SEGA

VIRTUA COP

U/R TYPE

OWNER'S MANUAL
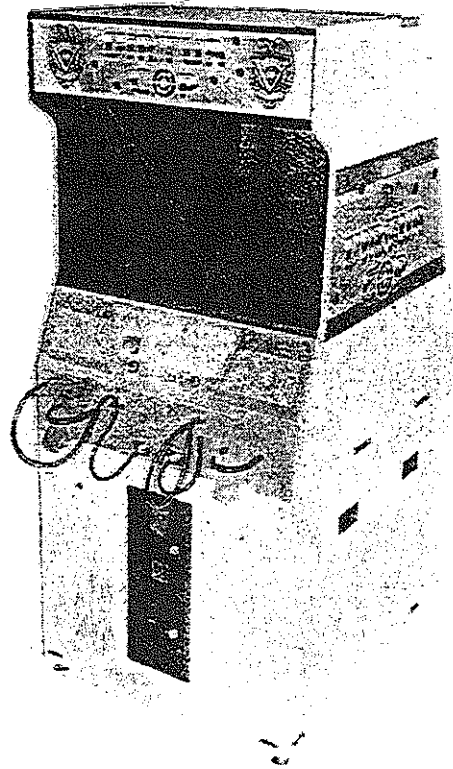
SEGA ENTERPRISES, LTD.

SPECIFICATIONS

Installation space	33 in by 36 in.
Height	71 in.
Weight	Approx. 363.1 lbs
Electrical Ratings	120 Vac, 60 Hz., 6 A, 720 VA
Monitor	26 in.

Note 1: Dimensions and weight are approximate

Note 2: Descriptions in this manual are subject to change without prior notice.

INTRODUCTION OF THE OWNER'S MANUAL

SEGA ENTERPRISES, LTD., supported by its high electronic technology of LSIs, microprocessors, etc. and a wealth of experience, has for more than 30 years been supplying various innovative and popular game machines to the world market. This Owner's Manual is intended to provide detailed descriptions together with all the necessary information covering the general operation of electronic assemblies, electromechanicals, servicing control, spare parts, etc. as regards
VIRTUA COP U/R TYPE, a new SEGA product .
This manual is intended for those who have knowledge of electricity and technical expertise especially in ICs, CRTs, microprocessors, etc. Carefully read this manual to acquire sufficient knowledge before working on the machine. Should there be a malfunction, non-technical personnel should under no circumstances touch the interior system. Should such a case arise, contact our Main Office or the closest branch office listed as follows:

SEGA ENTERPRISES, INC. (U.S.A.)/CUSTOMER SERVICE
45133 Industrial Drive, Fremont, California 94538, U.S.A.
Phone : (415) 802-3100
Fax   : (415) 802-1754

1. HANDLING PRECAUTIONS

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

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

○ To insert or pull out the plug quickly is dangerous.

○ It is necessary to make sure that the power cord or the grounding wire is not exposed on the surface (floor, ground, etc.) in a manner so as to be dangerous. Make sure that grounding connections are made safely at the position where so specified.

○ Do not use any fuse that does not meet specified rating.

○ Make complete connections for the IC board and other connectors. Insufficient insertion is very dangerous.

○ The operating (ambient) temperature range is from 5℃ to 40℃.

○ When cleaning the CRT surfaces, use a soft, dry cloth. Do not apply chemicals such as thinner, benzine, etc.

Also, for the IC board circuit inspections, only the logic tester is allowed. The use of a tester is not permitted, so be careful in this regard. After confirming that there are no irregularities, turn the power ON.

CAUTION!

When the controller is pointed outside the screen, it sometimes (though rarely) functions the same as when shooting inside the screen. This is caused by some other machine's on-screen light or fluorescent light , etc. reflected on the controller. Should such a phenomenon occur frequently, change the position and or direction of this unit or objects causing the problem.

2. PREVENTION OF COUNTERFEITING AND CONVERSION

◼ LABELLING

To prevent counterfeits and conversions, the following labels are put on all the SEGA products. When handling such goods, be sure to confirm the labels. They are used to prevent illegal acts such as the unauthorized copying of the products and the printed circuit boards thereof or carrying on business by manufacturing similar merchandise or by converting, selling or using such products or printed circuit boards.

ORIGINAL SEAL
The following seal is put on the
machines manufactured by SEGA.

```
          ╔══════════════╗
          ║    SEGA      ║
          ║ ┌──────────┐ ║
          ║ │オリジナル証│ ║
          ║ │ORIGINAL SEAL│║
          ║ └──────────┘ ║
          ║ THIS PRODUCT IS DESIGNED ║
          ║ AND MANUFACTURED BY ║
          ║ SEGA ENTERPRISES LTD ║
          ║ ┌──────────┐ ║
          ║ │ ORIGINAL #│ ║
          ║ │VIRTUA COP │ ║
          ║ │NO.       │ ║
          ║ └──────────┘ ║
          ║ SEGA ENTERPRISES, LTD ║
          ║     JAPAN     ║
          ╚══════════════╝
```

◼ COPYRIGHT NOTICE

This SEGA product has the copyright notice as follows:

© SEGA 1994

This signifies that this work was disclosed in 1994 and is the property of SEGA ENTERPRISES, LTD.

3. PRECAUTIONS CONCERNING INSTALLATION LOCATION

The VIRTUA COP U/R TYPE is an indoor game machine. Under no circumstances install it outside. Even indoors, avoid installing in places mentioned below so as to ensure proper usage:

○ Places subject to rain or water leakage, or condensation due to humidity.

○ In the proximity of an indoor swimming pool and/or shower.

○ Places subject to direct sunlight.

○ Places subject to heat sources from heating units, etc., or hot air.

○ Vicinity of highly inflammable/volatile chemicals or hazardous matter.

○ Sloped surfaces.

○ Vicinity of anti-disaster facilities such as fire exits and fire extinguishers.

○ Places subject to any type of violent impact.

○ Dusty places.

INSTALLATION PRECAUTIONS

- Verify the ampacity of the branch circuit that protects the outlet receptacles before connection. Do not overload the branch circuit protection.
- Avoid using an extension cord. If one is required, use an extension cord of type SJT, 16/8 AWG, rated min. 120 Vac, 7A.
- This unit requires a minimum openings (doors, entrances, etc.) dimension of 40 in (W) by 77 in. (H) for clearance.
- For installation of this equipment, secure a minimum area of 33 in. by 36 in.

Electrical Current Consumption
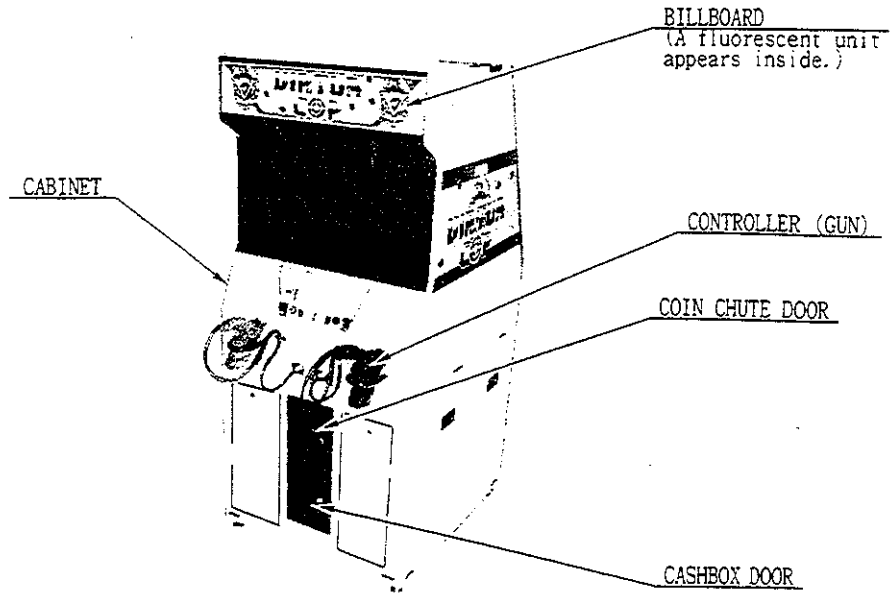
120 Vac, 60 Hz., 2.6 A

4. NAME OF PARTS

FIG. 4 OVERVIEW

TABLE 4

CABINET	32 WIDTH	35 DEEP 71 HEIGHT

5. ACCESSORIES

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

TABLE 5 ACCESSORIES

Part No.	Qty.	DESCRIPTION	Note
220-5381	2	KEY MASTER FOR 220-5380	For opening/closing the doors
	2	KEY	For the CASHBOX DOOR
420-6149-05	1	OWNERS MANUAL VIRTUA COP U/R ENG	
509-5080	1	SW MICRO TYPE	For spare, refer to Section 9.
514-5036-8000	1	FUSE UL Listed 250V, 5 A	
540-0006-01	1	WRENCH FOR TAMP PRF SCR DUAL TYPE M4	Tool
540-0004-01	1	WRENCH FOR TAMP PRF SCR DUAL TYPE M5	Tool

(TAMPERPROOF WRENCH)

TOOL

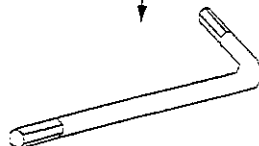M4 540-0006-01

M5 540-0004-01

FIG. 5 TAMPERPROOF WRENCH

6. PRECAUTIONS TO BE HEEDED WHEN ASSEMBLING AND MOVING THE MACHINE

WARNING:

● Perform the assembly work by following the procedure herein stated. Failing to comply with the instructions, for example, inserting the plug into an outlet at the stage not mentioned in this manual might cause an electric shock accident.

● Assembling should be performed as per this manual. Since this is a complex machine, erroneous assembling may cause damage to the machine, or malfunctioning to occur.

When carrying out the assembly work, follow the procedure in the following 4-item sequence:

1	SECURING IN PLACE (LEG ADJUSTER ADJUSTMENT)
2	POWER SUPPLY, AND EARTH CONNECTION
3	ASSEMBLY CHECK
4	INSTALLING THE DISPLAY CARD (OPTION)

Note that the tools such as a plus screwdriver and wrench for M16 hexagon bolt w/24 mm width across flats are required for the assembly work.

1 SECURING IN PLACE (LEG ADJUSTER ADJUSTMENT)

> **WARNING!**
> Make sure that all of the leg adjusters are in contact with the floor. If they are not, the cabinet may move and cause an accident.

This machine has 4 each of casters and leg adjusters (FIG. 6. 1). When the installation position is determined, cause the leg adjusters to come into contact with the floor directly, make adjustments in a manner so that the casters will be raised approximately 5 mm. from the floor and make sure that the machine position is level.

① Move the machine to the installation position.

② Cause all of the leg adjusters to make contact with the floor. By using a wrench, make adjustments in the height of the leg adjusters to ensure that the machine's position is level.

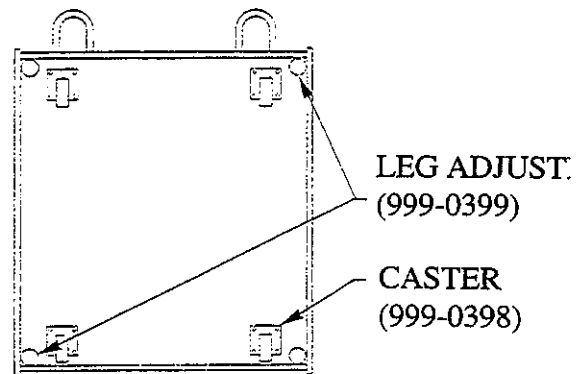③ After making adjustments, fasten the leg adjuster nut upward and secure the height of the leg adjuster.

LEG ADJUST.
(999-0399)

CASTER
(999-0398)

FIG. 6. 1 BOTTOM VIEW

LEG ADJUSTER
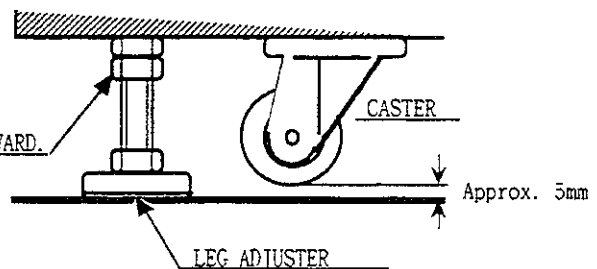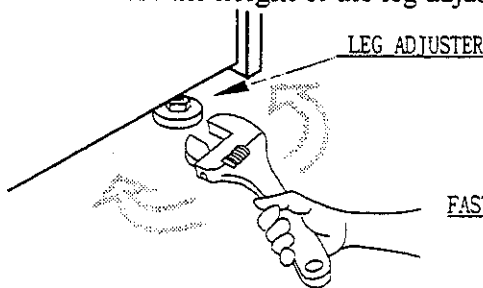
FASTEN UPWARD.

CASTER

Approx. 5mm

LEG ADJUSTER

FIG. 6. 2 LEG ADJUSTER

2 POWER SUPPLY, AND EARTH CONNECTION

> **CAUTION!**
> Ground the EARTH TERMINAL (this, however, is not required in the case where a power cord plug with earth is used). Check to make sure that the power cord or the ground wire is not exposed on the surface (floor, ground, etc.) where it may be dangerous.
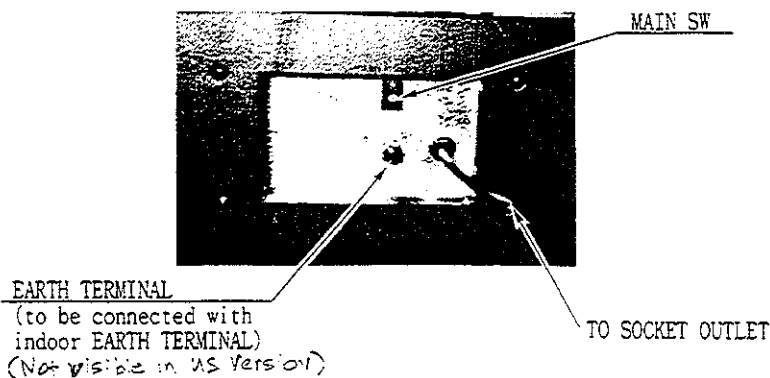
MAIN SW

The AC UNIT is located on back side of the CABINET. By using an earth wire, connect the AC UNIT EARTH TERMINAL and the securely grounded indoor EARTH TERMINAL.
For POWER ON, turn the AC UNIT's MAIN SW on.

EARTH TERMINAL
(to be connected with indoor EARTH TERMINAL)
(Not visible in AS Version)

TO SOCKET OUTLET

FIG. 6. 3 AC UNIT

3 ASSEMBLY CHECK

In the TEST MODE, ascertain that the assembly has been made correctly and IC BD. is satisfactory (refer to Section 8).
In the test mode, perform the following test:

```
                    MEMORY TEST
  ROM
  IC.   6  GOOD     IC.   7  GOOD     IC.   8  GOOD
  IC.   9  GOOD     IC.  10  GOOD     IC.  11  GOOD
  IC.  12  GOOD     IC.  13  GOOD     IC.  14  GOOD
  IC.  15  GOOD
  RAM
  IC.  45  GOOD     IC.  46  GOOD     IC.  47  GOOD
  IC.  48  GOOD     IC.  49  GOOD     IC.  50  GOOD
  IC.  54  GOOD     IC.  55  GOOD



            TEST  :  TO EXIT
```

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

```
              INPUT TEST
   CHUTE #1    OFF     CHUTE #2    OFF

   START1      OFF     START2      OFF

   TEST-SW     OFF     SERVICE-SW  OFF

   TRIGGER1    OFF     TRIGGER2    OFF



        TEST & SERVICE  :  TO EXIT
```

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

```
        GUN SETTING
     GUN MARK CHECK
   PLAYER1 GUN ADJUSTMENT
   PLAYER1 GUN DEFAULT ADJUSTMENT
   PLAYER1 GUN MANUAL ADJUSTMENT
   PLAYER2 GUN ADJUSTMENT
   PLAYER2 GUN DEFAULT ADJUSTMENT
   PLAYER2 GUN MANUAL ADJUSTMENT
   >> EXIT



     SELECT BY SERVICE BUTTON
       AND PUSH TEST BUTTON
```

On the menu screen in the test mode, selecting GUN SETTING displays the screen on which gun sighting is set. Check to see if there is any problem for playing game.

```
        OUTPUT TEST
          CRT SIZE
          CRT COLOR
          LAMP
     >> EXIT









     SELECT BY SERVICE BUTTON
       AND PUSH TEST BUTTON
```

In the TEST mode menu, selecting OUTPUT TEST allows the screen, on which the monitor or lamp is tested, to be displayed. Although the monitor adjustments have been made at the time of shipment from the factory, make judgment (by watching the test mode screen) as to whether an adjustment is needed. If it is necessary, adjust the monitor by referring to Section 11.

