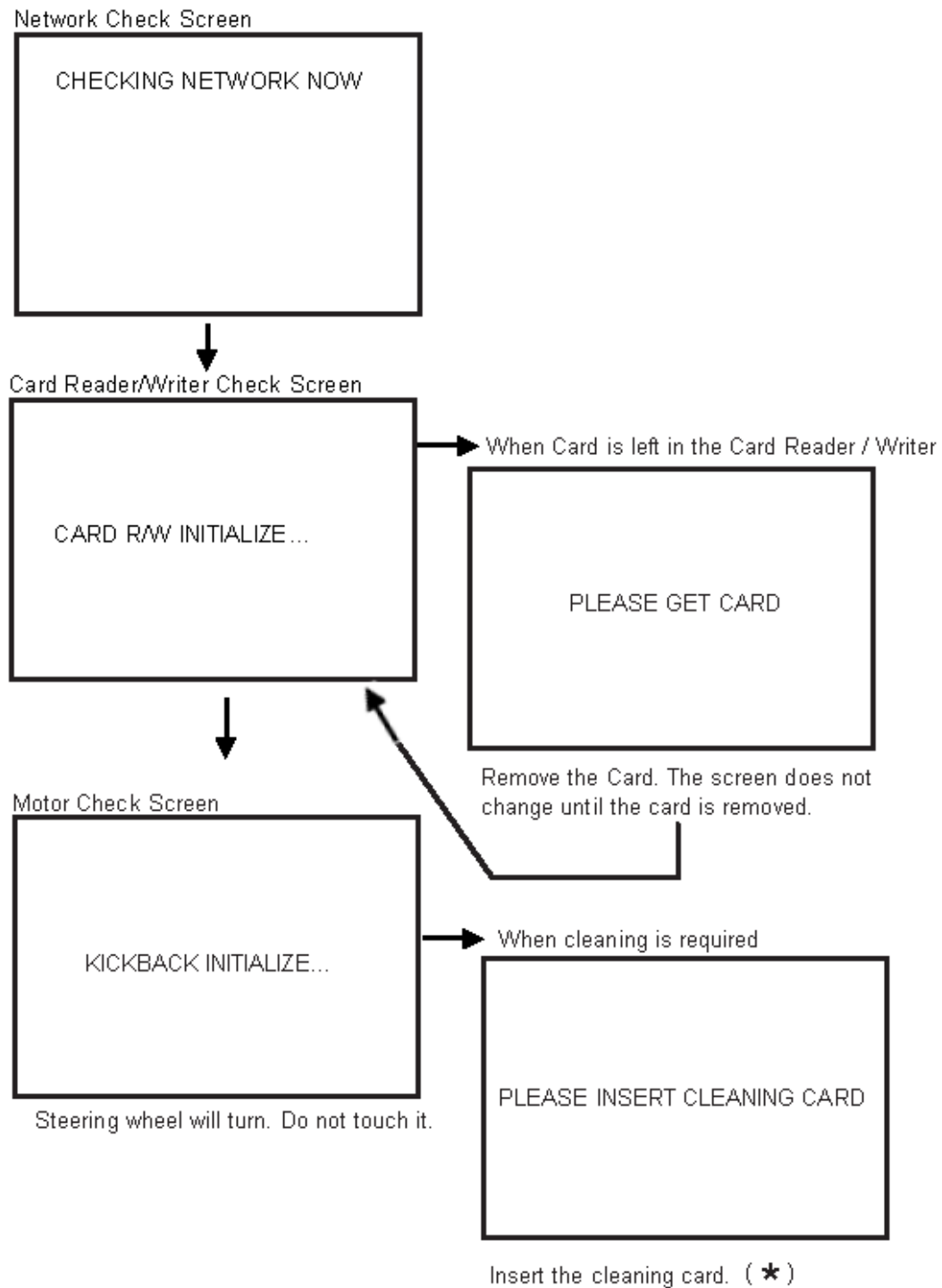
1. Turn the mains switch on.
2. Turn the switch on the AC bracket on.
3. Once power is turned on, the fluorescent lamp lights up. The Start System Screen displays after a lapse of several seconds. This is followed by the screen that indicates that the network is currently being checked if the communication mode has been set. If there is a bad or improper communication connection, each screen will not proceed to the next, remaining on the currently Network Check Screen. If this occurs, resolve the error according to the instructions in this document.
4. If the communication mode has not been set or the communication check ends normally, the Motor Check Screen returns. While the Motor Check Screen is on-screen, the steering wheel can move either clockwise or counter clockwise. If you touch the wheel, the motor check is hindered and the game will not operate normally. So, you must not touch it at this time. Failures are displayed, if found. Resolve the errors according to the instructions in this document.
5. Once all the above steps have been completed, the Advertise Screen displays and voices are output through the left and right loudspeakers, unless you have set the machine so that no voices are output during the Advertise mode.
6. This product retains the number of credits and the ranking data even after the power is turned off. It does not retain data about the fractional number of coins (i.e., the number of coins not reaching one credit) or the bonus adder count.



```
MODE : MASTER
SIZE : XXXX
GAP : XXXX
STATUS : XXXX
CHECKING NETWORK
```



Each Check Screen is followed as below:



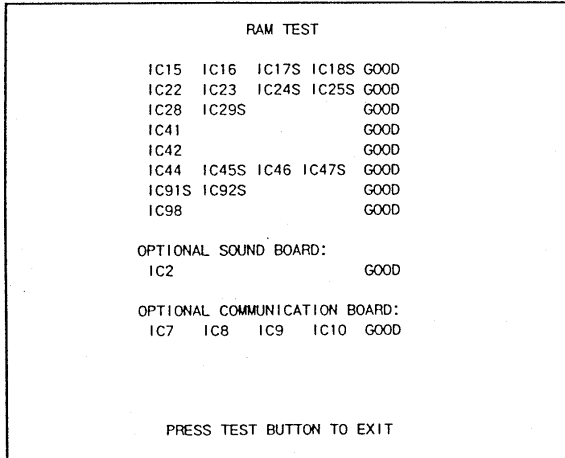
★Sec HEAD CLEANING, Section 3.9.2.2

3.7.9. ASSEMBLY CHECK

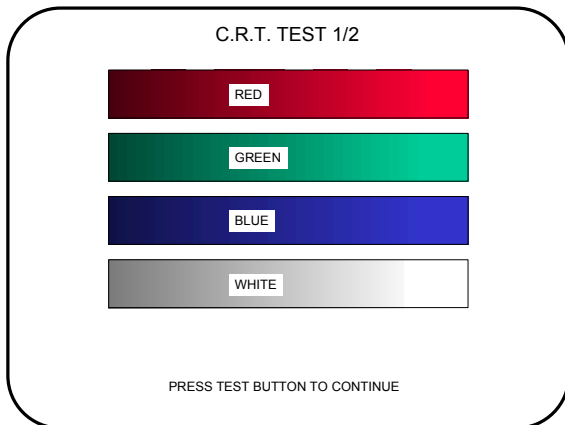


- Only QUALIFIED SERVICE PERSONNEL should carry out this operation.

In the TEST mode ensure the assembly has been made correctly by performing the following checks.

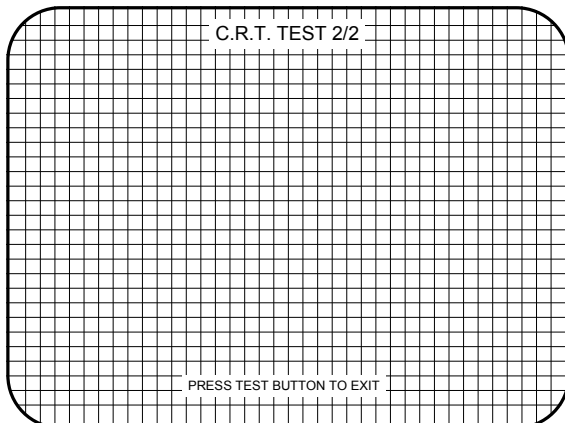


Selecting the RAM test on the test mode menu causes the on-board memory to be tested. The game board is satisfactory if the display beside each IC No. shows GOOD



In the TEST mode select CRT test to check the screen is satisfactory.

Although the projector has been set up before shipment at the factory check to see if the screen needs adjustment.



```

SOUND TEST

RIGHT SPEAKER OFF
LEFT SPEAKER OFF
> EXIT

SELECT WITH SERVICE BUTTON
AND
PRESS TEST BUTTON

```

Select SOUND test-to-test sound BD and wiring connections. Check that the sound is satisfactory from each speaker and the speaker volume is appropriate.

```

GAME TEST MODE

INPUT TEST

STEERING      XXH
ACCEL          XXH
BRAKE          XXH
GEAR POSITION   N
START          OFF
CHANGE VIEW    OFF
SERVICE       OFF
TEST           OFF

PRESS TEST AND SERVICE BUTTON
TO EXIT

```

INPUT TEST tests the input devices. Using this screen, check the input devices periodically. Operate each input device. If the display at the right of the appropriate device changes from OFF to ON, it is diagnosed as being normal. Check that each of the indications at the right of STEERING, ACCEL, BRAKE and GEAR POSITION change smoothly in response to operations of each of the input devices. Pressing the TEST button returns you to the Game Test Menu Screen.

```

JVS TEST
INPUT TEST
> EXIT

NODE      1/1
NAME      SEGA ENTERPRISES,LTD.;I/O BD JVS;
          837-13551 ;Ver1.00;98/10
CMD VER   1.1
JVS VER   2.0
COM VER   1.0
SWITCH    2PLAYERS 13BITS
COIN      2SLOTS
ANALOG    8CH
DRIVER OUT 6CH

SELECT WITH SERVICE BUTTON
AND
PRESS TEST BUTTON

```

For the coin switch test, insert a coin into the inlet while the cash door is open.

If the display beside each item shows ON as the input is made, the switches and wiring connections are satisfactory.

```

GAME TEST MODE

OUTPUT TEST

->START BUTTON
CHANGE VIEW BUTTON

PRESS TEST BUTTON TO EXIT

```

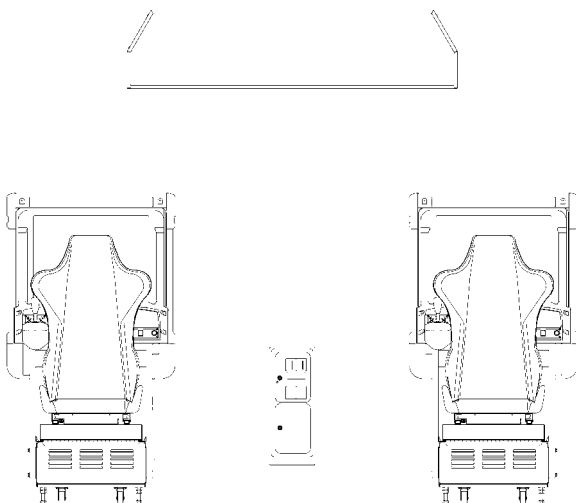
- Pressing the SERVICE button moves the arrow. With the arrow aligned with the tested lamp item, press the TEST button.
- If the lamp lights up when the indication at the right of each name is ON and goes out when it is OFF, this lamp and wiring connections are normal.
- By selecting EXIT and pressing the TEST button, you return to the Game Test Menu Screen.

3.7.10.MOVING THE MACHINE

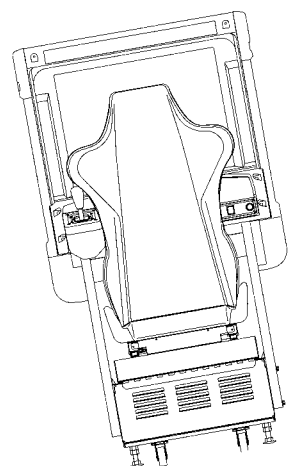


- When moving the machine, be sure to remove the plug from the power supply. Moving the machine with the plug inserted can cause the power cord to be damaged, resulting in a fire or electric shock.
- When moving the machine, retract the leg adjusters fully and ensure the casters make contact with the floor. During movement pay careful attention so that the casters or leg adjusters do not damage any other cabling laid on the floor. Such damage could result in a fire or electric shock.
- Don't push the cockpit cabinets from the side, as they may topple and cause damage.
- Don't put excessive pressure on the glass or plastic components as damage or personal injury may result if there is a breakage.

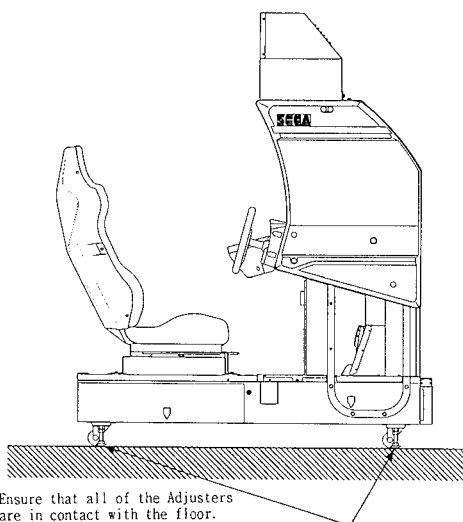
- Only QUALIFIED SERVICE PERSONNEL should carry out this operation.



Disassemble the cabinet into its components if transporting up or down step level changes!



Do not push an individual cockpit from the side!



3.8. FUSES



- Never touch places other than those specified. Touching places other than those specified can cause electric shock and short circuit. Disconnect the machine from the supply before attempting the replacement of any fuse.

- Only QUALIFIED SERVICE PERSONNEL should replace FUSES.

There are a number of fuses used on this machine to protect the user and the machine from damage. Only replace the fuse once you have remove the cause of its failure. Detailed below is a list of the fuses used, their location and if relevant PCB reference:

PART NUMBER	LOCATION	TYPE & DETAILS	QTY PER COCKPIT
514-5078-6300	838-11856CE (F1)	5x20 HRC SB 6300mA	1
514-5078-10000	EP1302 (IEC INLET)	5x20 HRC SB 10000mA	1 (PER MACHINE)
514-5078-4000	400-5397-01 (F1)	5x20 HRC SB 4000mA	1
514-5078-6300	838-13578	5X20 CERAMIC SB 6300MA	1
514-5080-15000	838-14174 (F1)	32x6.35 HRC SB 15000mA	1
514-5078-2500	838-14174 (F2)	5x20 HRC SB 2500mA	1
514-5033-5000	400-5421-07512 (F11)	5x20 Glass T 125v 5 A	1
514-5078-5000	AC BRACKET	5x20 HRC SB 5000mA	1

There are also fuses located on the Monitor PCB. Refer to the relevant Monitor manual supplied to reference these fuses.

3.9. MAINTENANCE



- Only Qualified Service Personnel must carry out maintenance.
- Ensure that the mains power is switch OFF and disconnected before attempting any work.

- The CONTROL PANEL ASSEMBLY is heavy and may cause injury or damage to the machine if dropped. Use an assistant when removing and replacing it.

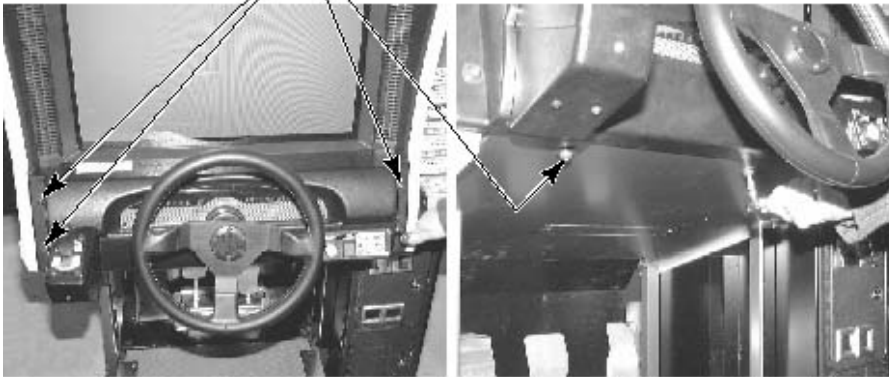
3.9.1. HANDLE MECHA

The handle mecha unit is housed in the control panel assembly. Follow the procedure below to access the components.

REMOVAL

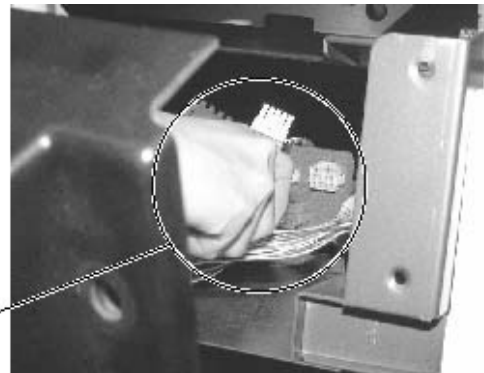
- Turn the POWER switch OFF
- Remove a total of six M8 tamperproof bolts from both sides of the Control Panel. Have your assistant support the Control Panel's weight while you remove the bolts.

6 x M8 BOLTS



- Wiring connectors are connected inside the Control Panel. Carefully withdraw the control panel in a manner so as not to damage the wiring.
- Disconnect the wiring connectors

DISCONNECT CONNECTOR



3.9.1.1.REPLACING AND ADJUSTING THE HANDLE MECHA'S VR



- Never touch places other than those specified. Touching places other than those specified can cause electric shock and short circuit.

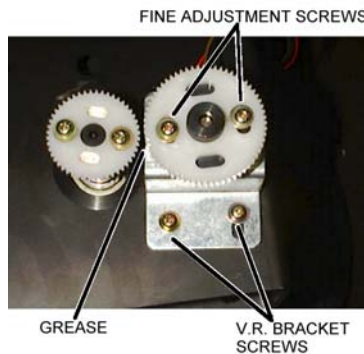
- After the replacement or adjustment of the V.R. be sure to set the Centre of Steer in the DRIVE BOARD TEST.

In the TEST MODE, if the steering wheel VR variations are not within the allowable limit, the VR installation position may require adjustment or replacement. Also be sure to apply grease every 3 months.

3.9.1.1.1.ADJUSTING THE VR

Remove the CONTROL PANEL as detailed above. Locate the V.R. on the rear surface of the HANDLE MECHA.

- By using a screwdriver loosen the 2 machine screws that secure the V.R. Bracket. Move the V.R. Bracket so as to disengage the gears.
- Gently rotate the VR until its value is within the range of the centring position.
- Mesh the gears together. Make sure that a correct amount of backlash is maintained.
- If the VR value is still not correct make fine adjustments by loosening the 2 machine screws on the VR gear. Rotate the gear holder until the correct value is obtained.
- The value should be adjusted such that with the steering wheel in the centre position the value read during INPUT TEST shall be $2000H \pm 5H$.



3.9.1.1.2.REPLACING THE VR

- Remove the CONTROL PANEL as detailed above. Locate the VR on the rear surface of the HANDLE MECHA
- By using a screwdriver remove the 2 machine screws that secure the VR Bracket. Remove the VR Bracket so as to disengage the gears.
- Loosen the hexagon drive grub screws in the collar and gently slide off the VR
- Reassemble is the reverse procedure of steps 1 and 2 above.
- When complete you must readjust the VR in accordance with the paragraph above.

3.9.1.2.GREASING

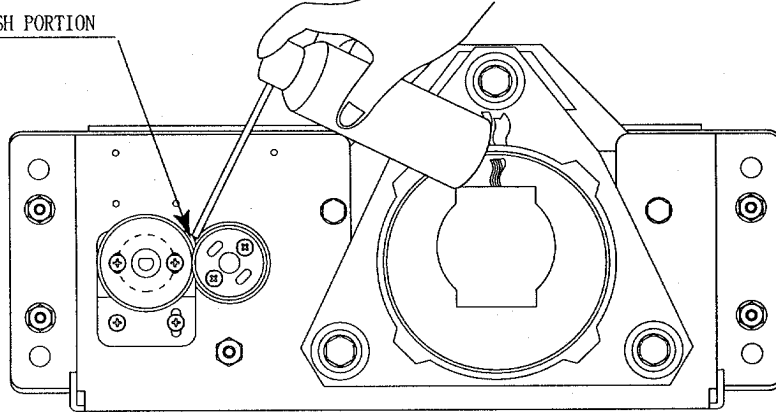


IMPORTANT

- Ensure proprietary **SYNTHETIC** grease is used. Different types of mineral-based grease may damage plastic parts.
- Apply grease only to specified locations.

Apply grease to meshing portion of gears once every **THREE** months. Use proprietary synthetic grease.

VOLUME GEAR MESH PORTION



3.9.2. CARD READER/WRITER UNIT



- Take care to work on the machine with the power turned off. In the powered state, the machine may operate suddenly and can cause fingers to be pinched or cut.

3.9.2.1.SETTING DEDICATED CARDS



IMPORTANT!

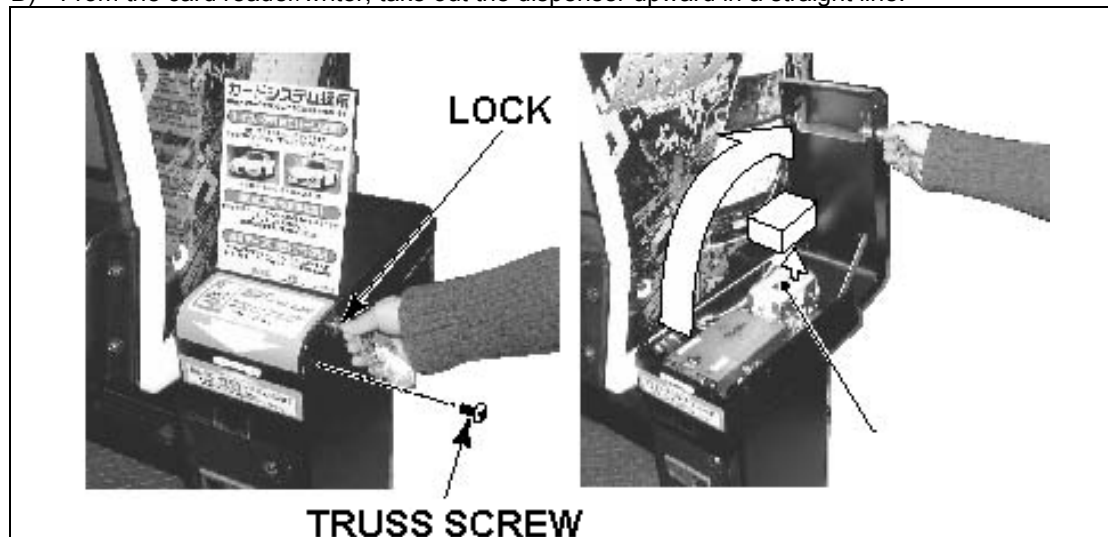
- Be sure to use dedicated cards available for this product. Use of ones other than such dedicated cards may cause a malfunction or failure of the machine.
- Be sure to set the specified number of card in the specified orientation by using the specified procedure. Wrong setting of the cards may cause the machine to fail.
- This machine allows you to set up to 100 cards at a time. You must not set over 101 cards at a time. If you do so, a trouble such as card jamming may occur.
- Set virgin cards taken out from a container that was unpacked immediately before use.
- Use of any deformed or deteriorated card may cause a trouble.
- Do not include a corrugated, bent, or used card in the card deck.

When the unit is out of cards, a message will be displayed at the upper right of the screen during advertisements. Follow the instructions below to restock the system with cards. Cards may be stocked when the unit is on or off.

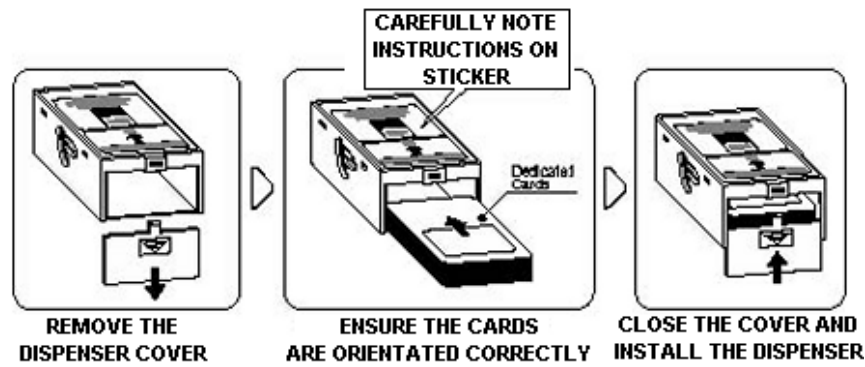
After restocking the system with cards, the message displayed after the "SEGA" logo will be updated. Gameplay can be resumed without waiting for the updated message.

Remove the truss screw

- Unlock and open the cover to find the card reader/writer.
The dispenser on which you should place the cards is located at the rear of the reader/writer.
- From the card reader/writer, take out the dispenser upward in a straight line.

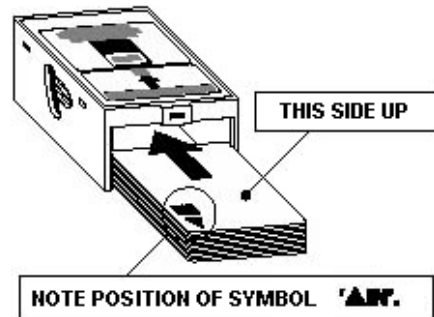


- C) Remove the cover from the back of the dispenser.



- D) Place the cards into the dispenser according to the instructions on the sticker attached to the dispenser. Refer to the diagram shown on the sticker and insert the cards. Be careful not to insert the cards in the wrong direction or with the wrong side facing up. The Dispenser can only hold 100 cards. Do not attempt to insert more than 100 cards, as too many cards may cause the Dispenser to jam or result in other problems. Insert magnetic cards into the Dispenser in complete packs of 100 or after carefully counting the number of cards (not to exceed 100).

LOAD CARDS THE CORRECT WAY AROUND



- E) Reinstall the cover to the dispenser.
- F) Insert the dispenser into the card reader/writer. The dispenser can be inserted only in the predetermined orientation.
- G) Close and lock the cover.
- H) Secure with the truss screw

3.9.2.2.HEAD CLEANING



- The unit enters Head Cleaning Mode when any of the following conditions are met:
- At power-up if the Card Reader/Writer has operated 100 times or more
- At power-up if the date has been updated
- At boot time after performing Backup Data Clear
- Once the unit enters Head Cleaning Mode, follow the on-screen instructions and perform Head Cleaning. The unit will not exit Cleaning Mode (i.e. games may not be played) until head cleaning is complete.
- Always use the designated Cleaning Card. Using anything other than the designated card or carrying out any other procedure other than the one outlined in the manual may cause faulty printing, faulty operation and/or unit failure.
- Cleaning Cards may only be used once. Dispose of them after use.
- Cleaning Cards should be used immediately after removal from the package. Cleaning Cards will not clean effectively if dried out.
- Perform head cleaning only when there are cards in the Card Reader/Writer Dispenser. If the Dispenser is empty, the part that secures the cards inside the Dispenser may touch the rotating part of the Card Reader/Writer and cause noise.
- Always remember to remove the Cleaning Card after completing head cleaning.
- After head cleaning, wait for the "SEGA LOGO" to be displayed at least twice before resuming gameplay.

This machine records the number of times the Card Reader/Writer is used.

The Card Reader/Writer writes data to and reads data from cards. Each write and read is counted, so the Card Reader/Writer usage count will not be the same as the number of times the game is played.

Once head cleaning of the Card Reader/Writer is complete, the unit will exit this mode.

Follow the on-screen instructions to carry out cleaning.

CLEANING CARD



PLEASE INSERT CLEANING CARD

Insert the Cleaning Card into the card slot.

NOW CLEANING...

Indicates that the unit is undergoing cleaning. Wait for cleaning to be completed.

The unit exits to normal mode after cleaning is complete.
Do not forget to remove the Cleaning Card.
Wait for the "SEGA LOGO" to be displayed at least twice before resuming gameplay after cleaning.

The Card Reader/Writer usage count described above is reset when cleaning is performed.

Manual head cleaning may also be performed from Test Mode. Refer to Test Mode Section 5.3.8 for more details.

3.9.2.3.CLEARING CARD JAMS



When attempting to perform this operation without powering down so that gameplay can be restored, exercise extreme caution. Machine parts may move unexpectedly when the power is ON. This may result in fingers being caught or severed and other injuries.

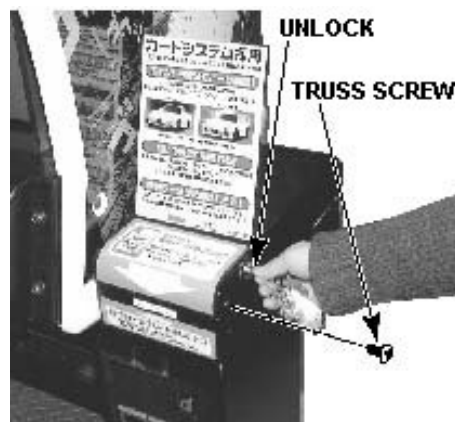
Verify the Stay Lock on the top cover before attempting this procedure. If the top cover closes during the procedure, it may result in serious injury.

If a problem, such as card jamming, occurs on the card reader/writer it will be reported on the screen. Play cannot proceed unless this problem is resolved. Identify the nature of the problem before any action is taken.

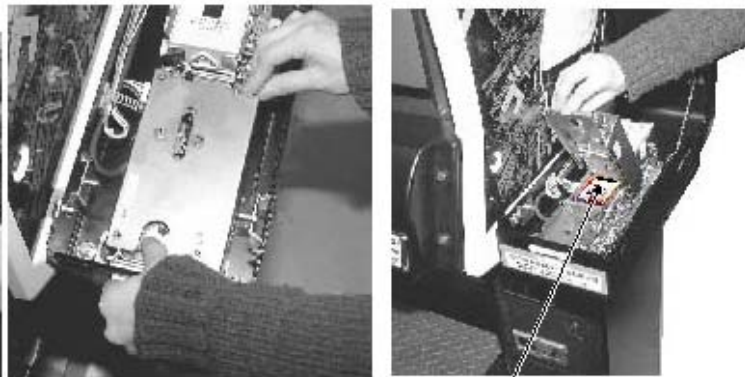
If repeated attempts continue to generate errors, follow the instructions below to remove the card.

Removing the card may force the game to shut down. If the game shuts down, existing customer game data will not be saved.

- A) Remove the truss screw.
- B) Unlock and open the cover.
- C) Unlock the hatch by drawing the green shaft attached to the top cover on the card reader/writer. While drawing the shaft, open the cover up.
- D) Remove the card jammed in the card reader/writer.



- E) While drawing the shaft, close the cover. With the top cover closed, release the green shaft. Check that the top cover has been locked securely.



- E) Close and lock the cover.
- F) Secure with the truss screw.

3.9.3. ACCELERATOR & BRAKE

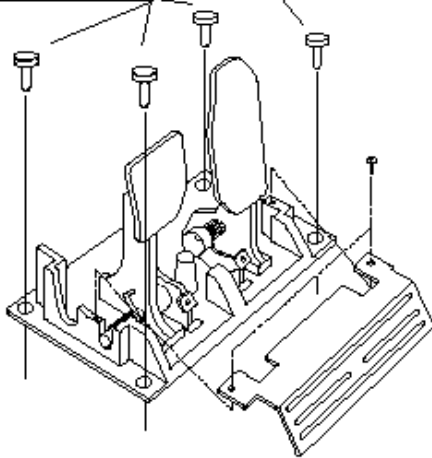


- Only Qualified Service Personnel must carry out maintenance. Ensure that the mains power is switched OFF and disconnected before attempting any work.

In the TEST MODE, if the brake or accelerator V.R. variations are not within the allowable limit, the V.R. installation position requires adjustment or the V.R. needs replacement. Also be sure to apply grease to all moving parts every 3 months.

3.9.3.1. Removing the Accelerator & Brake.

HEXAGON BOLT, BLACK (4)
M8 x20 & WASHERS

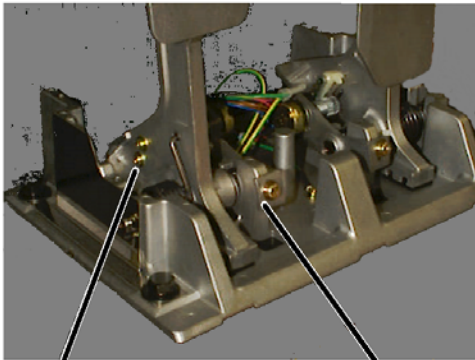


1. Turn the POWER switch OFF
2. Remove a total of 4 screws securing the covers over the ACCELERATOR & BRAKE
3. Fine adjustment of the V.R. values is accomplished with just these covers removed.
4. Coarse adjustment requires the ACCELERATOR & BRAKE mounting bolts to be removed. If this is necessary, remove the bolts from the unit, but do not remove the unit from the machine. Take extreme care when operating the unit in this condition as damage to other components can occur.

3.9.3.2.Adjusting the V.R.



- Never touch places other than those specified. Touching places other than those specified can cause electric shock and short circuit.
- After the replacement or adjustment of the V.R. be sure to set the values in the INPUT TEST.



COARSE ADJUST SCREWS

FINE ADJUST SCREW

1. Remove the cover panels as detailed above.
2. Fine Adjustment - By using a screwdriver loosen the 2 machine screws that secure the V.R. arm. Move the V.R. arm to adjust the V.R. value within the relaxed range.
3. Coarse Adjustment - Remove the four hexagon bolts detailed above and remove the side covers of the Accelerator & Brake.
4. Loosen the two machine screws holding the V.R. rack
5. Move the V.R. rack away so as to disengage the V.R.
6. Gently rotate the V.R. until its value is within the range of the centring position.
7. Mesh the gears together. Make sure that a correct amount of backlash is maintained.
8. If the V.R. value is still not correct make fine adjustments as detailed above.

The required values are:

GAS PEDAL:	Under 30H	⇒	Over C0H
BRAKE PEDAL:	Under 30H (THE PEDAL RELEASED)	⇒	Over C0H (THE PEDAL PRESSED)

3.9.3.3.Replacing the V.R.

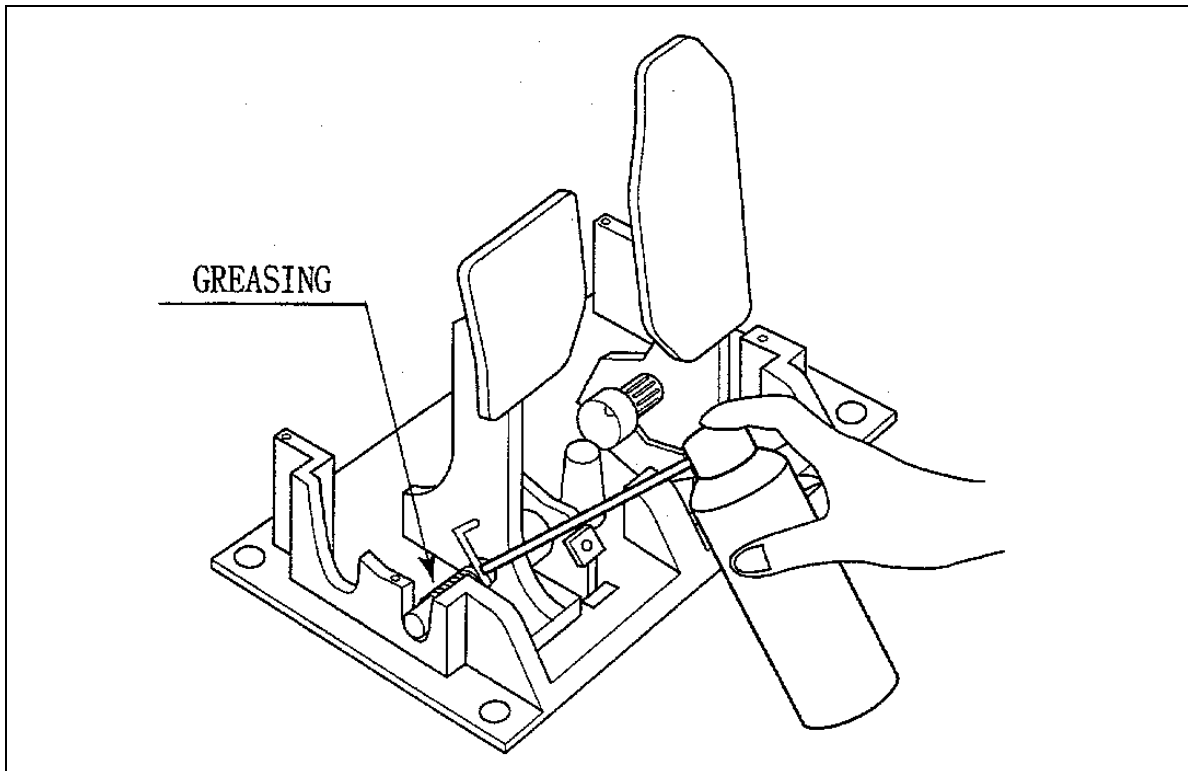
1. Loosen and withdraw the V.R. rack as detailed above.
2. Using a hexagon key loosen the two grub screws holding the V.R. gear onto the V.R.
3. Remove the V.R. gear
4. Using a spanner remove the nut holding the V.R. in position.
5. Gently remove the V.R. and its wire harness.
6. Refit is the reverse of removal.
7. When complete you must readjust the V.R. in accordance with the paragraph above.

3.9.3.4.Greasing



- Be sure to use a good quality, synthetic lubricant. Using a mineral-based lubricant will cause damage to the plastic parts.
- Do not apply lubricant to parts other than those specified. Doing so may cause damage or deterioration of parts.

Apply lubricant to gear mesh portions once every 3 months.



3.9.4. SHIFT LEVER

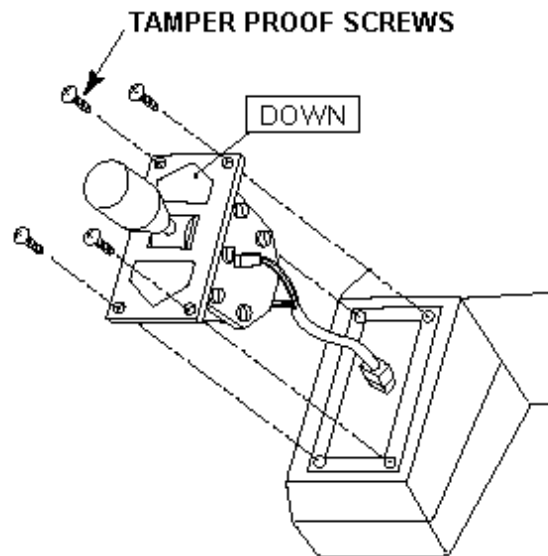
In the Test Mode, if the SHIFT LEVER's SW can not be inputted satisfactorily, replace the Switch. Apply greasing to the Mechanism's sliding portion once every 3 months. When performing the above work, remove the Shift Lever Unit.



- 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.

REMOVING THE SHIFT LEVER

- Turn the Power SW off.
- Remove the 4 Tamperproof Screws to lift the Shift Lever Unit.
- Disconnect the Connector to remove the Shift Lever Unit.
- When reinstalling, follow the procedure opposite as when removing. At this time, ensure that "DOWN" display appears on the upper part as shown.
- After reinstalling, be sure to check INPUT TEST in the test mode. (TEST.)



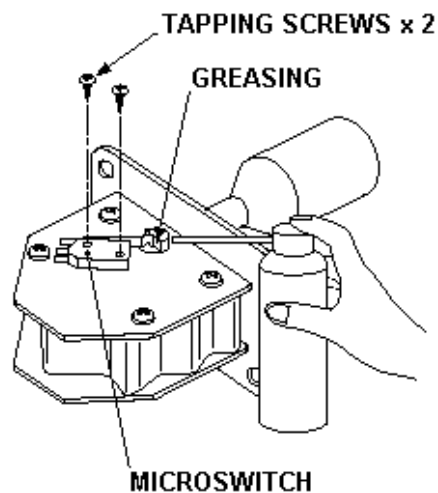
SWITCH REPLACEMENT

- Disconnect the wiring Connector of the Switch to be replaced.
- Remove the 2 Tapping Screws to replace the Microswitch.

GREASING

Apply greasing once in 3 months to the specified portions.

For spray grease, use NOK KLUBER L 60 or Grease Mate (Part No. 090-0066).



3.10. REPLACEMENT OF FLUORESCENT LAMP AND OTHER LAMPS

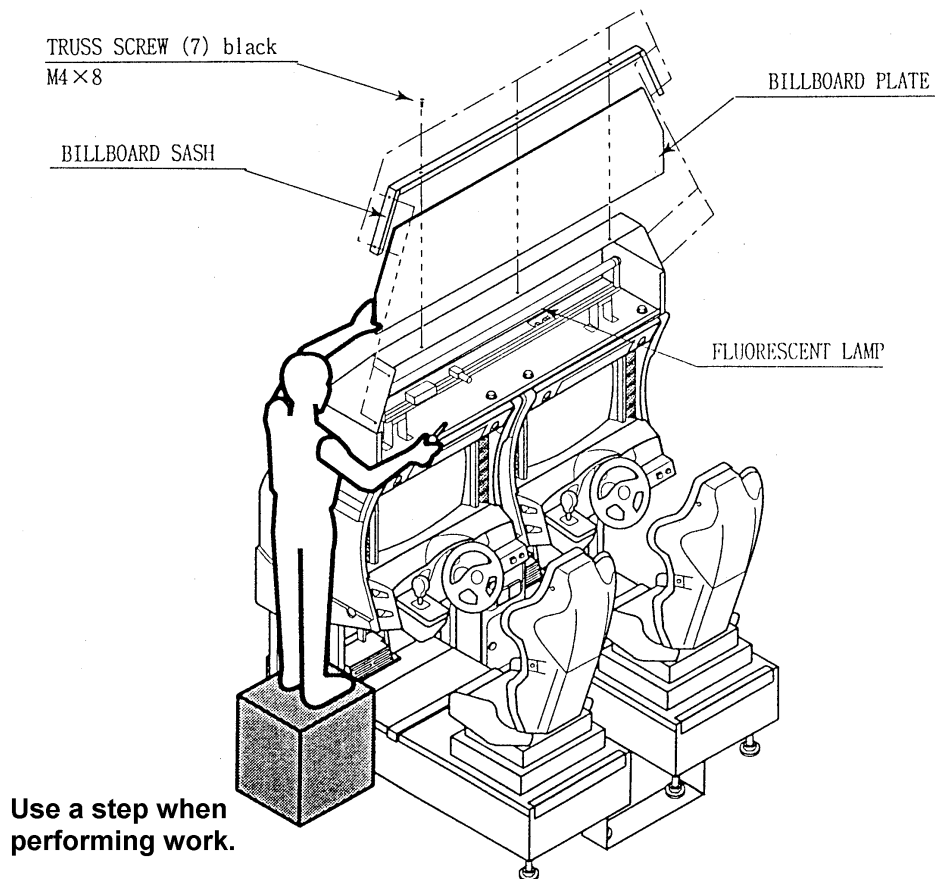


- Never touch places other than those specified. Touching places other than those specified can cause electric shock and short circuit. Disconnect the machine from the supply before attempting the replacement of any lamp.
- Prepare a secure step when working on the upper parts of the machine.

- Only QUALIFIED SERVICE PERSONNEL should replace lamps.

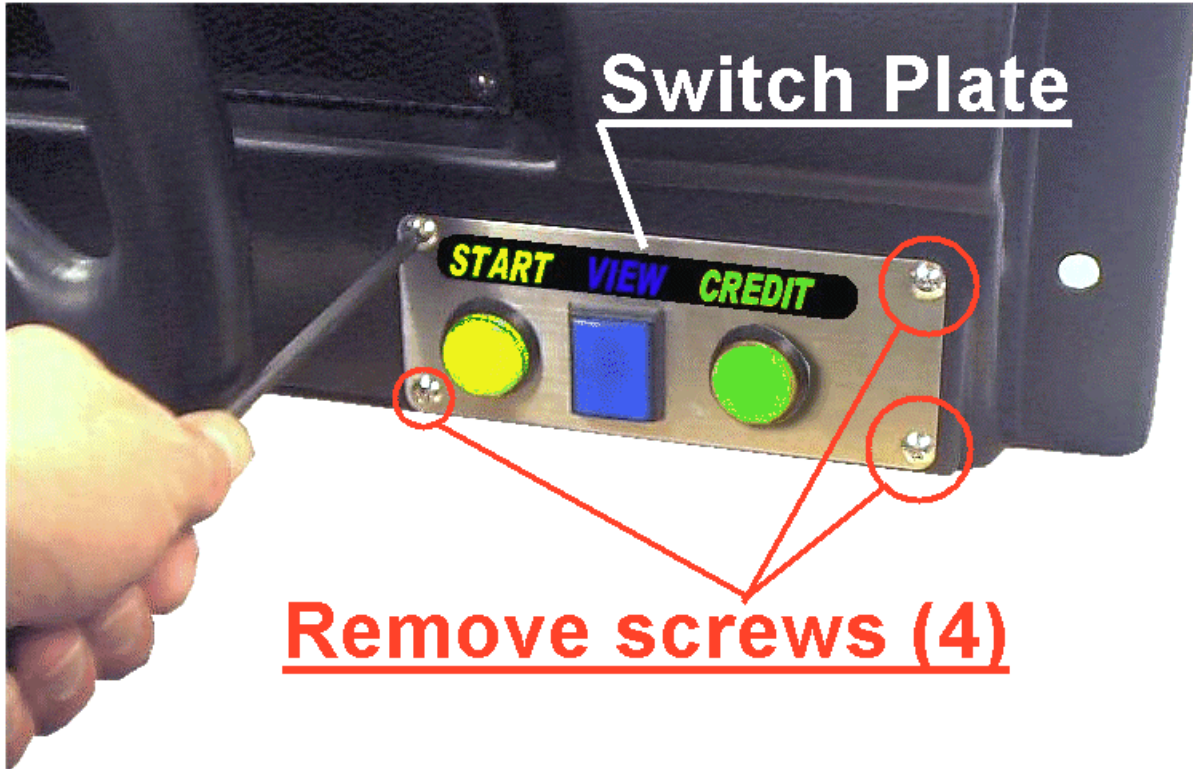
3.10.1. FLUORESCENT LAMP REPLACEMENT

1. Turn the POWER switch OFF.
2. Remove the POP if fitted, and remove the Billboard Sash by taking out the three screws, and withdrawn the Billboard Plate.
3. Remove the end caps from the fluorescent tube.
4. Carefully pull the tube out of the clips with a twisting action.

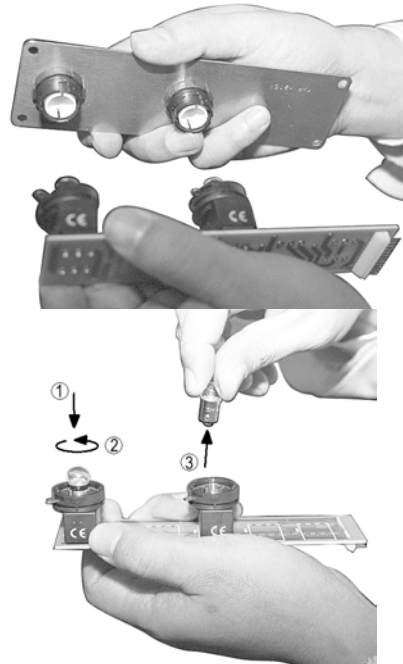


3.10.2.START BUTTON LAMP REPLACEMENT

1. Turn off power.
2. Take out four screws to remove the ASSY START SW from the CONTROL PANEL. Withdraw the ASSY START SW far enough only to disconnect the block connector of the START button.



3. The lamp (bulb) is on the inner side of the assembly. Turn the metal locking tag anticlockwise (when viewing the rear of the button) on each button, and remove the lamp housings from the assembly.



4. To remove the lamp, press it down and turn anticlockwise.

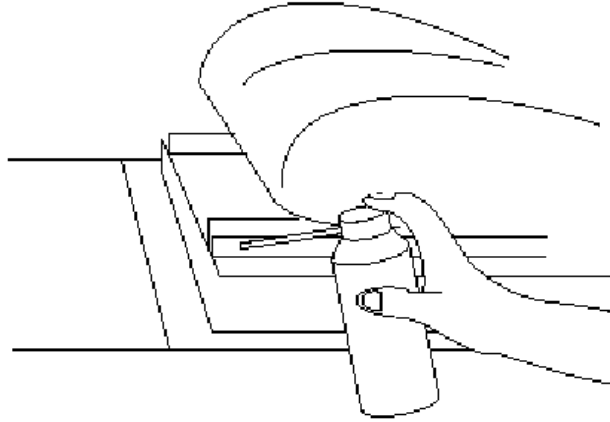
3.10.3.CLEANING THE CABINET SURFACES

When the cabinet surfaces are badly soiled, remove stains with a soft cloth dipped in water or diluted (with water) chemical detergent and squeezed dry. To avoid damaging surface finish, do not use such solvents as thinner, benzine, etc. other than ethyl alcohol, or abrasives, bleaching agent and chemical dustcloth.

3.10.4.SEAT (Greasing to Seat Rail Portion)

Move the Seat to the rearmost position 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.



3.11. TROUBLESHOOTING



- Only QUALIFIED SERVICE PERSONNEL should carry out these procedures.

3.11.1.CARD READER/WRITER

If this machine detects an error during the operation of the Card Reader/Writer, it will display the error messages listed below. Perform the appropriate maintenance based on the content of the error message displayed.

Should an error occur, do not attempt to open the top cover of the Card Reader/Writer. The unit will attempt to save the data to the customer's card and restore the game if the top cover is closed and the RESTORE command (hold down the Start button + Change View button for a short time) is used. However, attempting to use the RESTORE command after the top cover has been opened may force the game to shut down and not save data to the card.

When the game shuts down or the unit is reset, the data on the customer's card is not saved. In order to save customer data, perform the proper maintenance carefully.

ERROR DISPLAY	CAUSE	COUNTERMEASURES
Error occurred while reading card. Card will be ejected without saving data. Please press the Start and Change View buttons.	This message is displayed after several failed attempts to save data to the card at the end of the game.	Press the Start button and Change View button at the same time to eject the card and end the game.
Error occurred while saving data. Please notify a store attendant. Please press the Start and Change View buttons.	This message is displayed after several failed attempts to print at the end of the game.	Leave the card in place and press the Start button and Change View button at the same time to retry the save operation. Remove the card and press the Start button and Change View button at the same time to restore or end the game. If this error occurs several times, use Test Mode to perform manual cleaning. (See Cleaning Section 5.3.8)
Printing error. Card will be ejected without printing or saving data. Please press the Start and Change View buttons.	This message is displayed after several failed attempts to read the card at the end of the game.	Press the Start button and Change View button at the same time to eject the card and end the game.
A shutter error has occurred. Please remove any cards present in card insertion slot. Please press the Start and Change View buttons.	This message is displayed when the shutter is forced open or if the unit detects a problem with the shutter. This message is displayed when the unit is unable to open/close the shutter.	Correct the problem, then press the Start button and Change View button at the same time to restore the game. Circumstance may force the game to shut down. Correct the problem, then press the Start button and Change View button at the same time to restore the game.
This card cannot be used. Card will be ejected without saving data. Please press the Start and Change View buttons.	This message is displayed when the card in the Card Reader/Writer is not a proper player card at the end of the game.	Press the Start button and Change View button at the same time to eject the card and end the game.
Card jam. Ejecting card. Please press the Start and Change View buttons.	This message is displayed when various operations fail because of dirty rollers or heads.	Press the Start button and Change View button at the same time to eject the card and restore the game. If this error occurs several times, use Test Mode to perform manual cleaning. (See Section 5.3.8)

Continued from previous page

ERROR DISPLAY	CAUSE	COUNTERMEASURES
There is a problem with the card reader/writer. Please notify a store attendant. Please turn off the power and start again.	This message is displayed when there is a problem with the Card Reader/Writer and it sends improper signals.	Verify there are no problems with the shutter and that the top cover is closed and then restart the unit. (See 3.9.2)
The card reader/writer is not responding. Please notify a store attendant. Check the card reader/writer is connected properly, turn off the power and start again.	This message is displayed at power-up during advertisements when the Card Reader/Writer is not connected properly or when it is broken and unresponsive.	Verify that the Card Reader/Writer is connected properly and then restart the unit. (See Schematic Section 9.2)
SCIF Error. Please notify a store attendant. Check that the card reader/writer is connected properly, turn off the power and start again.	This message is displayed when a communication error occurs between the Card Reader/Writer and the game board.	Verify that the Card Reader/Writer is connected properly and then restart the unit. (See Schematic Section 9.2) If this error occurs several times, check the immediate area for sources of possible interference.
Card jam. Remove the card and press the Start and Change View buttons. If the card cannot be removed, please notify a store attendant.	This message is displayed when various operations fail because of dirty rollers or heads. This message is displayed when a card jam is suspected when there should be no card in the Card.	Leave the card in place and press the Start button and Change View button to retry the operation. Remove the card and press the Start button and Change View button at the same time to restore or end the game (refer to 3.9.2). If this error occurs several times, use Test Mode to perform manual cleaning. (See Section 5.3.8) Press the Start button and Change View button at the same time after removing the card or correcting the problem to restore the game. (See 3.9.2)

The following error messages are displayed when problems are detected during unit power-up (during initialization of the Card Reader/Writer). Perform the appropriate maintenance based on the content of the error message displayed.

ERROR DISPLAY	CAUSE	COUNTER MEASURES
CARD R/W ERROR!	This message is displayed at power-up when the Card Reader/Writer is not connected properly or when it is broken and unresponsive.	Verify that the Card Reader/Writer is connected properly and then restart the unit. (See Schematic Section 9.2). If broken, contact the company from whom the unit was purchased.
PLEASE INSERT CLEANING CARD.	This message is displayed when the conditions prompting an automatic Card Reader/Writer cleaning are met.	Perform the Card Reader/Writer cleaning. (See Section 3.9.2.2)
PLEASE WAIT	This message is displayed during network setup while the other unit is being initialized.	This message disappears once initialization of the other network game unit is complete.
CAN'T EJECT	This message is displayed at power-up when, after attempting to do so, the Card Reader/Writer is unable to eject a card for some reason.	Remove all cards from the Card Reader/Writer. (See 3.9.2.)
	This message is displayed at power-up when the shutter cannot be opened/closed properly.	Verify that there are no problems with the shutter and then restart the unit. If this error occurs several times, contact the company from whom the unit was purchased.

The following messages are displayed when there are limits to the Card Reader/Writer Operation Mode. The messages are displayed in the upper right of the screen during advertisements. The message content is updated after the "SEGA LOGO" is displayed.

If the message is not one displayed intentionally by the Operation Mode, perform the appropriate maintenance based on the content of the error message displayed.

ERROR DISPLAY	CAUSE	COUNTER MEASURES
The machine is currently unable to issue new cards. Please see a store attendant to have the machine restocked with cards.	The Card Reader/Writer Dispenser is empty (no cards).	Restock the Dispenser with cards. (See 3.9.2) If no cards are available, contact the company from whom the unit was purchased
Cards may not be used at this time.	Cards may not be used due to the Store Closing setting being activated.	If there is a mistake in the settings, use Test Mode to change the Store Closing setting. (See Section 5.3.9) (See Schematic, Section 9.2) If the setting is correct, but not operating properly, check the internal clock settings on the game board (Refer to the Service Manual.)

3.11.2.TROUBLESHOOTING (WHEN NO ERROR MESSAGE IS SHOWN)



- 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 the event that a problem cannot be resolved by employing the procedures listed in this Manual, be sure to request service from the office shown on this Manual or the dealer from whom the product was originally purchased. Attempts to employ procedures other than those specified in this Manual can cause electrical shock, shorting, or fire.
- In the event of a problem that is not described here, be sure to contact the office shown on this Manual or the dealer from whom the product was originally purchased. Careless attempts at repair can result in electrical shock, shorting, or fire.

If a problem occurs, first check to make sure that the wiring connectors are properly connected.

PROBLEM	CAUSE	COUNTER MEASURES
When the main SW is turned ON, the machine is not activated.	The power is not ON.	Firmly insert the plug into the outlet.
	Incorrect power source/voltage.	Make sure that the power supply/voltage are correct.
	The fuse of the connect board was blown out due to momentary overcurrent.	After eliminating the cause of overload, replace the specified rating fuse.
Fluorescent lamp inside FL box doesn't light up.	Connector connection fault.	Check connector connections between the Cabinet and the FL box.
	Fluorescent lamp and Glow lamp need replacement.	Replace the fluorescent lamp and the glow lamp (See Section 3.10)

PROBLEM	CAUSE	COUNTER MEASURES
Sound is not emitted.	Sound volume adjustment is not correct.	Adjust the Switch Unit's sound adjustment volume . (See Section 5.1.1)
	Faulty connections for various connectors.	Check the connections for the game board, amp, speakers and Volume connectors.
	Malfunctioning BD, Amp. and Speaker.	Perform SOUND TEST. (See 5.2.3)
Sounds are emitted and the lamps are lit, but the screen is black.	Faulty connections for the visual signal connector or the monitor power connector.	Check the connections for the monitor and game board connectors.
	Broken monitor.	Contact the company from whom the unit was purchased.
Irregular/uneven colors on the monitor screen.	Magnetization of the CRT.	Press the Degauss. switch on the VTS Assembly (See Section 5.1.1.)
Colors on the monitor screen are strange.	Faulty connection for the visual signal connector.	Check the visual signal connector connection and make sure it is secured properly.
	Screen adjustment is not appropriate.	Make adjustment appropriately. (See Monitor Manual)
The on-screen image sways and/or shrinks.	The power source and voltage are no correct.	Make sure that the power supply and voltage are correct.
Does not accept input from any switch or volume.	Faulty connector connections.	Check the connection for the I/O Board and Cabinet connector.
		Check the power for the I/O Board.
Does not accept input from the Shift Lever.	Faulty connector connections.	Check the connections for the connectors in the Control Panel and between the Control Panel and the Cabinet.
	Broken Microswitch.	Replace the Microswitch (MICROSWITCH 509-5704).
STEERING (Servomotor) response is incorrect.	Incomplete power on check.	Power on and verify that the power on check completes properly. (See Sections)
	Deviation of the volume value.	Adjust the volume value in the Test Mode.
	Volume gear engagement fault.	Adjust the engagement of the gear. (See Sections 3.9 & 5.3.2)
	Volume malfunctioning.	Replace the volume. (See 3.9.1.1.)
	Detached wires.	Check for faulty wire connections around moving parts. When replacing wires, secure them so that they do not touch any moving parts.

PROBLEM	CAUSE	COUNTER MEASURES
No response from Steering (Servomotor).	Failure of power-on checking procedure.	Reconnect the power and complete a power-on checking procedure. (See Section 3.7.8)
	Faulty connector connections.	Check the connections for the connectors between the Game Board and Servodriver and between the Servodriver and the Servomotor.
	Thermal element in the Servodriver is operating.	Occurs when the internal temperature reaches 70°C (158°F) and corrects automatically when the unit cools.
	Momentary overload caused a fuse on the Servodriver to blow.	Contact the company from whom the unit was purchased.
Steering (Servomotor) is weak in its force feedback.	Aging of the force feedback mechanism.	Reset in the Test Mode. (See 5.3.4)
Unsatisfactory Accel and Brake operation.	Incorrect volume setting.	Adjust the volume value in the Test Mode. (See 5.3.1.)
	Faulty Volume attachment or adjust gear alignment.	Adjust the volume attachment and verify in Test Mode. (See Sections 5.3.2& 3.9.3)
	Faulty connector connection.	Check the connections for the Accel and Brake connectors and the connectors between the Accel, Brake and Cabinet.
	Failure of the volume.	Replace the volume. (See 3.9.3)
Start button and Change View button input does not work and they do not flash.	Faulty connector connections.	Check the connections for the connectors between the I/O Board, the Cabinet and the Control Panel and those inside the Control Panel.
Start button and Change View button input works, but they do not flash.	Unverified settings or operation.	The Start button only flashes when Free Play is set. Check the operation in Test Mode. (See Section 5.3.3)
	The lamp is burnt out.	Replace the lamp. (See Section 3.10.2)
Failure of the network play.	Network play is wrongly set.	Reset correctly. (See Section 3.12.4.1)
	Communication cables are wrongly connected.	Reconnect the cables. (See Section 3.7.7)
	Communication cables are disconnected.	
	Damage of communication cables.	Reconnect cables correctly. (See Section 3.7.7) Replace the cables. Contact the company from whom the unit was purchased.

3.12. GAMEBOARD

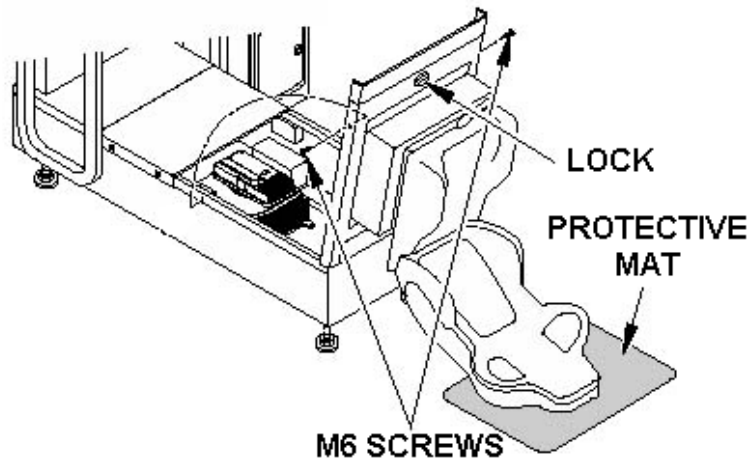


- Turn off the mains power and remove the power cord before opening the machine.
- The GAME BOARD should not require any work to be carried out upon it. All settings and tests can be achieved without access to the GAME BOARD.
- All work to be carried out by QUALIFIED SERVICE PERSONNEL

3.12.1.REMOVING THE BOARD

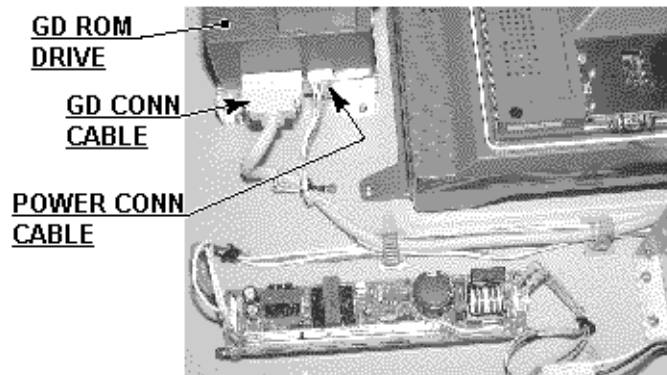
To return the game board for servicing, take out the board using the following procedure.

1. Turn the main switch OFF.
2. Unlock the base and remove the 2 M6 bolts.
3. Tip the seat carefully backwards as shown. Be careful not to damage the seat back when resting it on the floor. Use a protective mat under the seat back to protect it on hard floors.
4. Disconnect all connectors from the game board, remove the four screws securing the game board to the wooden base, and lift it out. Do not attempt to service the game board. THERE ARE NO USER SERVICEABLE PARTS INSIDE! Return the game board to the Service Department inside the special packaging provided.

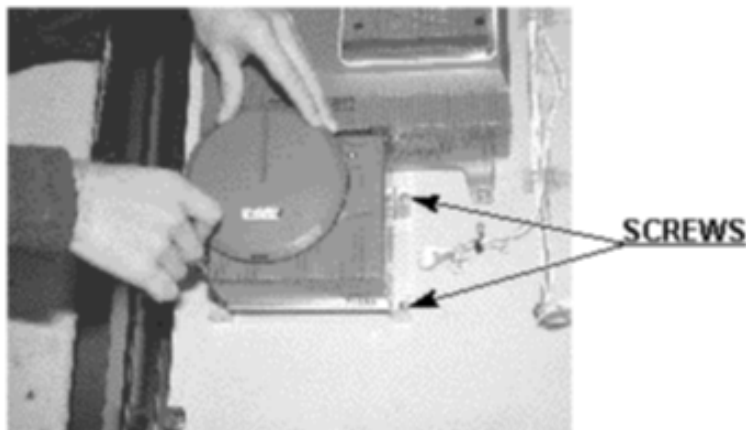


3.12.2.REMOVING THE GD-ROM DRIVE

Remove the GD cable connector and the power cord connector from the GD-ROM drive.

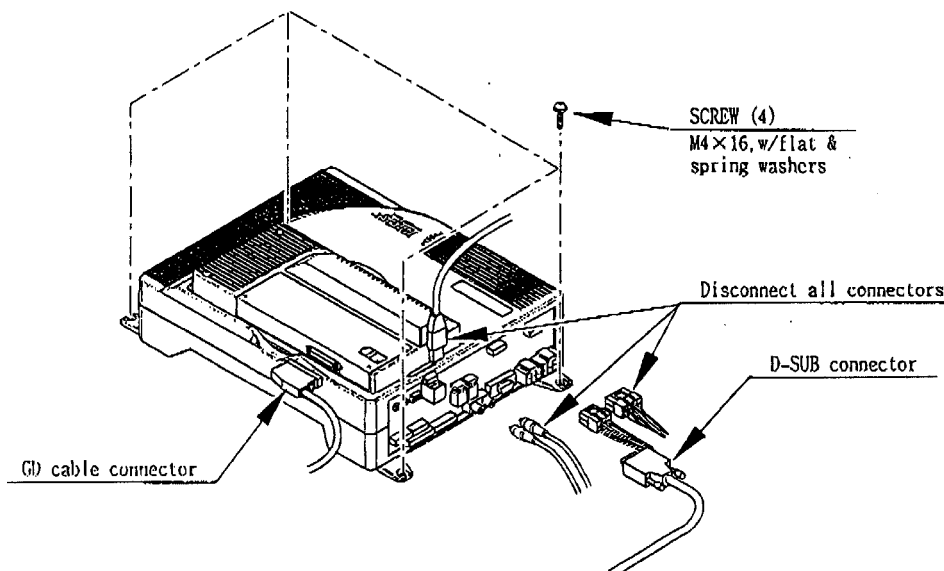


Remove the 4 screws to remove the GD-ROM drive.



3.12.3.REMOVING THE GAME BOARD

- A) Remove all the connectors from the filter board on the Game Board. Also remove the GD cable connector from the DIMM board.
- B) Remove the 4 screws that fix the Game Board.



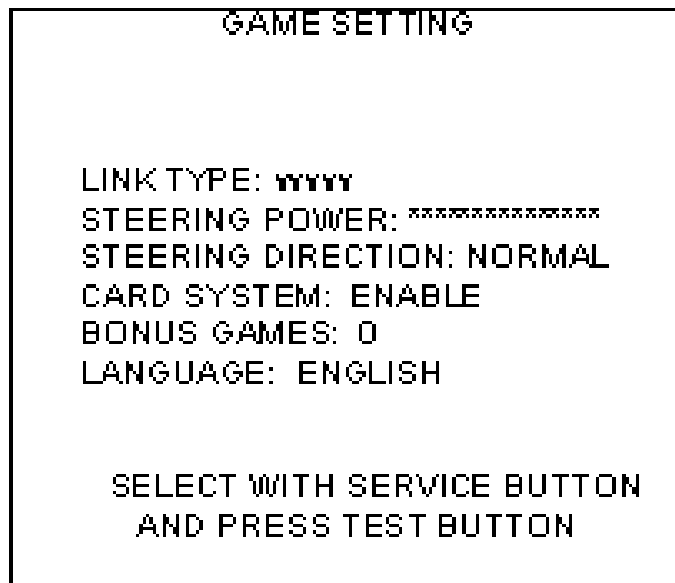
3.12.4.MACHINE SET UP

During linked play, if the test mode is not finished within three minutes on all linked machines, the NETWORK CHECK cannot be performed, causing a NETWORK ERROR.

First, set up each linked machine to meet the requirements of communication play. If the settings are incorrect, communication play is not possible.

SYSTEM ASSIGNMENTS	
CABINET TYPE	1PLAYER
ADVERTISE SOUND	ON
MONITOR TYPE	HORIZONTAL
SERVICE TYPE	COMMON
> EXIT	
SELECT WITH SERVICE BUTTON AND PRESS TEST BUTTON	

3.12.4.1.SETTING FOR COMMUNICATION PLAY



1. Turn all the linked machines on.
2. Enter TEST MODE in all machines.
3. Select SYSTEM ASSIGNMENTS.
4. Perform the COMMUNICATION MODE setting in the SYSTEM ASSIGNMENTS SCREEN. Set one of the machines to MASTER and to SLAVE. If one machine is intended to be used as a live monitor, set this one to RELAY (although this happens automatically if that machine is not being used).
5. Exit TEST mode on all machines: the NETWORK CHECK screen should be displayed.
6. If the ADVERTISE screen is displayed on completion of the NETWORK, the communication setting is satisfactory. The NETWORK CHECK normally takes less than one minute. If this is not the case, then recheck settings, connections etc. to determine the cause.