In the LAMP TEST mode, carry out the lamp test to ascertain that each lamp lights up satisfactorily.

```
        SOUND TEST
          AUTO
          SE1
          SE2
          SE3
          SE4
          SE5
          SE6
          SE7
          BGM

     >> EXIT

     SELECT BY SERVICE BUTTON
       AND PUSH TEST BUTTON
```

In the TEST mode, selecting SOUND TEST causes the screen, on which sound related BD and wiring connections are tested, to be displayed. Be sure to check if the sound is satisfactorily emitted from each speaker and the sound volume is appropriate.

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

MOVING THE MACHINE

Since the weight of this machine is approximately 165 kgs., its leg adjusters should be retracted when moving the machine over the floor.
In the case where there is a sharp difference in the surface level, be sure to hold the catch and or bottom when lifting the cabinet. Lifting the cabinet by holding other portions may cause the cabinet and parts to be damaged.

4 INSTALLING THE DISPLAY CARD (OPTION)

① By using the 3 truss screws, assemble the display card and display holder.

② Mount the assembled display card and holder on the cabinet.

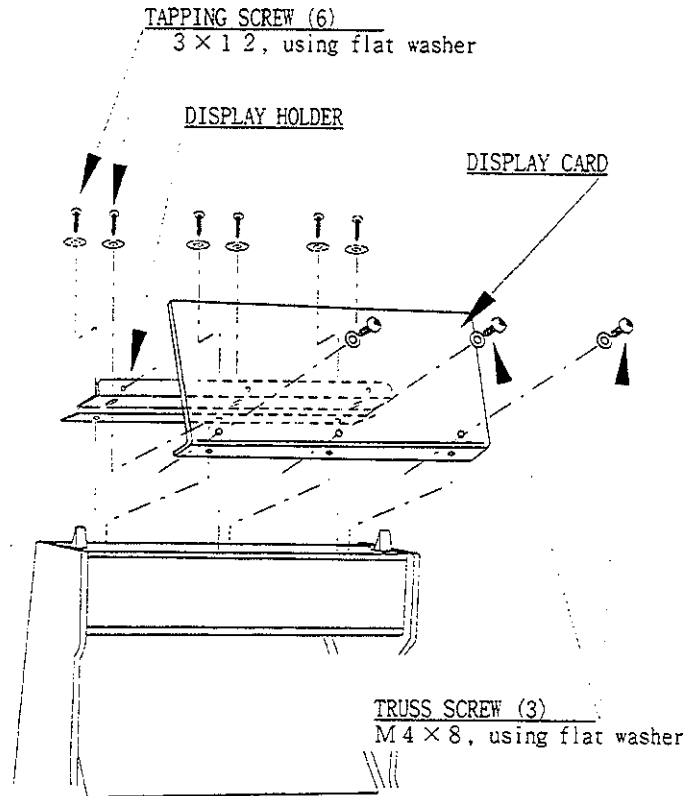③ Secure the assembled display card and holder to the top of the cabinet by using 6 tapping screws.

TAPPING SCREW (6)
3 × 1 2, using flat washer

DISPLAY HOLDER

DISPLAY CARD

TRUSS SCREW (3)
M 4 × 8, using flat washer

FIG. 6. 4 INSTALLING THE DISPLAY CARD
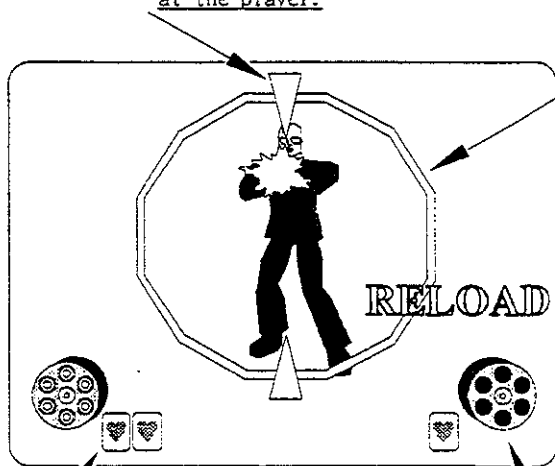
7. HOW TO PLAY

CONTENT OF GAME AND HOW TO PLAY

① Inserting a coin(s) causes the credit display on the bottom of the screen to count. Inserting one credit worth coin(s) changes the message on the bottom of the screen from "INSERT COIN(S)" to "PUSH START" and both of the start buttons light up. The maximum number of credits counted at a time is 9. Any coin inserted after counting 9 credits will not be counted as any credits, nor be returnable. These coins, however, will count as coins inserted in bookkeeping and the coin meter. Note that game setting to USA allows up to 24 credits to be counted.

② Pressing either of the start buttons determines which side (left or right) you are playing on. Pressing the start button causes the STAGE SELECT screen to appear. There are 3 stages, i. e., BEGINNER (stage 1), MEDIUM (stage 2) and EXPERT (stage 3) to choose from. Shoot to select the desired stage. If no desired stage is selected, BEGINNER will be chosen automatically to start.
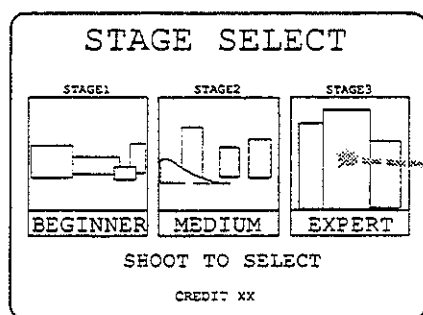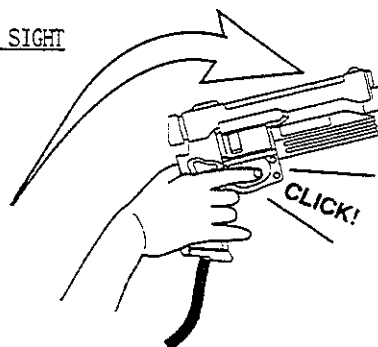

Shoot to select the desired stage.

③ When the game starts, the player's mission and boss character are introduced.

• The life points and the number of bullets of the left-hand side player (1P) are displayed on the lower left-hand side of the screen, and those of the right-hand side player (2P), on the lower right-hand side of the screen.

• The LOCK-ON SIGHT indicates the enemy character who is firing at the player. If the sight turns red, the enemy fires at the player and he loses one life point.

If the sight turns red, the enemy fires at the player.

LOCK-ON SIGHT

When your gun runs out of ammo, point outside the screen and pull the trigger to reload.

When the life point becomes zero, the game is over.

The loaded status of ammo is shown by cartridges in the cylinder.

—10—

- The player loses one life point if he shoots a hostage by mistake.

- The gun holds 6 bullets. When it runs out of ammo, "RELOAD" is displayed on the screen. At this time, point outside the screen and pull the trigger to reload. Note that by using the DIP SW, the reload setting can be changed to AUTO RELOAD (refer to Section 15).

- The enemy's hand grenades, axes, rocket bombs, fire bombs, etc., can be shot down for your defense.

- Shooting the background causes Special Items to appear. Capturing an item by shooting strengthens your weapon or recovers life points (explanations as regards the items are given later),

- When the life point becomes zero, the game is over.

- Downing the boss character awaiting you at each stage results in clearing that particular stage. The player can not defeat the boss until his life meter becomes zero.

④ If you would like to join in the game at anytime while the other person is playing, insert a coin(s) and press the start button. Also, when credits allowing the game to be played still remain, the start button on the other side will keep flashing. The player can participate in the game by pressing the flashing button.

⑤ When the life point becomes zero, if you want to continue, insert a coin(s) required to continue and press the start button. If credits allowing the player to continue still remain, you can continue by merely pressing the start button.

⑥ At the time of game over, if the player's score ranks 10th or higher, his name can be entered.

CONCERNING SPECIAL ITEMS:

MACHINE GUN
Holds 30 bullets. Can be repeatedly fired by keeping the trigger pulled. This can not be reloaded. Running out of ammo, or being damaged by the enemy causes the machine gun to become an ordinary gun.
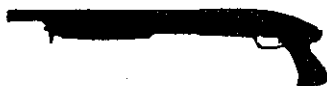
RIFLE
Holding 24 bullets, this allows for 3 consecutive shoots every time the trigger is pulled. It can not be reloaded. Running out of ammo, or being damaged by the enemy causes the rifle to become an ordinary gun.

AUTOMATIC
Holding 15 bullets, this allows for reloading. When damaged by the enemy, this becomes an ordinary gun.

SHOT GUN
Holds 6 bullets. Having a large "HIT" determining range, this allows you to shoot the enemy easier. It allows for reloading. When damaged by the enemy, it becomes an ordinary gun.

MAGNUM GUN
Holds 6 bullets. Allows you to hit the enemy through an obstacle. Can be reloaded. When damaged by the enemy, it becomes an ordinary gun.

LIFE
The life point increases by one, provided however that the life points in total do not exceed 10.

Depending on items, when a certain item is already strengthened, shooting another may cause such strengthened item to become another item.

KNACK OF EARNING A HIGH SCORE:

● **ACCURATELY SHOOT AT THE HEAD OR CHEST.**

In each stage, enemy characters other than the boss can be downed by hitting any part of the body. When a bullet hits any portion other than the head or chest, a hit or not must be determined. Until such time that a hit or not is determined, shooting at the character that appears behind the opponent who was previously shot will result in shooting the previously shot character again instead. On the other hand, if any character is shot in the head or chest, he will be downed by single shot and in this case, there will be no need for hit determination, thus making it easy to shoot the enemy behind. The higher the stage level is, the more important the shooting accuracy becomes.

● **FORESEEING THE ENEMY APPEARANCE POSITION**

The enemy marked with the LOCK-ON SIGHT is the only one that fires at you. To forecast the enemy's appearance position, pay attention to the direction in which the sight moves. Since their appearance pattern is the same every time, you could master a knack of play by learning such pattern through repeated game play.

8. EXPLANATION OF TEST AND DATA DISPLAY

By operating the switch unit, periodically perform the tests and data check. When installing the machine initially or collecting cash, or when the machine does not function correctly, perform checking in accordance with the explanations given in this section. The following shows tests and modes that should be utilized as applicable.

TABLE 8. 1 EXPLANATION OF TEST MODE

ITEMS	DESCRIPTION	REFERENCE SECTIONS
INSTALLATION OF MACHINE	When the machine is installed, perform the following:	
	1. Check to see that each setting is as per standard setting made at the time of shipment.	8 - 4, 8 - 5
	2. In the INPUT TEST mode, check each SW and VR.	8 - 6
	3. In the OUTPUT TEST mode, check each of lamps.	8 - 7
	4. In the SELF-TEST mode, check ICs on the IC Board.	8 - 10, 8 - 11
MEMORY	Choose MEMORY TEST in the MENU mode to allow the MEMORY test to be performed. In this test, PROGRAM RAMs, ROMs, and ICs on the IC Board are checked.	8 - 10, 8 - 11
PERIODIC SERVICING	Periodically perform the following:	
	1. MEMORY TEST	8 - 10, 8 - 11
	2. Ascertain each setting.	8 - 4, 8 - 5
	3. In the INPUT TEST mode, test the CONTROL device	8 - 6
	4. In the OUTPUT TEST mode, check each of lamps.	8 - 7
CONTROL SYSTEM	1. In the INPUT TEST mode, check each SW and VR.	8 - 6
	2. Adjust or replace each SW and VR.	9
	3. If the problem can not be solved yet, check the CONTROL's moves.	9
MONITOR	In the MONITOR ADJUSTMENT mode, check to see if the MONITOR adjustment is appropriately made.	8 - 7
IC BOARD	1. MEMORY TEST	8 - 10, 8 - 11
	2. In the SOUND TEST mode, check the sound related ROMs.	8 - 9
DATA CHECK	Check such data as game play time and histogram to adjust the difficulty level, etc..	8 - 3

8.1 POWER SUPPLY

Open REAR DOOR, and the power supply is located on the bottom of the cabinet. The power supply distribution consists of an EMI filter, fuseholder, fuse (rated 250 Vac, 5 A), power transformer, and a switching supply.

Other controls such as TEST & SERVICE BUTTONS, SOUND CONTROL, DEMAGNETIZER SWITCH are located at the front of the cabinet. Open COIN DOOR, and the buttons are located on the left hand side.
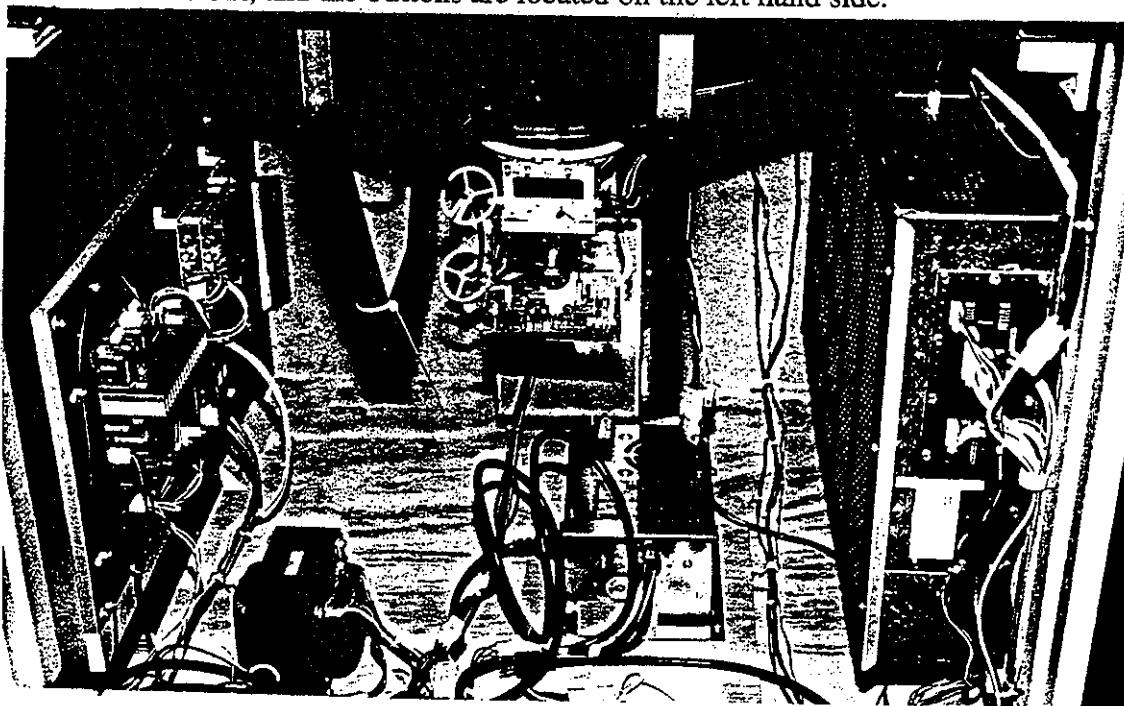

FIG. 8. 1 POWER SUPPLY UNIT

8-1 TEST MENU

This mainly checks if the operation of the game BD is accurate, and allows for COIN ASSIGNMENTS/GAME ASSIGNMENTS setting adjustments.

> SELECTION OF TEST ITEMS

```
        TEST MODE
     BOOKKEEPING
     GAME SYSTEM
     COIN ASSIGNMENT
     INPUT TEST
     OUTPUT TEST
     GUN SETTING
     SOUND TEST
     TGP TEST
     MEMORY TEST
     BACKUP RAM CLEAR
  >> EXIT


   SELECT BY SERVICE BUTTON
   AND PUSH TEST BUTTON
```

① Push the TEST BUTTON to cause the following TEST MENU to appear:

② By pushing the SERVICE BUTTON, bring the arrow mark ">>" to the desired item and press the TEST BUTTON.

③ After the test is complete, move ">>" to "EXIT" and press the TEST BUTTON to return to the Game Mode.