IMPORTANT!

- Perform advertise sound settings on the MASTER seat; SLAVE machine will adopt these settings.
- If, during communication play, the link is interrupted, the game is discontinued and the NETWORK CHECK is displayed.
- If one linked machine enters TEST mode, all others display NETWORK CHECK, hence be careful not to do this while a linked machine is being played.

Be aware that linked machines are different in operation to independent machines. As per the above, the MASTER unit sets some Game Assignments. If these settings are changed on the SLAVE machine, the new settings will be ineffectual.

3.13. PERIODIC CHECK AND INSPECTION

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



- Be sure to check annually to see if the power cords are damaged. The plug is securely inserted and that there is no dust in the interior of the machine or between the socket and the power cord. Using the product in an unclean condition may cause a fire or electric shock.



- Only QUALIFIED SERVICE PERSONNEL should carry out periodic checks.

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

When handling the controller, the player will be in direct contact with it . In order to always allow the player to enjoy the game, be sure to clean it regularly. Also, it is advisable to provide wet tissue, etc. available for player use.

ITEMS	DESCRIPTION	PERIOD
CABINET	Check Adjusters' contact with surface.	Daily
CARD READER/WRITER	Head cleaning	Every 151 counts of the card reader/writer or Daily
CONTROL PANEL	Cleaning	As necessary
	Inspection of VR	Monthly
	Inspection of adjusting gear mesh	Tri-monthly
	Greasing	Tri-monthly
SHIFT LEVER	Inspection of SW	Monthly
	Greasing	Tri-monthly
ACCEL. & BRAKE	Inspection of VR	Monthly
	Gear and Spring portion greasing	Tri-monthly
MONITOR	SCREEN cleaning.	Weekly
	Check adjustments.	Monthly or when moving.
COIN CHUTE DOOR	Inspection of COIN SW	Monthly
	Coin insertion test	Monthly
	Cleaning of COIN SELECTOR.	Tri-monthly
SEAT	Greasing to the seat rail	Tri-monthly
GAME BD	MEMORY TEST	Monthly
	Check settings.	Monthly
POWER SUPPLY PLUG	Inspection and cleaning	Annually
INTERIOR	Cleaning	As necessary
CABINET SURFACES	Cleaning	As necessary

4. HOW TO PLAY

4.1. GAME DESCRIPTION

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.

When the power is connected, the fluorescent lamp in the FL box is always on. When in an advertising state, the screen displays the demonstration pictures and ranking data. Sounds are heard from the speakers on the right and left of the monitor. The advertising sounds are not heard if you have set this function to off (disabled).

The start button and the change view button on the control panel are integrated with a lamp. The start button (lamp) flashes when the coins are inserted enough to play the game.

4.1.1. Game Overview

The game is a car racing game with three different game modes: "Legend of the Streets", "Time Attack" and "The Bunta Challenge!". By connecting two units, you can also enjoy "Network Battle Game" play. The card system allows players to store information such as the car, wins/loss records and car tune-up status on a special card.

4.1.1.1. Legend of the Streets

Game Content & Rules

Battle rival characters man to man on 9 different courses. Each checkpoint you pass adds time to the overall time limit. The first one across the finish line with the allotted time wins. If you run out of time or cross the finish line second, you lose.

Once you've defeated all 28 rival characters, you'll get a chance to race against a hidden rival character I and a hidden rival character II (final battle/race). Defeat them and you'll race for the title of street legend against the last hidden rival character (special battle/race). Only when the title is yours will you get to see the ending.

INITIAL D CARD

Purchasing a card when you start the game creates your car. The card can store all the data for one car. Information on the card includes the player name, car, tune-up status, names of defeated rival characters, times from Time Attack mode, Network Game records, passwords from Time Attack mode and more. On the Card Screen, the player's name, car name, cleared areas, Key and Speed Demon Level are displayed. The Key is necessary when recording results on the Net Rankings. Speed Demon Level stars increase as various conditions are cleared.



Car Tune Ups

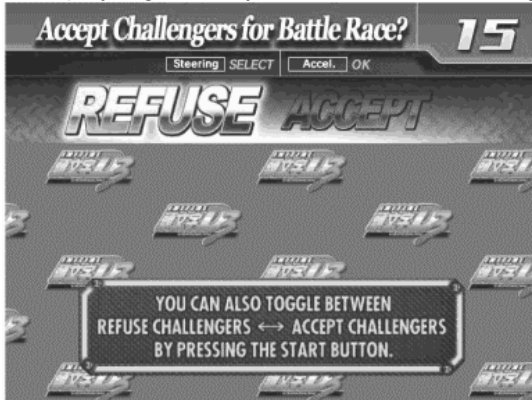
Depending on how well you do, points are added to your card when you use it to play in "Legend of the Streets", "Time Attack", "The Bunta Challenge!" and "Network Battle Race" modes. When you've accumulated enough points, you are given the option of using those points to do tune-ups on your car to increase performance.

4.1.2. Game Flow

4.1.2.1.Challenger Accept Screen, Battle Race Select Screen:

When network play is disabled, this screen will not appear.

For a 1-player game only, select "Refuse Challengers" or "Not Ready" (Not enter a Battle Race)..



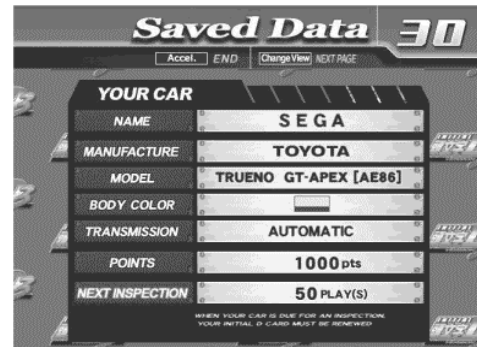
4.1.2.2.Card Entry Screen and Card Purchase Screen:

Insert your card if you've got one after completing the Card Purchase Screens. If you don't already have a card, you can purchase one.



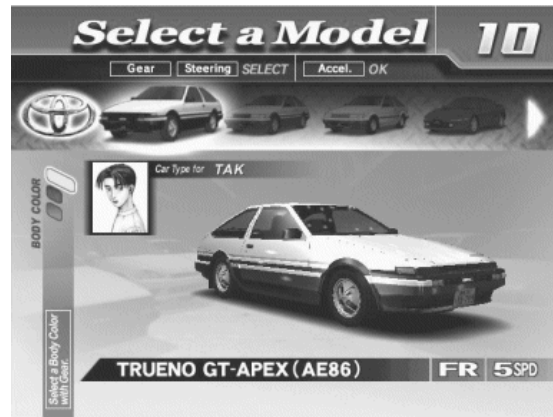
4.1.2.3.Card Data Check Screen:

Insert your card and you can check the recorded data on this screen.



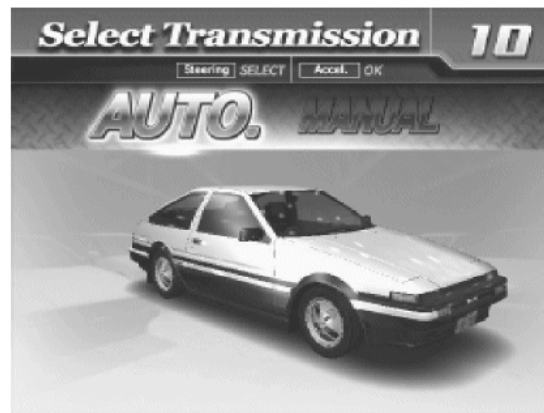
4.1.2.4.Vehicle Selection Screen:

This screen isn't displayed if you've already purchased a card.



4.1.2.5.Transmission Selection Screen:

Transmission Selection Screen: This screen isn't displayed if you've already purchased a card.



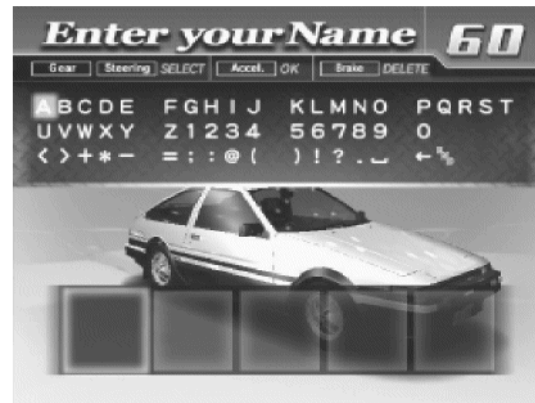
4.1.2.6.Parts Course Selection Screen:

If you're purchasing a card, select one of the Parts courses.
These parts are then attached to your car when you accumulate enough points.



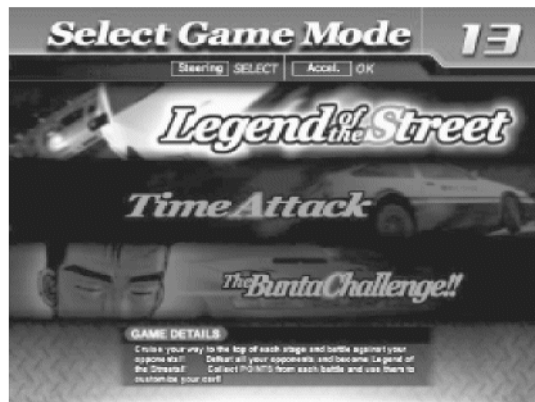
Name Entry Screen:

If you're purchasing a card, enter your name (driver's name) at the player name input screen.

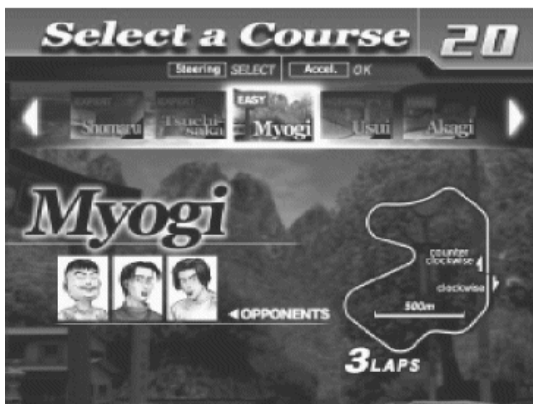


Mode Select Screen:

Select "Legend of the Streets" at the Mode Selection Screen.



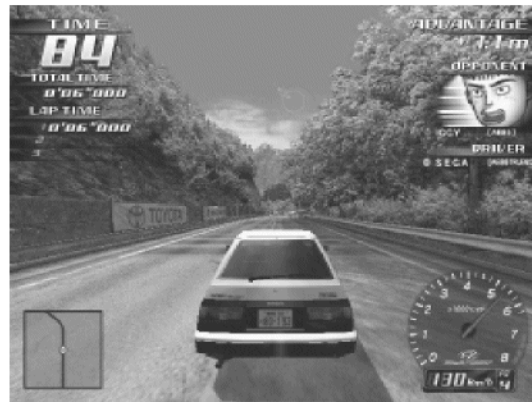
Course and Rival Character Selection Screens



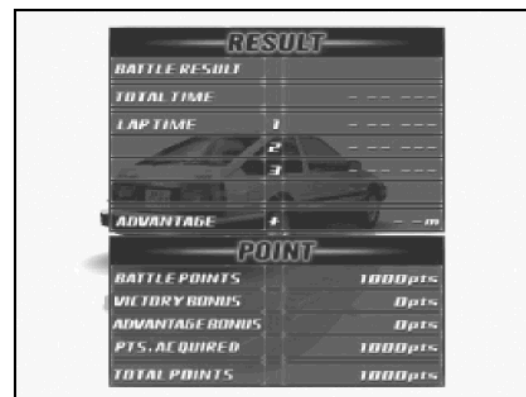
Rival Character Scenes



Battle (Race)

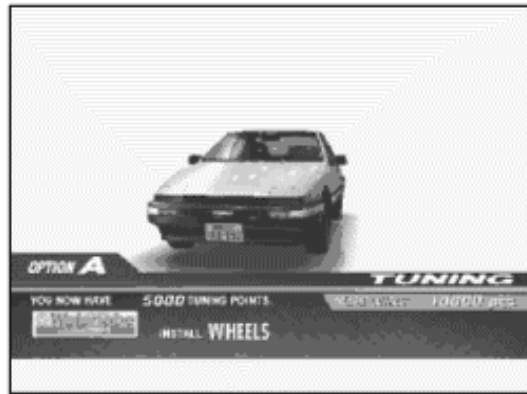


Results Screen



Tune Up Screen:

Use your card to play and accumulate points you can put towards performance enhancing tune-ups.



Continue Screen:

Choose to continue or quit after rival character scenes. If you select "YES", nothing is recorded to the card and you can continue playing. If you select "NO", your game data is stored on your card and your game ends.



4.1.2.7. Time Attack

Game Content & Rules

This is a race against time. The goal is to cross the finish line as quickly as you can.

Direction, Time of Day and Weather can be selected for each of the nine courses – note that Happogahara and Akina (Snow) can only be set to Night.

Each checkpoint you pass adds time to the overall time limit. When you cross the finish line, a password is displayed. (The password is not displayed when you don't use the card.)

You may use this password to participate in the online Internet rankings.

In order to register the password, you must have played the game with a card and you'll need to enter the 3 digit number or KEY printed on the front of the card.

Your times, when recorded with the Card (tuned car), are displayed in the ranking. The way to accumulate points is to play with a card.

4.1.2.8. The BUNTA Challenge!

Game Content & Rules

Race head-to-head against a single rival, Fujiwara Bunta, on eight different courses:

Myogi, Usui, Akagi, Akina (Snow on Level 11), Happogahara, Shomaru and Tsuchisaka.

For each course, only Dry or Night conditions may be selected.

A Card with saved points is necessary to play.

Player must finish ahead within the time limit to win.

Finishing behind or over the time limit means the player loses.

Beating Bunta earns points and increases the Bunta Level for that course by one.

The Bunta Level indicates Bunta's strength; the higher the level the stronger he becomes.

Losing reduces the player's points total.

4.1.2.9. Network Battle Race

Game Content & Rules

Two vehicles race for victory.

When either car passes a checkpoint, remaining race time will be increased.

The winner is the car that crosses the finish line first or is occupying first place when time runs out.

A car built on the Card (tuned car) may also be used.

When racing with a tuned car, results will be saved on the Card.

Challengers may challenge at any point during the champion side race.

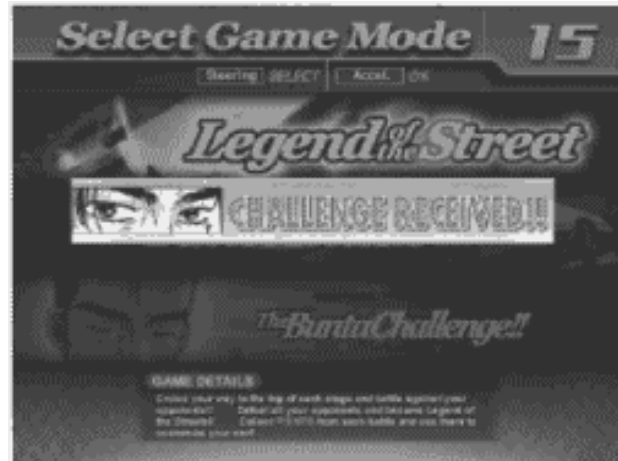
Cards may not be purchased during a Network Battle Race.

Before the Race

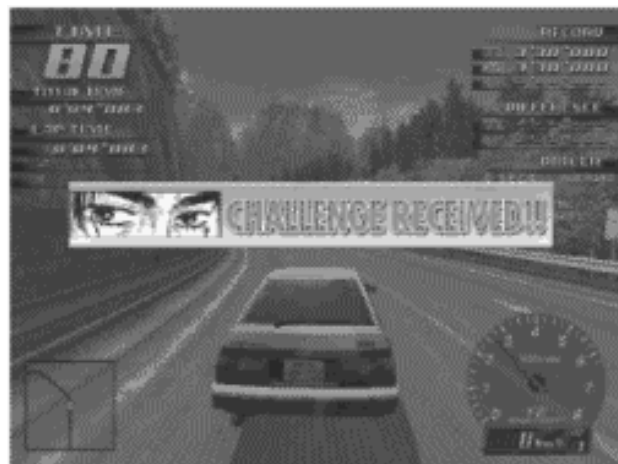
[Champion Side]

Battle Entry Challenge Request Screen.

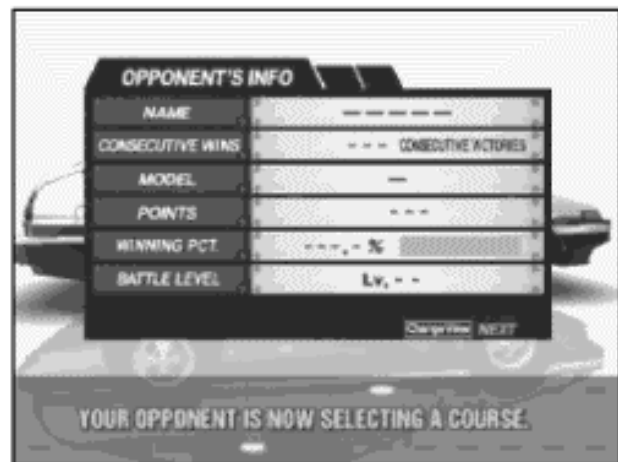
When a challenge occurs before the start of the race (during selection phase):
If the challenge occurs before the mode selection phase (during Car Selection etc), the Network Battle Race Information Screen is displayed directly before the selection phase.
If the challenge occurs after the selection phase, selection is interrupted and the Network Battle Race Information Screen is displayed



When a challenge occurs during the race:
The race is interrupted and the Network Battle Race Information Screen is displayed.



Network Battle Race Information Screen
The challenger selects the course while the champion waits at the Network Battle Race Information Screen.



[Challenger Side]

Network Battle Race Select Screen

This screen asks if a new player wishes to enter a Battle Race. It only appears when a new player first inserts coins and the current player has opted to accept Battle Race challengers.



Card Entry Screen

When a Battle Race is established, the Card Entry Screen appears.

A Battle can be raced even without a Card. If there is no Card, the game proceeds to the Car Selection and Transmission Selection Screens.

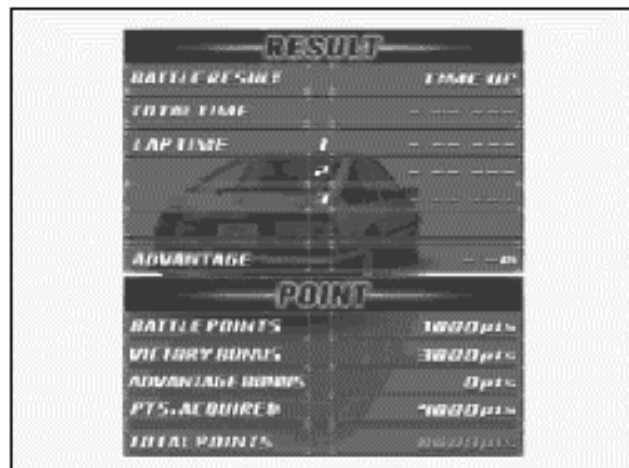
The Course Selection Screen then appears. The challenger selects the course.



After the Race

Results Screen

After a battle, the Results Screen appears. Depending on the results, the Battle Level will change.



Continue Screen

The winning player will receive victory points and will be allowed to continue play.

The losing player will go to the Continue Screen.

When the number of victories exceeds the set limit

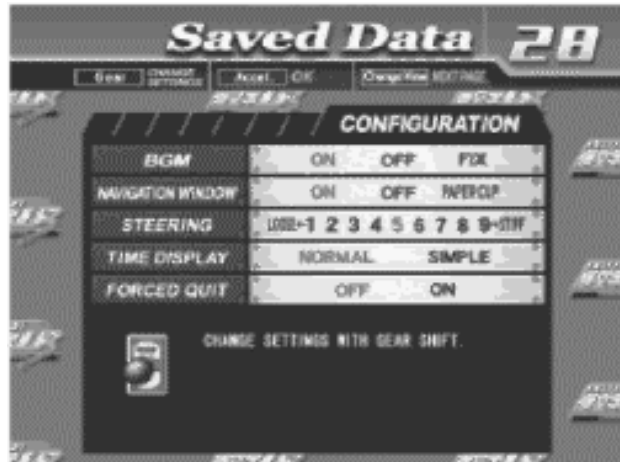
When a player's total number of victories exceeds the set limit, the player will be taken to the Continue Screen even if they win.



4.1.2.10.Configuration

When a Card is inserted, a number of options may be set.

Press the View Change Button at the Card Data Confirmation Screen to go to the Configuration screen. When displaying the configuration Screen, you can select the item by the Shift Lever. After selecting the item, press the Start Button and change the setting by the Steering Wheel. After changing the setting, press the Start Button again to be settled the new settings.



BGM

Set race background music options

On: Play BGM as normal (Default Setting).

Off: Turn BGM off.

Fix: Play the melody selected at Song Selection. Will play the same BGM until changed.

Navigation Display

Set options for the Navigation Display that appears at the lower left of the Race Screen.

On: Show navigation display (Default setting).

Off: Do not show navigation display.

Paper Cup: A paper cup full of water appears on the navigation display.

Steering

Set steering wheel stiffness.

1 to 9: 1 is the loosest. Stiffness increases up to a maximum setting of 9.

Default Setting is 5

Time Display

Set the Time Display on the Race Screen.

Normal: Standard time display. (Default setting)

Simple: Simplified time display.

Forced Quit

Force end of game during Legend of the Streets and Time Attack play.

Off: Disable force quit (Default setting)

On: Enable force quit. Press the Start and Change View Buttons simultaneously to end game.

4.1.2.11.Game Over

With "Legend of the Streets", "Time Attack" and "Network Battle Race" play, the Continue Screen appears after each race.

If you choose not to continue, the game ends.

4.1.2.12.Transferring Old Card Data

Card data from the previous versions, "Initial D" and "Initial D Ver. 2" may be transferred for use with "Initial D Ver. 3". Not all player data will be transferred to the new Card.

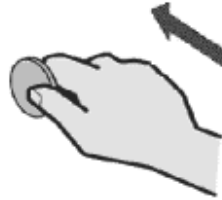
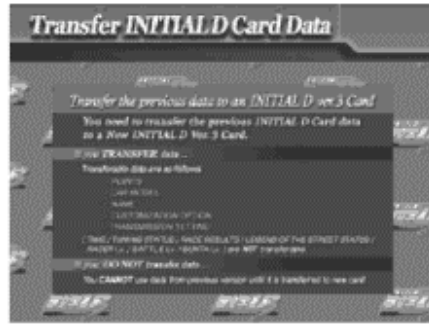
- Transferable Data: Points, car model, player name, customization options, Auto/ Manual transmission setting, number of plays till next inspection (the number of plays remaining on the Card, plus 50, max. 127).
- Non-transferable Data: Tune-up (Tune-up status is returned to default, but transferred points may be used to re-tune the car), times, race results, Legend of the Street status, Key and Speed Demon Level, Network Battle Level, Bunta Level.

1. The player inserts coins to start.



Player inserts Card at the Card Entry Screen.

2. Player inserts credits at the Transfer Card Data Screen.



3. The old Card will be ejected. This Card can no longer be used



4. When the Card Data Transferred message appears, the game will restart.

The new Card is for exclusive use with the Initial D Ver. 3, and cannot be used with the previous versions, Initial D and Initial D Ver. 2.

4.1.2.13.Limit on Card Use

Each Card can be used for up to fifty plays, until Car Inspection time is reached. Continued game play after each race is not counted as part of the 50 game limit. Cards may be renewed by transferring data to a new Card (stored points will not be lost). However, if you do not renew your card at the Car Inspection, you will not longer be able to play using the data stored on your card.

4.1.2.14.Car Selections

TOYOTA
 TRUENO GT-APEX [AE86]
 LEVIN GT-APEX [AE86]
 LEVIN SR [AE85]
 MR2 G-Limited [SW20]
 MR-S S EDITION [ZZW30]
 ALTEZZA RS-200 [SXE10]
 CELICA GT-FOUR [ST205]

NISSAN
 SKYLINE GT-R [BNR32]
 SKYLINE GT-R [BNR34]
 SKYLINE 25GT TURBO [ER34]
 SILVIA K's [S13]
 SILVIA Q's [S14]
 SILVIA K's AERO [S14]
 SILVIA spec-R [S15]
 180SX TYPE X [RPS13]
 SILEIGHTY [RPS13]

HONDA
 CIVIC SiR II [EG6]
 CIVIC TYPE R [EK9]
 INTEGRA TYPE R [DC2]
 S2000 [AP1]

MITSUBISHI
 LANCER GSR EVOLUTION III [CE9A]
 LANCER RS EVOLUTION IV [CN9A]
 LANCER RS EVOLUTION V [CP9A]
 LANCER GSR EVOLUTION VI [CP9A]
 LANCER GSR EVOLUTION VII [CT9A]

LANCER EVOLUTION WRS [CN9A]
 LANCER EVOLUITON ZGSR [CT9A]

MAZDA
 RX-7 Type R [FD3S]
 RX-7 SPIRIT R Type A [FD3S]
 RX-7 [FC3S]
 RX-8 Type S [SE3P]
 ROADSTER S Special [NA6CE]
 ROADSTER RS [NB8C]

SUBARU
 IMPREZA WRX STi Version VI [GC8]
 IMPREZA WRX STi [GDB]
 IMPREZA WRX Type R STi Version V [GC8]

SUZUKI
 Cappuccino [EA11R]

4.1.2.15.Race Courses

- Easy: Myogi, Circular Course/3 laps, Clockwise & Counter-clockwise, Day & Night, Dry & Wet
- Normal: Usui, Circular Course/2 laps, Clockwise & Counter-clockwise, Day & Night, Dry & Wet
- Hard: Akagi, Single road, Uphill & Downhill, Day & Night, Dry & Wet
- Hard: Akina, Single road, Uphill & Downhill, Day & Night, Dry & Wet
- Expert: Irohazaka, Single road, Downhill/Reverse, Day & Night, Dry & Wet
- Expert: Akina (Snow), Single road, Uphill & Downhill, Night
- Expert: Happogahara, Single road, Outbound & Inbound, Night, Dry & Wet
- Expert: Shomaru, Single road, Outbound & Inbound, Day & Night, Dry & Wet
- Expert: Tsuchisaka, Single road, Outbound & Inbound, Day & Night, Dry & Wet

4.1.2.16. Legend of the Streets Rival Characters

IGGY	EASY (MYOGI)
KENJI	LEVIN SR [AE85]
SHINGO	LEVIN SR [AE85]
	CIVIC SRI [EG6]
	NORMAL (USUI)
TORU	ROADSTER S Special [NA6CE]
KAWAI	SKYLINE 25GT TURBO [ER34]
MAYA&SIMONE	SILEIGHTY [RPS13]
	HARD (AKAGI)
TWO GUYS FROM TOKYO	SILVIA spec-R [S15]
DANNY	SILVIA Q's [S14]
K. T.	RX-7 Type R [FD3S]
	HARD (AKINA)
COLE	SILVIA K's [S13]
ZACK	SKYLINE GT-R V-spec II [BNR32]
KYLE	LANCER GSR EVOLUTION III [CE9A]
RY	RX-7 Ⅲ [FC3S]
TAK	TRUENO GT-APEX [AE86]
BUNTA	IMPREZA WRX R STi Version V [GC8]
	EXPERT (IROHAZAKA)
HAWK	LANCER RS EVOLUTION IV [CN9A]
KYLE	LANCER GSR EVOLUTION III [CE9A]
CAINE	MR2 G-Limited [SW20]
	EXPERT (AKINA SNOW)
MIKI	CELICA GT-FOUR [ST205]
	EXPERT (HAPPOGAHARA)
DICE	CIVIC TYPE R [EK9]
SMILEY	INTEGRA TYPE R [DC2]
TOUCH	CIVIC TYPE R [EK9]
	EXPERT (SHOMARU)
NOBU	ALTEZZA RS-200 [SXE10]
SID	CAPPUCCINO [EA11R]
AKI	LEVIN GT-APEX [AE86]
	EXPERT (TSUCHISAKA)
KYLIE	RX-7 Type R [FD3S]
RY	RX-7 [FC3S]
Man in Evo V	LANCER RS EVOLUTION V [CP9A]
Man in Evo VI	LANCER GSR EVOLUTION VI [CP9A]
K. T.	RX-7 Type R [FD3S]
TAK	TRUENO GT-APEX [AE86]

5. MAINTENANCE INSTRUCTIONS

5.1. EXPLANATION OF TEST AND DATA DISPLAY

Use the switches on the VTS to enter the TEST MODE. This will allow you to carry out post installation and periodic checks and adjustments. The following section details the function of each of the tests:



- Be very careful about entering TEST MODE. If the machine you wish to test is linked to other machines, exiting test on your machine will cause a network check to be carried out. This will disable all other machines linked to it.

ITEM	DESCRIPTION / REFERENCE	INTERVAL
INSTALLATION OF THE MACHINE	When the machine is installed perform the following checks: Check to see that each setting is as per the standard settings input at the time of shipment. In the INPUT TEST mode, check each switch and VR. Section 5.3.2 In the OUTPUT TEST mode, check each of the lamps. Section 5.3.3 In the MEMORY TEST mode check all of the IC's on the IC BD. Section 5.2.1	Monthly
MEMORY	On the TEST MENU screen choosing the MEMORY TEST allows self test to be performed. In this test RAM & ROM are tested.	Monthly
PERIODIC CHECKS	Periodically perform the following MEMORY TEST. Section 5.2.1. Ascertain each setting: In the INPUT TEST mode, test the control devices. Section 5.3.2 In the OUTPUT TEST mode, check each of the lamps. Section 5.3.3	Monthly
CONTROL SYSTEM	In the INPUT TEST mode, check each switch and VR. Section 5.3.2 Adjust or replace each switch and VR. Section 3.9	Monthly
MONITOR	In the CRT TEST mode, check to ensure the monitor is adjusted correctly. Section 5.2.4	Monthly
	Clean screen (switch off machine and remove the plug)	Weekly
IC BOARD	MEMORY TEST In the SOUND TEST mode, check the sound related ROMs. 5.2.3	Monthly
DATA CHECK	Check such data as held in the bookkeeping screens, relating to number and length of plays. Section 5.4	Monthly
EXTERIOR MAINTENANCE	Clean surfaces Lubricate seat sliders	Monthly
COIN MECHANISM	Check switch operation (if fitted)	Monthly

5.1.1. VTS ASSEMBLY



- Do not touch places other than those specified. Touching places not specified could cause an electric shock or short circuit.



Opening the Coin Chute door will reveal the VTS Assembly shown above. The function of each switch is as follows. The controls on the left affect the 1P cockpit, those on the right the 2P

TEST BUTTON
(TEST SW)

Used to enter TEST mode. Also has function during TEST mode. Refer to the later section detailing TEST mode.

SERVICE BUTTON
(SERVICE SW)

Gives credits without registering on the coin counter. Also used during TEST mode.

DEMAG

Demagnetises (degausses) the CRT to remove colour unevenness.

VOLUME MAIN

Adjusts the volume of the left and right main speakers.

VOLUME WOOFER

Adjusts the volume of the woofer.

5.2. SYSTEM TEST MODE



- 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.
- Perform setting as per specified in this manual for operation. If setting not specified is performed for operation, proper function of this product may not be obtained.

In the SYSTEM TEST MODE, IC BD functioning can be checked, the monitor adjusted, and the coin setting performed.

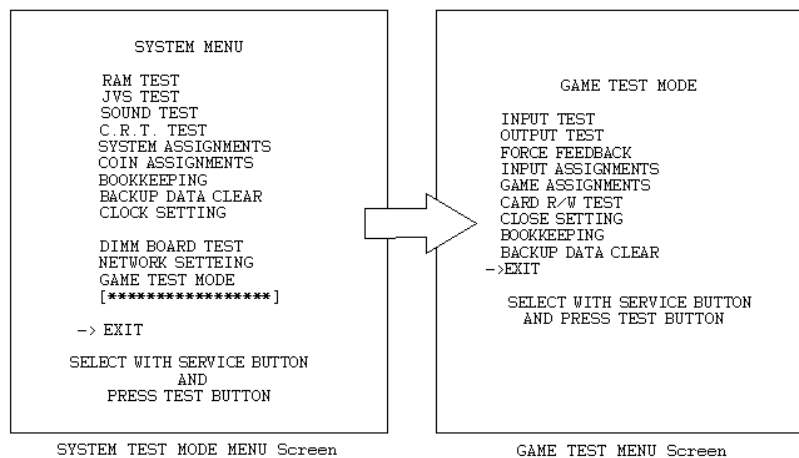
Refer to NAOMI NETWORK SYSTEM SERVICE MANUAL for the details. Note that the setting of the following items need to be performed in accordance with the instruction given.

CABINET TYPE : 1 PLAYER(S)
 MONITOR TYPE : HORIZONTAL
 SERVICE TYPE : COMMON
 COIN CHUTE TYPE : COMMON
 NETWORK TYPE : NONE

The SEQUENCE SETTING items of COIN/CREDIT SETTING are as follows.

SEQUENCE SETTING

- SEQUENCE 1: Number of credits required for starting the game.
 SEQUENCE 2: Number of credits required for continuing the play.
 SEQUENCE 3: Number of credits required for dedicated CARD purchase.
 SEQUENCE 4 -8: NOT USED



Press the TEST BUTTON to bring up the screen shown to the left.

Press the SERVICE BUTTON to move downwards through the list. The arrow shows the current selection.

Press the TEST BUTTON to activate the selected test.

To finish TEST MODE, move the arrow to EXIT and press the TEST.

5.2.1. RAM 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

```

The memory test mode is for automatically checking the on-board memory IC functioning. "GOOD" is displayed for normal IC's and "BAD" for abnormal IC's

- When the test is completed, if the results are as shown on the left then the Game Board is satisfactory.
- The test should take approximately thirty seconds to complete. If the test exceeds this time the board may have malfunctioned.
- After finishing the test press the TEST BUTTON or START BUTTON to exit.

5.2.2. JVS TEST

```

          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    2PLAYERS 12BITS
COIN       2SLOTS
ANALOG     8CH
DRIVER OUT 22CH

SELECT WITH SERVICE BUTTON
AND
PRESS TEST BUTTON

```

- In this test, functioning of the I/O Board connected to the Game Board is displayed, and INPUT TEST can be performed. Select EXIT to return to the MENU screen, or select INPUT TEST to display the second screen.