FIG. 8.2   TEST MENU

8-3 BOOKKEEPING

Selecting the BOOKKEEPING in the menu mode causes the bookkeeping data up to the present to be displayed on 2 pages.To proceed to another screen, press the service button. Pressing the test button (on any screen page) causes the menu to return back on to the screen.

```
┌─────────────────────────────────────┐
│         BOOKKEEPING 1/2              │
│                                     │
│    COIN CHUTE #1  xxxxxxxxxxxx       │
│    COIN CHUTE #2  xxxxxxxxxxxx       │
│      TOTAL COINS  xxxxxxxxxxxx       │
│                                     │
│     COIN CREDITS  xxxxxxxxxxxx       │
│   SERVICE CREDITS xxxxxxxxxxxx       │
│    TOTAL CREDITS  xxxxxxxxxxxx       │
│                                     │
│   NUMBER OF GAMES xxxxxxxxxxxx       │
│                                     │
│       TOTAL TIME    xDxxHxxMxxS      │
│   GAME PLAY TIME    xDxxHxxMxxS      │
│   AVERAGE GAME TIME    xxMxxS        │
│   LONGEST GAME TIME    xxMxxS        │
│   SHORTEST GAME TIME   xxMxxS        │
│                                     │
│       TEST      :TO EXIT             │
│     SERVICE     :TO OTHER PAGE       │
│                                     │
└─────────────────────────────────────┘
```

FIG. 8. 3a BOOKKEEPING(1/2)

- **COIN CHUTE# * :**
  Number of coins put in

- **TOTAL COINS:**
  Total number of activations of coin chutes

- **COIN CREDITS:**
  Number of credits registered by inserting coins

- **SERVICE CREDITS:**
  Credits registered by the SERVICE BUTTON

- **TOTAL CREDITS:**
  Total number of credits (COIN CREDITS + SERVICE CREDITS)

- **TOTAL TIME:**
  The total energized time

```
┌─────────────────────────────────────┐
│         BOOKKEEPING 2/2              │
│                                     │
│   TOTAL PLAY GAMES    xxxxxxxxGAMES  │
│      CONTINUE GAMES   xxxxxxxxGAMES  │
│         P1 GAMES      xxxxxxxxGAMES  │
│         P2 GAMES      xxxxxxxxGAMES  │
│                                     │
│                                     │
│                                     │
│                                     │
│       TEST      :TO EXIT             │
│     SERVICE     :TO OTHER PAGE       │
│                                     │
└─────────────────────────────────────┘
```

On page (2/2), each play frequency is displayed. When setting difficulty levels, the frequency can be referred to as a standard.

- **P1 GAMES:**
  Games played on 1P side.

- **P2 GAMES:**
  Games played on 2P side.

FIG. 8. 3b BOOKKEEPING(2/2)

8-4 GAME ASSIGNMENTS

Selecting the GAME ASSIGNMENTS in the menu mode causes the present game setting to be displayed and also the game setting changes can be made. Each item displays the following content.

SETTING CHANGE PROCEDURE

NOTE: The setting can not be changed until "EXIT." When the setting is changed, be sure to "EXIT."

① Press the SERVICE BUTTON to move the arrow ">>" to the desired item.

② Choose the desired setting change item by using the TEST BUTTON.

③ To return back to the MENU mode, move the arrow to EXIT and press the TEST BUTTON.

```
                GAME  SYSTEM
        ADVERTIZE  SOUND   OFF
        COUNTRY            EXP
        CABINET            U/R
        DIFFICULTY         NORMAL
        LIFE               5
        HUMAN  TYPE        NORMAL
        RELOAD  TYPE       NORMAL
      >>EXIT



            SELECT BY SERVICE BUTTON
               AND PUSH TEST BUTTON
```
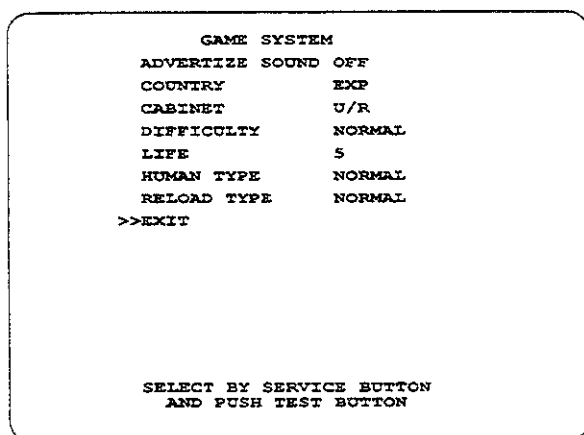
FIG. 8. 4   GAME ASSIGNMENTS

● **ADVERTISE SOUND**
Determines whether ADVERTISE SOUND is to be emitted or not by setting to ON when emitting it and to OFF when not emitting it.

● **COUNTRY**
Message language (select USA for the U.S.A., and EXP for other countries)

● **CABINET**
In this machine, the cabinet is set to "U/R."

● **DIFFICULTY**
The game difficulty levels can be set in 9 steps from EASIEST to HARDEST.

● **LIFE**
This is the number of life points allotted at the time of starting game. Can be set from 1 to 9.

The following two items allow settings to be changed by using DIP SWes on the I/O BOARD. For details, refer to Section 15.

● **HUMAN TYPE**
Setting No. 1 of DIP SW 1 to ON causes the representation of enemy characters to be a robot type, and to OFF causes it to be a human type (NORMAL).
With a robot type expression, the character's surface quality being a metallic type causes sparks at the impact area of his body.

● **RELOAD TYPE**
Setting No. 2 of DIP SW 1 to ON allows for AUTOMATIC reload, and to OFF for NORMAL reload by pointing outside the screen and pulling the trigger.
With the AUTOMATIC reload, keep your finger off the trigger for a certain period of time to automatically reload. Changing the setting to OFF causes the reloading explanations to change accordingly in the advertise mode.

8-5 COIN ASSIGNMENTS

The "COIN ASSIGNMENTS" mode permits you to set the start number of credits, as well as the basic numbers of coins and credits. This mode expresses "how many coins correspond to how many credits."

> ### SETTING CHANGE PROCEDURE

NOTE: The setting can not be changed until "EXIT." When the setting is changed, be sure to "EXIT."

① Press the SERVICE BUTTON to move the arrow ">>" to the desired item.

② Choose the desired setting change item by using the TEST BUTTON.

③ To return back to the MENU mode, move the arrow to EXIT and press the TEST BUTTON.

```
            COIN ASSIGNMENT
COIN CHUTE TYPE          COMMON

CREDIT TO START         1CREDIT(S)
CREDIT TO CONTINUE      1CREDIT(S)

COIN/CREDIT SETTING  #1

        CHUTE #1    1COIN   1CREDIT



        CHUTE #2    1COIN   1CREDIT



EXIT


        SELECT BY SERVICE BUTTON
        AND PUSH TEST BUTTON
```

FIG. 8.5 COIN ASSIGNMENTS

● **COIN CHUTE TYPE**
Sets the combination of the number of COIN CHUTEs and the number of players as applicable. In the case that the COIN CHUTE is changed, be sure the setting is made in a manner meeting the replaced coin chute.

INDIVIDUAL :
Each player uses a coin chute which accepts coins independently.

COMMON :
Coins are accepted in common for both players.

● **CREDIT TO START**
Number of credits required for starting game (1～5 credits are selected.)

● **CREDIT TO CONTINUE**
Number of credits required for continuing game (1～5 credits are selected.)

● **COIN/CREDIT SETTING**
Sets the CREDIT increase increment per coin insertion. There are 26 settings from #1 to #26, expressed in ◯◯ CREDIT as against ◯◯ COINS inserted. (TABLE 8.2, 8.3) #26 refers to FREE PLAY.
When the COIN CHUTE TYPE is set to INDIVIDUAL, there are some setting numbers not displayed as indicated in TABLE 8.3.

TABLE 8.2   COIN/CREDIT SETTING (COIN CHUTE COMMON TYPE)

NAME OF SETTING	FUNCTIONING OF COIN CHUTE #1		FUNCTIONING OF COIN CHUTE #2	
SETTING #1	1 COIN	1 CREDIT	1 COIN	1 CREDIT
SETTING #2	1 COIN	1 CREDIT	1 COIN	2 CREDITS
SETTING #3	1 COIN	1 CREDIT	1 COIN	3 CREDITS
SETTING #4	1 COIN	1 CREDIT	1 COIN	4 CREDITS
SETTING #5	1 COIN	1 CREDIT	1 COIN	5 CREDITS
SETTING #6	1 COIN	2 CREDITS	1 COIN	2 CREDITS
SETTING #7	1 COIN	2 CREDITS	1 COIN	5 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	2 COINS	1 CREDIT	1 COIN	1 CREDIT
SETTING #14	2 COINS	1 CREDIT	1 COIN	2 CREDITS
SETTING #15	1 COIN 2 COINS	1 CREDIT 3 CREDITS	1 COIN 2 COINS	1 CREDIT 3 CREDITS
SETTING #16	1 COIN 2 COINS	1 CREDIT 3 CREDITS	1 COIN	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 2 COINS 3 COINS 4 COINS	1 CREDIT 2 CREDITS 3 CREDITS 5 CREDITS	1 COIN 2 COINS 3 COINS 4 COINS	1 CREDIT 2 CREDITS 3 CREDITS 5 CREDITS
SETTING #20	1 COIN 2 COINS 3 COINS 4 COINS	1 CREDIT 2 CREDITS 3 CREDITS 5 CREDITS	1 COIN	5 CREDITS
SETTING #21	3 COINS 5 COINS	1 CREDIT 2 CREDITS	1 COIN	2 CREDITS
SETTING #22	2 COINS 4 COINS 5 COINS	1 CREDIT 2 CREDITS 3 CREDITS	2 COINS 4 COINS 5 COINS	1 CREDIT 2 CREDITS 3 CREDITS
SETTING #23	2 COINS 4 COINS 5 COINS	1 CREDIT 2 CREDITS 3 CREDITS	1 COIN	3 CREDITS
SETTING #24	1 COIN 2 COINS 3 COINS 4 COINS 5 COINS	1 CREDIT 2 CREDITS 3 CREDITS 4 CREDITS 6 CREDITS	1 COIN 2 COINS 3 COINS 4 COINS 5 COINS	1 CREDIT 2 CREDITS 3 CREDITS 4 CREDITS 6 CREDITS
SETTING #25	1 COIN 2 COINS 3 COINS 4 COINS 5 COINS	1 CREDIT 2 CREDITS 3 CREDITS 4 CREDITS 6 CREDITS	1 COIN	6 CREDITS
SETTING #26	FREE PLAY		FREE PLAY	

TABLE 8. 3   COIN/CREDIT SETTING
(COIN CHUTE INDIVIDUAL TYPE)

NAME OF SETTING	FUNCTIONING OF EACH COIN CHUTE		
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	3 COINS	1	CREDIT
	5 COINS	2	CREDITS
SETTING #22	2 COINS	1	CREDIT
	4 COINS	2	CREDITS
	5 COINS	3	CREDITS
SETTING #24	1 COIN	1	CREDIT
	2 COINS	2	CREDITS
	3 COINS	3	CREDITS
	4 COINS	4	CREDITS
	5 COINS	6	CREDITS
SETTING #26	FREE PLAY		

8-6   INPUT TEST

When INPUT TEST is selected, the monitor will show the following, allowing you to watch the status of each switch.
On this screen, periodically check the status of each switch.
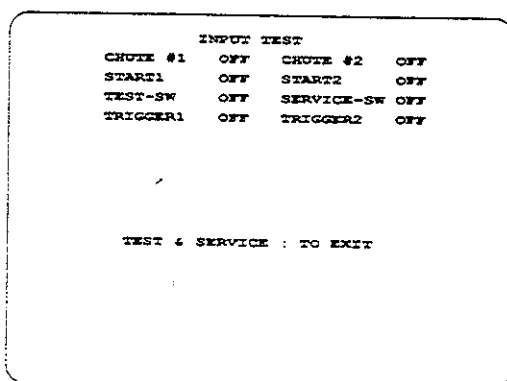
● By pressing each switch, if the display on the right-hand side of the name of each switch changes to ON from OFF, the SW and the wiring connections are satisfactory.

● Open the COIN CHUTE DOOR and insert a coin from the COIN ENTRY to check the COIN CHUTE COIN SW.

In the INPUT test, pressing the test button and the service button simultaneously causes the menu to return back on to the screen.

FIG. 8. 6 INPUT TEST

8-7 OUTPUT TEST

Choose OUTPUT TEST to cause the following topmost screen to appear. In this test, periodically adjust the monitor and check the status of each lamp.
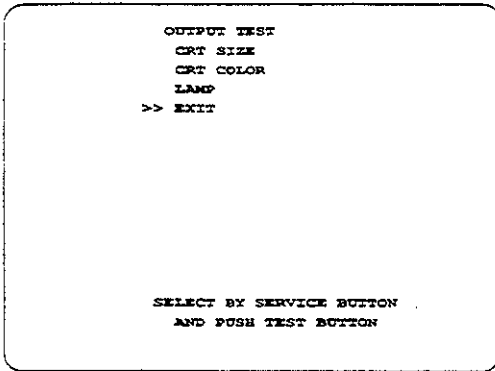
The FIG. at the left shows the menu mode of OUTPUT TEST. Press the SERVICE BUTTON to bring the arrow (>>) to the desired test item.
Press the TEST BUTTON to cause the test mode screen below to appear.
To return back to the menu mode, bring the arrow to EXIT and press the TEST BUTTON (FIG. 8.2).
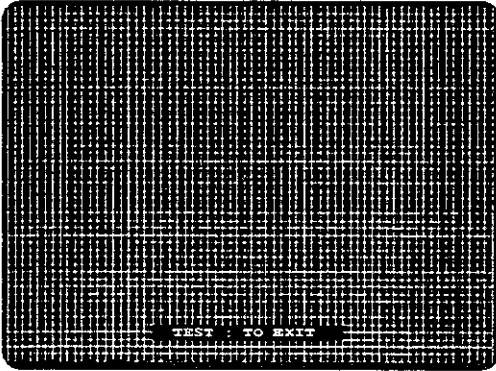
Choose CRT SIZE to cause the screen shown at the left to appear.
Adjust the monitor to make sure that the crosshatch lines do not go beyond the screen size and crosshatch distortion does not occur.
Press the TEST BUTTON to have the above OUTPUT TEST menu return back on to the screen.
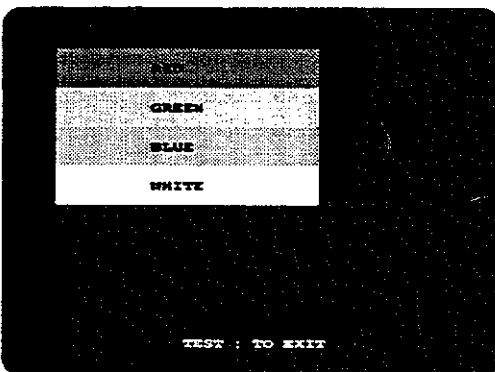
Choose CRT COLOR to cause the screen shown at the left to appear. This test allows the on-screen color adjustment to be performed. The color of a color bar (for each of the 4 colors, i. e., red, green, blue, and white) is darkest at the leftmost end and brightest at the rightmost end.
Press the TEST BUTTON to have the above OUTPUT TEST menu return back on to the screen.

Choose LAMP to cause the screen shown at the left to appear, and both TEST BUTTONs to flash. Press the TEST BUTTON to have the above OUTPUT TEST menu return back on to the screen.