```

          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.

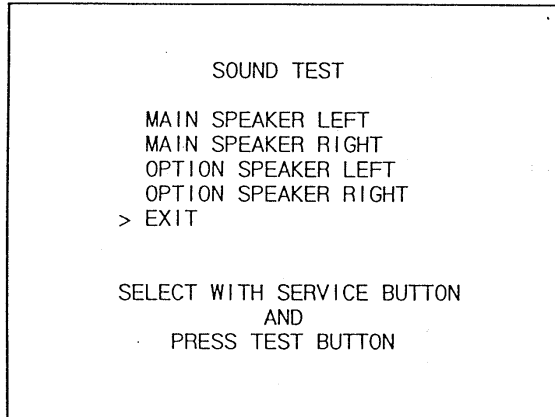
Select EXIT to return to the MENU screen.

5.2.3. SOUND TEST

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

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

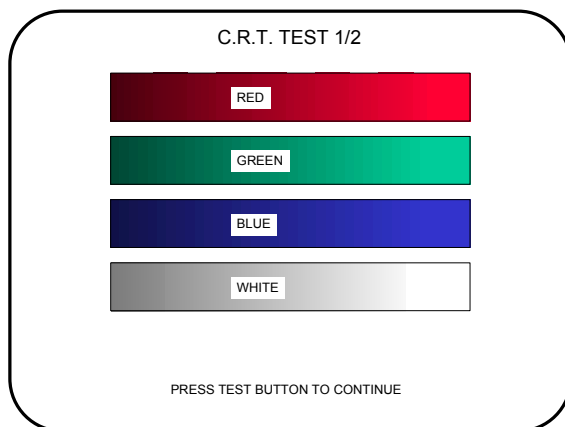
Press TEST button to output the sound.



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

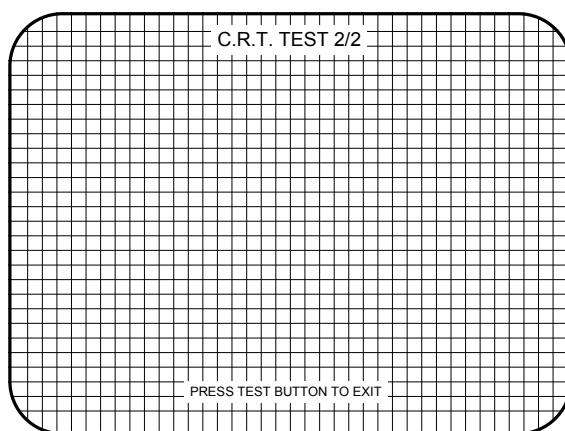
Select EXIT to return to MENU screen.

5.2.4. C.R.T TEST



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

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



5.2.5. SYSTEM ASSIGNMENTS

Allows system options to be set. Select required setting with SERVICE button, confirm with TEST button. Default settings are indicated in parentheses.

SYSTEM ASSIGNMENTS	
CABINET TYPE	1PLAYER
ADVERTISE SOUND	ON
MONITOR TYPE	HORIZONTAL
DISPLAY MODE	AUTOSCAN
SERVICE TYPE	COMMON
COMMUNICATION MODE	MASTER
> EXIT	
SELECT WITH SERVICE BUTTON AND PRESS TEST BUTTON	

- CABINET TYPE specifies Control Panel and number of Coin Chutes. The number of players displayed in BOOKKEEPING varies in accordance with the value displayed here. (**1PLAYER**)
- ADVERTISE SOUND allows the sound emission to be turned (**ON**) or OFF during ADVERTISE MODE.
- MONITOR TYPE changes the orientation of the image on the screen (**HORIZONTAL**)
- SERVICE TYPE sets the functioning of the SERVICE button, should several SERVICE buttons exist.
INDIVIDUAL: Service credit is applied to the machine on which the SERVICE button is pressed.
(**COMMON**): Service credit is applied to all machines when SERVICE button is pressed.

5.2.5.1.COIN ASSIGNMENTS

COIN ASSIGNMENTS	
COIN CHUTE TYPE	COMMON
COIN/CREDIT SETTING	#1
COIN CHUTE #1	
1COIN 1CREDIT	
COIN CHUTE #2	
1COIN 1CREDIT	
MANUAL SETTING	
SEQUENCE SETTING	
> EXIT	
SELECT WITH SERVICE BUTTON AND PRESS TEST BUTTON	

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

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

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

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

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

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

5.2.5.4.MANUAL SETTING

```

COIN ASSIGNMENTS
MANUAL SETTING

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

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

SEQUENCE SETTING
> EXIT

SELECT WITH SERVICE BUTTON
AND
PRESS TEST BUTTON

```

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

The available combinations are detailed below.

MANUAL SETTING

COIN TO CREDIT	1 COIN	1 CREDIT
	2 COINS	1 CREDIT
	3 COINS	1 CREDIT
	4 COINS	1 CREDIT
	5 COINS	1 CREDIT
	6 COINS	1 CREDIT
	7 COINS	1 CREDIT
	8 COINS	1 CREDIT
	9 COINS	1 CREDIT
BONUS ADDER	NO BONUS ADDER	
	2 COINS GIVE 1 EXTRA COIN	
	3 COINS GIVE 1 EXTRA COIN	
	4 COINS GIVE 1 EXTRA COIN	
	5 COINS GIVE 1 EXTRA COIN	
	6 COINS GIVE 1 EXTRA COIN	
	7 COINS GIVE 1 EXTRA COIN	
	8 COINS GIVE 1 EXTRA COIN	
	9 COINS GIVE 1 EXTRA COIN	
COIN CHUTE MULTIPLIER	1 COIN COUNTS AS 1 COIN	
	1 COIN COUNTS AS 2 COINS	
	1 COIN COUNTS AS 3 COINS	
	1 COIN COUNTS AS 4 COINS	
	1 COIN COUNTS AS 5 COINS	
	1 COIN COUNTS AS 6 COINS	
	1 COIN COUNTS AS 7 COINS	
	1 COIN COUNTS AS 8 COINS	
	1 COIN COUNTS AS 9 COINS	

5.2.5.5.SEQUENCE SETTING

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

COIN ASSIGNMENTS	
SEQUENCE SETTING	
SEQUENCE1	*CREDIT
SEQUENCE2	*CREDIT
SEQUENCE3	*CREDIT
SEQUENCE4	*CREDIT
SEQUENCE5	*CREDIT
SEQUENCE6	*CREDIT
SEQUENCE7	*CREDIT
SEQUENCE8	*CREDIT
> EXIT	
[XXXXXXXXXXXXXXX]	
[SEGA ENTERPRISES, LTD.]	
DESCRIPTION OF SEQUENCE	
SE01	TO START
SE02	TO CONTINUE
SE03	TO MAKE CARD
SE04	NOT USED
SE05	NOT USED
SE06	NOT USED
SE07	NOT USED
SE08	NOT USED
SELECT WITH SERVICE BUTTON	
AND	
PRESS TEST BUTTON	

5.2.5.6. BOOKKEEPING

BOOKKEEPING PAGE#1			
TOTAL TIME	55H27M13S		
COIN1	16	SERVICE1	5
COIN2	4	SERVICE2	0
CREDIT	10		
TOTAL COIN	20		
COIN CREDIT	10		
SERVICE CREDIT	5		
TOTAL CREDIT	15		
PRESS SERVICE BUTTON TO ANOTHER PAGE			
PRESS TEST BUTTON TO EXIT			

BOOKKEEPING PAGE#2		
PLAYER1		
SE01	1	
SE02	0	
SE03	1	
SE04	0	
SE05	0	
SE06	0	
SE07	0	
SE08	0	
PRESS SERVICE BUTTON TO ANOTHER PAGE		
PRESS TEST BUTTON TO EXIT		

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

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

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

5.2.5.7. BACKUP DATA CLEAR

BACKUP DATA CLEAR	
YES (CLEAR)	
> NO (CANCEL)	
SELECT WITH SERVICE BUTTON	
AND	
PRESS TEST BUTTON	

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

Note that this does not clear the contents of BOOKKEEPING in GAME TEST MODE. For this, use the BACKUP DATA CLEAR in GAME TEST MODE.

5.2.5.8.ROM BD TEST

In this test, Game Board ROM is checked. If GOOD is displayed, it is satisfactory. The IC number, TYPE, BYTE and WORD refer to the checksum of each unit. Press TEST to exit.

ROMBD TEST					
[XXXXXXXXXXXXXXXX]					
[SEGA ENTERPRISES, LTD.]					
NO.	TYPE	RESULT	BYTE	WORD	
IC35	32M	-----	XXXX	XXXX	
IC36	32M	-----	XXXX	XXXX	
IC19	128M	GOOD	XXXX	XXXX	
IC20	128M	GOOD	XXXX	XXXX	
.					
.					
.					
.					
.					
.					
PRESS TEST BUTTON TO EXIT					

On above screen, IC35 and IC36 (program ROMs) do not display GOOD or BAD. Press TEST Button to EXIT.

5.2.5.9. CLOCK SETTING

YEAR, MONTH, DAY, HOUR and MINUTE are set for SEGA NAOMI BOARD. Select the desired item with SERVICE button and press TEST to increase the value. Select EXIT to return to MENU mode.

CLOCK SETTING									
2000	7/	7	7:	7	7	FRI			
YEAR									
MONTH									
DAY									
HOUR									
MINUTE									
SECOND									
-> EXIT									
CANCEL									
2000 7/ 7 7: 7 ** FRI									
SELECT WITH SERVICE BUTTON									
AND									
PRESS TEST BUTTON									

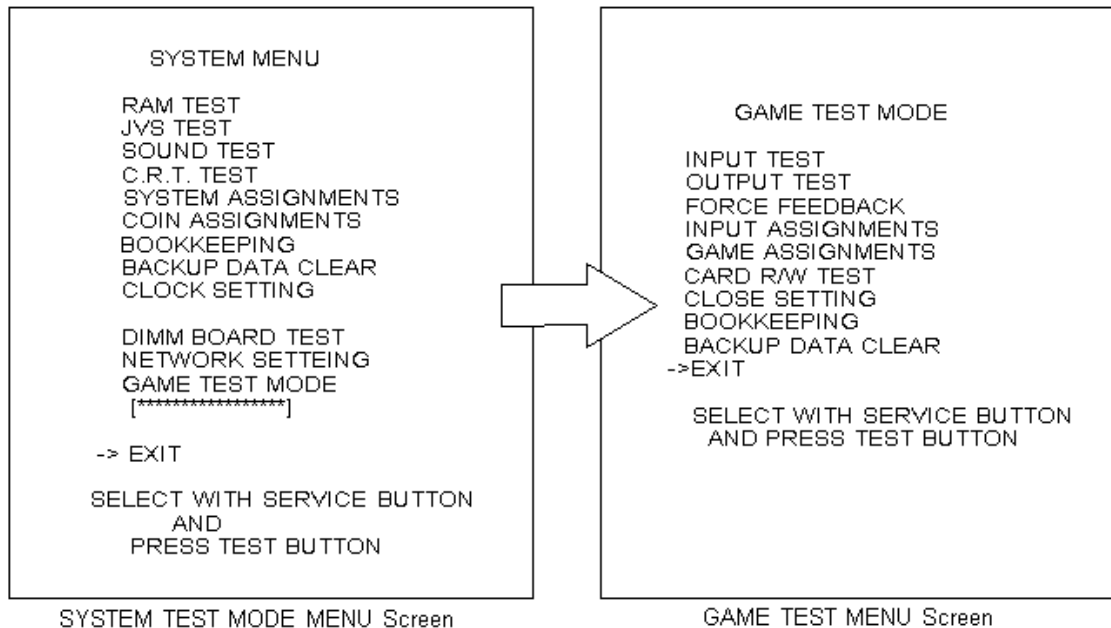
5.3. GAME TEST MODE

 STOP IMPORTANT	• When changing the game configuration, changes will not take effect until the Game Test Mode has been completed. Be sure to exit the Game Test Mode properly after configuration changes. • Do not configure the game in ways not described in this text. It is possible that the game will not function properly.
---	---

5.3.1. GAME TEST MENU MODE

Select GAME TEST MODE from the System Menu screen to display the Game Test Menu screen.

Use the SERVICE Button to move the cursor to the desired test item.
Press the TEST Button to enter the selected item.

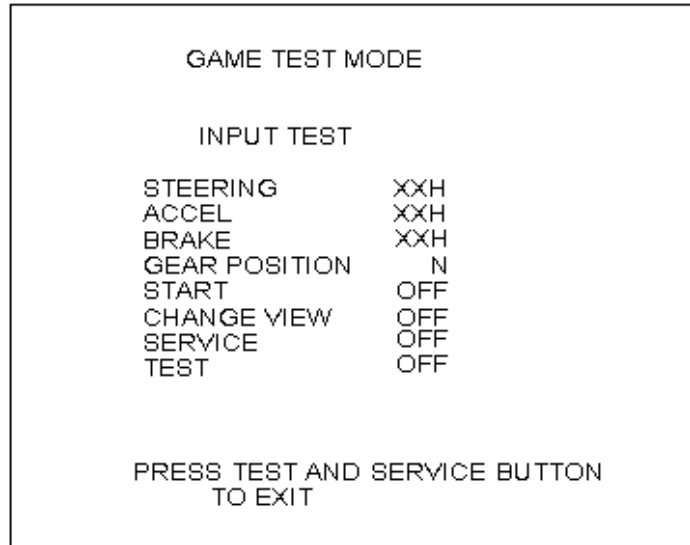


After making changes, be sure to select EXIT and press the TEST Button in order to enable the new settings.

Move the cursor to EXIT and press the TEST Button to return to the System Menu screen.

5.3.2. INPUT TEST

Select INPUT TEST to display the following screen and check the status of input devices. This test should be used periodically to check that each input device is functioning correctly.

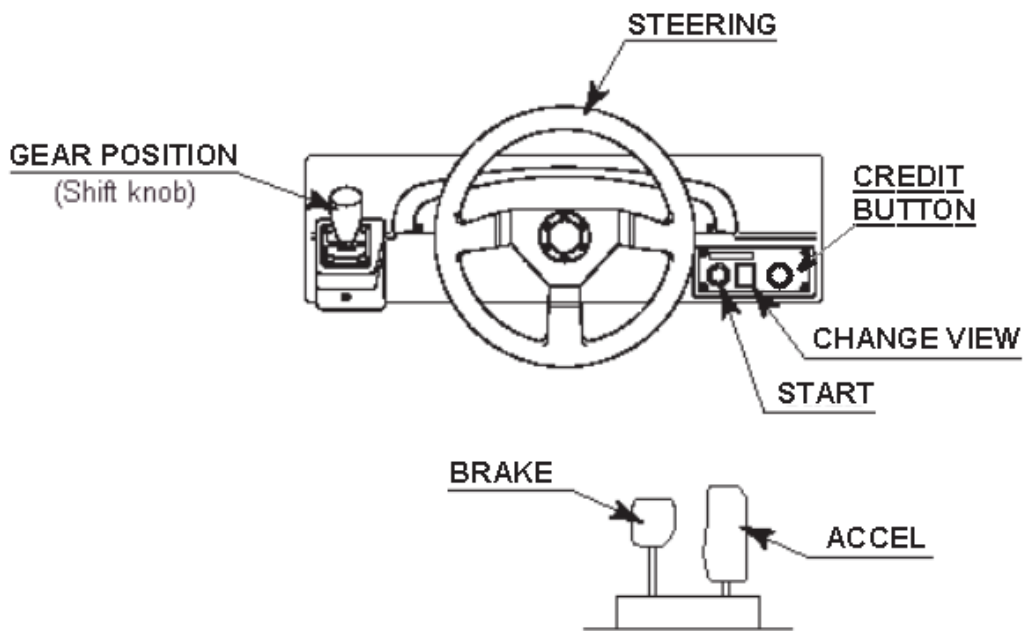


INPUT TEST Screen

Test the STEERING, ACCEL and BRAKE controls to ensure that they are functioning properly and that the parameters change smoothly as each input device is operated.

Display N, UP and DOWN using the GEAR POSITION. N should display there is no control input. Verify that both UP and DOWN display in sync with the position of the shift knob.

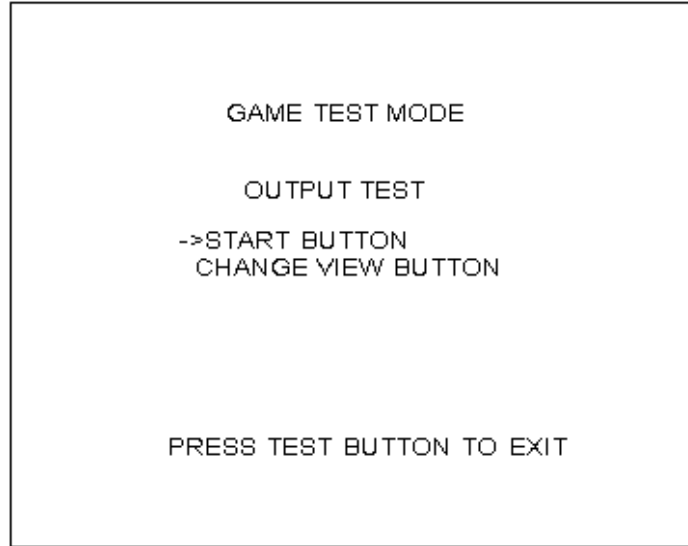
Press the START, CHANGE VIEW, SERVICE and TEST Buttons. If functioning correctly, each indicator will switch from OFF to ON.



Press the SERVICE and TEST Buttons simultaneously to return to the Game Test Menu screen.

5.3.3. OUTPUT TEST

Select OUTPUT TEST to display the following screen and check the status of each lamp. This test should be used periodically to check that the lamps are functioning correctly.



OUTPUT TEST Screen

The cursor toggles automatically between START Button and CHANGE VIEW Button, and each lamp lights up.

Press the TEST Button to return to the Game Test Menu screen.

5.3.4. FORCE FEEDBACK

	• If you select FORCE FEEDBACK, the STEERING will rotate automatically when you press the TEST Button. The STEERING will also rotate automatically during FORCE TEST. Make sure that no one is touching the STEERING before running these tests as contact may cause injury.
---	--

When you select "FORCE FEEDBACK", a connection test runs and the STEERING rotates. When the connection check completes, a screen similar to the one below is displayed, and you may adjust the STEERING resistance.

```
GAME TEST MODE
FORCE FEEDBACK

(MIN 0 : MAX 10 : DEFAULT 4)

FORCE =  XX

UP
DOWN

FORCE TEST (FORCE = 4)

CENTER  OFF
RIGHT   OFF
LEFT    OFF

->EXIT

SELECT WITH SERVICE BUTTON
AND PRESS TEST BUTTON
```

FORCE FEEDBACK Screen

FORCE: Set the STEERING resistance

The smaller the value, the weaker the resistance; the larger the value, the stronger the resistance.
(Minimum value is 0; the maximum value is 10. The default setting is 4.)
Move the cursor to UP or DOWN and press the TEST Button to change the value.

FORCE TEST: Verifies the STEERING motor is working properly

Conducted when the STEERING resistance is set at 4.
Toggle between OFF and ON by aligning to CENTRE and pressing the TEST Button. The STEERING will rotate and stop in the centre position. Pressing the SERVICE Button moves the cursor to the next menu item and CENTRE changes to OFF. Control of the STEERING is then released.
When the RIGHT menu item is ON, the STEERING rotates to the right as far as possible and then stops. Press the SERVICE Button again to turn it OFF and release control of the STEERING.
When the LEFT menu item is ON, the STEERING rotates to the left as far as possible and then stops. Press the SERVICE Button again to turn it OFF and release control of the STEERING.

Move the cursor to EXIT and press the TEST Button to return to the Game Test Menu screen.

5.3.5. INPUT ASSIGNMENTS

Select INPUT ASSIGNMENTS to display the following screen.

```

      GAME TEST MODE
      INPUT ASSIGNMENTS

      STEERING:      XXX
      (DEFAULT = 0)
      ACCEL  :      XXX
      (DEFAULT = 0)
      BRAKE  :      XXX
      (DEFAULT = 0)

      DEFAULT SETTING
      ->EXIT

      SELECT WITH SERVICE BUTTON
      AND PRESS TEST BUTTON

```

INPUT ASSIGNMENTS Screen

You can adjust each of the menu items by moving the cursor to the menu item and pressing the TEST Button.

Return all settings to the default settings with DEFAULT SETTING.

STEERING: Make adjustments to STEERING
Press the TEST Button to display the following screen.

```

      GAME TEST MODE
      STEER ASSIGNMENT
      (MIN -40 : MAX 40 : DEFAULT 0)
      STEERING = XXX

      0
      ^
      CENTER
      RIGHT
      LEFT
      ->EXIT

      SELECT WITH SERVICE BUTTON
      AND PRESS TEST BUTTON

```

STEER ASSIGNMENTS Screen

Centre the STEERING. When the "0" displayed is not exactly aligned with the "^" mark above CENTRE, use the cursor to select RIGHT or LEFT and move the "0" until it is displayed directly above the "^" mark. Move the cursor to RIGHT and press the TEST Button to move the "0" to the right. Each time you press the TEST Button, "0" moves slightly to the right. Move the cursor to LEFT and press the TEST Button to move the "0" to the left. Each time you press the TEST Button, "0" moves slightly to the left.

Move the cursor to EXIT and press the TEST Button to return to the INPUT ASSIGNMENTS screen.

ACCEL: Make adjustments to ACCEL
Press the TEST Button to display the following screen.

```

      GAME TEST MODE
      ACCEL ASSIGNMENT
(MIN -40 : MAX 40 : DEFAULT 0)
      ACCEL = XXX

      0
      ^
      ^
    MIN      MAX

    RIGHT
    LEFT

->EXIT

SELECT WITH SERVICE BUTTON
AND PRESS TEST BUTTON

```

Adjust the distance between "0" displayed and the "^" mark equally so that when your foot is off the ACCEL pedal, the "0" on the left is aligns with the "^" above MIN and when you press the ACCEL pedal down all the way, the "0" on the right is aligns with the "^" mark above MAX.

Move the cursor to RIGHT and press the TEST Button to move "0" to the right. Each press of the TEST Button moves "0" slightly to the right.

Move the cursor to LEFT and press the TEST Button to move "0" to the left. Each press of the TEST Button moves "0" slightly to the left.

Move the cursor to EXIT and press the TEST Button to return to the INPUT ASSIGNMENTS screen.

BRAKE: Make adjustments to BRAKE
Press the TEST Button to display the following screen.

```

      GAME TEST MODE
      BRAKE ASSIGNMENT
(MIN -40 : MAX 40 : DEFAULT 0)
      BRAKE = XXX

      0
      ^
      ^
    MIN      MAX

    RIGHT
    LEFT

->EXIT

SELECT WITH SERVICE BUTTON
AND PRESS TEST BUTTON

```

Adjust the distance between "0" displayed and the "^" mark equally so that when your foot is off the BRAKE pedal, the "0" on the left is aligns with the "^" above MIN and when you press the BRAKE pedal down all the way, the "0" on the right is aligns with the "^" mark above MAX.

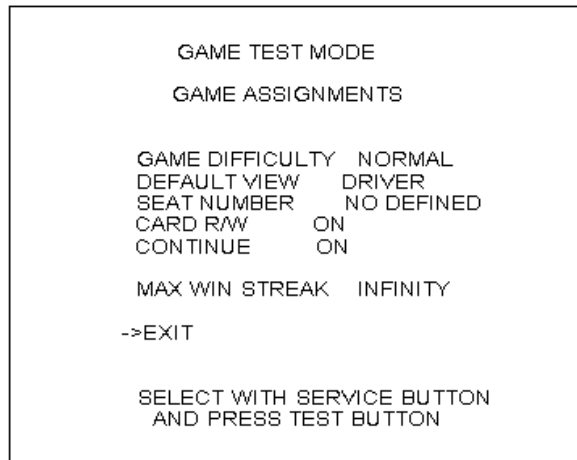
Move the cursor to RIGHT and press the TEST Button to move "0" to the right. Each press of the TEST Button moves "0" slightly to the right.

Move the cursor to LEFT and press the TEST Button to move "0" to the left. Each press of the TEST Button moves "0" slightly to the left.

Move the cursor to EXIT and press the TEST Button to return to the INPUT ASSIGNMENTS screen.

5.3.6. GAME ASSIGNMENTS

Select GAME ASSIGNMENTS to display the current game settings and make changes.



The GAME DIFFICULTY and CONTINUE menu items can be set only when the SEAT NUMBER is set to either 1 or NO DEFINED. The MAX WIN STREAK menu item can be set only when the SEAT NUMBER is set to 1.

- * **GAME DIFFICULTY:** Set the level of difficulty for the game
You may select one of 5 different levels of difficulty: VERY EASY, EASY, NORMAL, HARD or VERY HARD.
This setting does not affect the speed of rivals in "Legend of the Streets" mode.
- * **DEFAULT VIEW:** Set the view perspective at the start of races
You may select one of the following 2 settings: DRIVER view or REAR view.
- * **SEAT NUMBER:** Assign seat numbers to seats in each arcade unit for network play
If you have two arcade units side by side, make sure you assign different seat numbers; the seat on the left would be 1 and the one on the right would be 2. If the unit will not be used for network play, set the SEAT NUMBER to NO DEFINED.
You may select one of the following 3 settings: 1, 2 or NO DEFINED.
- * **CARD R/W:** Set to ON if using the Card Reader/Writer.
Set to OFF when not using the Card Reader/Writer.
- * **CONTINUE:** Enable/Disable Continue function.
ON: Enables Continue for Legend of the Street Time Attack and Network Battle Race games.
OFF: Disable Continue.
- * **MAX WIN STREAK:** Set maximum possible wins in the Battle Race game
1/3/5/10/20/30: Causes the continue screen to appear when the number of wins exceeds the indicated limit.
INFINITY: Play continues without inserting new coins as long as the player continues to win.

Changes to settings are not enabled until Test Mode is exited.
After changing settings, be sure to exit Test Mode.
After changing the settings, select EXIT and press the TEST Button to return to the Game Test Menu screen.

5.3.7. CARD R/W TEST

 IMPORTANT	• Clean the card reader/writer periodically.
---	--

Test the functionality of or clean the CARD R/W (read/writer).
The CARD R/W should be tested and cleaned periodically.

```
GAME TEST MODE  
CARD R/W TEST  
CARD R/W STATUS : *****  
( INFORMATION )  
  
INITIALIZE  
CLEANING  
CHECK R/W : --  
-> EXIT  
  
SELECT WITH SERVICE BUTTON  
AND PRESS TEST BUTTON
```

The cursor can move to the following items:

- * INITIALIZE: Initialisation
- * CLEANING: Cleaning
- * CHECK R/W: R/W Operation Check

Move the cursor to EXIT and press the TEST Button to return to the Game Test Menu screen.

Depending on the R/W running mode, one of the following is displayed in "*****" in "CARD R/W STATUS:

*****.

READY..... Now waiting (Clear to Send Command)
 INITIAL Now initializing (Not Clear to Send Command)
 CLEAN Now cleaning (Not Clear to Send Command)
 GET..... Cards are being taken out from the dispenser (Not Clear to Send Command)
 SAVE..... Sample data is saved onto the card (Not Clear to Send Command)
 PRINT..... Sample data is printed onto the card (Not Clear to Send Command)
 LOAD..... Load card data and compares it with sample data (Not Clear to Send Command)
 OUT..... Eject cards (Not Clear to Send Command)
 SHUTTER..... Now closing/opening the shutter (Not Clear to Send Command)
 ERROR..... Error (Clear to Initialize Command Only)

While a status with a note of "Not Clear to Send Command " in parentheses is on-screen, no operations are accepted. If such a status has occurred, wait until the operation in that status stops automatically and the display comes to READY.

Occasionally, the "INFORMATION" field on the screen outputs one of the instructions below.

It usually displays nothing (blank), although it displays NO ERROR when each item is completed normally.

While cleaning is in progress, waiting in the ready mode for inserting a cleaning card:

--PLEASE INSERT CLEANING CARD --

After the operation check, waiting for the ready mode for ejecting the card:

-- PLEASE REMOVE --

When an error occurs, its type are displayed in the "INFORMATION" field:

NO ERROR.....	Normal Completion
CAN'T LOAD.....	Loading Error
CAN'T SAVE.....	Writing Error
DRAW CARD ERROR.....	Error in Taking Card from dispenser
CARD STUFFED.....	Card Jamming
SHUTTER ERROR.....	Shutter Error
WRONG DATA.....	Data Error, Dispenser Card Empty
CONNECTION ERROR.....	Connection Error
SCIF ERROR RC-232C.....	Communication Error
UNKNOWN EROR.....	Unknown Error

The "---" field in "CHECK R/W : ---" shows the result of the operation check.

---.....	Not Checked
OK	No Failure
NG.....	Failure

5.3.8. CLEANING PROCESS

Cleaning refers to the optional cleaning of the heads on the CARD R/W.
Refer to Head Cleaning for details on the use of the cleaning card.

Select "CLEANING" and press the TEST Button.

- A. If the CARD R/W is not initialised, it will be initialised first. :INITIALIZE is displayed.
- B. The following message appears to show that the R/W is ready for insertion of the cleaning card:
-- PLEASE INSERT CLEANING CARD --
- C. Insert the cleaning card into the R/W.
On the screen, the status display is replaced with "CLEAN", and cleaning begins.
- D. Once cleaning ends after a lapse of a certain time, the R/W automatically ejects the card.
The status display changes from "CLEAN" to "READY."
NO ERROR is displayed on the screen.

TESTING FUNCTIONALITY

The operation check takes out each card from the dispenser, and writes the sample data onto it. The check then loads and reads it, and checks whether the read data matches the sample data. Then, the check ejects the card. When you draw out the card at this time, the entire process of the check is completed. The functionality test uses 1 card from the dispenser.

Select "CHECK R/W" and press the TEST button.

R/W operates automatically as follows:

- A If the CARD R/W is not initialised, it will be initialised first. :INITIALIZE is displayed.
- B Close the shutter: SHUTTER is displayed.
- C Takes out the card from the dispenser: GET is displayed.
- D Saves the sample data onto the card: SAVE is displayed.
- E Print the sample data onto the card: PRINT is displayed.
- F Loads the data on the card for comparison with the sample data: LOAD is displayed.
- G Open the shutter: SHUTTER is displayed.
- H Ejects the card: OUT is displayed.
- I Draws out the card. Now the entire process of the check is completed.

If execution of the operation check results in display of NG, check the error condition. If you can take action against the error, execute the operation check again after you take the proper action.

If you cannot take action against the error, repeat the check several times. If the result of the check is still NG, clean the R/W.

If the subsequent execution of the operation check still results in NG, the R/W may be faulty.

If an error occurs, it is cleared by executing the INITIALIZE command.

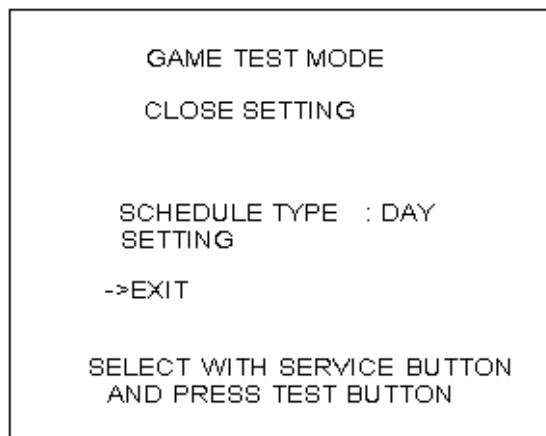
Note that, when an error has occurred, the R/W only accepts this command (except EXIT).

5.3.9. CLOSE SETTING

Select CLOSE SETTING to display the following screen.

Change the setting for the time when the store closes.

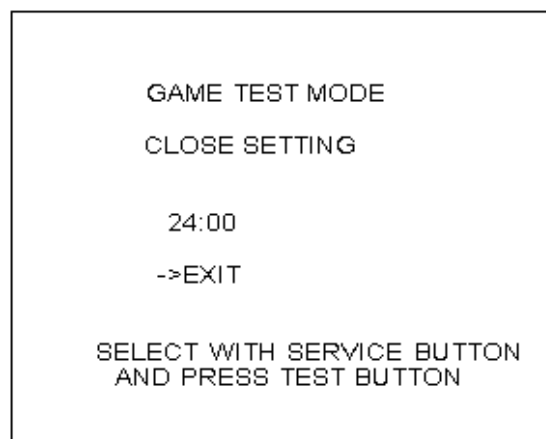
The game will be unusable for card play starting 15 minutes before the time you set until 6:00 AM the next morning. Before the store closing time, be sure to pay attention to the players with the card.



You can set SCHEDULE TYPE to DAY, WEEK or OFF. Press the TEST Button to select the item. (The unit is shipped with SCHEDULE TYPE set to OFF.)

Move the cursor to SETTING and press the TEST Button to display the appropriate time setting screen.

DAY: Set the daily store closing time. This time setting will be used every day



Set the daily store closing time. When you press the SERVICE Button, the "hour" display will begin to flash. Press the TEST Button to select any hour from "19" to "26".

Press the SERVICE Button again to accept the "hour" selection. Once accepted, the "minute" display will then begin to flash. Press the TEST Button to select one of the following "minute" options: "00, 15, 30, 45". Press the SERVICE Button again to accept the "minute" selection.

When complete, move the cursor to EXIT. If you press the SERVICE Button when the cursor is next to EXIT, the "hour" display will begin to flash again indicating that you can change the settings.

Move the cursor to EXIT and press the TEST Button to return to the CLOSE SETTING screen.

WEEK: Set a different store close time for each day of the week

GAME TEST MODE

CLOSE SETTING

SUN : 24:00
MON : 24:00
TUE : 24:00
WED : 24:00
THU : 24:00
FRI : 24:00
SAT : 24:00

->EXIT

SELECT WITH SERVICE BUTTON
AND PRESS TEST BUTTON

Set the store closing time for each day of the week. When you press the SERVICE Button, the "hour" display will begin to flash. Press the TEST Button to select any hour from "19" to "26".