FIG. 8. 7 OUTPUT TEST

8-8 GUN SETTING

Selecting GUN SETTING causes the following screen shown at the top to appear. This allows the controller sighting to be adjusted. Periodically check the sighting adjustment status on this screen.
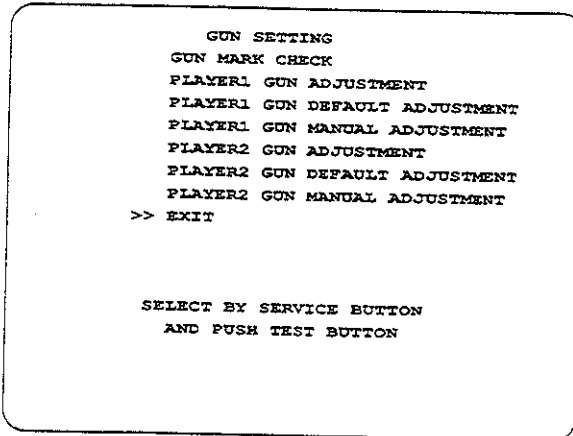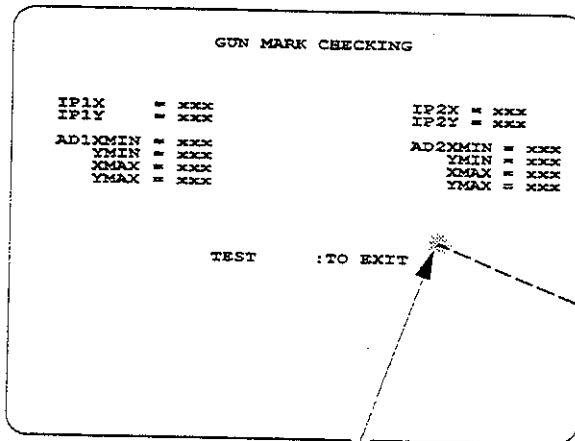
```
              GUN SETTING
          GUN MARK CHECK
        PLAYER1 GUN ADJUSTMENT
        PLAYER1 GUN DEFAULT ADJUSTMENT
        PLAYER1 GUN MANUAL ADJUSTMENT
        PLAYER2 GUN ADJUSTMENT
        PLAYER2 GUN DEFAULT ADJUSTMENT
        PLAYER2 GUN MANUAL ADJUSTMENT
     >> EXIT



          SELECT BY SERVICE BUTTON
          AND PUSH TEST BUTTON
```

FIG. 8.8a SIGHTING ADJUSTMENT MENU

The screen shown at the left is the sighting adjustment menu mode. Press the service button to bring the (>>) arrow to the desired adjustment item to select.
Press the test button to cause the following sighting check screen and sighting adjustment screen to appear. Each of 1P side and 2P side has 3 different kinds of adjustments to be made. Adjustments for both 1P and 2P can not be made on the same screen.
To return back to the menu, bring the arrow to EXIT and press the test button (FIG. 8.2).

```
              GUN MARK CHECKING

        IP1X  = xxx              IP2X = xxx
        IP1Y  = xxx              IP2Y = xxx
        AD1XMIN = xxx            AD2XMIN = xxx
            YMIN = xxx               YMIN = xxx
            XMAX = xxx               XMAX = xxx
            YMAX = xxx               YMAX = xxx


              TEST    :TO EXIT
```

IMPACT MARK

FIG. 8.8b SIGHTING CHECK

Selecting GUN MARK CHECK causes the screen at the left to appear. Point the controller at this screen to have an impact mark appear on the screen. The position of the mark shows the impact point shot by the controller. A blue impact mark applies to the 1P side and a red one to the 2P side. Perform sighting check on this screen.
Press the test button to return back on to the above sighting adjustment menu screen.

```
          PLAYER1 GUN ADJUSTMENT

    [+] <---PLEASE SHOOT GRID WITH PLAYER1 GUN




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

      PLEASE SHOOT GRID WITH PLAYER1 GUN-->[+]

          TEST : TO EXIT
```
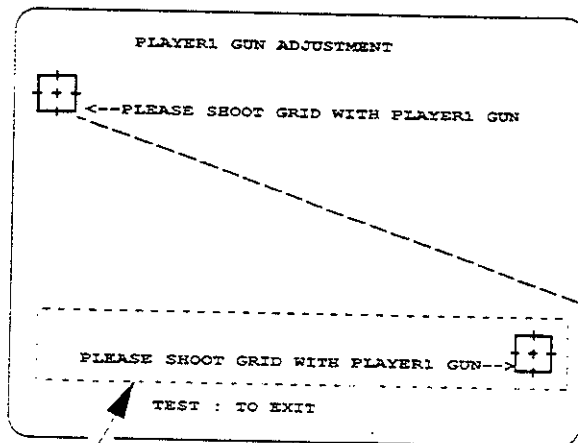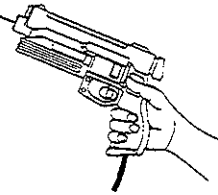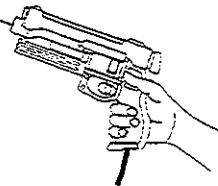
This appears if the upper left grid is hit.

FIG. 8.8c SIGHTING ADJUSTMENT

Selecting PLAYER 1 GUN ADJUSTMENT causes the screen shown at the left to be displayed. 1P side sighting adjustment can be made on this screen. If the test button is pressed, the sighting adjustment menu returns back on to the screen without performing anything.
Adjustment procedure: First shoot at the center of the grid (the square mark at the upper left portion of the screen). This causes another grid to appear at the lower right portion of the screen. Shoot at this grid also. (To be continued.)

```
                GUN MARK CHECKING




                ⚡


           TEST OR PLAYER1_START  :  TO MEMORIZE
           SERVICE OR PLAYER2_START  :  TO CANCEL
```
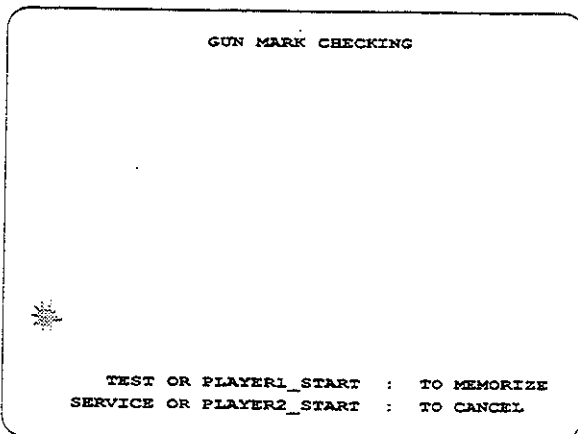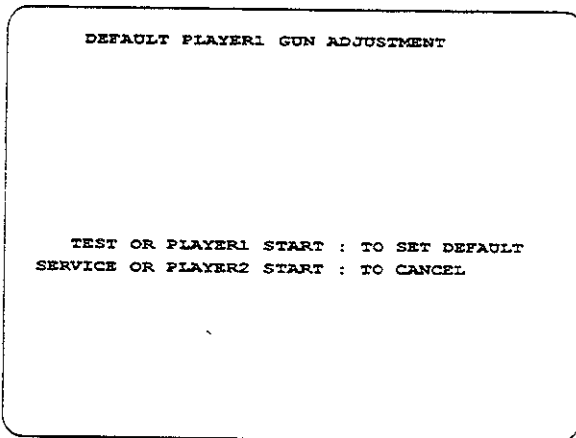
FIG. 8.8d SIGHTING ADJUSTMENT SELECTION

After shooting at the 2 grids, the screen shown at the left appears. In this screen, choose if the adjustment made is satisfactory or not. Pointing the controller at the screen causes the impact mark to be displayed. The mark shows the shot impact position.
If the adjustment is satisfactory, press the test button or 1P side start button. For readjustment, press the service button or 2P side start button.

```
           DEFAULT PLAYER1 GUN ADJUSTMENT




         TEST OR PLAYER1 START  :  TO SET DEFAULT
         SERVICE OR PLAYER2 START  :  TO CANCEL
```

FIG. 8.8e SIGHTING ADJUSTMENT

Choosing PLAYER 1 GUN DEFAULT ADJUSTMENT causes the screen shown at the left to be displayed. The sighting is reset to the initial setting made at the time of shipment from the factory.
However, due to some changes in the unit's environment and cabinet after shipment, sighting may not be always accurate. To reset to the initial setting, press the test button or 1P side start button. To return back on to the sighting adjustment menu without doing anything, press the service button or 2P side start button.

```
            PLAYER1 GUN MANUAL ADJUSTMENT


     ADXMIN = xxx
     ADYMIN = xxx
     ADXMAX = xxx
     ADYMAX = xxx
  >> EXIT



            SELECT BY SERVICE BUTTON
            PLAYER1 START  :  DECREASE
            PLAYER2 START  :  INCREASE
```
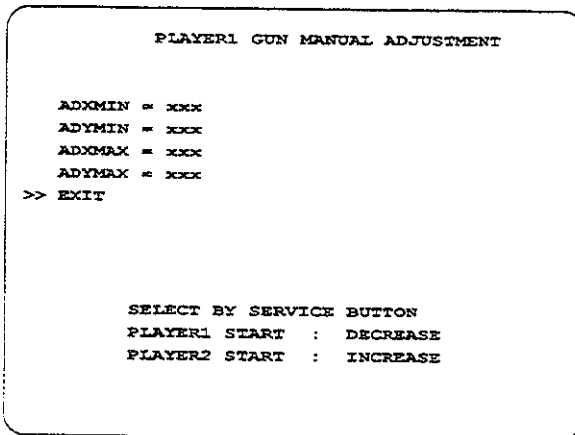
FIG. 8.8f SIGHTING ADJUSTMENT

Select PLAYER GUN MANUAL ADJUSTMENT to cause the screen shown at the left to be displayed. In this screen, the 4 adjustment values which determine sighting can directly be set. Use this adjustment mode only when accurate sighting can not be achieved in the above 2 screens. When setting each of the 4 adjustment values, follow the procedure below: Be sure to shoot at the screen's end portion in the designated direction and determine the adjustment value by paying attention to the impact mark movement.

ADXMIN = xxx

Determines the adjustment value of the left-hand end in the horizontal direction. By pointing the controller at the screen's left-hand end,bring the impact mark to the left end of the screen. While pointing at the screen's left-hand end, pressing the left and right start buttons to change the adjustment value causes the impact mark to move left and right. Make adjustments in a manner so that the impact mark is at an appropriate position. At this time, disregard vertical directions.

ADYMIN = xxx

Determines the adjustment value of the screen's upper end in the vertical direction. Point the controller at the screen's upper end to bring the impact mark to the screen's upper end. While pointing at the screen's upper end, changing the adjustment value by pressing the left and right start buttons causes the impact mark to move up and down. Make adjustments in a manner so that the impact mark is at an appropriate position. At this time, disregard horizontal directions.
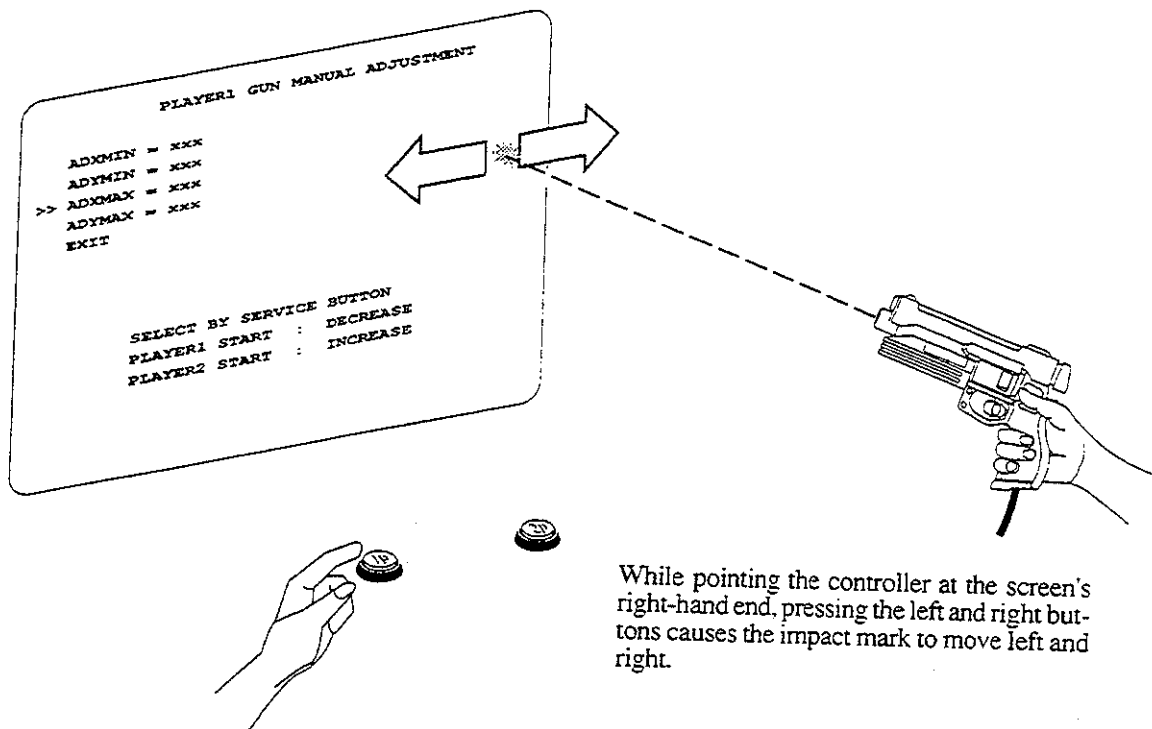
FIG. 8.8g SIGHTING ADJUSTMENT (in the case of ADXMAX)

While pointing the controller at the screen's right-hand end, pressing the left and right buttons causes the impact mark to move left and right.

ADXMAX = xxx

Determines the adjustment value of the screen's right-hand end in the horizontal direction. Point the controller at the screen's right-hand end to bring the impact mark to the screen's right-hand end. While pointing at the screen's right-hand end, changing the adjustment value by pressing the left and right hand start buttons causes the impact mark to move left and right. Make adjustments in a manner so that the impact mark is at an appropriate position. At this time, disregard vertical directions.

ADYMAX = xxx

Determines the adjustment value of the screen's lower end in the vertical direction. Point the controller at the screen's lower end to bring the impact mark to the screen's lower end. While pointing at the lower end, changing the adjustment value by pressing the left and right start buttons causes the impact mark to move up and down. Make adjustments in a manner so that the impact mark is at an appropriate position. At this time, disregard horizontal directions.

Choosing PLAYER 2 GUN ADJUSTMENT causes 2P side sighting adjustment screen to be displayed. How to operate is the same as for 1P side.

Choosing PLAYER 2 GUN DEFAULT ADJUSTMENT causes 2P side sighting to be reset to the initial setting. How to operate is the same as for 1P side.

Choosing PLAYER 2 GUN MANUAL ADJUSTMENT causes the screen to adjust the 4 adjustment values for 2P side to appear. How to operate is the same as for 1P side.

8-9 SOUND TEST

```
         SOUND TEST
           AUTO
           SE1
           SE2
           SE3
           SE4
           SE5
           SE6
           SE7
           BGM

        >>  EXIT

     SELECT BY SERVICE BUTTON
     AND PUSH TEST BUTTON
```
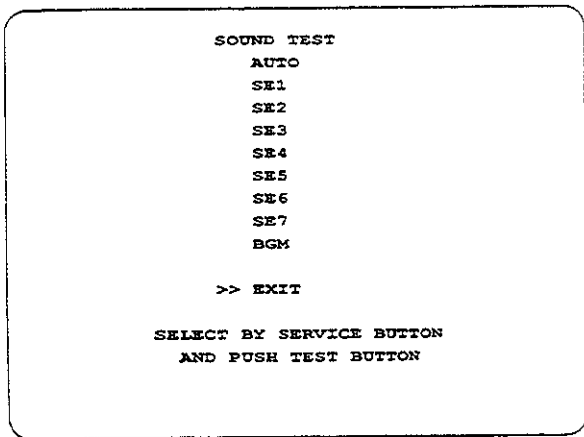
FIG. 8.9 SOUND TEST

This enables sounds used in the game to be checked. Sound related memory and each speaker are checked. Press the service button to bring the arrow (>>) to the desired sound item to be tested. Pressing the test button causes the desired sound test screen to appear.
Bring the arrow to EXIT and press the test button to return back on to the menu screen (FIG. 8.2).
In each sound test screen, pressing the service button to bring the arrow (>>) to the desired sound item to be tested and pressing the test button causes the selected sound to be emitted.

● **AUTO:**
Auto play covering from SE1 to BGM.
Bring the arrow to this item and press TEST BUTTON to cause SOUND TEST covering from SE1 to BGM to be automatically and repeatedly performed.

● **SE*:**
Sound effects during game.

● **BGM:**
Background music during game.