Press the SERVICE Button again to accept the "hour" selection. Once accepted, the "minute" display will then begin to flash. Press the TEST Button to select one of the following "minute" options: "00, 15, 30, 45". Press the SERVICE Button again to accept the "minute" selection. Once accepted, the "hour" display for the next day of the week will begin to flash. Set the "hour" and "minute" settings in the same fashion as described above.

When you have completed setting the time for SAT, move the cursor to EXIT. If you press the SERVICE Button when the cursor is next to EXIT, the "hour" display for SUN will begin to flash again indicating that you can change the settings.

Move the cursor to EXIT and press the TEST Button to return to the CLOSE SETTING screen.
OFF: Do not set any store closing times. Other SETTING items are not displayed

5.4. BOOKKEEPING

Select BOOKKEEPING to display the following screens of operating status data. Each time the TEST Button is pressed, the ensuing page appears. Pressing the TEST Button while the 5/5 page is displayed causes the Game Test Menu to return on the screen.

GAME TEST MODE		
BOOKKEEPING 1/7		
NUMBER OF GAMES	0	
NUMBER OF NETWORK PLAY	0	0
NUMBER OF CARD	0	
NUMBER OF CARD PLAY	0	
PLAY TIME	00 0H 0M 0S	
AVERAGE PLAY TIME	0M 0S	
LONGEST PLAY TIME	0M 0S	
SHORTEST PLAY TIME	0M 0S	
PLAY TIME HISTOGRAM		
0M 0S ~ 0M59S	0	
1M 0S ~ 1M59S	0	
2M 0S ~ 2M29S	0	
2M30S ~ 2M59S	0	
3M 0S ~ 3M29S	0	
3M30S ~ 3M59S	0	
4M 0S ~ 4M29S	0	
4M30S ~ 4M59S	0	
5M 0S ~ 5M29S	0	
5M30S ~ 5M59S	0	
6M 0S ~ 6M29S	0	
OVER 6M30S	0	
PRESS TEST BUTTON TO CONTINUE		

GAME TEST MODE		
BOOKKEEPING 2/7		
GAME / LEGEND OF THE STREETS		
MYOGI-1	0	
MYOGI-2	0	
MYOGI-3	0	
MYOGI-4	0	
USUI-1	0	
USUI-2	0	
USUI-3	0	
USUI-4	0	
AKAGI-1	0	
AKAGI-2	0	
AKAGI-3	0	
AKAGI-4	0	
AKINA-1	0	
AKINA-2	0	
AKINA-3	0	
AKINA-4	0	
PRESS TEST BUTTON TO CONTINUE		

Press the TEST Button to move to screen 3/7 of BOOKKEEPING.

GAME TEST MODE	
BOOKKEEPING 3/7	
GAME / LEGEND OF THE STREETS	
HAPPOGAHARA-1	0
HAPPOGAHARA-2	0
HAPPOGAHARA-3	0
HAPPOGAHARA-4	0
IROHAZAKA-1	0
IROHAZAKA-2	0
IROHAZAKA-3	0
IROHAZAKA-4	0
IROHAZAKA-5	0
SPECIAL	0
PRESS TEST BUTTON TO CONTINUE	

GAME/LEGEND OF THE STREETS: Displays the number of times each rival character was selected in "Legend of the Street" mode. "MYOGI-1" refers to the first rival in MYOGI who is IGGY.
Press the TEST Button to move to screen 4/7 of BOOKKEEPING.

GAME TEST MODE	
BOOKKEEPING 4/7	
GAME / TIME ATTACK	
MYOGI	0
USUI	0
AKAGI	0
AKINA	0
HAPPOGAHARA	0
IROHAZAKA	0
GAME / NETWORK GAME	
MYOGI	0
USUI	0
AKAGI	0
AKINA	0
HAPPOGAHARA	0
IROHAZAKA	0
PRESS TEST BUTTON TO CONTINUE	

GAME/TIME ATTACK: Displays the number of times each course was selected in TIME ATTACK mode
GAME/NETWORK GAME: Displays the number of times each course was selected in NETWORK GAME (VERSUS) mode

Press the TEST Button to move to screen 5/7 of BOOKKEEPING

GAME TEST MODE	
BOOKKEEPING 5/7	
GAME / BUNTA CHALLENGE	
AKAGI	0
AKINA	0
HAPPOGAHARA	0
IROHAZAKA	0
TRANSMISSION SELECT	
AUTOMATIC	0
MANUAL	0
PRESS TEST BUTTON TO CONTINUE	

GAME/BUNTA CHALLENGE: Displays number of times each course has been selected for the Bunta Challenge.

TRANSMISSION SELECT: Displays the number of times each TRANSMISSION was selected in all game modes.

Press the TEST Button to move to screen 6/7 of BOOKKEEPING.

GAME TEST MODE	
BOOKKEEPING 6/7	
CAR SELECT	
TRUENO	0
LEVIN(AE86)	0
LEVIN(AE85)	0
MR-2	0
MR-S	0
ALTEZZA	0
CELICA GT-FOUR	0
GTR(BNR32)	0
GTR(BNR34)	0
SILVIA(S13)	0
SILVIA(S14Q)	0
SILVIA(S14K)	0
SILVIA(S15)	0
180SX	0
SILEIGHTY	0
PRESS TEST BUTTON TO CONTINUE	

Press the TEST Button to move to screen 7/7 of BOOKKEEPING.

GAME TEST MODE	
BOOKKEEPING 7/7	
CAR SELECT	
CIVIC(EK9)	0
CIVIC(EG6)	0
INTEGRA	0
S2000	0
LANCER EVO3	0
LANCER EVO4	0
LANCER EVO7	0
RX-7(FD3S1)	0
RX-7(FD3S6)	0
RX-7(FC3S)	0
ROADSTER(NA6C)	0
ROADSTER(NB8C)	0
IMPREZA(GC8S6)	0
IMPREZA(GDB)	0
IMPREZA(GC8S5)	0
CAPPUCCINO	0
PRESS TEST BUTTON TO EXIT	

CAR SELECT: Displays the number of times each car was selected
Move the cursor to EXIT and press the TEST Button to return to the Game Test Menu screen.

5.4.1. BACKUP DATA CLEAR

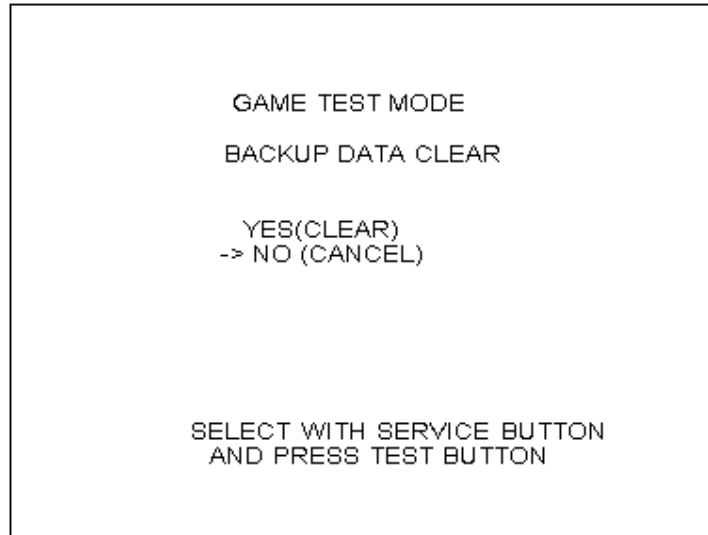
Delete all BOOKKEEPING screen data. Use BACKUP DATA CLEAR in the SYSTEM TEST MODE to delete data about coin/credit collection.

Deleting this data does not affect the game settings or other data stored by the game.

Deleting this data will delete the data showing how many times the CARD R/W was used.

After deleting the data, the CARD R/W automatically enters Head Cleaning mode.

Refer to section <7-2> Head Cleaning for more information about head cleaning.



To clear data, use the SERVICE Button to move the cursor to YES (CLEAR) and then press the TEST Button. When the data has been cleared, the message "COMPLETED" will be displayed.

Press the TEST Button again to return to the Game Test Menu screen.

Move the cursor to NO (CANCEL) and press the TEST Button to return to the Game Test Menu screen without clearing the data.

6. COIN MECH INSTALLATION AND CREDIT BOARD SET UP

6.1. INTRODUCTION

Game credits between the Coin Mechanism and the game board for this machine are controlled by a *VTS* board. This electronic circuit allows the price of play to be set for a range of different countries. These functions are set on Dual In Line (DIL) PCB mounted switches.

SW1 is used to set the currency (or coin ratio) and SW3 the price of play. Refer to the Tables on the following pages for the correct settings for your environment.

The *VTS* board pictured below is mounted in the Coin Chute Tower.

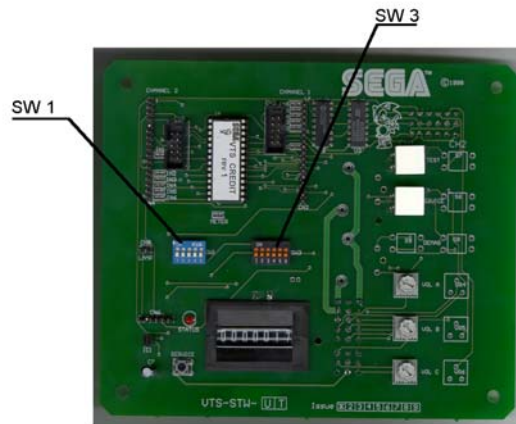
The *VTS* board is connected to the coin validator and lamps via a dedicated wiring harness depending upon the coin validator used:

Wiring Harness	Validator	
LM1006	Coin Controls	(15 way connector)
LM1007	Mars	(13 way connector)
LM1008	Mechanical	See note 2
N/A	NRI	See note 1

Notes

1. If NRI mechanisms are to be used, these should be ordered with the highest denomination coin on coin path #1 and the lowest denomination on coin path #4. The *VTS* board should be then be set up for either the UK or Switzerland settings. A minimum connecting lead length of 600mm is required.
2. Mechanical coin mechanisms may be connected in parallel allowing two identical mechanisms to be fitted.

The *VTS* Board



Credit Board Mode Settings Switch 3																			
Country	Setting	Switch 3 Setting						Coin Validator Programming								C120/SR3 Only			
		SW1	SW2	SW3	SW4	SW5	SW6	COIN1	COIN2	COIN3	COIN4	COIN5	COIN6	COIN7	COIN8	COIN9	COIN10	COIN11	COIN12
UK	Coin Controls C220 Parallel	OFF	OFF	OFF	OFF			£1	50p new	20p	10p	-	50p old	-	-				
UK	Coin Controls C220 Binary	ON	OFF	OFF	OFF			£1	50p new	20p	10p	-	50p old	-	£2				
UK	Coin Controls C220 Binary	OFF	ON	OFF	OFF			£1	50p new	20p	10p	-	£2	-	50p old				
UK	Coin Controls SR3 Parallel	ON	ON	OFF	OFF			£1	50p new	20p	10p	-	£2	-	50p old	-	-	-	-
UK Euro	Coin Controls SR3 Parallel	OFF	OFF	ON	OFF			£2 €2	£1 €1	50p new 50¢	20p 20¢	10p 10¢	-	-	-	50p old	-	-	-
UK	Mars ME/MS 111 Parallel	ON	OFF	ON	OFF			£1	£2	20p	10p	50p new	50p old						
UK	NRI Parallel	OFF	ON	ON	OFF			10p	20p	50p	£1	£2	-						
Belgium	Parallel	ON	ON	ON	OFF			-	50BFr	20BFr	5BFr								
Holland	Parallel	OFF	OFF	OFF	ON			-	5NLG	2.5NLG	1NLG								
Austria	SR3 Parallel	ON	OFF	OFF	ON			20Sch	10Sch	5Sch	1Sch								
Spain	Coin Controls C220 Binary	OFF	ON	OFF	ON			500Pta	200Pta	100Pta	50Pta	25Pta	200Pt old	50Pta old	25Pta old				
Spain	SR3/NRI Parallel	ON	ON	OFF	ON			500Pta	200Pta	100Pta	50Pta	25Pta	-	-	200Pta	-	50Pta old	25Pta old	-
Spain	Coin Controls C220 Parallel	OFF	OFF	ON	ON			100Pta	50Pta new	-	25Pta new	-	50Pta old	-	25Pta old				
Portugal Euro	Parallel	ON	OFF	ON	ON			200Es €1	100Es 50¢	50Es	-	-	-	-	-				
	TBA					OFF		TBA					Please Note The credit board automatically sets the validator for parallel and binary operation through an output on pin 8 of the 17 way pinstrip. For the feature to work it is necessary for the validator interconnecting cable to include at wire at this position						
						ON		TBA											
	Channels						OFF	Direct Mode											
							ON	2 channel Mode											

Note: These switch settings are under constant review and may change due to world currency updates.

- Set SW 1 according to the option settings found in the relevant Price of Play Settings Table on the following pages.
- For Germany (DM), France (Fr) & Switzerland (SFr), use the appropriate existing setting shown above (from another country) that matches the coin ratios programmed into your coin mech.
- Set SW 3 on the VTS /Excel board as shown in the table above corresponding to the country required.

6.1.1. PRICE OF PLAY SETTINGS UK

	Price	Bonus			DIL Switch 1				
					Switch 1	Switch 2	Switch 3	Switch 4	Switch 5
1	10p	No Bonus			OFF	OFF	OFF	OFF	OFF
2	10p	6 = 50p			ON	OFF	OFF	OFF	OFF
3	20p	No Bonus			OFF	ON	OFF	OFF	OFF
4	20p	3 = 50p	6 = £1	12 = £2	ON	ON	OFF	OFF	OFF
5	30p	No Bonus			OFF	OFF	ON	OFF	OFF
6	30p	1.66 = 50p	4 = £1	8 = £2	ON	OFF	ON	OFF	OFF
7	30p	2 = 50p	4 = £1		OFF	ON	ON	OFF	OFF
8	30p	AMLD *	3 = £1	6 = £2	ON	ON	ON	OFF	OFF
9	40p	No Bonus			OFF	OFF	OFF	ON	OFF
10	40p	1.25 = 50p	3 = £1	6 = £2	ON	OFF	OFF	ON	OFF
11	50p	No Bonus			OFF	ON	OFF	ON	OFF
12	50p		3 = £1	6 = £2	ON	ON	OFF	ON	OFF
13	50p		2 = £1	5 = £2	OFF	OFF	ON	ON	OFF
14	60p	No Bonus			ON	OFF	ON	ON	OFF
15	60p		2 = £1	4 = £2	OFF	ON	ON	ON	OFF
16	80p	No Bonus			ON	ON	ON	ON	OFF
17	80p	1.25 = £1	2 = £1.50	2.5 = £2	OFF	OFF	OFF	OFF	ON
18	£1	No Bonus			ON	OFF	OFF	OFF	ON
19	£1		3 = £2		OFF	ON	OFF	OFF	ON
20	£1		2 = £2	5 = £4	ON	ON	OFF	OFF	ON
21	£1.50	No Bonus			OFF	OFF	ON	OFF	ON
22	£1.50		2 = £2		ON	OFF	ON	OFF	ON
23	£2	No Bonus			OFF	ON	ON	OFF	ON
24	£2			3 = £5	ON	ON	ON	OFF	ON
25	£3	No Bonus			OFF	OFF	OFF	ON	ON
26	£3			2 = £5	ON	OFF	OFF	ON	ON
27	£5	No Bonus			OFF	ON	OFF	ON	ON
28	£5			3 = £10	ON	ON	OFF	ON	ON
29	£7.50	No Bonus			OFF	OFF	ON	ON	ON
30	£7.50			2 = £10	ON	OFF	ON	ON	ON
31	£10	No Bonus			OFF	ON	ON	ON	ON
32	Free Play				ON	ON	ON	ON	ON

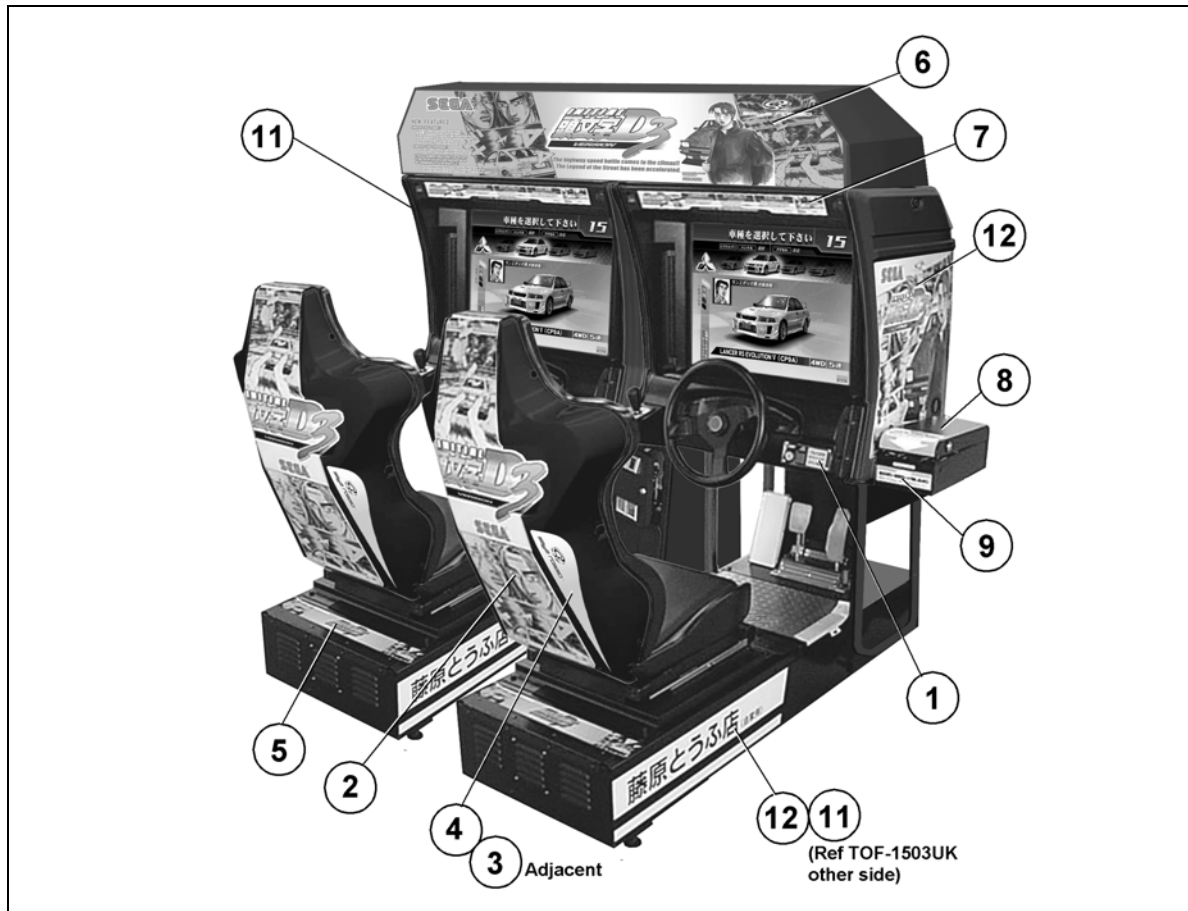
6.1.2. PRICE OF PLAY SETTINGS EURO

	Price	Bonus			DIL Switch 1				
					Switch 1	Switch 2	Switch 3	Switch 4	Switch 5
1	10¢	No Bonus			OFF	OFF	OFF	OFF	OFF
2	10¢	6 = 50¢			ON	OFF	OFF	OFF	OFF
3	20¢	No Bonus			OFF	ON	OFF	OFF	OFF
4	20¢	3 = 50¢	6 = €1	12 = €2	ON	ON	OFF	OFF	OFF
5	30¢	No Bonus			OFF	OFF	ON	OFF	OFF
6	30¢	1.66 = 50¢	4 = €1	8 = €2	ON	OFF	ON	OFF	OFF
7	30¢	2 = 50¢	4 = €1		OFF	ON	ON	OFF	OFF
8	30¢	AMLD *	3 = €1	6 = €2	ON	ON	ON	OFF	OFF
9	40¢	No Bonus			OFF	OFF	OFF	ON	OFF
10	40¢	1.25 = 50¢	3 = €1	6 = €2	ON	OFF	OFF	ON	OFF
11	50¢	No Bonus			OFF	ON	OFF	ON	OFF
12	50¢		3 = €1	6 = €2	ON	ON	OFF	ON	OFF
13	50¢		2 = €1	5 = €2	OFF	OFF	ON	ON	OFF
14	60¢	No Bonus			ON	OFF	ON	ON	OFF
15	60¢		2 = €1	4 = €2	OFF	ON	ON	ON	OFF
16	80¢	No Bonus			ON	ON	ON	ON	OFF
17	80¢	1.25 = €1	2 = €1.50	2.5 = €2	OFF	OFF	OFF	OFF	ON
18	€1	No Bonus			ON	OFF	OFF	OFF	ON
19	€1		3 = €2		OFF	ON	OFF	OFF	ON
20	€1		2 = €2	5 = €4	ON	ON	OFF	OFF	ON
21	€1.50	No Bonus			OFF	OFF	ON	OFF	ON
22	€1.50		2 = €2		ON	OFF	ON	OFF	ON
23	€2	No Bonus			OFF	ON	ON	OFF	ON
24	€2			3 = €5	ON	ON	ON	OFF	ON
25	€3	No Bonus			OFF	OFF	OFF	ON	ON
26	€3			2 = €5	ON	OFF	OFF	ON	ON
27	€5	No Bonus			OFF	ON	OFF	ON	ON
28	€5			3 = €10	ON	ON	OFF	ON	ON
29	€7.50	No Bonus			OFF	OFF	ON	ON	ON
30	€7.50			2 = €10	ON	OFF	ON	ON	ON
31	€10	No Bonus			OFF	ON	ON	ON	ON
32	Free Play				ON	ON	ON	ON	ON

6.1.3. PRICE OF PLAY SETTINGS Austria-Czech-Denmark-Norway-
Israel-France2

	Price	Bonus			Switch 1				
					Switch 1	Switch 2	Switch 3	Switch 4	Switch 5
1	1	No Bonus			OFF	OFF	OFF	OFF	OFF
2	1			11 = 10	ON	OFF	OFF	OFF	OFF
3	1		6 = 5		OFF	ON	OFF	OFF	OFF
4	2	No Bonus			ON	ON	OFF	OFF	OFF
5	2			6 = 10	OFF	OFF	ON	OFF	OFF
6	2		3 = 5		ON	OFF	ON	OFF	OFF
7	3	No Bonus			OFF	ON	ON	OFF	OFF
8	3			4 = 10	ON	ON	ON	OFF	OFF
9	3		2 = 5		OFF	OFF	OFF	ON	OFF
10	4	No Bonus			ON	OFF	OFF	ON	OFF
11	4		3 = 10		OFF	ON	OFF	ON	OFF
12	5	No Bonus			ON	ON	OFF	ON	OFF
13	5			3 = 10	OFF	OFF	ON	ON	OFF
14	6	No Bonus			ON	OFF	ON	ON	OFF
15	6			4 = 20	OFF	ON	ON	ON	OFF
16	8	No Bonus			ON	ON	ON	ON	OFF
17	10	No Bonus			OFF	OFF	OFF	OFF	ON
18	10			3 = 20	ON	OFF	OFF	OFF	ON
19	20	No Bonus			OFF	ON	OFF	OFF	ON
20	20			3 = 50	ON	ON	OFF	OFF	ON
21	30	No Bonus			OFF	OFF	ON	OFF	ON
22	30			2 = 50	ON	OFF	ON	OFF	ON
23	50	No Bonus			OFF	ON	ON	OFF	ON
24	50			3 = 100	ON	ON	ON	OFF	ON
32	Free Play				ON	ON	ON	ON	ON

7. DESIGN RELATED PARTS

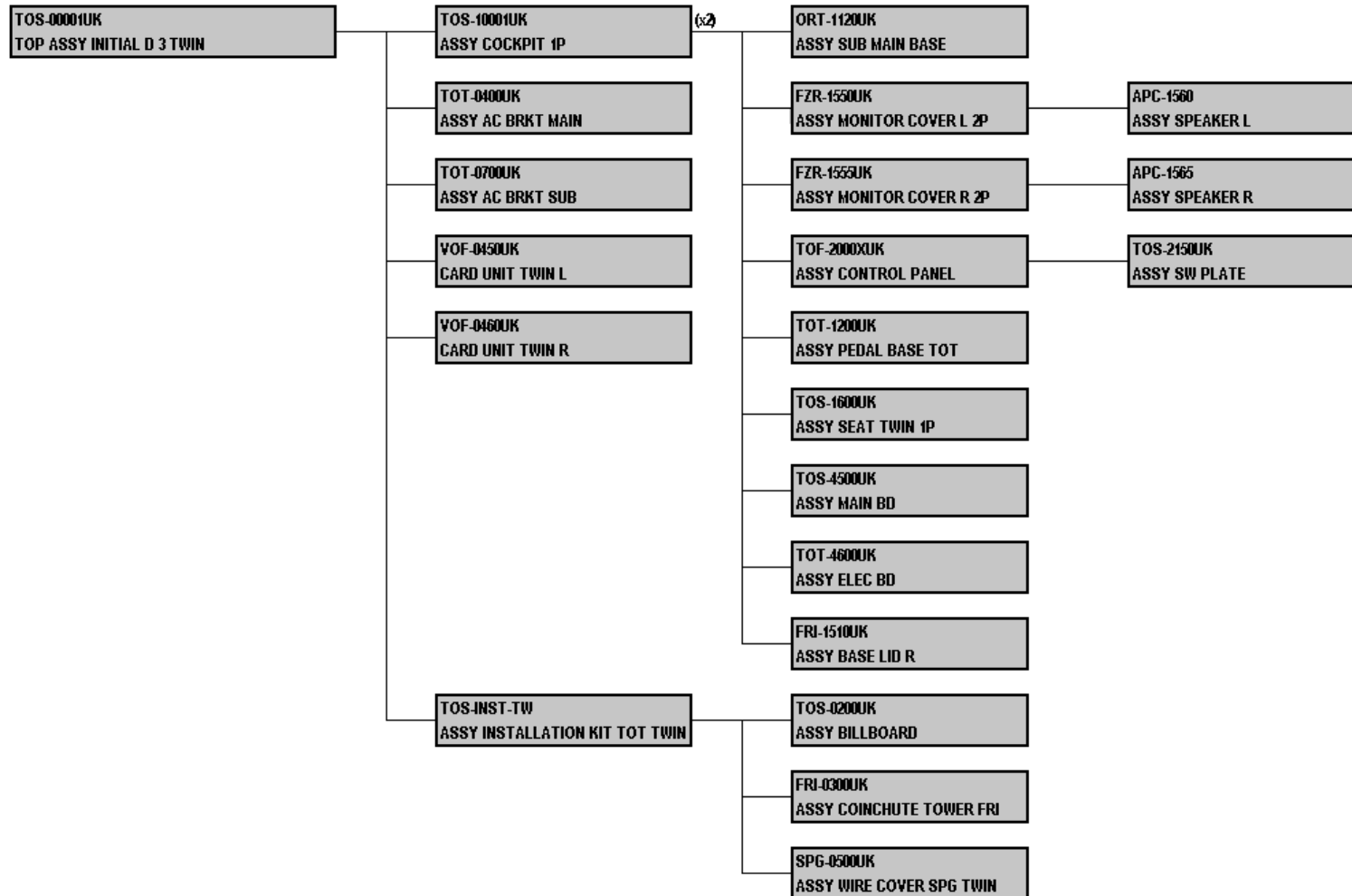


ITEM	PART NO,	DESCRIPTION
1	TOS-2152UK	STICKER START/VIEW/CREDIT
2	TOS-1603-BUK	STICKER SEAT BACK
3	TOS-1603-CUK	STICKER SEAT BACK L
4	TOS-1603-DUK	STICKER SEAT BACK R
5	TOS-1504UK	STICKER BASE LID
6	TOS-0203UK	BILLBOARD PLATE TOS TWIN
7	422-0924UK	PLAY INSTR SH TOS MULTI
8	TOS-0004UK	STICKER CARD SLOT TOF A MULTI
9	TOT-0005UK	STICKER CARD SLOT TOF B MULTI
10	421-7987-TOT-T	STICKER ELEC SPEC TOS TW
11	TOS-1551-AUK	STICKER COVER PANEL L
12	TOS-1556-AUK	STICKER COVER PANEL R
13	TOF-1502UK	STICKER BASE L
14	TOF-1503UK	STICKER BASE R

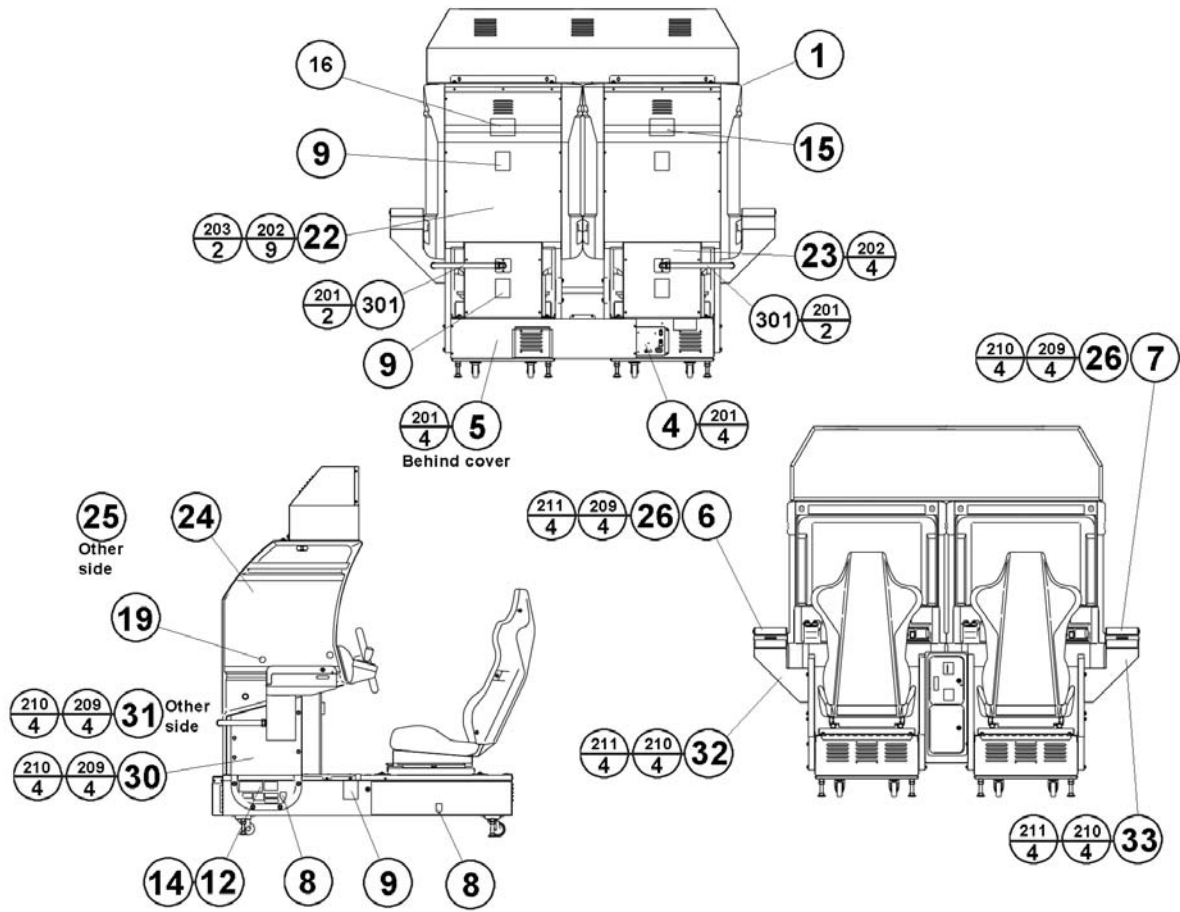
8. PARTS LIST

8.1. ASSEMBLY STRUCTURE

INITIAL D3 TWIN BOM STRUCTURE



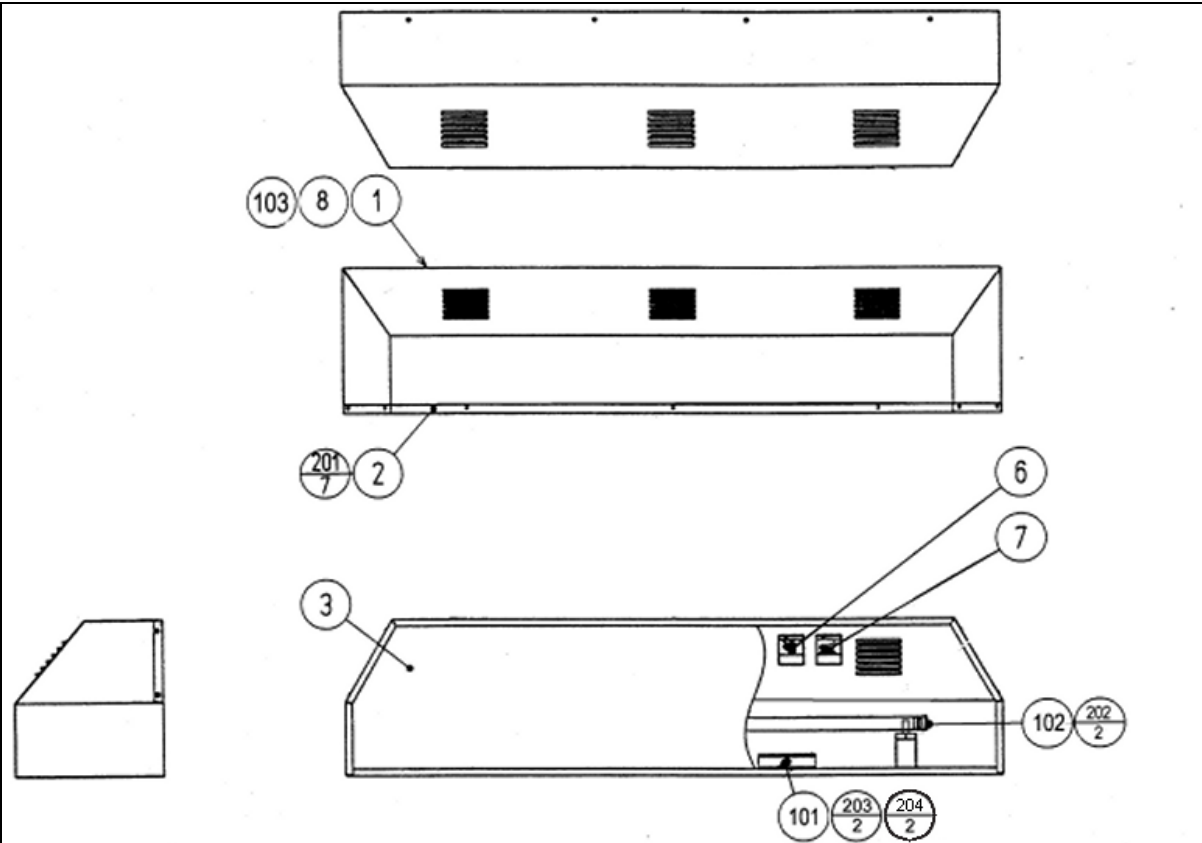
8.2. TOS-00001UK TOP ASSY INITIAL D 3 TWIN



ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
1	TOS-10001UK	2	ASSY COCKPIT 1P	
3	TOS-INST-TW	1	ASSY INSTALLATION KIT TOT TWIN	
4	TOT-0400UK	1	ASSY AC BRKT MAIN	
5	TOT-0700UK	1	ASSY AC BRKT SUB	
6	VOF-0450UK	1	CARD UNIT TWIN L	
7	VOF-0460UK	1	CARD UNIT TWIN R	
8	421-7020UK	4	STICKER CAUTION FORK	
9	LB1102	6	STICKER DANGEROUS VOLTAGE	BACK LIDS-4, REAR FLOOR-2
12	421-7987-TOS-T	1	STICKER ELEC SPEC TOT TW	MAIN CABI, LHS OF MAIN BASE
14	421-7988-91UK	3	STICKER SERIAL NUMBER UK	1P-1,2P-2,CCT INSIDE TOP DOOR
15	421-8543UK	1	STICKER CABINET L UK	1P
16	421-8544UK	1	STICKER CABINET R UK	2P
18	SGM-3863	2	POLY COVER 1800X950X1700	
19	SDW-0001UK	24	BLIND CAP	1P CABI (LHS), 2P CABI (RHS)
22	INY-0004	2	BACK LID INY	
23	CKT-0001UK	2	BACK LID B W/HOLE UK	
24	TOS-1551-AUK	1	STICKER COVER PANEL L	
25	TOS-1556-AUK	1	STICKER COVER PANEL R	

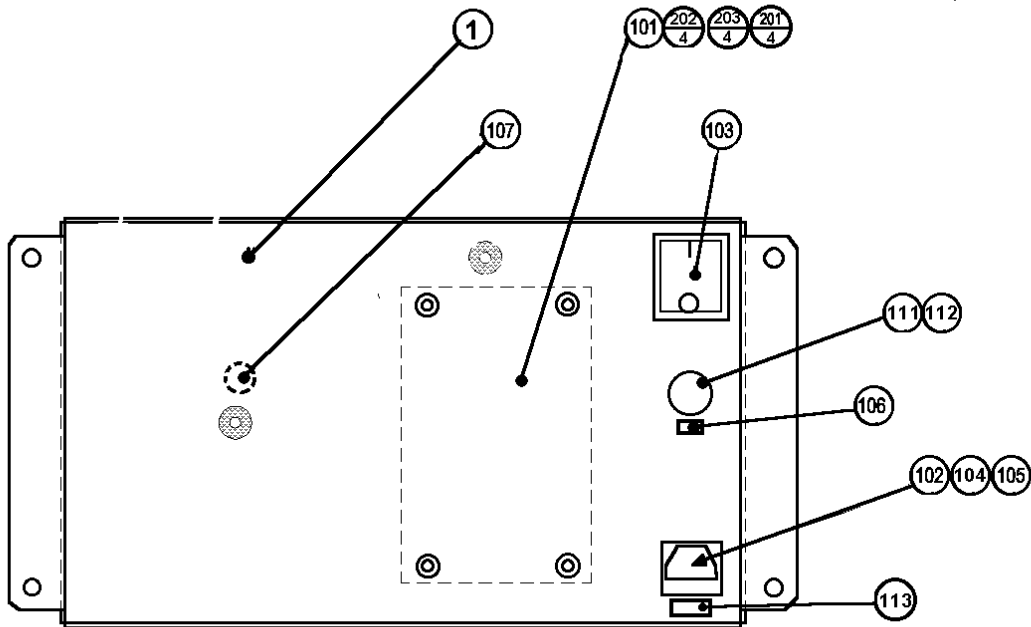
ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
26	CKT-0015UK	2	STICKER CARD LOADING INSTR	
27	LB1046	1	LABEL TESTED FOR ELEC. SAFETY	
28	RAL-XXXX-13UK	2	LOCK COVER UK	(R.FLOORS)-2
30	CKT-0004	1	SIDE PNL L	
31	CKT-0005	1	SIDE PNL R	
32	CKT-0006	1	CARD UNIT BASE L	
33	CKT-0007	1	CARD UNIT BASE R	
201	000-P00412-WB	12	M4X12 MSCR PAN W/FS BLK	(4)-4,(5)-4,(301)-4
202	000-P00408-WB	26	M4X8 MSCR PAN W/FS BLK	(22)-18,(23)-8
203	010-P00412	4	M4X12 S-TITE PAN PAS	(22)-4
204	008-T00408-0C	16	M4X8 TMP PRF TH CRM	(28)-8,(F.FLOORS)-8
205	029-B00620-0B	4	M6X20 SKT BH BLK	(R.FLOORS)-4
206	060-S00600-0B	4	M6 WSHR SPR BLK	(R.FLOORS)-4
207	060-F00600-0B	4	M6 WSHR FORM A FLT BLK	(R.FLOORS)-4
209	030-000820-SB	24	M8X20 BLT W/S BLK	(6)-4, (7)-4, (30)-4, (31)-4, (32)-4, (33)-4
210	068-852216-0B	16	M8 WSHR 22OD FLT BLK	(30)-4, (31)-4, (32)-4, (33)-4
211	060-F00800	8	M8 WSHR FORM A FLT PAS	(6)-4, (7)-4
301	CKT-61009UK	2	WH EXT CARD R/W C	
401	PK0359	2	SLEEVE COCKPIT TOS TWIN	
402	PK0317	1	PALLET TOF	
403	PK0359-LID	2	LID TOS TWIN	
404	PK0341	1	PALLET TOT	

8.3. TOS-0200UK ASSY BILLBOARD



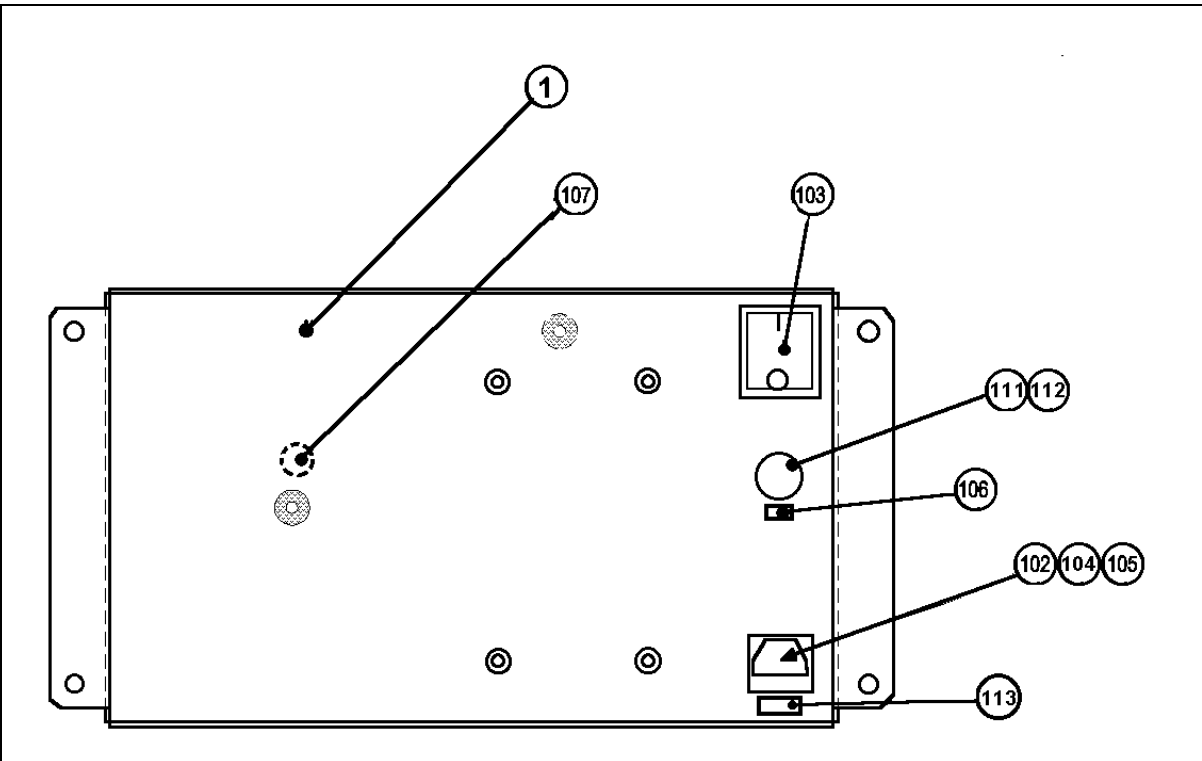
ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF
1	POD-0201UK	1	BILLBOARD BOX	BLACK/SHAPE
2	POD-0202UK	1	BILLBOARD SASH	BLACK/SHAPE
3	TOS-0203UK	1	BILLBOARD PLATE TOT TWIN	
6	LB1102	1	STICKER DANGEROUS VOLTAGE	CENTRE BACK OF (1)
7	LB1104	1	STICKER CAUTION, HOT SURFACE	CENTRE BACK OF (1)
8	LB1046	1	LABEL TESTED FOR ELEC. SAFETY	
101	390-5695-40-CUK	1	FL TRAY 110V 40W (T12)	
102	390-5695-40-BUK	1	FL TUBE 40W 4' DIA 1.5" T12	
103	421-7501-10	1	STICKER FL 40W	
201	000-T00408-0B	7	M4X8 MSCR TH BLK	(2)-7
202	000-P00412	2	M4X12 MSCR PAN PAS	TERRY CLIPS -2
203	068-441616	2	M4 WSHR 16OD FLT PAS	(101)-2
204	050-F00400	3	M4 NUT FLG SER PAS	(101)-2,(EARTH)-1
205	280-A00900-A	5	ROUTER TWIST D9 ADH	
301	600-7064-031UK	1	WIRE HARN FL	

8.4. TOT-0400UK ASSY AC BRKT MAIN



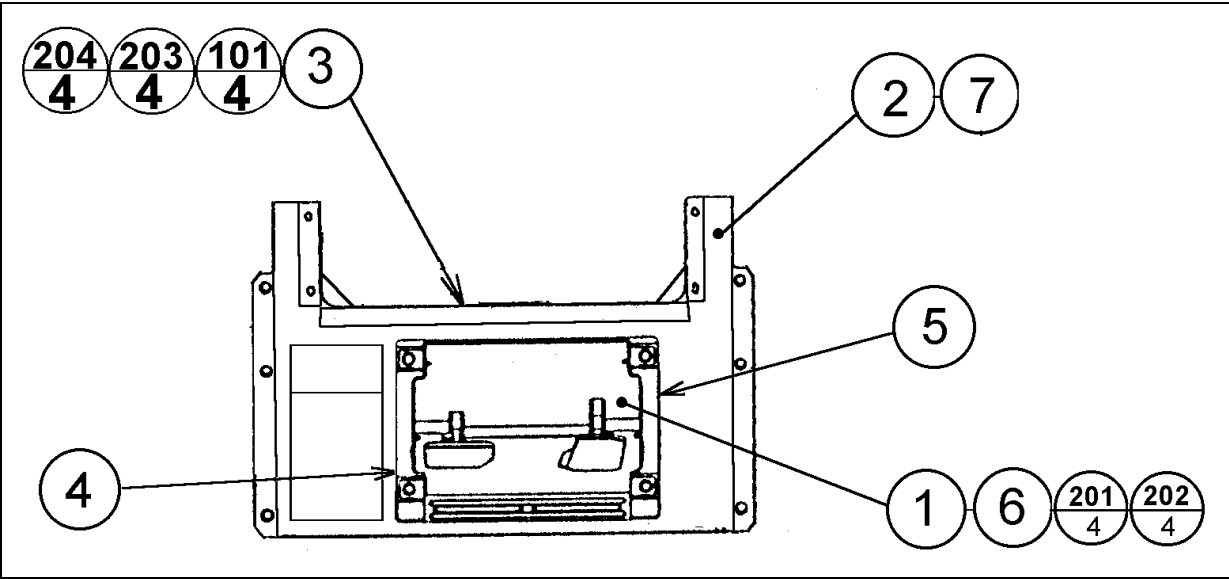
ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
1	TOF-0401UK	1	AC BRKT UK	
101	EP1379	1	FILTER EMI 10A ARCOTRONICS	
102	EP1302	1	EUROSOCKET FUSED 10A 250Vac	
103	EP1303	1	SWITCH ROCKER DPST 10A 250Vac	
104	514-5078-10000	1	FUSE 5X20 CERAMIC SB 10000mA	IEC INLET
105	310-5029-D508	5	HEAT SHRINK SLEEVING 50.8DIA	OVER ITEM 102(50MM OVER SOCKET)
106	421-6595-5000-T	1	STICKER FUSE 5000mA TYPE T	FUSE HOLDER
107	LB1096	1	STICKER PROTECTIVE EARTH	EARTH POINT INSIDE
108	211-5479-01	2	CONN OPT JOINT PNL-TOCA150	
109	LB1087	1	STICKER FIBRE CABLE RX	@ TOP
110	LB1088	1	STICKER FIBRE CABLE TX	@ BOTTOM
111	EP1334	1	FUSE HOLDER 20mm 10A 240Vac	
112	514-5078-5000	1	FUSE 5X20 CERAMIC SB 5000mA	
113	421-6595-10000T	1	STICKER FUSE 10000mA TYPE T	IEC INLET
201	060-S00300	4	M3 WSHR SPR PAS	(101)-4
202	060-F00300	4	M3 WSHR FORM A FLT PAS	(101)-4
203	000-P00310	8	M3X10 MSCR PAN PAS	(101)-4,(108)-4
204	050-F00400	3	M4 NUT FLG SER PAS	(INSIDE EARTH)-2,(OUTSIDE)-1
301	600-6873-001UK	1	WIRE HARN XFMR IN	
303	600-9030-44K	1	WIRE HARN EARTH 300mm M4/M4 K	AC BRKT TO MAIN BASE
304	600-9040-45K	1	WIRE HARN EARTH 400mm M4/M5 K	AC BRKT - XFMR

8.5. TOT-0700UK ASSY AC BRKT SUB



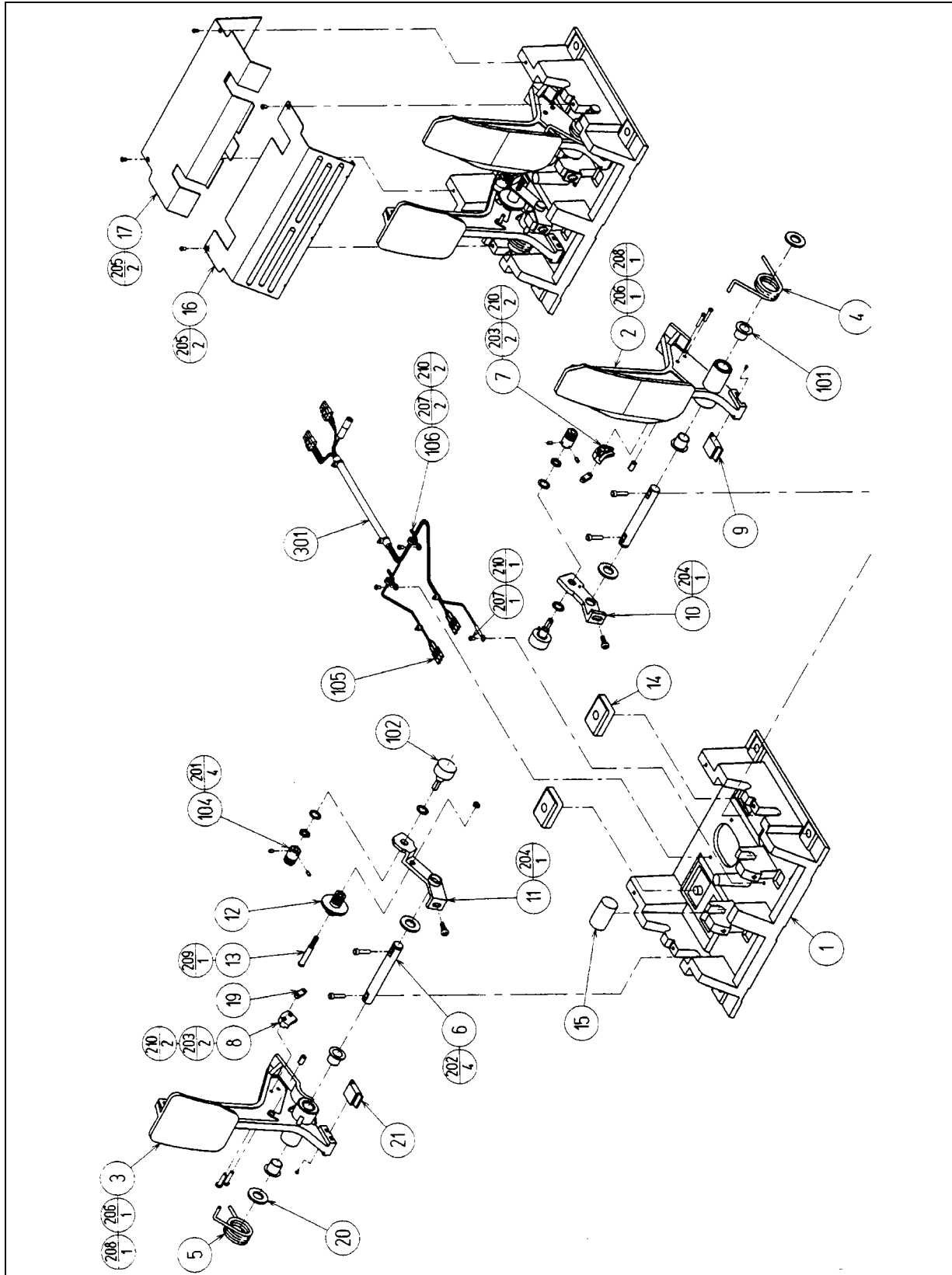
ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REFERENCE
1	TOF-0401UK	1	AC BRKT UK	
106	421-6595-5000-T	1	STICKER FUSE 5000mA TYPE T	FUSE HOLDER
107	LB1096	1	STICKER PROTECTIVE EARTH	EARTH POINT INSIDE
108	211-5479-01	2	CONN OPT JOINT PNL-TOCA150	
109	LB1087	1	STICKER FIBRE CABLE RX	@ TOP
110	LB1088	1	STICKER FIBRE CABLE TX	@ BOTTOM
111	EP1334	1	FUSE HOLDER 20mm 10A 240Vac	
112	514-5078-5000	1	FUSE 5X20 CERAMIC SB 5000mA	
203	000-P00310	4	M3X10 MSCR PAN PAS	(108)-4
204	050-F00400	3	M4 NUT FLG SER PAS	(INSIDE EARTH)- 2,(OUTSIDE)-1
303	600-9030-44K	1	WIRE HARN EARTH 300mm M4/M4 K	AC BRKT TO MAIN BASE
304	600-9040-45K	1	WIRE HARN EARTH 400mm M4/M5 K	AC BRKT - XFMR
305	600-6999-201UK	1	WIRE HARN SUB AC BRKT	

8.6. TOT-1200UK ASSY PEDAL BASE TOT



ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
1	SPG-2200	1	ASSY BRAKE & ACCCELL	
2	TOF-1501UK	1	PEDAL BASE	
3	NCR-1104UK	1	WIRE COVER BOX	
4	SPG-2222UK	1	ANTI FINGER TRAP PLATE LEFT	
5	SPG-2223UK	1	ANTI FINGER TRAP PLATE RIGHT	
6	SPG-2224UK	1	PEDAL GASKET	
7	SRT-2031UK	0.52	NEOPRENE RUBBER STRIP 10	(2)-520mm X1 INSIDE FLANGE
101	280-A01200-A	6	ROUTER TWIST D12 ADH	WIRE COVER BOX
201	068-852216-0B	4	M8 WSHR 22OD FLT BLK	(1)-4
202	030-000820-SB	4	M8X20 BLT W/S BLK	(1)-4
203	000-P00408-WB	4	M4X8 MSCR PAN W/FS BLK	(3)-4
204	050-F00400	3	M4 NUT FLG SER PAS	(3)-3 EARTHS
301	600-9050-44K	1	WIRE HARN EARTH 500mm M4/M4 K	WIRE COVER TO MAIN BASE

8.7. ASSY ACCEL & BRAKE (SPG2200)



Item	Component Part	Description	Component Reference	Qty
1	SPG-2201	BASE		1
2	SPG-2202	ACCEL PEDAL		1
3	SPG-2203	BRAKE PEDAL		1
4	SPG-2204	ACCEL SPRING		1
5	SPG-2205	BRAKE SPRING		1
6	SPG-2206	SHAFT		2
7	SPG-2207	ACCEL		1
8	SPG-2208	BRAKE GEAR		1
9	SPG-2209	NEUTRAL STOPPER		1
10	SPG-2210	VR PLATE ACCEL		1
11	SPG-2211	VR PLATE BRAKE		1
12	SPG-2212	AMPL GEAR		1
13	SPG-2213	GEAR SHAFT		1
14	SPG-2214	STOPPER		2
15	SPG-2215	RUBBER CUSHION		1
16	SPG-2216	COVER		1
17	SPG-2217	VR COVER		1
19	SPG-2219	GEAR STAY		2
20	SPG-2220	WSHR		4
21	SPG-2221	NEUTRAL STOPPR D		1
101	100-5263	BEARING 12 (OILES 80F-1212)		4
102	220-5484	VOL CONT B-5K OHM		2
104	601-7944	GEAR 15		2
105	310-5029-F15	SUNITUBE F F15MM		6
106	280-0419	HARNESS LUG		2
201	028-A00304-P	SET SCR HEX SKT CUP P M3X4		4
202	020-000516-OZ	HEX SKT H CAP SCR BLK OZ M5X16		4
203	000-P00420	M SCR PH M4X20		4
204	000-P00508-W	M SCR PH W/FS M5X8		2
205	000-T00408-OC	M SCR TH CRM M4X8		4
206	FAS-450005	SPR PIN BLK OZ 6X10		2
207	000-P00405	M SCR PH M4X5		3
208	FAS-000001	M SCR TH CRM M3X6		2
209	050-H00500	HEX NUT M5		1
210	060-F00400	FLT WSHR M4		7

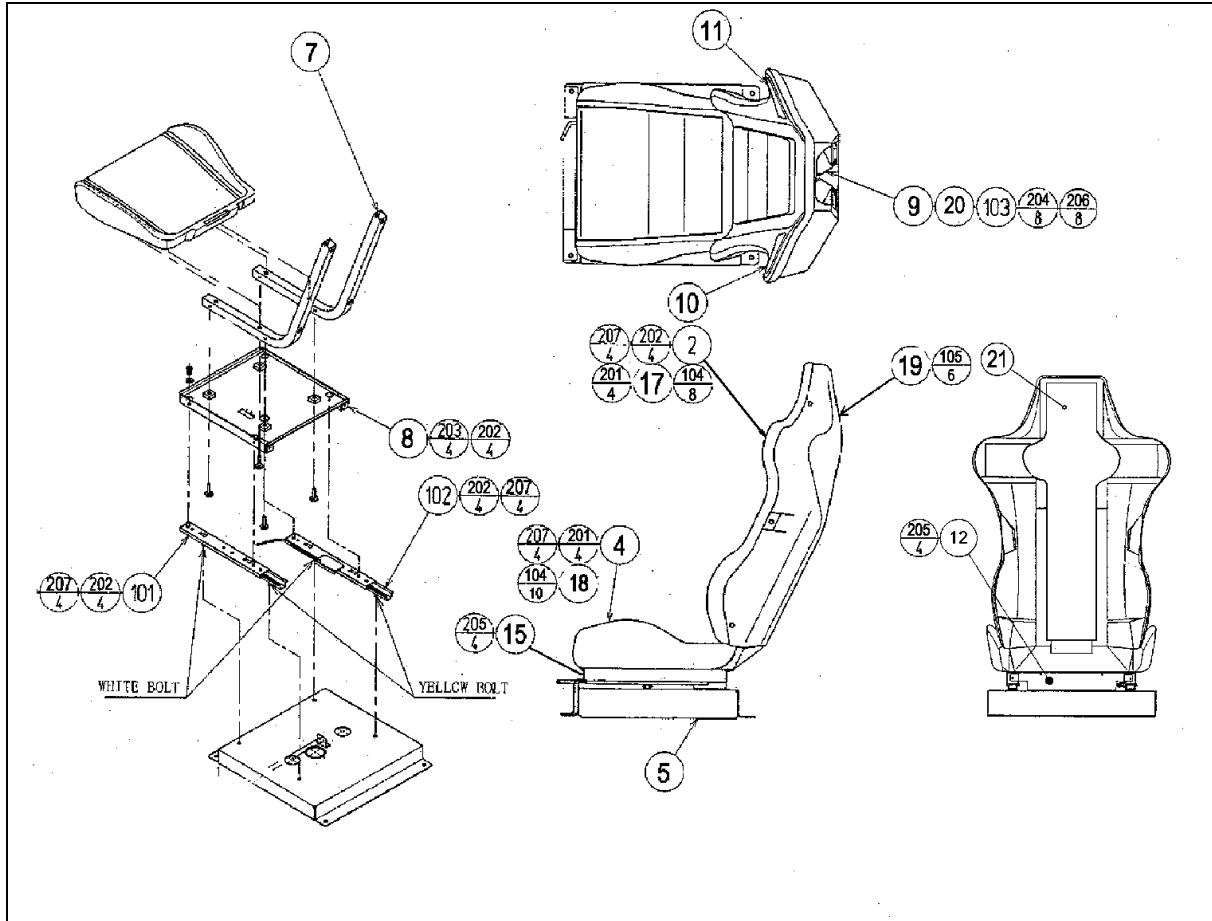
8.8. FZR-1550UK ASSY MONITOR COVER L 2P

SECTION A-A				
ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
1	POD-1161X-A	1	COVER PANEL L BLANK	
2	APC-1560	1	ASSY SPEAKER L	
3	DYN-1032UK	1	MASK BRKT	
201	000-P00408-W	3	M SCR PH W/FS M4X8	(2)-2,(3)-1

8.9. FZR-1555UK ASSY MONITOR COVER R 2P

SECTION A-A				
ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
1	POD-1161X-A	1	COVER PANEL R BLANK	
2	APC-1565	1	ASSY SPEAKER R	
3	DYN-1032UK	1	MASK BRKT	
201	000-P00408-W	3	M SCR PH W/FS M4X8	(2)-2,(3)-1

8.10. TOS-1600UK ASSY SEAT TWIN 1P



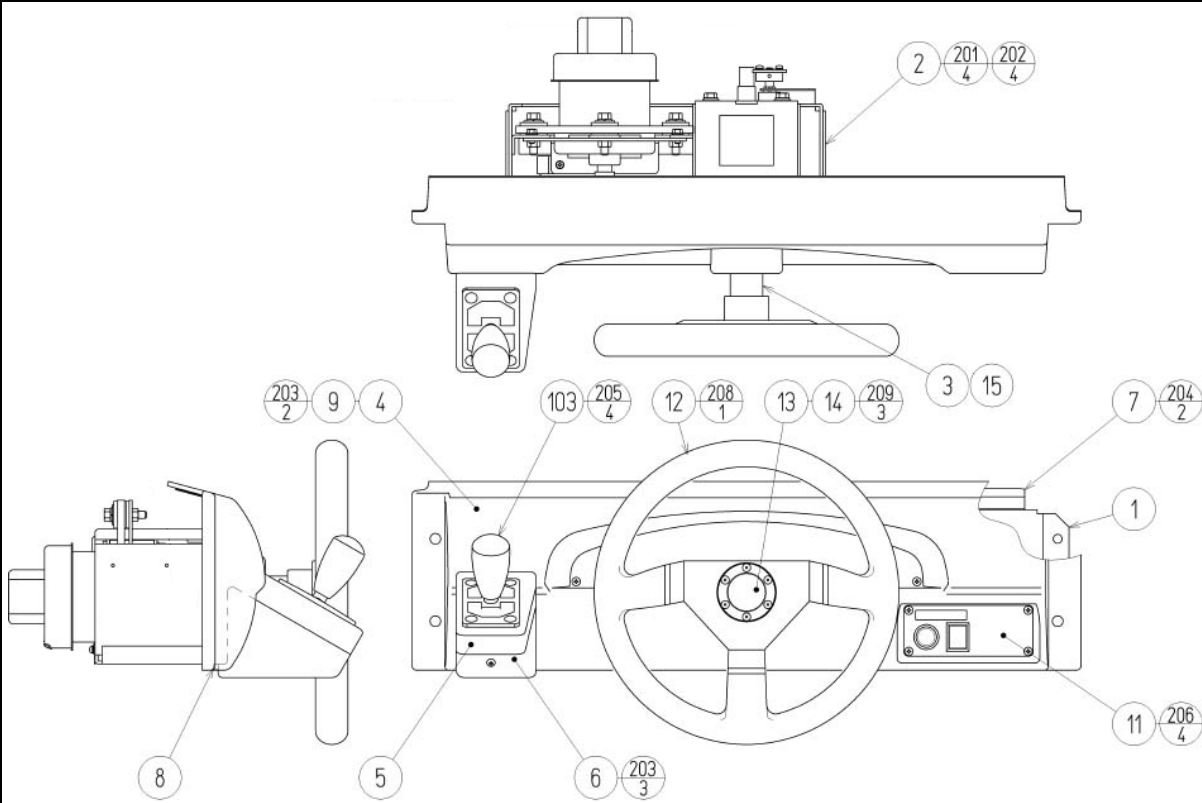
ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
2	SPG-2401-A	1	UPPER SEAT BLANK	
4	SPG-2402-A	1	LOWER SEAT BLANK	
5	STC-1603	1	SEAT BASE	
7	STC-1604	2	SEAT FRAME	
8	STC-1606	1	SEAT MOUNT TRAY	
9	STC-1607	2	SP MOUNT BRKT	
10	STC-1608	1	SPEAKER NET L	
11	STC-1609	1	SPEAKER NET R	
12	STC-1610	1	SAFETY GUARD	
14	STC-1612	2	PROTECT RUBBER	
15	STC-1613	1	SAFETY GUARD F	
16	OS1004	0.8	DRAFT EXCLDR 4 X7MM BLK x 10M	(103)-0.8M
17	SPG-2401-BUK	1	UPPER SEAT INSERT	(2)-1
18	SPG-2402-BUK	1	LOWER SEAT INSERT	(4)-1
19	TOS-1603-AUK	1	SEAT REAR COVER BLANK UK	
20	SRT-2409	2	SHOULDER PAD	INBETWEEN SPKR NETS & SEAT
21	TOS-1603-BUK	1	STICKER SEAT BACK	
22	TOS-1603-CUK	1	STICKER SEAT BACK L	
23	TOS-1603-DUK	1	STICKER SEAT BACK R	

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ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
101	601-9059-91	1	SEAT RAIL L	
102	601-9060-91	1	SEAT RAIL R	
103	130-5186-91	2	DUMMY SPEAKER	
104	280-K02529-WX	18	DRIVE FASTENER 25FH 24L 7.9DIA	(17)-8,(18)-10
105	280-5297	6	SCRIVET 8 1K31	(19)-6
201	030-000850-S	8	M8X50 BLT W/S PAS	(2)-4,(4)-4
202	068-852216	20	M8 WSHR 22OD FLT PAS	(2,4,8,101,102)-4EA
203	030-000816-S	4	M8X16 BLT W/S PAS	(8)-4
204	000-P00410-W	8	M4X10 MSCR PAN W/FS PAS	(9)-8
205	000-T00408-0B	8	M4X8 MSCR TH BLK	(12)-4,(15)-4
206	012-P03512-F	8	N6X1/2" S/TAP FLG PAS	(103)-8
207	050-U00800	8	M8 NUT NYLOK PAS	(101)-4,(102)-4

8.11. TOF-2000XUK ASSY CONTROL PANEL



ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
1	TOF-2001UK	1	CONTROL PANEL BRKT	
2	TOF-2500	1	ASSY HANDLE MECHA	
3	TOS-2002UK	1	HANDLE COLLAR	
4	TOF-2003	1	CONTROL PANEL COVER	
5	TOF-2004	1	SHIFT COVER UPPER	
6	TOF-2005	1	SHIFT COVER LOWER	
7	TOF-2006UK	1	COVER HOLDER	
8	OS1220	0.075	FOAM STRIP 8mmSQ ADHESIVE	
9	TOF-2008UK	1	CTRL PNL PLATE	(4)-1
11	TOT-2150UK	1	ASSY SW PLATE	
12	601-11097	1	STEERING WHEEL 340	
13	601-11098	1	STEERING EMBLEM 340	
14	TOF-2010	1	STICKER STEERING EMBLEM	(13)-1
15	TOS-2011UK	1	TAPER COLLAR	
16	440-WS00220UK	1	WARNING STICKER TRAP HAZARD	
102	280-A02000-A	5	ROUTER TWIST D20 ADH	
103	610-0408-91	1	UP/DOWN SHIFTER AL	
104	601-0460	1	CABLE TIE 100mm	
105	280-A00900-A	3	ROUTER TWIST D9 ADH	