8-10 TGP TEST

```
            TGP TEST
      IC. 47    GOOD    GOOD
      IC. 56    GOOD    GOOD
      IC. 60    GOOD    GOOD
      IC. 64    GOOD    GOOD



        TEST  :  TO EXIT
```
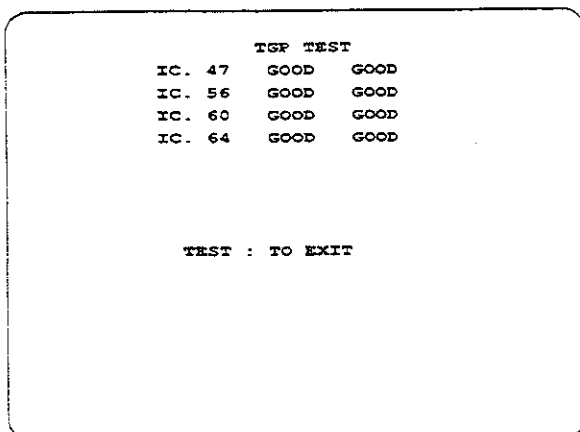
FIG. 8.10 TGP TEST

In this test, TGP (on-screen display related IC) is checked. As shown at the left, if "GOOD" is displayed for all, it is satisfactory. Press TEST BUTTON to return to the menu screen.

8-11 MEMORY TEST

```
       ROM              MEMORY TEST
   IC:   6  GOOD
   IC:   9  GOOD    IC:   7  GOOD       IC:   8  GOOD
   IC:  12  GOOD    IC:  10  GOOD       IC:  11  GOOD
   IC:  15  GOOD    IC:  13  GOOD       IC:  14  GOOD

       RAM
   IC:  45  GOOD    IC:  46  GOOD       IC:  47  GOOD
   IC:  48  GOOD    IC:  49  GOOD       IC:  50  GOOD
   IC:  54  GOOD    IC:  55  GOOD



              TEST  :  TO  EXIT
```

The MEMORY TEST mode is for checking the on-BD memory IC functioning.
"GOOD" is displayed for normal ICs and "BAD" is displayed for abnormal ICs.

FIG. 8. 11 MEMORY TEST

● When the test is completed, if the results are shown as above, it is satisfactory.

● It takes approximately thirty seconds to complete the test. If the period exceeds thirty seconds, this may have been caused by board malfunctioning.

● After finishing the test, pressing the TEST BUTTON allows the MENU mode to return on to the screen.

8-12 BACKUP RAM CLEAR

```
            BACKUP  RAM  CLEAR
                   YES
              >>   NO




         SELECT  BY  SERVICE  BUTTON
          AND  PUSH  TEST  BUTTON
```

Clears the contents of BOOKKEEPING and high score player ranking entry.
When clearing, bring ">>" to "YES" and when not clearing, to "NO", by using the SERVICE BUTTON, and then push the TEST BUTTON.
When the data has been cleared, "COMPLETED" will be displayed. Bring ">>" to "NO" and press the TEST BUTTON to cause the Menu mode to return on to the screen.
Note that the contents of game setting and sighting adjustment are not affected by BACKUP RAM CLEAR operation.

FIG. 8. 12 BACKUP RAM CLEAR

9. CONTROLLER (GUN)

In the cases where the controller's operation is not satisfactory or the controller sight deviates the direction in which the controller is pointed, it is possible that some maintenance may be required (the controller's interior parts may have been damaged). Replace the parts by disassembling the controller in the following procedure: Also, be sure to perform sighting check in the test mode when the controller parts are replaced.

9-1 REPLACING THE MICROSWITCH

① Disassemble the controller.

② Pull out the microswitch from COVER RIGHT.

③ Take out the microswitch by removing the soldering from it.

④ Solder the new microswitch and assemble the controller.
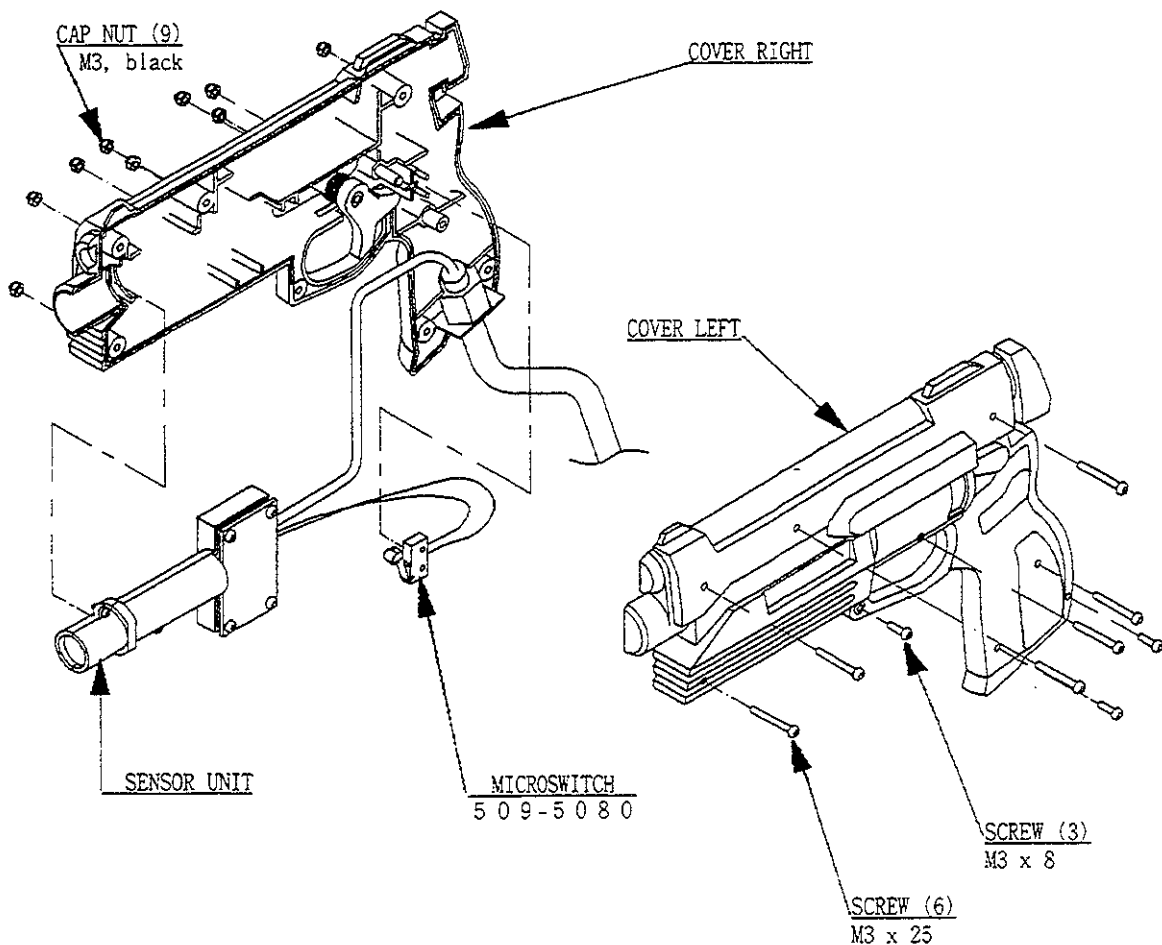
FIG. 9.1

9-2 REPLACING THE SENSOR BOARD

The sensor board fits in between LENS HOLDER L and LENS HOLDER R. Replace the sensor board by disassembling sensor unit in the following procedure:

① Disassemble the controller.

② Remove the sensor unit from COVER R.

③ Take off the 2 tapping screws to remove LENS HOLDER L.

④ Take off the 4 tapping screws and remove the sensor board from LENS HOLDER R.

SENSOR BOARD
839-0717

LENS HOLDER R

CONNECTOR

TAPPING SCREW (4)
3 x 8

LENS HOLDER L

LENS
380-5003

TAPPING SCREW (2)
2.6 x 6
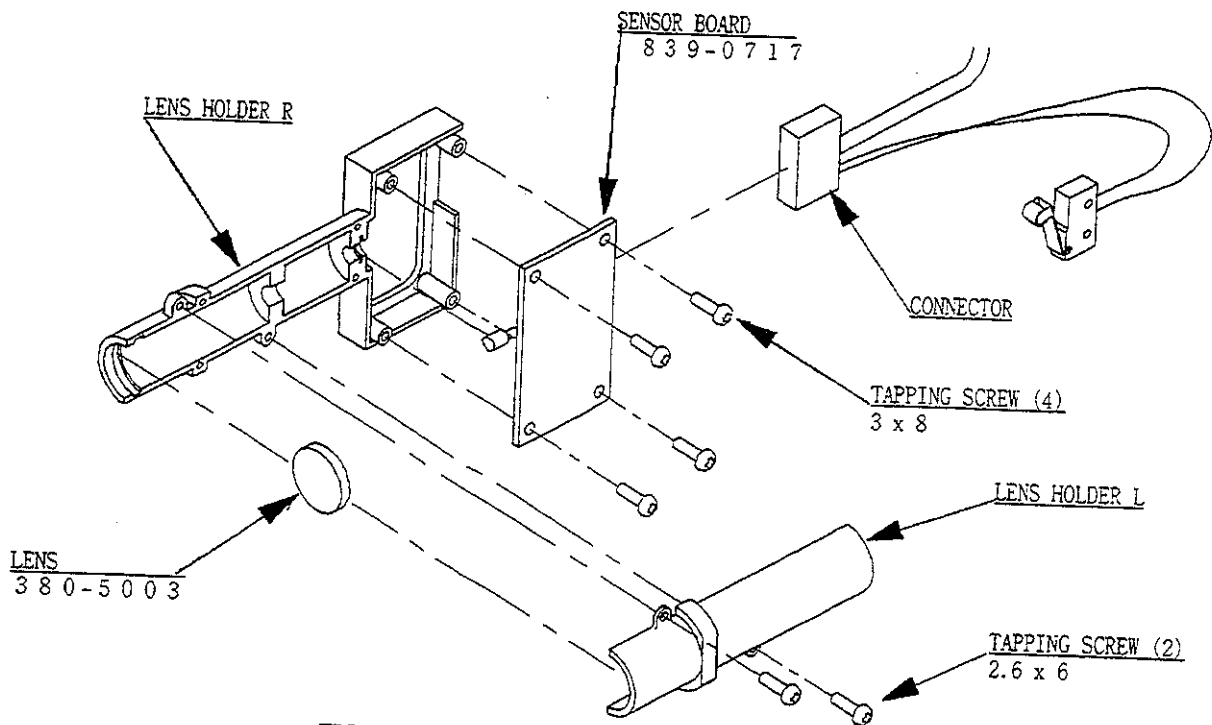
FIG. 9.2

10. COIN SELECTOR

HANDLING THE COIN JAM

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

CLEANING THE COIN SELECTOR

NOTE:

- Absolutely do not apply machine oil, etc. to the coin selector.
- After cleaning the coin selector, insert a regular coin in the normal working status and ascertain that the selector correctly functions.

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

① Turn the power for the machine OFF. Open the coin chute door.

② Open the gate and dust off by using a soft brush (made of wool, etc.).

③ Remove stain by wiping with a soft cloth which contains water or chemical detergent.

④ Remove the CRADLE. When removing the retaining ring(E ring), be very careful so as not to bend the shaft.

⑤ Remove stain from the shaft and pillow portions by wiping off with a soft cloth, etc.

⑥ After wiping off as per 5 above, further apply a dry cloth, etc. to cause the coin selector to dry completely.
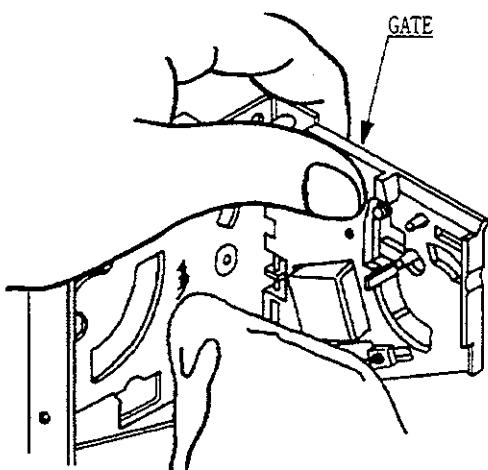
FIG. 10. 1 CLEANING THE COIN SELECTOR   FIG. 10. 2 CLEANING THE COIN SELECTOR
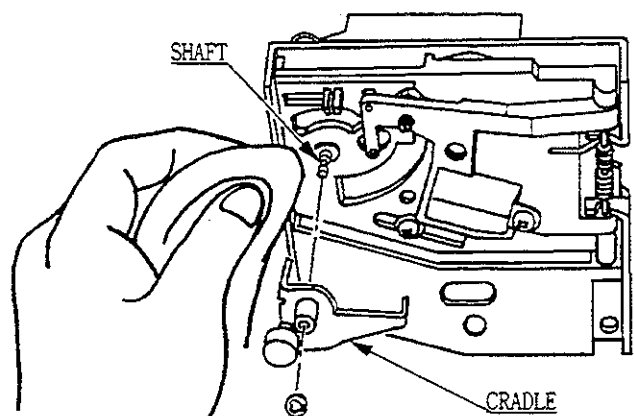
11. MONITOR ADJUSTMENT

WARNING !
- Do not operate the ADJUSTMENT knobs without good reason.
- A certain portion of the monitor is subject to a high voltage and therefore be very careful of this point.
- When making adjustment, utilize a resinous Alignment Screwdriver.

Remove the back door at the rear of the cabinet, and the monitor adjustment knob appears. When cleaning the CRT, be sure to turn the power switch off and then remove the back door.

① Take off the 2 tamperproof screws to remove the back door.

TAMPERPROOF SCREW (2)
M4×30
(OPTIONAL)
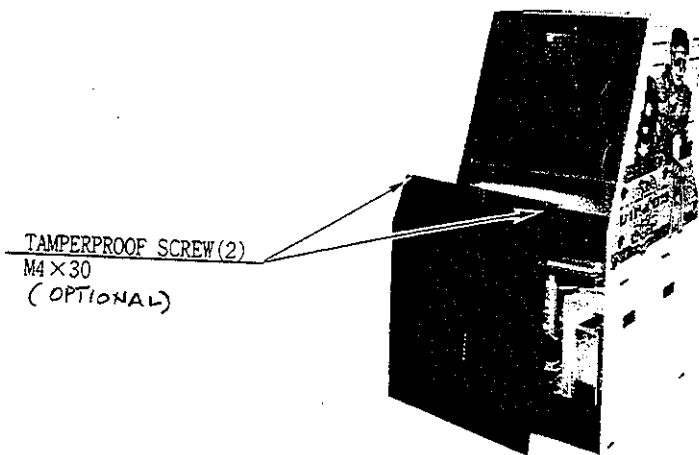
② There are two different manufacturers (NANAO and SANWA) for the 29 INCH MONITORs. Each of the manufacturers has their own adjustment method. Therefore, when making adjustments, ascertain the name of the maker by referring to the part No. below and follow the applicable method.

NANAO monitor: 2 0 0 — 5 2 4 2 — 2 4 — 0 5 (24K mode)

①	②	③	④	11	⑤	⑥	⑦	⑧	⑨	⑩
R-G	G-G	B-G	BRI	S.S	H.S	H.H	H.P	V.S	V.H	V.P
R-GAIN		B-GAIN		SS. SW	H. SIZE		H. POSI		V. HOLD	
	G-GAIN		BRIGHT			H. HOLD		V. SIZE		V. POSI

−29−

SANWA monitor: 2 0 0 — 5 2 4 3 — 2 4 — 0 1 (24K mode)

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
R GAIN	G GAIN	B GAIN	BRIGHT	H SIZE	H HOLD	H POSI	V SIZE	V HOLD	V POSI

① R-GAIN

② G-GAIN .... Controls colors.

③ B-GAIN

④ BRIGHT .... Controls screen brightness.

⑤ H. SIZE .... Controls horizontal screen size.

⑥ H. HOLD .... Provides horizontal synchronization, i.e., controls right/left blurring of image.

⑦ H. POSI .... Controls horizontal display position on screen.

⑧ V. SIZE .... Controls vertical screen size.

⑨ V. HOLD .... Provides vertical synchronization, i.e., controls up-down scrolling of image.

⑩ V. POSI .... Controls vertical display position on screen.

|11| SS. SW .... Controls the visual quality. (Only applies to Nanao.)

         A: Ordinary   B: Super-sharpness

12. REPLACEMENT OF FLUORESCENT LAMP

Replace the fluorescent lamp by taking off the related parts in the following procedure:

① Take off the 3 screws and remove either of BILLBOARD SASH (upper) or BILLBOARD SASH (lower).

② Take out the billboard from the cabinet and replace the fluorescent lamp (20W).
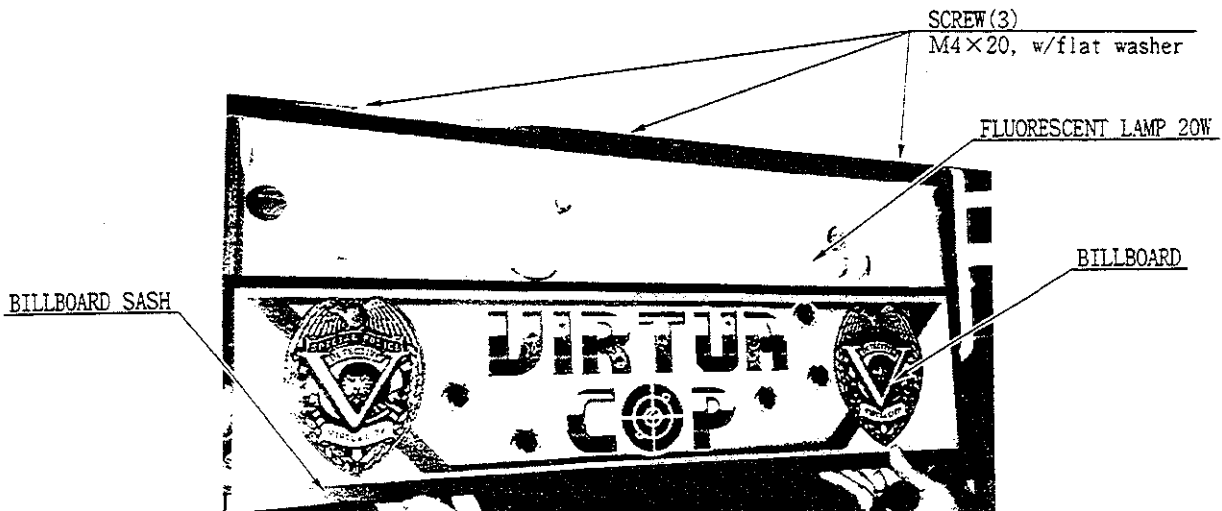
FIG. 12

13. PERIODIC INSPECTION TABLE

The items listed below require periodic check and maintenance to retain the performance of this machine and ensure safe 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	REFERENCE
CONTROLLER	Cleaning	As required	
	Sight check	Weekly	8
	Check SWes.	Monthly	8
COIN SELECTOR	Check COIN SWes.	Monthly	8
	COIN SELECTOR cleaning.	Trimonthly	1 0
MONITOR	C.R.T. cleaning.	Weekly	1 1
	Check adjustments.	Monthly	6、8、1 1
FRONT GLASS, MIRROR	Cleaning	Weekly	See below.
GAME BD	Setting check	Monthly	8

CLEANING THE FRONT GLASS AND MIRROR:

When cleaning, be sure to comply with the following CAUTION and instructions so as to ensure that the front glass and mirror are not damaged.

> **CAUTION !**
> ○ Use alcohol based cleaner (liquid).
> ○ Use a soft cloth.
> ○ When removing an attached large particle of dust (or foreign matter), do not rub with a cloth.

Remove the front glass when cleaning the front glass and mirror. First, remove GLASS HOLDER UPPER only. Then, put your hand through the square hole in the back side of GLASS HOLDER UPPER, and pull the front glass toward you.

GLASS HOLDER UPPER

TRUSS SCREW (3)
M5×16, black
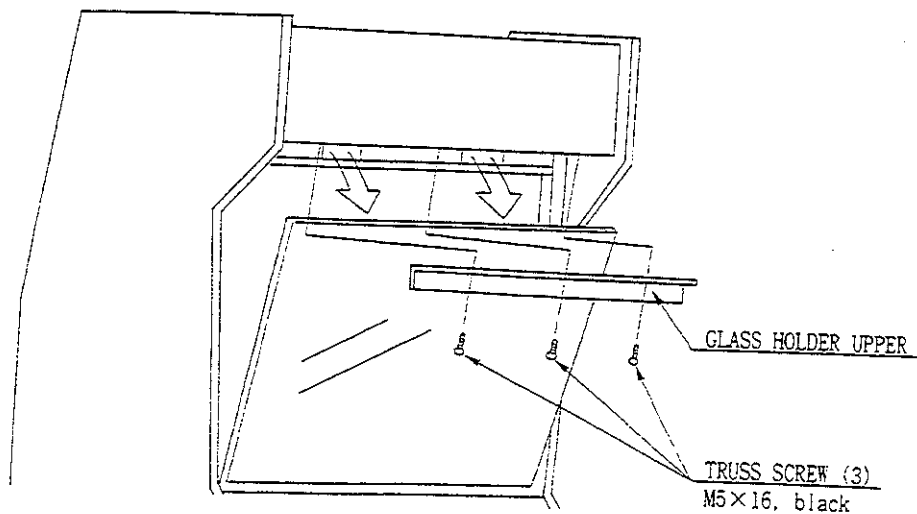
FIG. 13

14. TROUBLESHOOTING

Should trouble occur, first check wiring connector connections.

PROBLEMS	CAUSE	COUNTERMEASURES
With Main SW ON, no activation	Power is not supplied.	Plug in correctly.
	Power supply/voltage is not correct.	Make sure that power supply/voltage is correct.
	Power supply unit fuse is blown due to momentary overload.	First remove the cause of overload, and then replace the power supply unit fuse (See Sec. 8). 514-5036-8000 FUSE ' UL LiSTED 250V 5A
	The SUB POWER SW of the power supply unit is OFF.	Turn it ON. (See Section 8).
The monitor screen sways or shrinks.	The power supply voltage is not correct.	Ensure that the power supply voltage is correct.
No sound is emitted.	Sound volume adjustment is not appropriate.	Adjust sound volume (see Section 8).
	Sound BD and speaker are malfunctioning.	Perform sound test to find and replace defective parts (See Section 8).
Controller operation is not satisfactory.	Due to environmental changes, etc., sighting became inappropriate.	Perform sighting adjustment in the test mode (see Section 8).
	Microswitch malfunctioning.	Replace the microswitch (see Section 9).
	Sensor BD malfunctioning.	Replace the sensor BD. (see Section 9).
The Fluorescent lamp does not light up.	The Fluorescent tube is burnt out.	Replace the Fluorescent tube with an FL 30W tube (refer to Sction 12).

15. GAME BOARD

15-1 REMOVING THE BOARD

To replace the IC Board (such as GAME BD, I/O BD, etc.) or to change DIP SW settings, follow the procedures below:

1. Turn the MAIN SW off
2. Remove the REAR DOOR
3. Locate the shield case located on the right hand side
4. Disconnect all connectors. Label connectors and match them with receptacles so that they can be reconnected correctly.
5. Remove the cover of the shield case
6. Replace boards
7. Reinstalled the cover with the screws provided.
8. Reconnect all connections. Verify that connections are made correctly.
9. Turn the unit back on and verify operation.
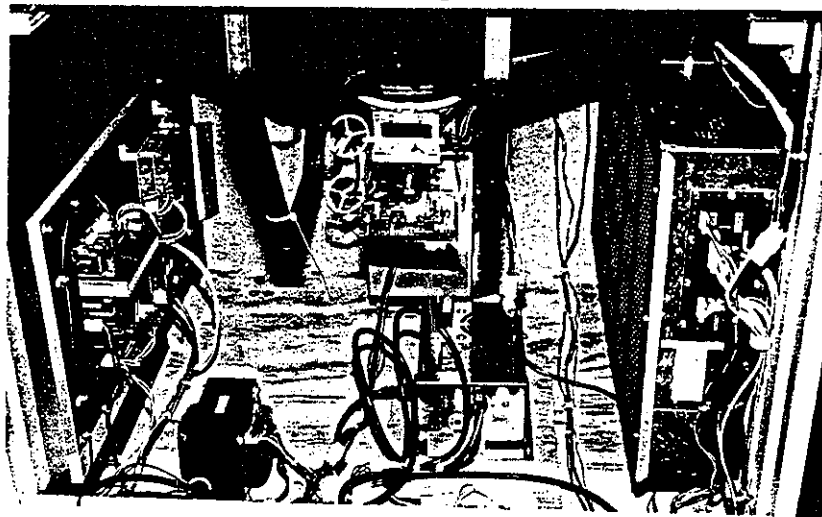
FIG 15-1 REMOVING THE BOARD

15-2 COMPOSITION OF GAME BOARD

When changing enemy characters and the bullet reloading method, use No. 1 and No. 2 of DIP SW 1 out of the 3 DIP SWes on the I/O BD.

> **CAUTION!**
> ● Make sure that, where NOT USED is specified, that particular DIP SW is always is set to OFF.
> ● When changing DIP SW setting, ensure that the power is OFF.

DIP SW 1 SETTING

DIP SW 1		1	2	3 ~ 8
ENEMY CHARACTER	Human type (NORMAL)	OFF		
	Robot type (ROBOT)	ON		
RELOADING	Point outside the screen and pull the trigger (NORMAL).		OFF	NOT USED
	Automatically reloaded (AUTO RELOAD).		ON	

I/O BD VIRTUA COP (837-11130)

SCREW (4)
M3×30, w/flat &
spring washers

SCREW (3)
M3×10, using flat &
spring washers

Except for No. 1 and No. 2 of DIP
SW 1, set all of the switches to
OFF.

DIP SW1
DIP SW2
DIP SW3
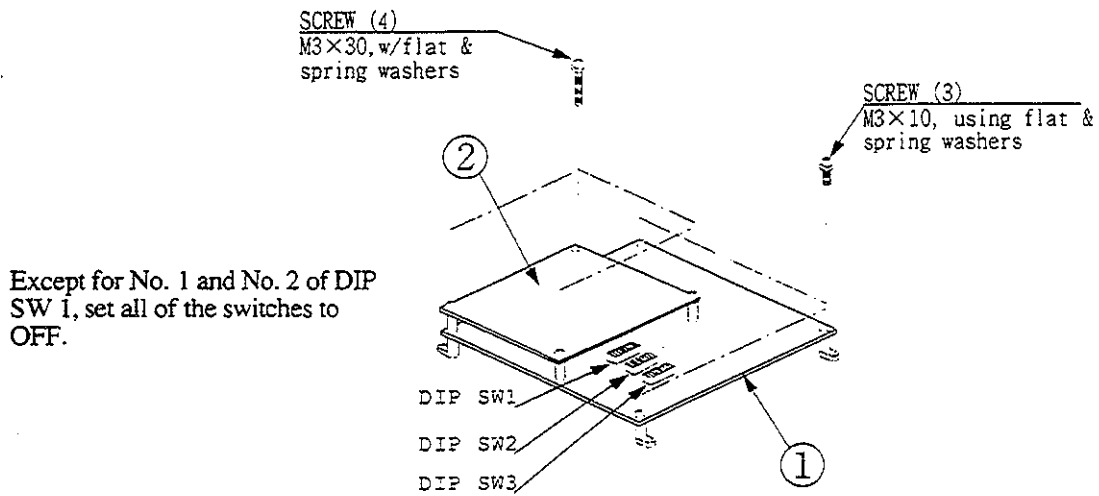
No.	PART No.	DESCRIPTION
1	837-10279-01	I/O BD COM (FULL MOUNT)
	837-10279-04	I/O BD COM (VIRTUA COP)
2	837-11131	I/O OPTION BD COP

GAME BD VIRTUA COP (833-11127)

SCREW(4)
M3×35, using flat &
spring washers

SCREW(7)
M3×75, using flat & spring
washers
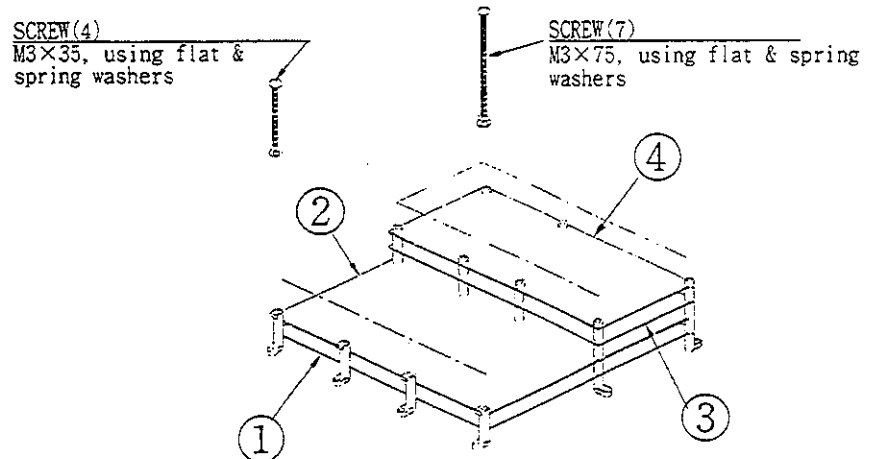
No.	PART No.	DESCRIPTION
1	837-10072-92	CGT VIDEO BD COM
2	837-10071-91-01	CGT CPU BD COM
	837-10071-91-02	CGT CPU BD COM
3	834-11128	ROM BD VIRTUA COP
4	837-5258	DUMMY BD

16. DESIGN RELATED PARTS
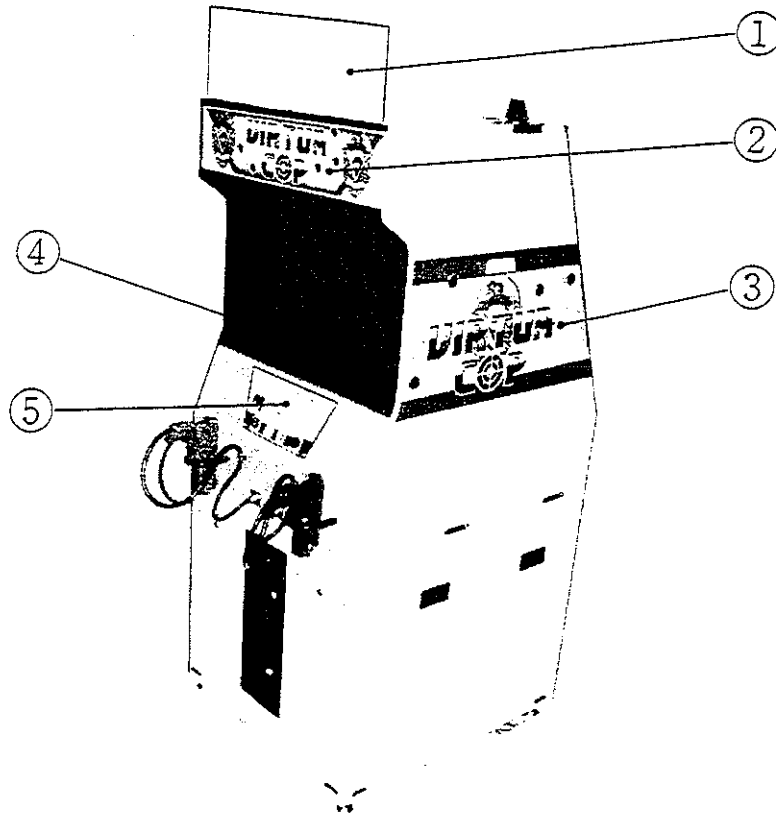
FIG. 16

TABLE 16

No.	Part No.	Description
1	Not used in US version	
2	COP0-1508	MARQUEE U/R
3	COP0-1504	STICKER CABINET RIGHT
4	COP0-1505	STICKER CABINET LEFT
5	999-0351	CONTROL PANEL OVERLAY WITH INSTRUCTIONS