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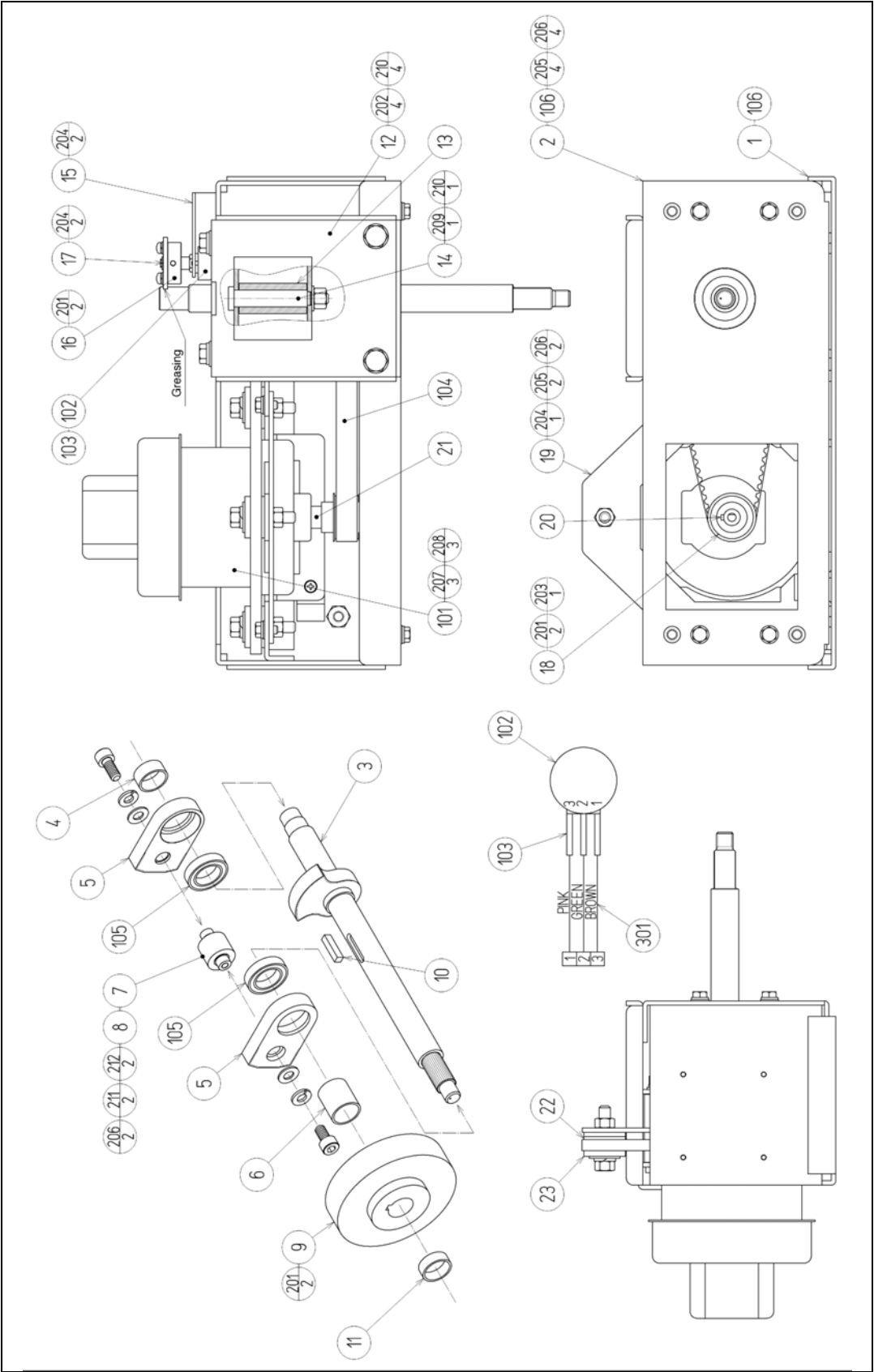
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ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
201	030-000820-S	4	M8X20 BLT W/S PAS	(2)-4
202	060-F00800	4	M8 WSHR FORM A FLT PAS	(2)-4
203	000-T00408-0B	5	M4X8 MSCR TH BLK	(9)-2,(6)-3
204	000-P00410-W	2	M4X10 MSCR PH W/FS	(7)-2
205	008-T00512-0B	4	M5X12 TMP PRF TH BLK	(103)-4
206	000-T00410-0C	4	M4X10 TH CRM M4X10	(11)-4
207	000-T00408-0B	5	M4X8 MSCR TH BLK	(102)-5
208	050-F01200	1	M12 NUT FLG SER PAS	(12)-1
209	FAS-290015	3	M4X12 HEX SKT SCR FH BLK	(13)-3
210	060-S01200	1	M12 WSHR SPR PAS	(12)-1
301	TOF-60016UK	1	WH EXT VOLUME C	
302	TOF-60017UK	1	WH EXT VIEW BUTTON C	
303	TOF-60018UK	1	WH EXT SHIFTER	
304	CKT-62037UK	1	WIRE HARN ENCODER EXT 2	
305	CKT-62036UK	1	WIRE HARN SERVO OUTPUT EXT 2	

8.12. TOS-2150UK ASSY SW PLATE

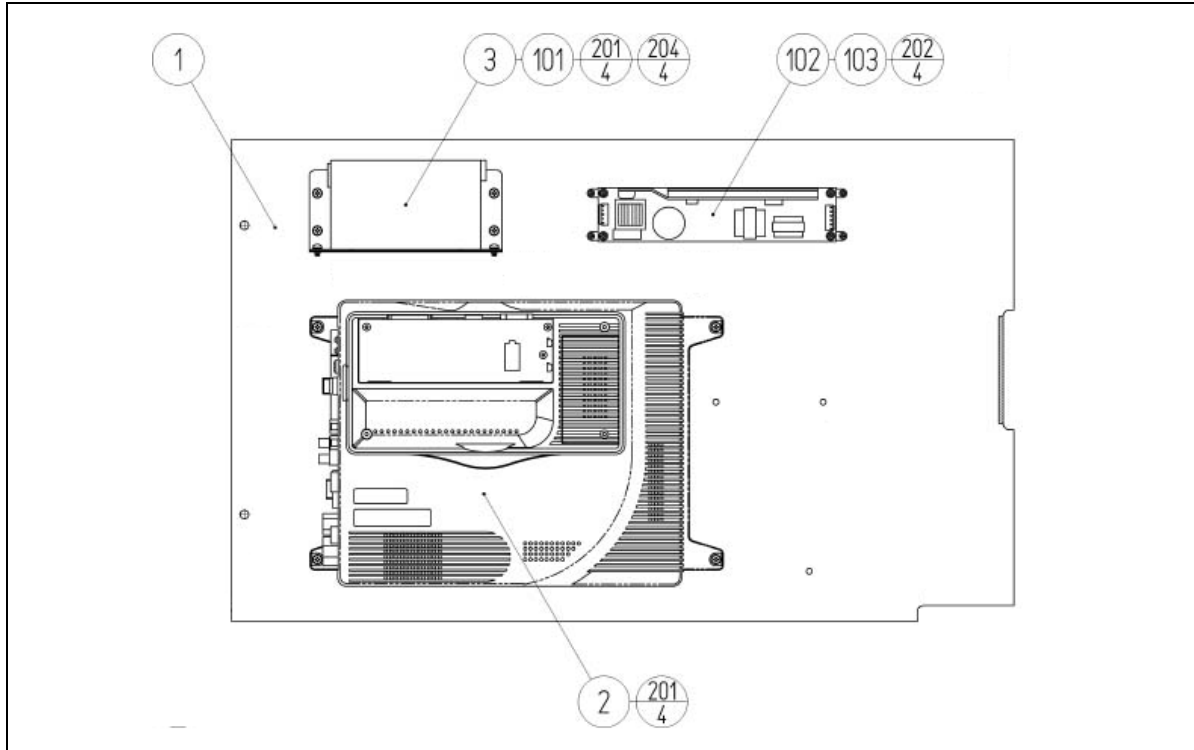
ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
1	TOS-2151UK	1	BUTTON PLATE	
2	TOS-2152UK	1	STICKER START/VIEW/CREDIT	
101	509-5838-Y	1	SW PB LW1L-15Y-TK1670	START
102	509-5495-05	1	PUSH BUTTON BLUE	VIEW
103	280-A02000-A	1	ROUTER TWIST D20 ADH	
104	509-5440	1	PUSH BTN SW IT GRN W/L DC14V	CREDIT
301	TOF-60019UK	1	WH VIEW BUTTON	
302	TOT-61078UK	1	WH PLAYER SELECT SW	

8.13. TOF-2500 ASSY HANDLE MECHA



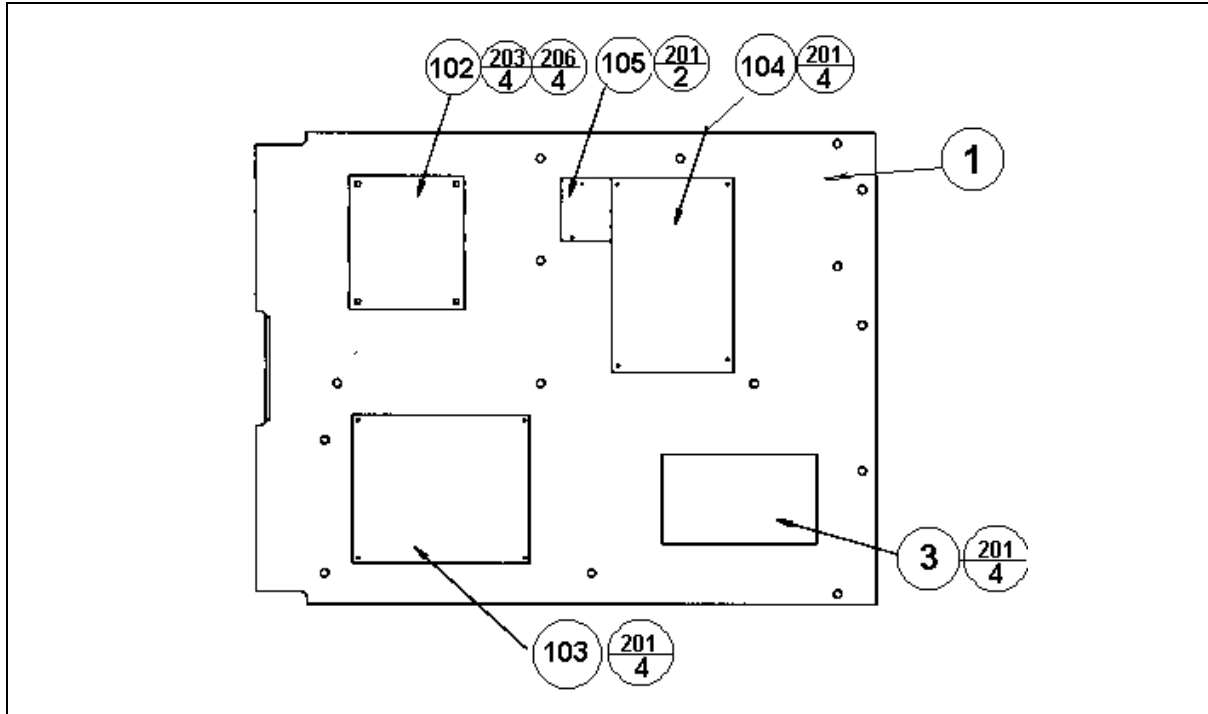
ITEM	PART NO.	DESCRIPTION
1	TOF-2501	MECHA BASE
2	TOF-2502	MECHA BASE LID
3	TOF-2503	HANDLE SHAFT
4	TOF-2504	SPACER COLLAR A
5	TOF-2505	STOPPER BLOCK A
6	TOF-2507	SPACER COLLAR B
7	TOF-2508	STOPPER PIN SS
8	TOF-2509X	STOPPER RUBBER SS
9	SPG-2505	PULLEY 60 S5M
10	DYN-1270	STOPPER KEY
11	TOF-2510	SPACER COLLAR C
12	TOF-2511	STOPPER HOLDER
13	TOF-2512	STOPPER RUBBER
14	TOF-2513	STOPPER BOLT
15	TOF-2514	VR BRKT
16	TOF-2515	GEAR HOLDER
17	601-6172	GEAR 48
18	SPG-2504	PULLEY 20 S5M
19	SPG-2506	MOTOR BRKT
20	SPG-2453	KEY 4 x 4 x 40
21	SPG-2454	MOTOR SHAFT COLLAR
22	ASK-3502	MOTOR SPACER
23	ASK-3503	MOTOR COLLAR
101	350-5448-01	SERVO MOTOR 500W NEW
102	220-5484	VOL CONT B-5K OHM
	220-5753	VOL CONT B-5K OHM
103	310-5029-F20	SUMITUBE F F 20MM
104	601-11089	TIMING BELT (150 S5M 520)
105	100-5168	BEARING 20 (NSK 6904ZZ)
106	100-5285	BEARING 20 (6804ZZ)
201	028-A00408-P	SET SCR HEX SKT CUP P M4 x 8
202	030-000820-S	HEX BLT W/S M8 x 20
203	065-S012S0-Z	STP RING BLK OZ S12
204	000-P00410-W	M SCR PH W/FS M4 x 10
205	030-000612-S	HEX BLT W/S M6x 12
206	060-F00600	FLT WSHR M6
207	030-000840-S	HEX BLT W/S M8 x 40
208	068-852216	FLT WSHR 8.5-22 x 1.6
209	050-U00800	U NUT M8
210	060-F00800	FLT WSHR M8
211	020-000612-0Z	HEX SKT H CAP SCR BLK OZ M6 x 12
212	060-S00600	SPR WSHR M6
301	600-6866	WIRE HARN ASSY HANDLE MECHA VR

8.14. TOS-4500UK ASSY MAIN BD



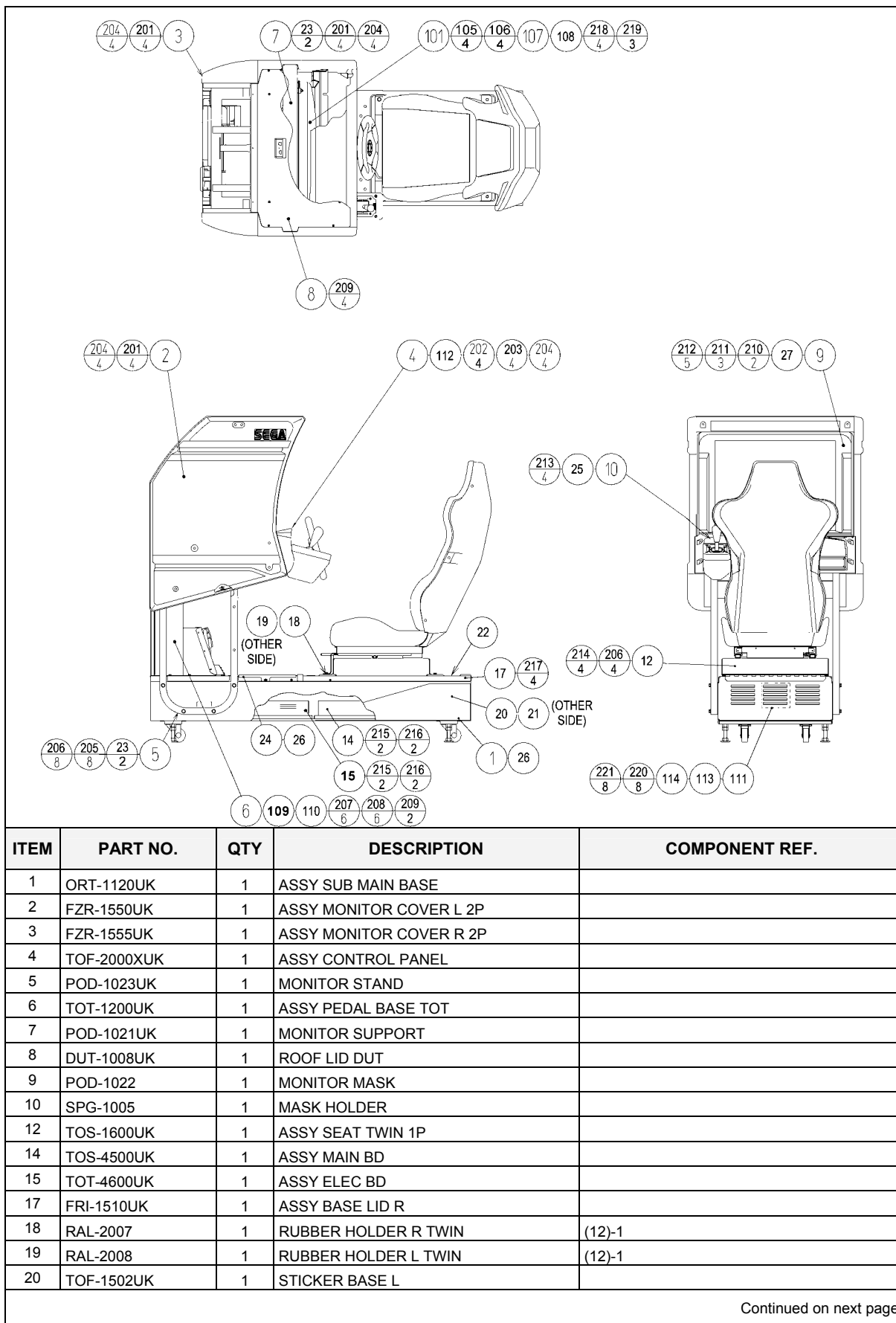
ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
1	TOF-4501UK	1	MAIN BD BASE	
2	840-0091D-12	1	ASSY CASE NAT RT/232C &COM EXP	
3	APC-4002	1	SW REG BRKT	
4	105-5435	1	GD DRIVE BRKT STD	
5	LB1111	1	STICKER PLEASE RECYCLE	
6	610-0617	1	GD-ROM DRIVE UNIT NAOMI	
7	610-0624-0033	1	GD SOFT KIT TOS ENG	
8	253-5508-0384	1	KEY CHIP	
101	400-5397-01	1	SW REGU FOR JVS VA	
102	400-5421-07512	1	SW REGU LCA75S-12	
103	OS1071	1	FEET P.C.B PKT OF 4	(102)-4 FEET
104	354081	4	TWIST LOK BHKL-450-4	
105	354083	4	(A)TWIST N LOK BHKL-750-4	
106	280-A00964-WX	6	ROUTER TWIST D09 SO6.4 WOOD X	
107	LB1101	1	STICKER WARNING BATTERY	GAME BD
201	000-P00416-W	11	M4X16 MSCR PAN W/FS PAS	(2)-4,(4)-3,(3)-4
202	012-P03516	4	N6X5/8" S/TAP PAN PAS	(102)-4
203	012-P00410-F	4	N8X3/8" S/TAP FLG PAS	(6)-4
204	000-P00408-W	4	M4X8 MSCR PAN W/FS PAS	(101)-4
302	TOF-60002UK	1	WH MAIN BD AC	
303	TOF-60003UK	1	WH JVS PWR 6P W/CARD	
304	TOF-60004UK	1	WH JVS PWR 8P W/GD	
305	TOF-60005UK	1	WH MAIN BD I/O PWR	
306	TOF-60006UK	1	WH MAIN BD SOUND	
307	600-7247-500	1	CABLE SCSI ST-L TYPE2 500MM	

8.15. TOT-4600UK ASSY ELEC BD



ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
1	TOF-4601UK	1	WOODEN BASE ELEC	
3	837-13551-92	1	I/O CONTROL BD FOR JVS	
102	560-5394UK	1	TRANSFORMER DUT TW	
103	838-13578	1	PWR AMP 2CH & MIXER	
104	838-14174	1	SERVO MOTOR DRIVE BD MIDI	
105	838-11856CE-02	1	CONNECT BD W/FUSE 6.3A CE	
107	354081	11	TWIST LOK BHKL-450-4	
108	354083	10	(A)TWIST N LOK BHKL-750-4	
109	280-A00964-WX	12	ROUTER TWIST D09 SO6.4 WOOD X	
201	012-P00325	14	N4X1" S/TAP PAN PAS	(3)-4,(103)-4,(104)-4,(105)-2
203	000-P00416-W	4	M4X16 MSCR PH W/FS	(102)-4
206	068-441616	4	M4 WSHR 16OD FLT PAS	(102)-4
301	600-7141-100	1	CABLE JVS TYPE A-B 100CM	
302	600-6985-006UK	1	WIRE HARN 100V OUT	
303	FRI-61003UK	1	WIRE HARN CONN BD B	
306	TOF-60104UK	1	PWR AMP 14V AC IN	
307	NCR-61002UK	1	WH AMP VR	
308	NCR-61003UK	1	WH AMP AUDIO	
309	NCR-61004UK	1	WH AMP SP F	
310	TOF-60001UK	1	WH CONN BD OUT A	
311	TOF-60007UK	1	WH MIDI	
312	TOF-60008UK	1	WH ELEC BD I/O PWR	
313	TOF-60009UK	1	WH I/O BD	
314	TOF-60105UK	1	WH I/O BRD A/D	
315	POD-61057UK	1	WH EARTH AC UNIT	
316	FRI-61030UK	1	WIRE HARN EXT MOTOR A	
317	TOF-60011UK	1	WH EXT ENCODER A	
318	440036	1	FERRITE 74271221	

8.16. TOS-10001UK ASSY COCKPIT 1P



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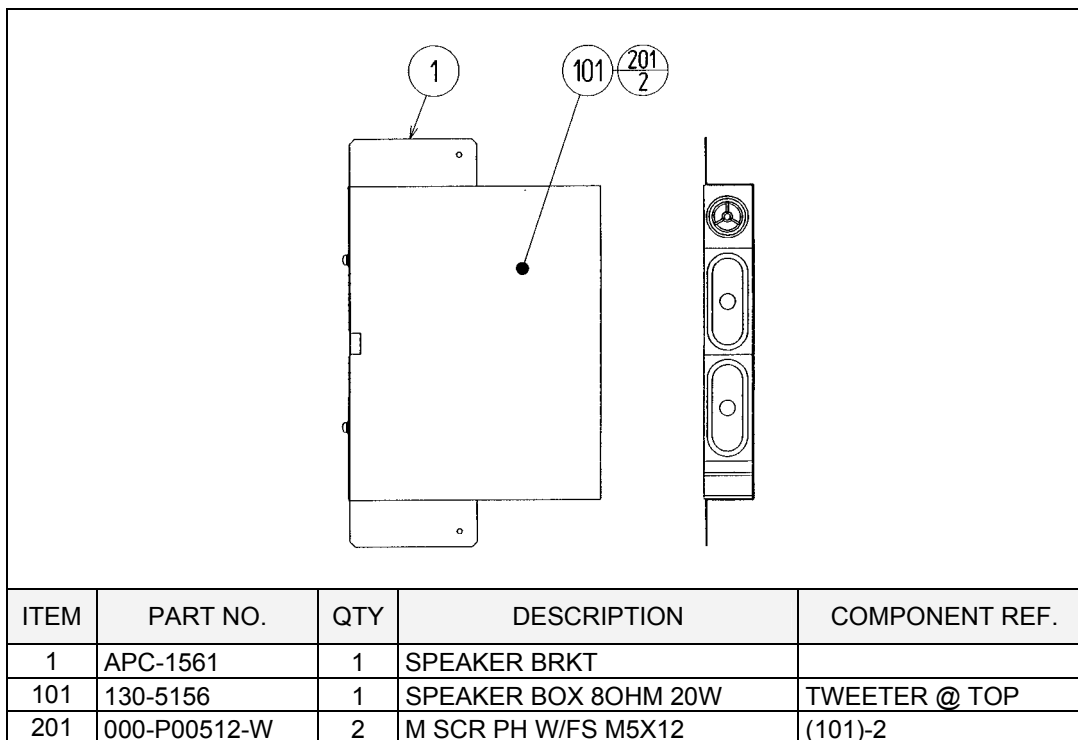
ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
21	TOF-1503UK	1	STICKER BASE R	
22	TOS-1504UK	1	STICKER BASE LID	(17)-1
23	POD-1026UK	4	CRT SPACER (POD)	(5)-2,(7)-2
24	DUT-2031UK	1	FRONT FLOOR UK DUT	FIX DOWN AT NEXT LEVEL UP
25	SRT-1009UK	1	MONITOR SPASHGUARD SRT TW	FIX TO (10)
26	SRT-2031UK	0.9	NEOPRENE RUBBER STRIP 10X3mm	(24)-0.5,(1)-0.4 4X10cm STRIPS
27	OS1004	0.705	DRAFT EXCLDR 4 X7MM BLK x 10M	(9)-705mm ON FRONT LIP
30	440-WS00220UK	1	WARNING STICKER TRAP HAZARD	
31	421-8075-81	1	JASRAC STICKER TOT	
33	421-11409-12	1	STICKER JASRAC V TOT	
101	200-5949	1	ASSY CLR DSPL 29 TYPE 31K UK	
105	280-5112	4	BUSH FOR TV	(101)-4
106	280-5113	4	COLLAR FOR TV	(101)-4
107	068-652516	4	M6 WSHR 25OD FLT PAS	(101)-4
108	280-L00716-OS	3	STANDOFF 70D 4ID 16L	(101)-3 REMOTE BD
109	601-6231-C100	2	EDGING NEW TYPE	TOP OF WIRE COVER -2
110	601-6231-D100	2	EDGING NEW TYPE	INSIDE OF PEDAL BASE -2
111	260-0011-02	1	AXIAL FLOW FAN AC100V 50-60Hz	
112	440-WS00220UK	1	WARNING STICKER TRAP HAZARD	NEXT TO STEERING GEARS
113	FN1012	2	MESH GUARD METAL 120mm FAN	(111)-2
114	OS1195	8	RIVET SNAP MOSS SR1811	(113)-8
115	280-A00900-A	20	ROUTER TWIST D9 ADH	
116	280-A00748-PM	4	ROUTER TWIST D7 SO4.8PA	MONITOR STAND HORIZONTAL BAR
117	280-A02048-PM	12	ROUTER TWIST D20 SO4.8PA	WIRE COVER BOX 2X4 CORNER DROP
201	030-000840-SB	12	M8X40 BLT W/S BLK	(2)-4,(3)-4,(7)-4
202	008-B00825-0B	4	M8X30 TMP PRF BH BLK	(4)-4
203	060-S00800-0B	4	M8 WSHR SPR BLK	(4)-4
204	060-F00800-0B	16	M8 WSHR FORM A FLT BLK	(2)-4,(3)-4,(4)-4,(7)-4
205	030-000850-SB	8	M8X50 BLT W/S BLK	(5)-8
206	068-852216-0B	12	M8 WSHR 22OD FLT BLK	(5)-8,(12)-4
207	030-000616-SB	6	M6X16 BLT W/S BLK	(6)-6
208	068-651616-0B	6	M6 WSHR 16OD FLT BLK	(6)-6
209	000-P00408-WB	6	M4X8 MSCR PAN W/FS BLK	(8)-4,(6)-2
210	000-T00530-0B	2	M5X30 MSCR TH BLK	(9)-2
211	000-T00512-0B	3	M5X12 MSCR TH BLK	(9)-3
212	068-552016-0B	5	M5 WSHR 20OD FLT BLK	(9)-5
213	000-F00512	4	M5X12 MSCR CSK PAS	(10)-4
214	030-000820-SB	4	M8X20 BLT W/S BLK	(12)-4
215	032-000425	4	M4X25 W/BLT PAS	(14)-2,(15)-2
216	068-441616	4	M4 WSHR 16OD FLT PAS	(14)-2,(15)-2
217	008-T00512-0B	4	M5X12 TMP PRF TH BLK	(17)-4
218	050-F00600	4	M6 NUT FLG SER PAS	(101)-4
219	000-P00320	3	M3X20 MSCR PAN PAS	(101)-3 REMOTE BD
220	012-HB0512	8	N10X1/2" S/TAP HEX B PAS	(111)-8
221	060-F00500	8	M5 WSHR FORM A FLT PAS	(111)-8

Continued on next page

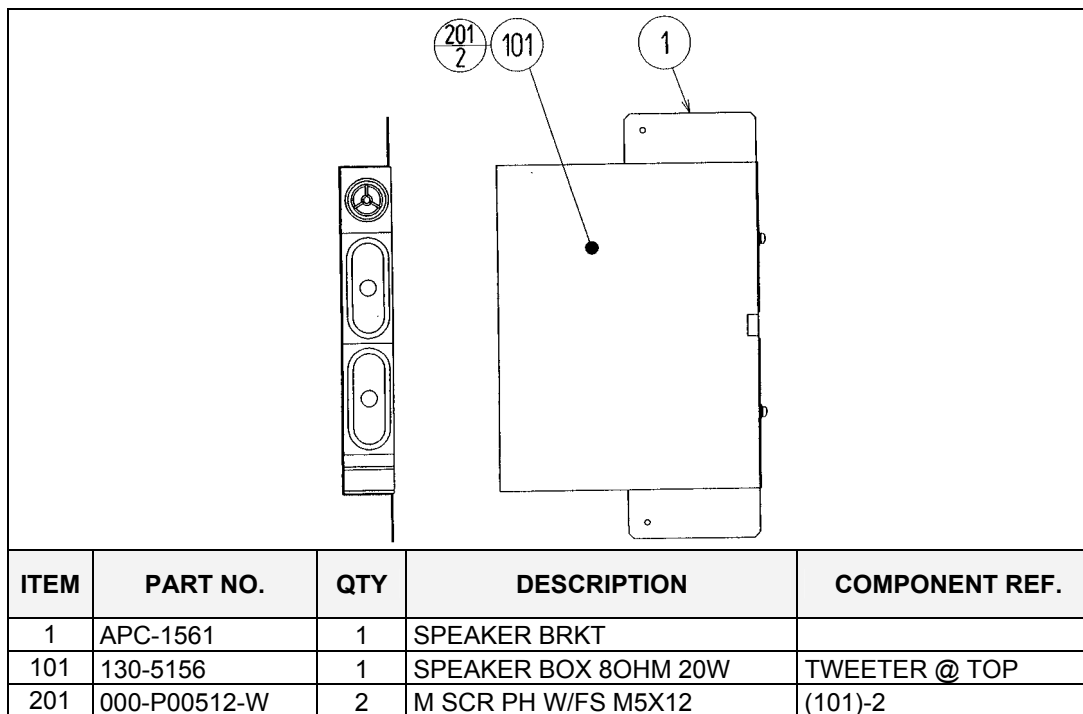
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ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
301	TOF-60100UK	1	WH EXT VIEW BUTTON A	
304	NCR-61034UK	1	WIRE HARN EXT COIN	
306	600-6373-77-91	1	WIRE HARNESS PLAYER SEL EXT B	
307	TOF-60101UK	1	WH EXT FRONT SP B	
308	FRI-61042UK	1	WIRE HARN EXT VR B	
309	NCR-61011UK	1	WIRE HARN VIEW BUTTON B	
310	600-7009-2500	1	ASSY RGB CA D-SUB 15P 2500MM	
312	FRI-61041UK	1	WIRE HARN EXT MOTOR B	
313	FRI-61027UK	1	WIRE HARN EXT AC100V A	
314	TOF-60021UK	1	WH EXT AC100V B	
315	TOF-60052UK	1	WH EARTH FOR DRIVER MAIN BASE	
316	POD-61012UK	1	WIRE HARN 100V EXT COCKPIT	
317	TOF-60015UK	1	WH EXT ENCODER B	
318	NCR-61008UK	1	WH EXT FRONT SP A	
319	POD-61026UK	1	WIRE HARN EXT AC UNIT	
320	TOF-60103UK	1	WH VTS EXT	
321	TOF-60010UK	1	WH EXT CARD R/W A	
322	600-6275-0150	2	ASSY FIBER OPTIC 5 0150CM	
323	600-9020-44K	1	WIRE HARN EARTH 200mm M4/M4 K	MON STAND TO WIRE COVER BOX
324	600-9100-44K	2	WIRE HARN EARTH 1000mm M4/M4 K	MON STAND TO MON SUPPORT & C.PNL
325	600-9020-44K	1	WIRE HARN EARTH 200mm M4/M4 K	MON SUPPORT TO ROOF LID
326	600-9060-46K	1	WIRE HARN EARTH 600mm M4/M6 K	MON STAND TO LH BOT OF 101