17. PARTS LIST

1 - ASSY CABINET U/R (COP1-10002)
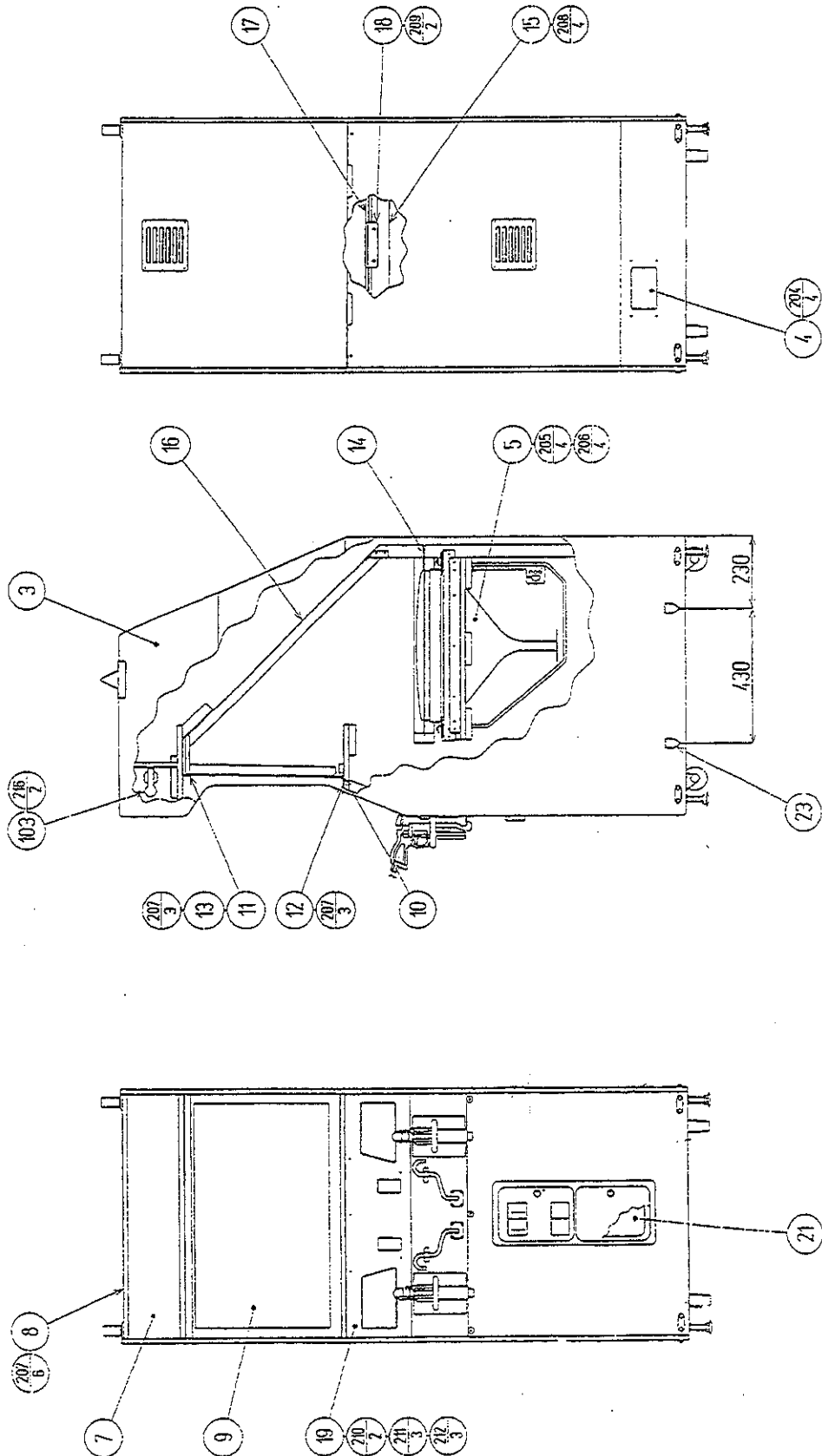
1 - ASSY CABINET U/R (COP1-10002)

ITEM NO.	PART NO.	DESCRIPTION
2	COP1-0210	ASSY SOUND BD U/R
3	COP1-1500	ASSY SUBCABI U/R
4	COP1-1550	AC UNIT
5	2001-5187-15	ASSY MONITOR 26
6	COP1-1580	ASSY WIRE U/R
7	COP0-1508	MARQUEE U/R
8	COP1-1509	MARQUEE SASH
9	COP1-1510	FRONT GLASS
10	AIN1-1032	RUBBER PACKING
11	AIN1-1033	GLASS HOLDER UPPER
12	COP1-1551	GLASS HOLDER LOWER
13	AIN1-1035	CUSHION
14	AIN1-1036	WOODEN MASK
15	AIN1-1044	MIRROR BRACKET
16	AIN1-1038	MIRROR
17	AIN1-1039	MIRROR SASH
18	AIN1-1040	MIRROR HOLDER
19	COP1-2200	ASSY CONT PANEL U/R
21		CASH BOX, LOCAL PURCHASE
103		LAMP ASSY, LOCAL PURCHASE, 20W

2 ASSY SW PANEL (COP-2210)
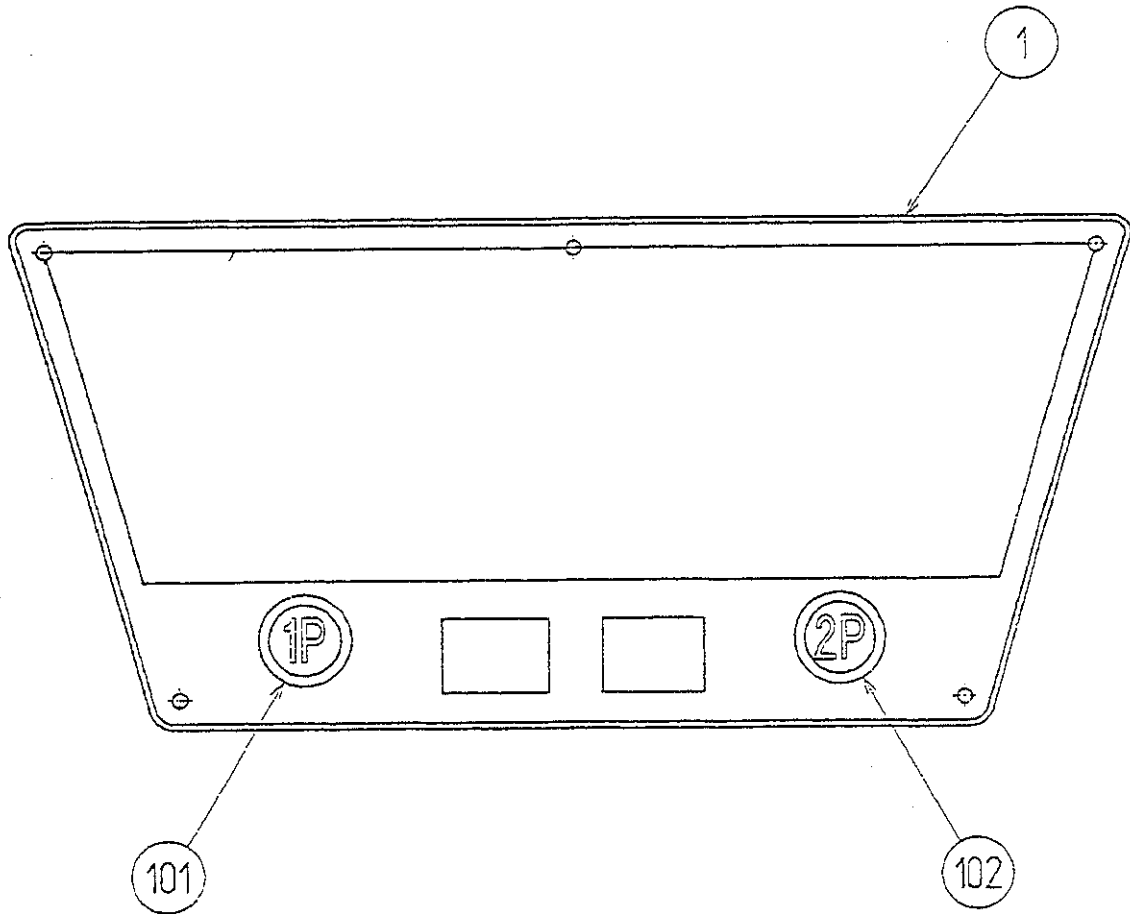
ITEM NO.	PART NO.	DESCRIPTION
1	999-0351	INSTR PLATE U/R
101	54-0006-21-1P	SW PB SMALL ROUND, WHITE 6V #555
102	54-0006-21-2P	SW PB SMALL ROUND WHITE 6V #555
301		WIRE HARN START
302		WIRE HARN START EX

3 ASSY SHIELD CASE U/R (COP-0120)

ITEM NO.	PART NO.	DESCRIPTION	NOTE
1	COP-0121	WOODEN BASE	
2	DYN-2401	SHIELD CASE MAIN & I/O	
3	DYN-2402	CASE LID	
4	DYN-2403	OPTICAL WIRE LID	
5	DYN-2405	FAN BRKT	
6	833-11127	GAME BD VIRTUA COP	
7	837-11130	I/O BD VIRTUA COP	
8	838-10800	CONN BD 1	
9	839-0716	FLT BD COP MAIN	
10	839-0719	FLT BD COP I/O A	
11	839-0658	FILTER BD DAYTONA I/O B	
101	260-0055	FAN MOTOR DC5V	
102	209-0023	CONN CLOSED END	
103	270-5009	LINE FILTER	
105	280-0425	CORD CLAMP ϕ10	
106	280-5009	CORD CLAMP ϕ21	
107	601-0460	PLASTIC TIE BELT 100mm	
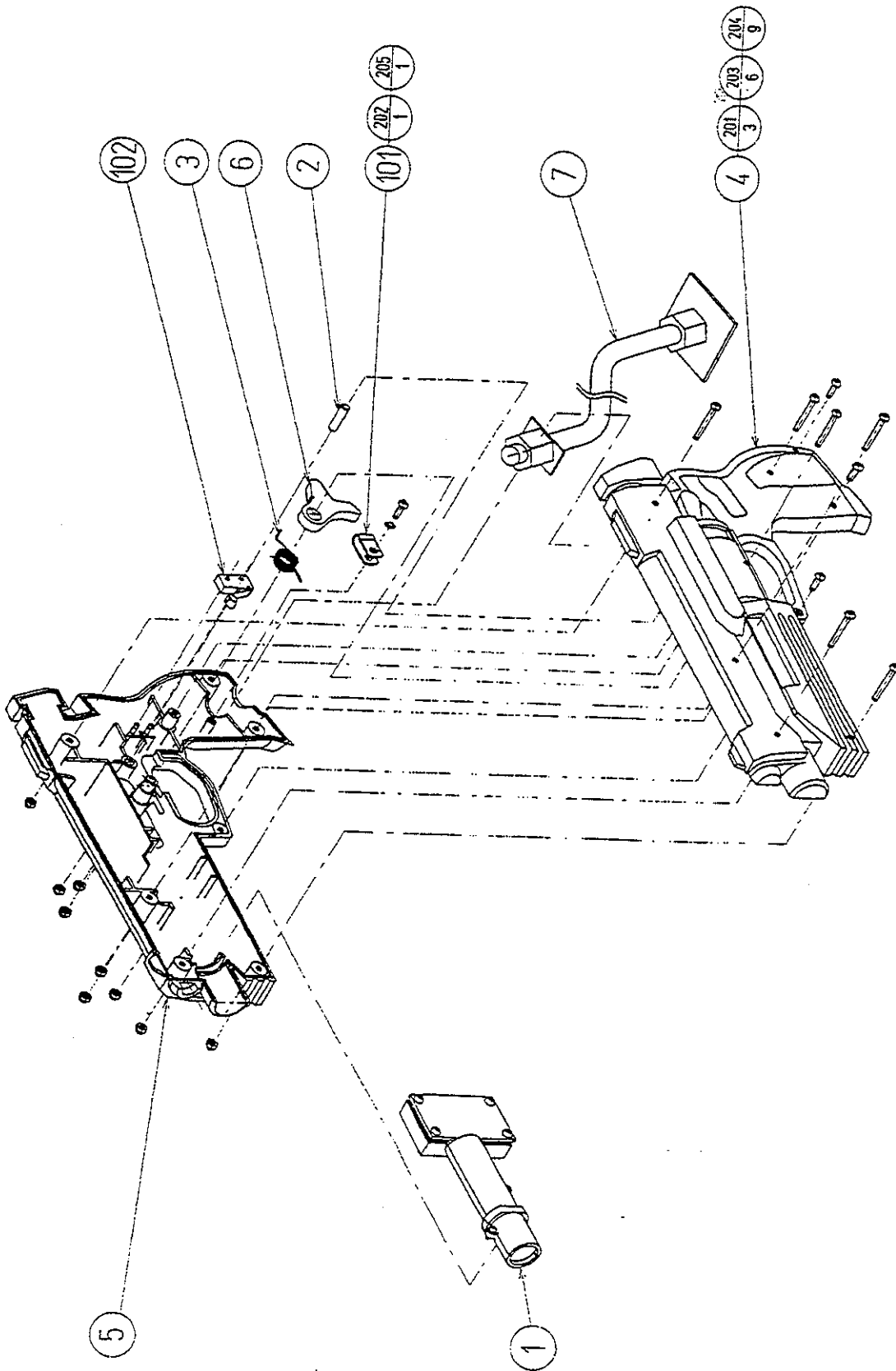
ITEM NO.	PART NO.	DESCRIPTION	NOTE
1	COP-2020	SENSOR UNIT	
2	COP-2005	STOPPER PIN	
3	125-5124	TORSION SPRING	
4	253-5404-01	COVER LEFT BLUE	
5	253-5405-01	COVER RIGHT BLUE	
6	253-5406-01	TRIGGER BLUE	
7	6011-7655-1000	PROTECT TUBE L=1000 WITH WIRE	
8	421-7226-02-91	STICKER B LONG	
101	280-5124-03	NYLON CLAMP NK03	
102	509-5080	SW MICRO TYPE	
201	000-P00308-0B	M SCR PH BLK M3×8	
202	012-P00306	TAP SCR PH 3×6	
203	FAS-000015	M SCR PH BLK M3×25	
204	FAS-500006	CAP NUT TYPE 3 BLK M3	
205	060-F00300	FLT WSHR M3	
301	600-6456-30	WIRE HARN CONTROL UNIT	
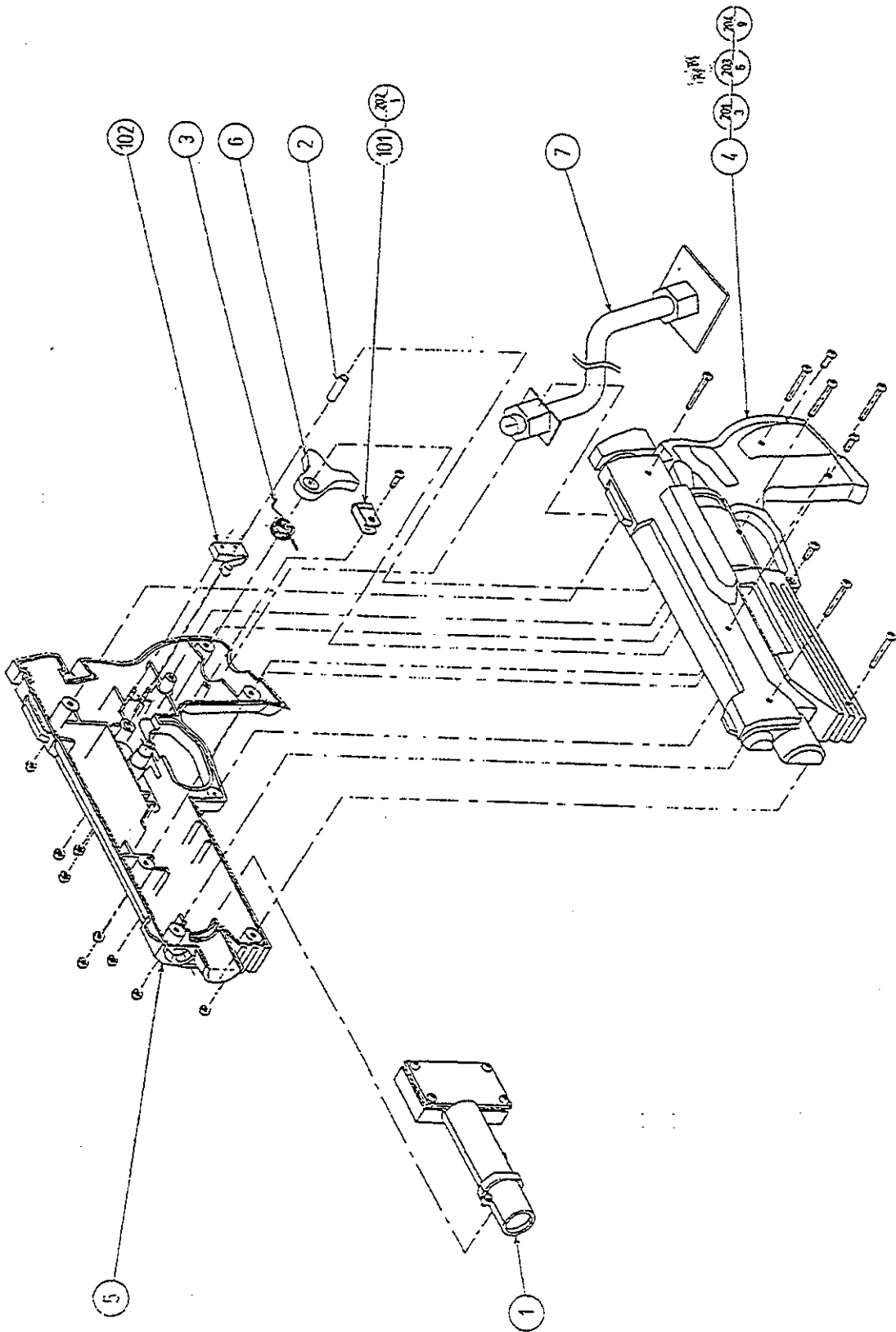
5 CONTROL UNIT (GUN) 2P (COP1-2050)