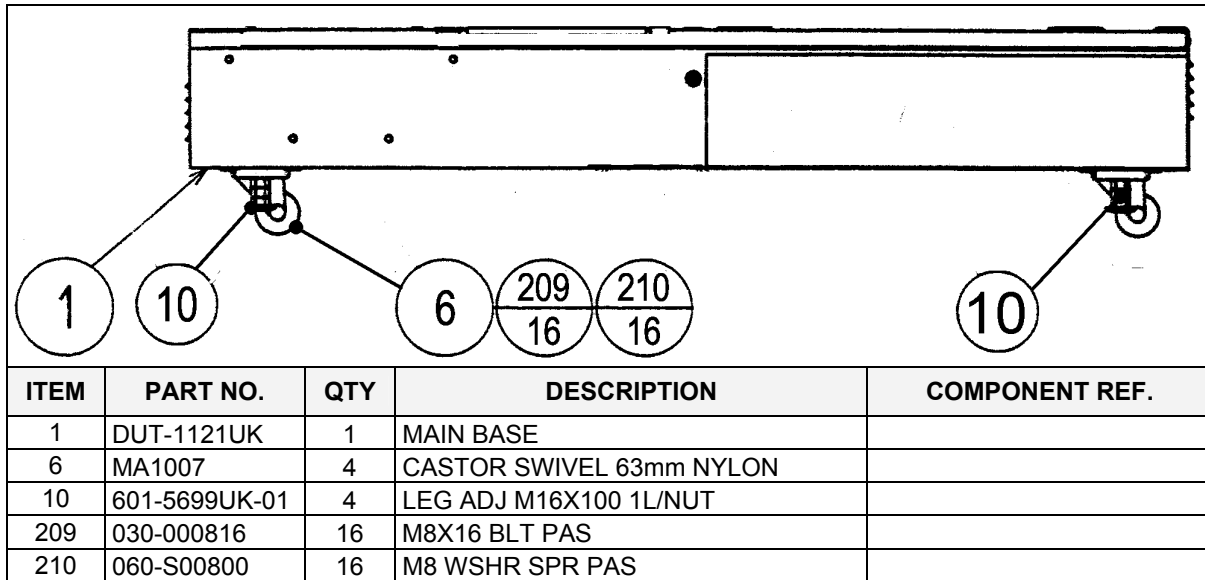
8.17. APC-1560 ASSY SPEAKER L



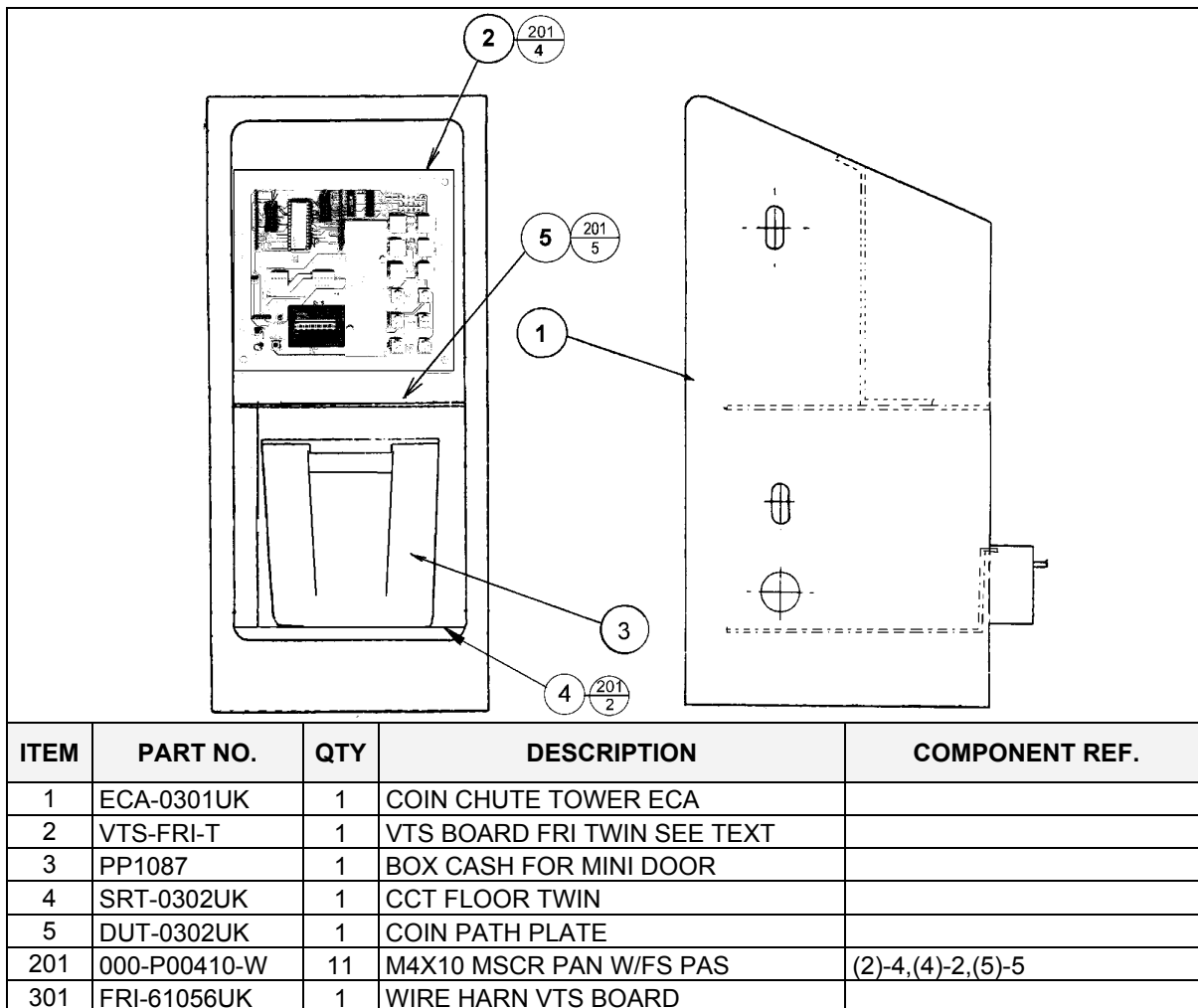
8.18. APC-1565 ASSY SPEAKER R



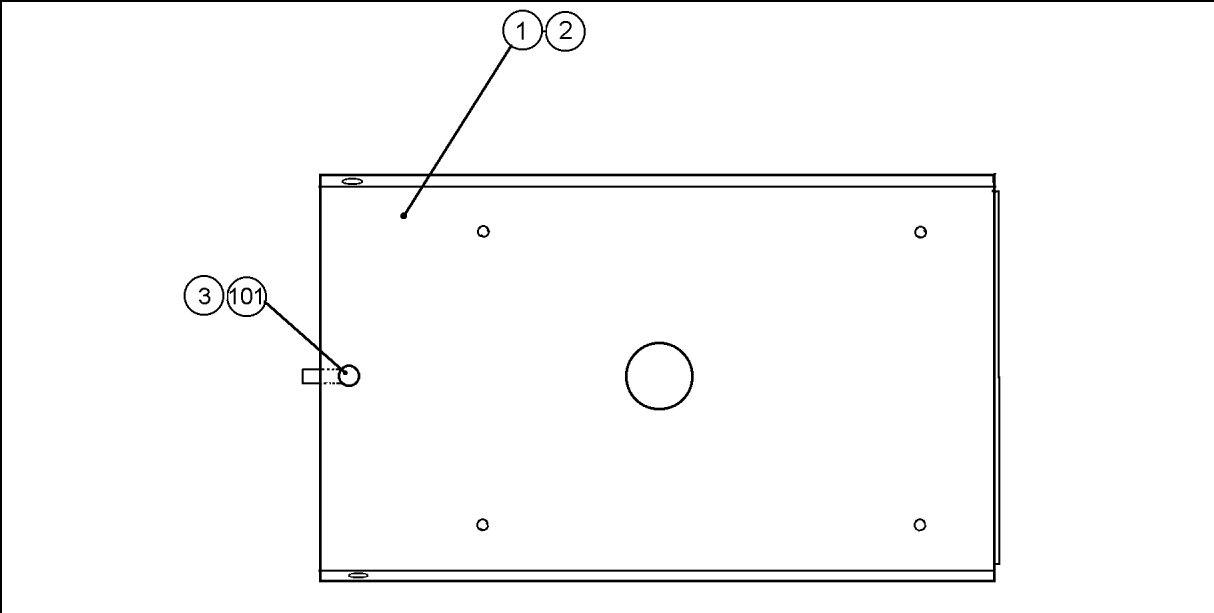
8.19. ORT-1120UK ASSY SUB MAIN BASE



8.20. FRI-0300UK ASSY COINCHUTE TOWER FRI

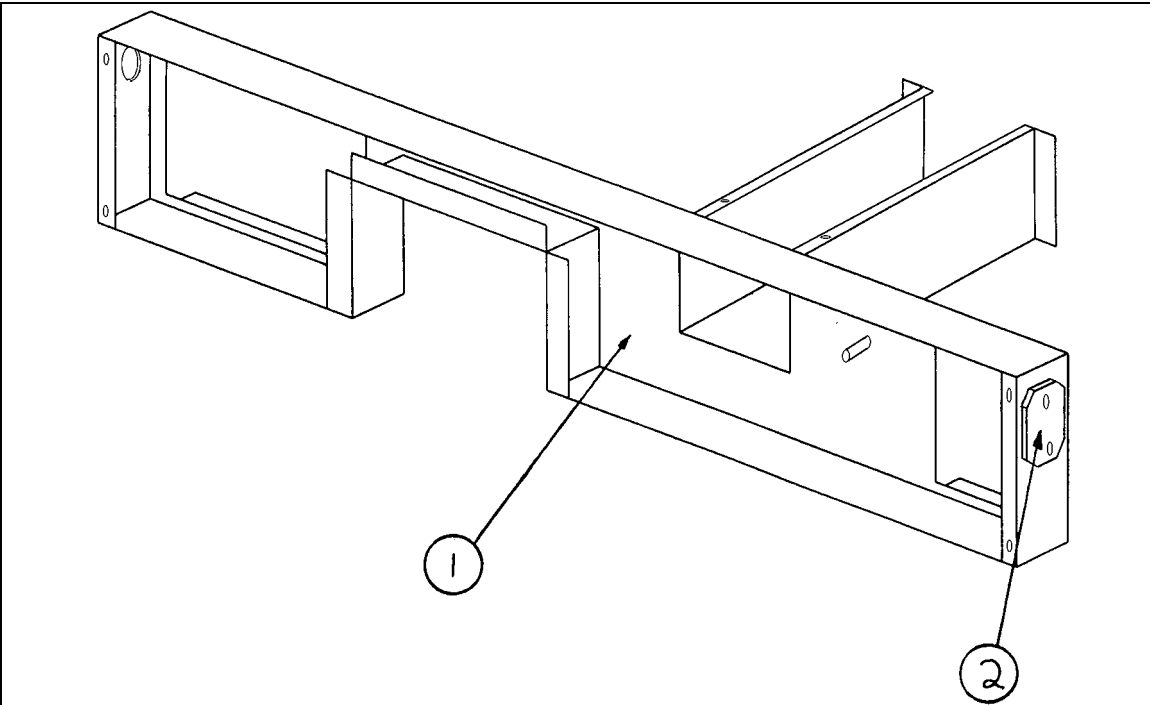


8.21. FRI-1510UK ASSY BASE LID R



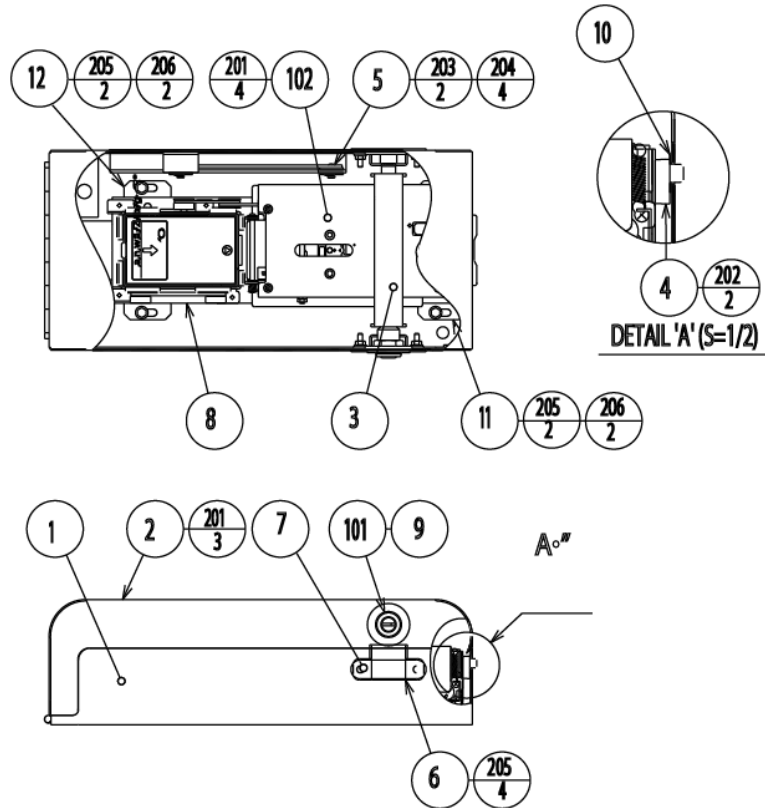
ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
1	DUT-1511UK	1	BASE LID R	
2	DUT-1511-CUK	1	GASKET STRIP	(1)-1
3	DUT-1511-DUK	1	LOCK TONGUE DUT	(101)-1
101	220-5575UK	1	LOCK	
201	050-F00400	1	M4 NUT FLG SER PAS	(301)-1
301	600-9020-44K	1	WIRE HARN EARTH 200mm M4/M4 K	R.FLOOR TO MAIN BASE

8.22. SPG-0500UK ASSY WIRE COVER SPG TWIN



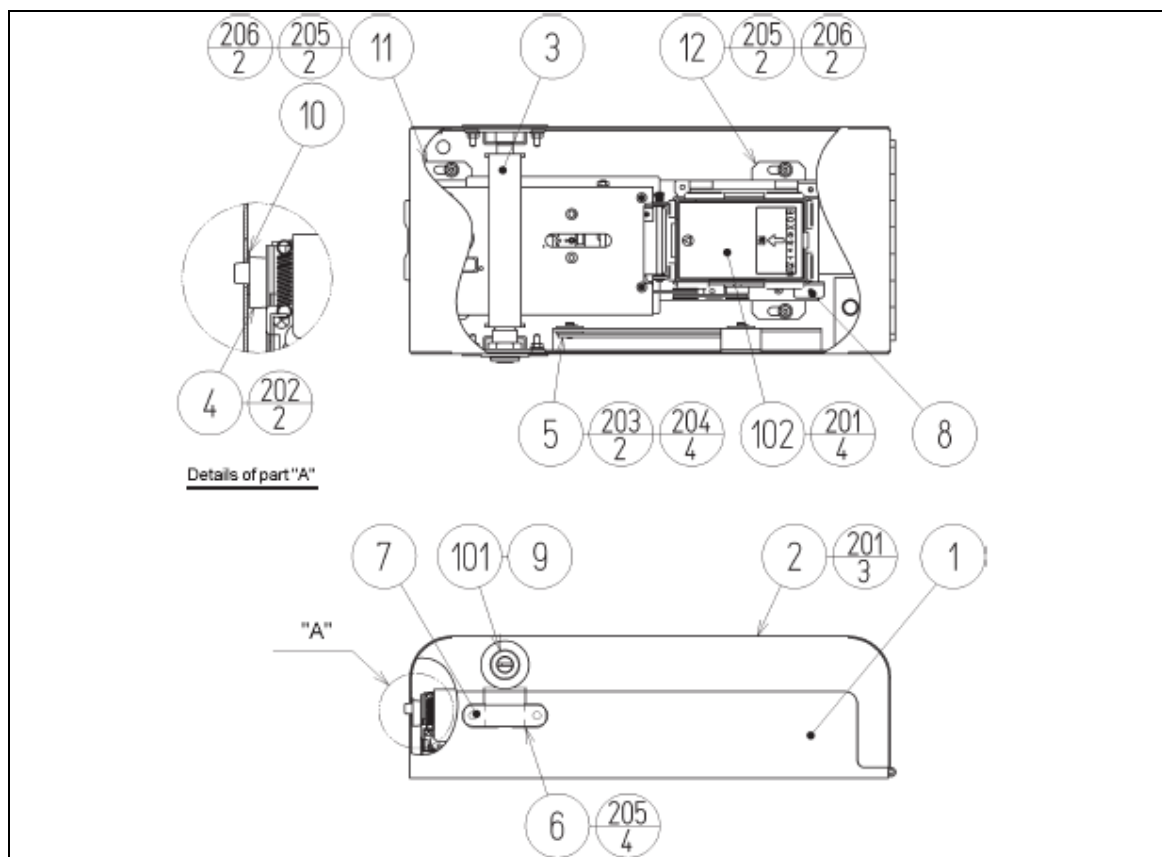
ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
1	DYN-0005UK	1	AC COVER A	
2	DYN-0009UK	2	HOLE LID	(1)-2
101	600-6275-0500	2	CABLE FIBER OPTIC 5mm x 500cm	
201	000-P00308-WB	4	M3X8 MSCR PAN W/FS BLK	(2)-4
202	050-F00400	1	M4 NUT FLG SER PAS	EARTH - 1
203	280-A02000-A	5	ROUTER TWIST D20 ADH	(1)-5
301	600-6817-104	1	WIRE HARN EXT AC (SPG)	
302	600-6817-102	1	WIRE HARN EXT TOWER L (SPG)	
303	600-6817-103	1	WIRE HARN EXT TOWER R (SPG)	
304	600-6373-76	1	WIRE HARNESS PLAYER SEL EXT A	
305	600-9075-44K	1	WIRE HARN EARTH 750mm M4/M4 K	SUB AC-AC COVER
306	600-9030-44K	1	WIRE HARN EARTH 300mm M4/M4 K	MAIN AC-AC COVER
307	600-9040-45K	1	WIRE HARN EARTH 400mm M4/M5 K	AC COVER - CCT

8.23. VOF-0450UK CARD UNIT TWIN L



ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
1	CKT-0401UK	1	CARD R/W BASE TWIN	
2	CKT-0402UK	1	CARD R/W COVER TWIN L	
3	CKT-0403UK	1	LOCKING TONGUE NARROW	
4	253-5512	1	CARD GUIDE	
5	CKT-0404UK	1	PLATE STAY	
6	CKT-0408UK	2	LOCK BRKT S	
7	CKT-1307	2	STUD PLATE	
8	VOF-0451UK	1	CARD R/W BRKT FOR VOF	
9	170048	1	SPACER-L+F REF 9203602	
10	CKT-0406UK	1	GATE	
11	CKT-0407UK	1	INSULATOR PLATE CKT	
12	VOF-0452UK	1	INSULATOR PLATE VOF	
13	100-5365-0606	1	OILES BEARING 80T 0606	(2)-1
101	220-5575UK	1	LOCK	(9)-1
102	601-11082	1	CARD R/W UNIT CRP-1231BR-10	
103	280-A01200-A	3	ROUTER TWIST D12 ADH	
201	000-P00308-W	7	M3X8 MSCR PAN W/FS PAS	(2)-3,(102)-4
202	000-F02508	2	M2.5 X 8 MSCR CSK BZP	(4)-2
203	065-E00500	2	DIA5 E RING	(5)-2
204	068-652016	4	M6 WSHR 20OD FLT PAS	(5)-4
205	050-F00400	8	M4 NUT FLG SER PAS	(6)-4,(11)-2,(12)-2
206	000-F00308	4	M3X8 MSCR CSK PAS	(11)-2,(12)-2
301	VOF-60050UK	1	WH CARD R/W	

8.24. VOF-0460UK CARD UNIT TWIN R



ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
1	CKT-0401UK	1	CARD R/W BASE TWIN	
2	CKT-0422UK	1	CARD R/W COVER TWIN R	
3	CKT-0403UK	1	LOCKING TONGUE NARROW	
4	253-5512	1	CARD GUIDE	
5	CKT-0404UK	1	PLATE STAY	
6	CKT-0408UK	2	LOCK BRKT S	
7	CKT-1307	2	STUD PLATE	
8	VOF-0451UK	1	CARD R/W BRKT FOR VOF	
9	170048	1	SPACER-L+F REF 9203602	
10	CKT-0406UK	1	GATE	
11	CKT-0407UK	1	INSULATOR PLATE CKT	
12	VOF-0452UK	1	INSULATOR PLATE VOF	
13	100-5365-0606	1	OILES BEARING 80T 0606	(2)-1
101	220-5575UK	1	LOCK	(9)-1
102	601-11082	1	CARD R/W UNIT CRP-1231BR-10	
103	280-A01200-A	3	ROUTER TWIST D12 ADH	
201	000-P00308-W	7	M3X8 MSCR PAN W/FS PAS	(2)-3,(102)-4
202	000-F02508	2	M2.5 X 8 MSCR CSK BZP	(4)-2
203	065-E00500	2	DIA5 E RING	(5)-2
204	068-652016	4	M6 WSHR 20OD FLT PAS	(5)-4
205	050-F00400	8	M4 NUT FLG SER PAS	(6)-4,(11)-2,(12)-2
206	000-F00308	4	M3X8 MSCR CSK PAS	(11)-2,(12)-2
301	VOF-60050UK	1	WH CARD R/W	

8.25. TOS-INST-TW ASSY INSTALLATION KIT TOS TWIN

ITEM	PART NO.	QTY	DESCRIPTION	COMPONENT REF.
1	TOS-0200UK	1	ASSY BILLBOARD	
2	FRI-0300UK	1	ASSY COINCHUTE TOWER FRI	
3	SPG-0500UK	1	ASSY WIRE COVER SPG TWIN	
4	DYN-0013	1	JOINT PIPE	
5	DYN-0006XUK	1	AC COVER B	
6	SRT-0018UK	1	AC COVER C	
7	DYN-0019UK	1	AC COVER D	
9	SPG-0008	2	BILLBOARD HOLDER	
10	422-0924UK	2	PLAY INSTR SH TOS MULTI	422-0924UK
13	PK0358	1	INST KIT BOX TOS TWIN	
14	TOS-0004UK	2	STICKER CARD SLOT TOS A MULTI	
15	TOT-0005UK	2	STICKER CARD SLOT TOF B MULTI	
16	601-11358-01	3	CARD PACKAGE TOS ENG	
17	601-11050-91	1	CLEANING KIT(30SHT)	
18	220-5753	1	VOL CONT B-5K OHM (TOCOS)	spare
101	440-CS0186UK	2	STICKER C EPILEPSY MULTI	
201	030-000825-SB	20	M8X25 BLT W/S BLK	(1,2,4)-4EA,(9)-8
202	068-852216-0B	20	M8 WSHR 22OD FLT BLK	(1,2,4)-4EA,(9)-8
203	000-P00412-WB	15	M4X12 MSCR PAN W/FS BLK	(3)-5,(5)-4,(6)-2,(7)-4
204	050-F00400	3	M4 NUT FLG SER PAS	(AC UNITS)-1EA, (2)-1
205	068-441616	3	M4 WSHR 16OD FLT PAS	(12)-3
401	420-5827	1	SERVICE MANUAL SANWA 31K	
402	420-6799-02UK	1	SERVICE MANUAL TOS TWIN	
403	OS1019	2	SELF SEAL BAG 9X12.3/4	
404	540-0006-01	1	WRENCH M4 TMP PRF	
405	540-0007-01	1	WRENCH M5 TMP PRF	
406	540-0009-01	1	WRENCH M8 TMP PRF	
407	220-5484	1	VOL CONT B-5K OHM	
408	SAECE-xxx	1	DECLARATION OF CONFORMITY	DEC. OF CONFORMITY TOTT
409	514-5078-5000	2	FUSE 5X20 CERAMIC SB 5000mA	
411	420-6620UK	1	SERVICE MANUAL GD ROM SYSTEM	
416	509-5704	1	SW MICRO TYPE (OMRON K3L13)	

9. APPENDIX A - ELECTRICAL SCHEMATIC

9.1. WIRE COLOURS

THE WIRE COLOUR CODE IS AS FOLLOWS:

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

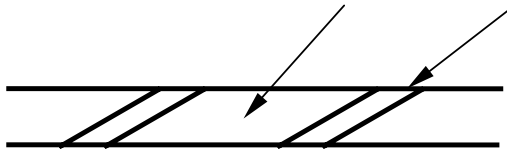
Wires other than those of any of the colours listed above will be displayed by 2 alphanumeric characters:

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

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

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

[Example] 51----- WHITE/RED = WHITE wire with RED stripes



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

K:	AWG18, UL1015
L:	AWG20, UL1007
None	AWG22, UL1007

9.2. ELECTRICAL SCHEMATIC

The following pages contain the electrical schematic for this machine.

Schematic 1 here

Schematic 2 here

Schematic 3 here

SEGA AMUSEMENTS EUROPE LTD./ SEGA SERVICE CENTRE

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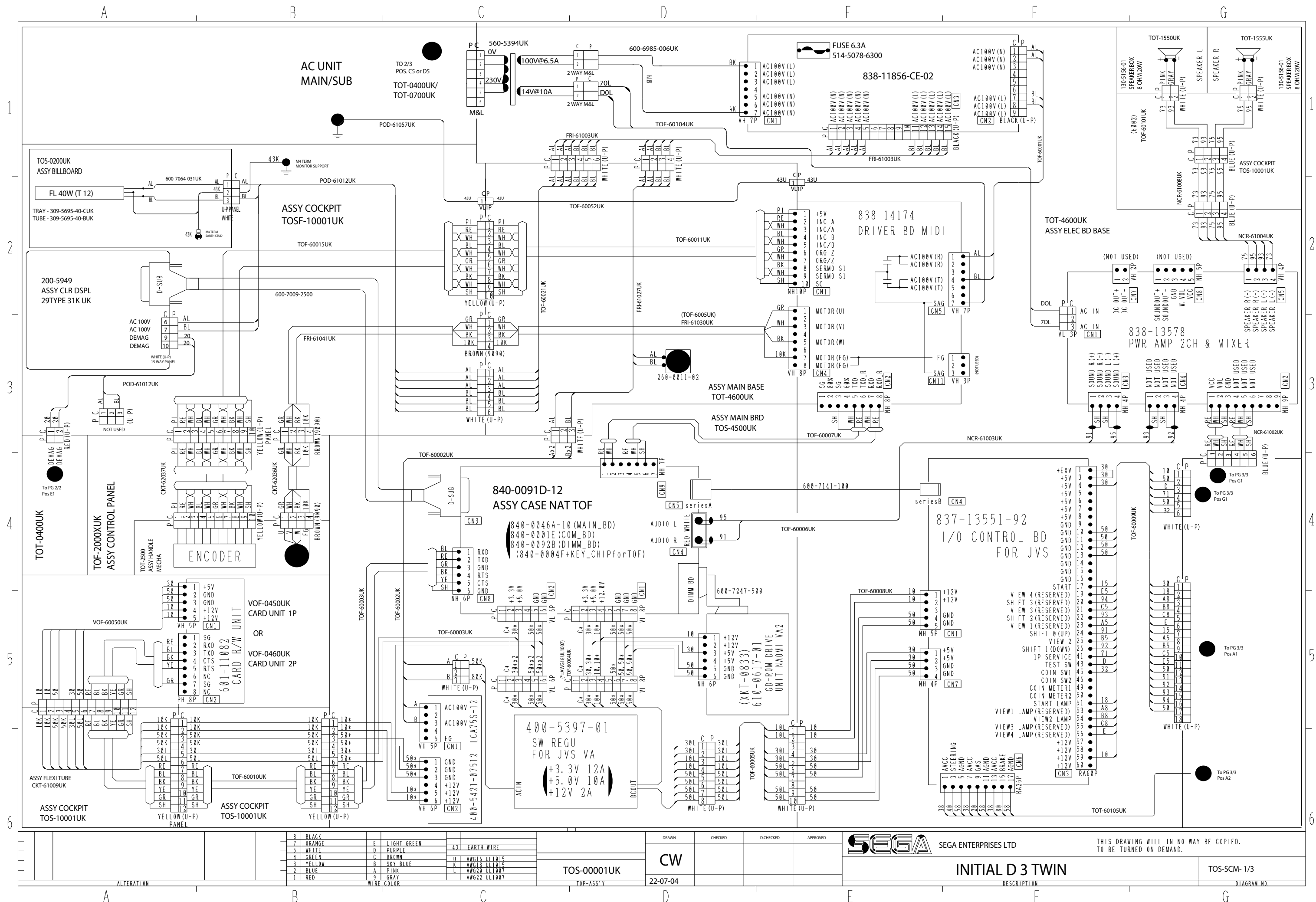
Telephone: +44 (0) 1372 731820

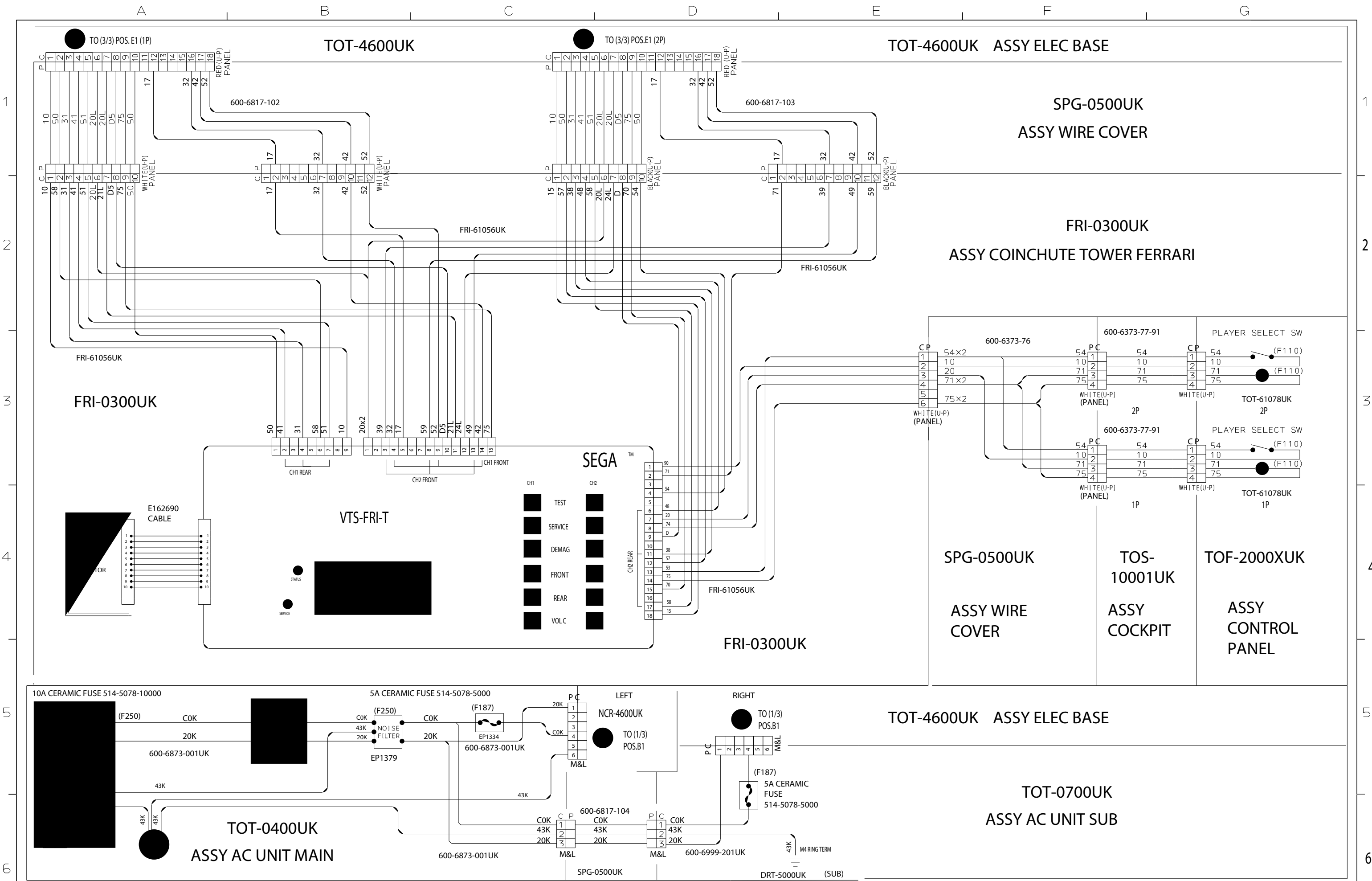
Fax: +44 (0) 1372 731849

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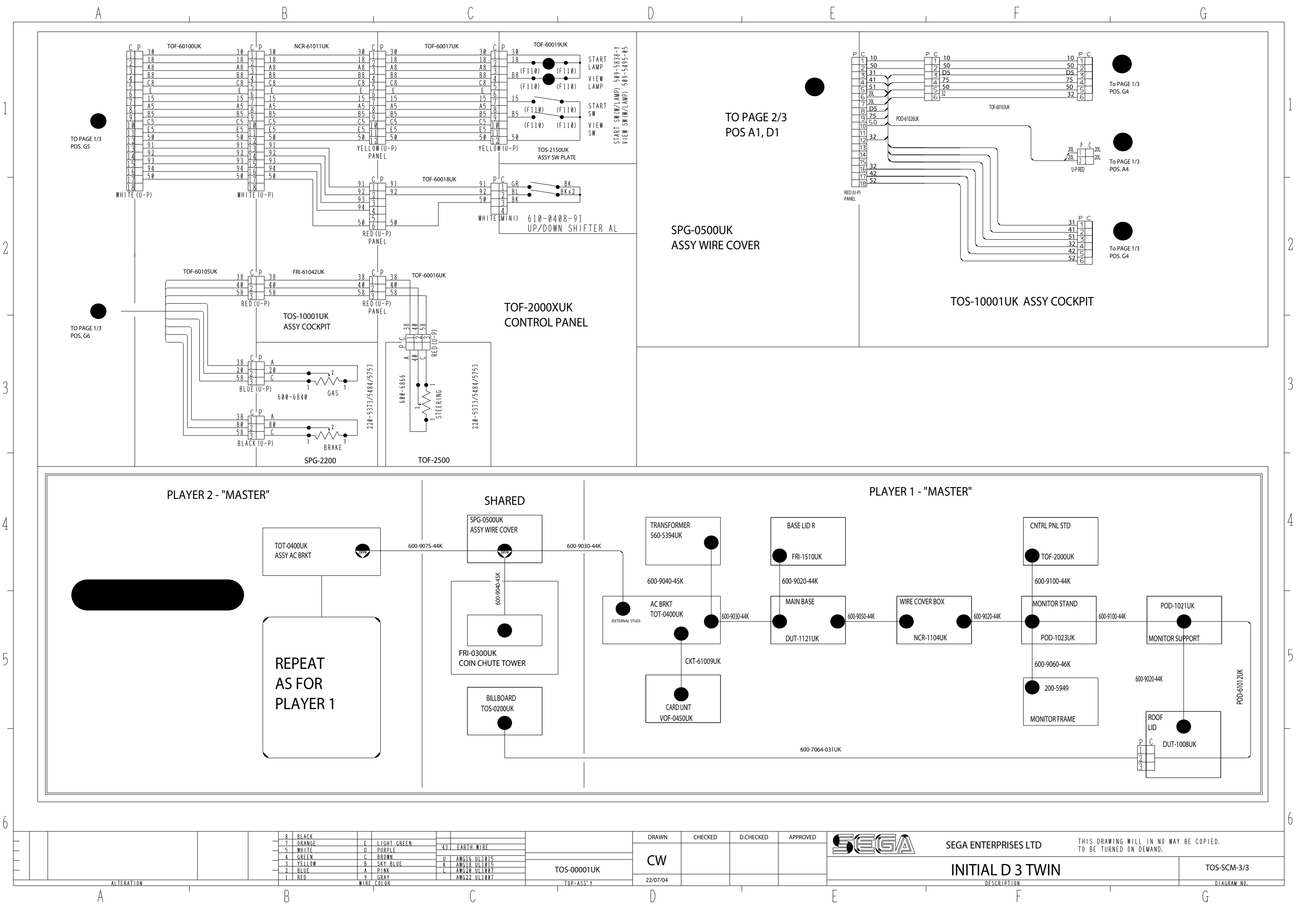


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						8 BLACK		E LIGHT GREEN		50L WHITE AWG20		DRAWN		CHECKED		D CHECKED		APPROVED		SEGA SEGA ENTERPRISES, LTD. THIS DRAWING WILL IN NO WAY BE COPIED. TO BE RETURNED ON DEMAND.		TOS-SCM-2/3	
						51 WHITE RED		50 WHITE															
						5 WHITE		D PURPLE		EXAMPLE		CW								INITIAL D 3 TWIN			
						4 GREEN		C BROWN		U AWG16 UL1015													
						3 YELLOW		B SKY BLUE		K AWG18 UL1015													
						2 BLUE		A PINK		L AWG20 UL1007													
						1 RED		9 GRAY		L AWG22 UL1007		22/07/04								DESCRIPTION		DIAGRAM No.	
ALTERATION		WIRE COLOR		TOP ASS'Y																105			
A		B		C		D		E		F		G											



--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--