ITEM NO.	PART NO.	DESCRIPTION	NOTE
1	COP-2020	SENSOR UNIT	
2	COP-2005	STOPPER PIN	
3	125-5124	TORSION SPRING	
4	253-5404-02	COVER LEFT RED	
5	253-5405-02	COVER RIGHT RED	
6	253-5406-02	TRIGGER RED	
7	6011-7655-1000	PROTECT TUBE L=1000 WITH WIRE	
101	280-5124-03	NYLON CLAMP NK03	
102	509-5080	SW MICRO TYPE	
201	000-P00308-0B	M SCR PH BLK M3×8	
202	012-P00306	TAP SCR PH 3×6	
203	FAS-000015	M SCR PH BLK M3×25	
204	FAS-500006	CAP NUT TYPE 3 BLK M3	
301	600-6456-30	WIRE HARN CONTROL UNIT	

6 ASSY SOUND BD U/R (COP-0210)
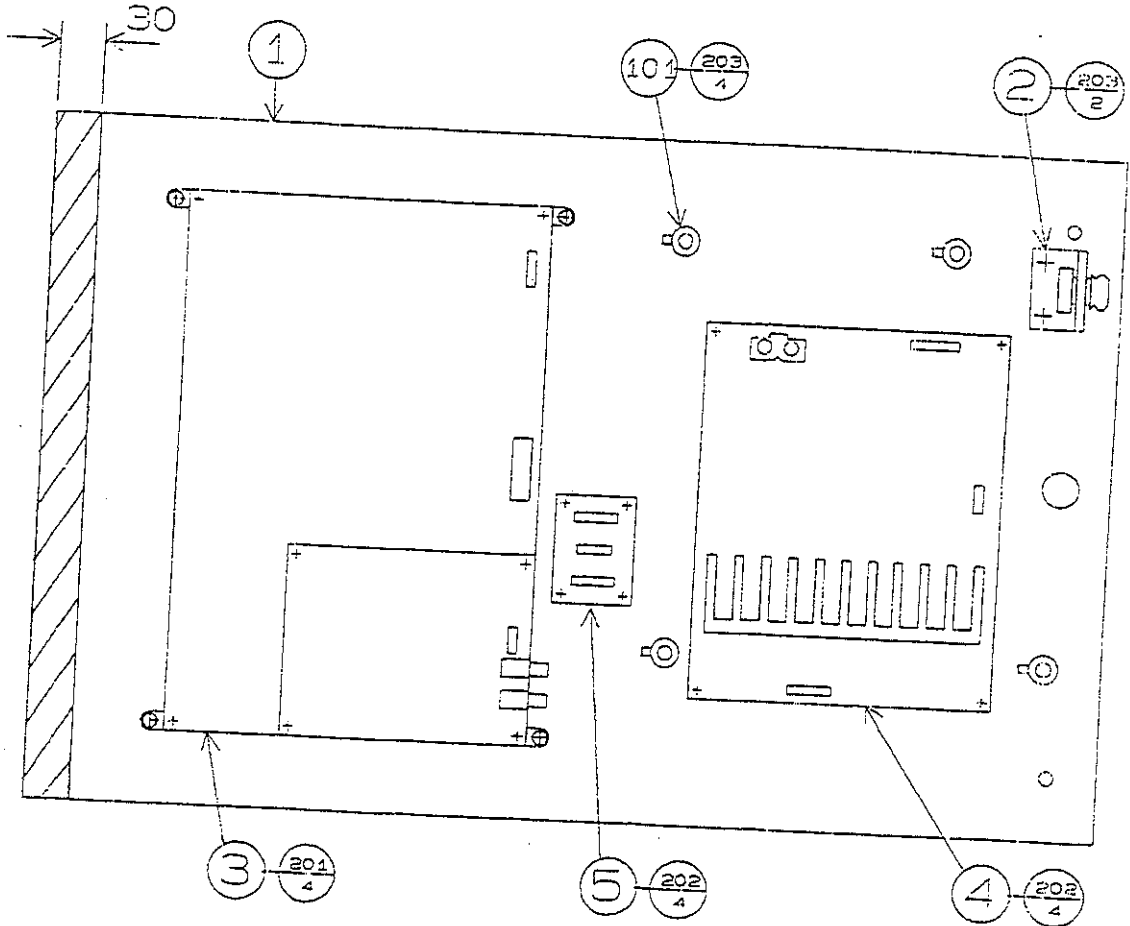
ITEM NO.	PART NO.	DESCRIPTION	NOTE
1	COP-0211	WOODEN BASE	
2	SAC-0201	ASSY VOLUME	
3	837-11129	SOUND BD VIRTUA COP	
4	838-10018-01	AMP BD SERVO (HIGH GAIN)	
5	839-0542	AUDIO MIX BD	

7 - ASSY CONTROL PANEL U/R - (COP1-2200)
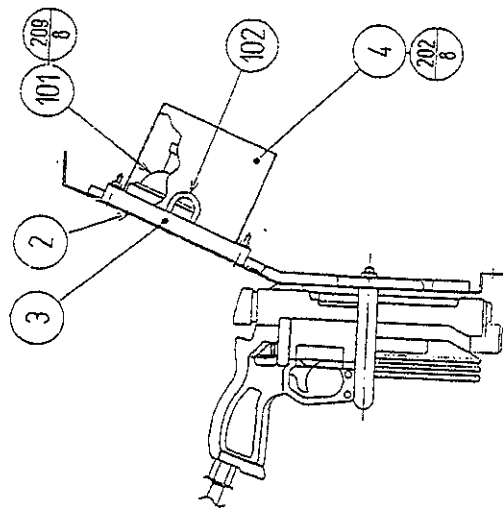
SECTION A-A
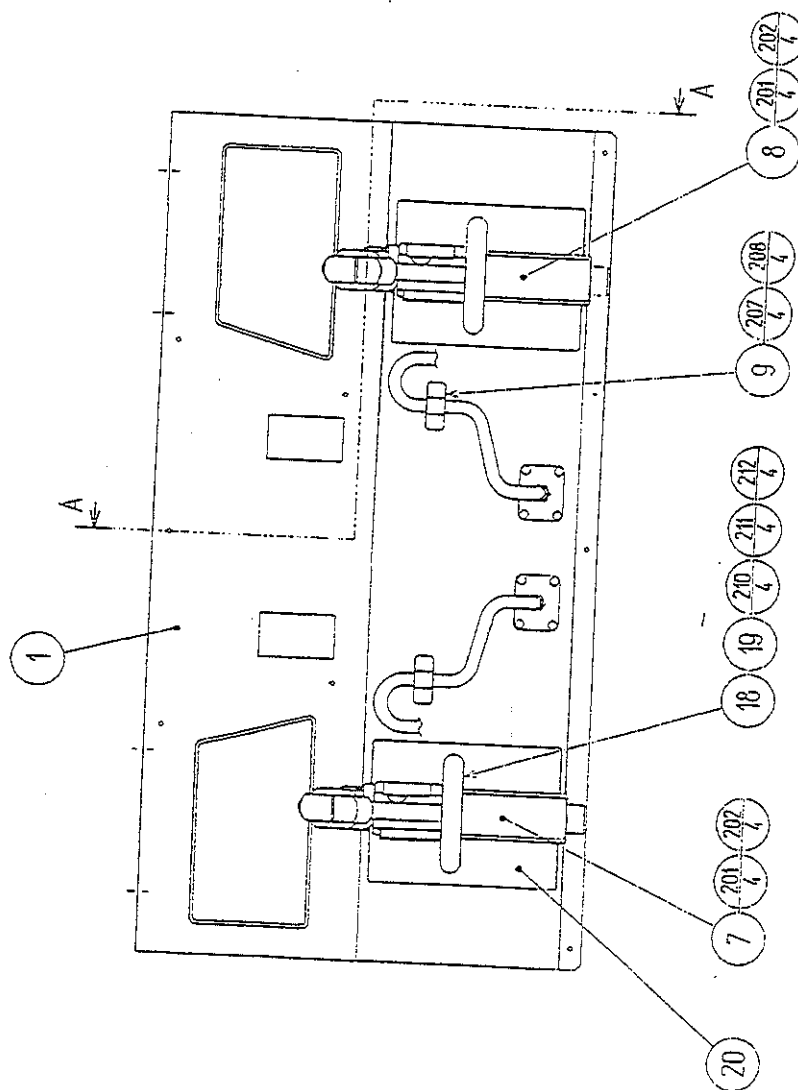
7 - ASSY CONTROL PANEL U/R - (COP1-2200) (Not all numbers correspond to illustration)

ITEM NO.	PART NO.	DESCRIPTION
1	COP1-2201X	CONT PNL BASE
2	COP1-2202	SPEAKER NET
3	COP1-2203	SPEAKER BASE
4	COP1-2204	SPEAKER COVER
7	COP1-2000	CONTROL UNIT 1P
8	COP1-2050	CONTROL UNIT 2P
9	COP1-2135	CABLE CLAMP DX
18	COP1-2207	HOLDER
19	COP1-2208	HOLDER PLATE
20	COP1-2209	PROTECT SHEET
101	130-5064	SPEAKER 8 OHM 10W ϕ100 2WAY
102	601-5525-045	BUSH 1.2t
103	280-5009-01	CORD LAMP 21

8 SENSOR UNIT (COP-2020)
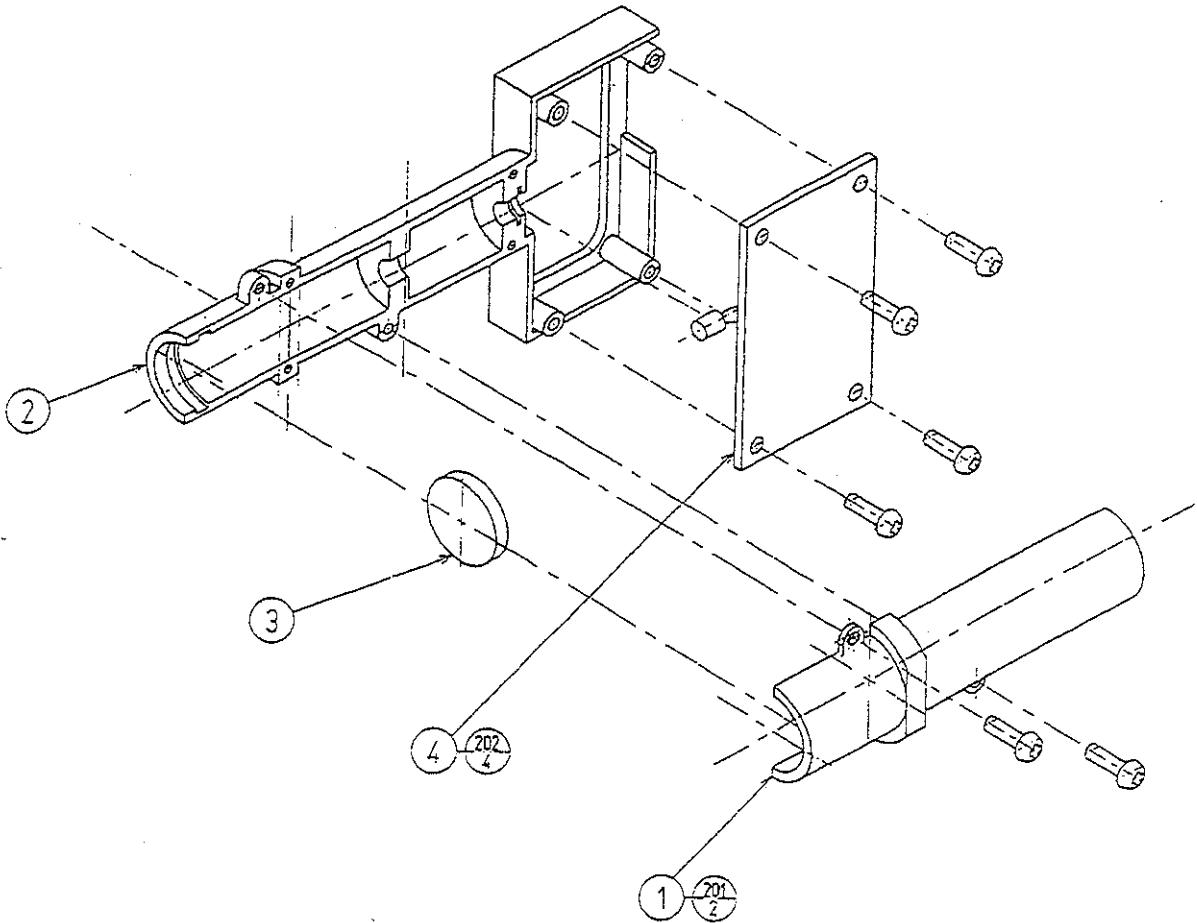
ITEM NO.	PART NO.	DESCRIPTION	NOTE
1	COP-2003	LENS HOLDER L	
2	COP-2004	LENS HOLDER R	
3	380-5003	LENS LP	
4	838-11145	SENSOR BD	
201	012-P02606	TAP SCR PH 2.6×6	
202	012-P00306	TAP SCR PH 3×6	

18. WIRE COLOR CODE TABLE

THE WIRE COLOR CODE is as follow:

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

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

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

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

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

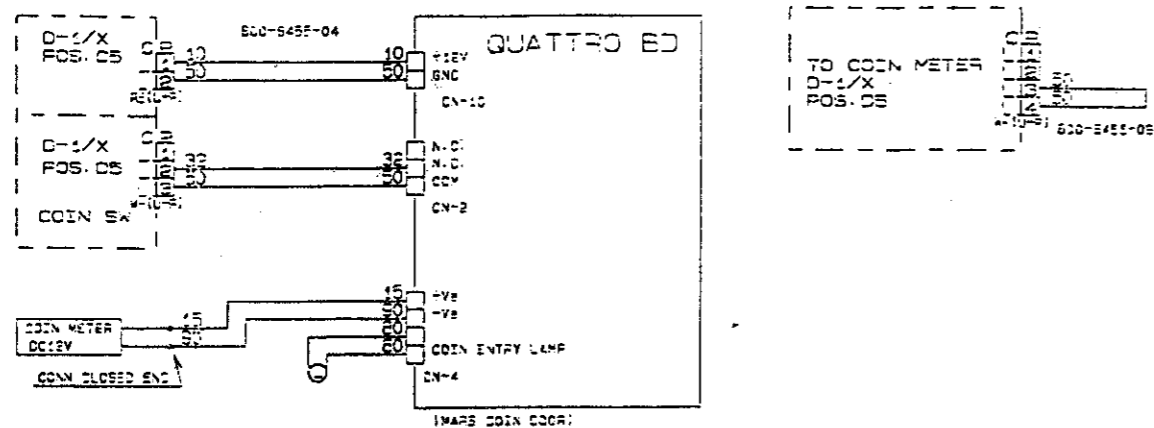<Example> 51 ········· WHITE / RED
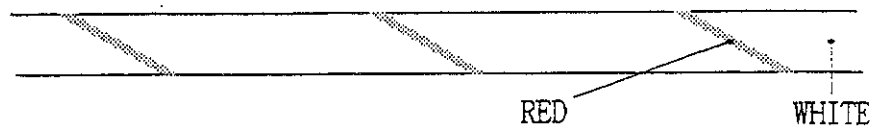
Note 2: The character following the wire color code indicates the size of the wire.

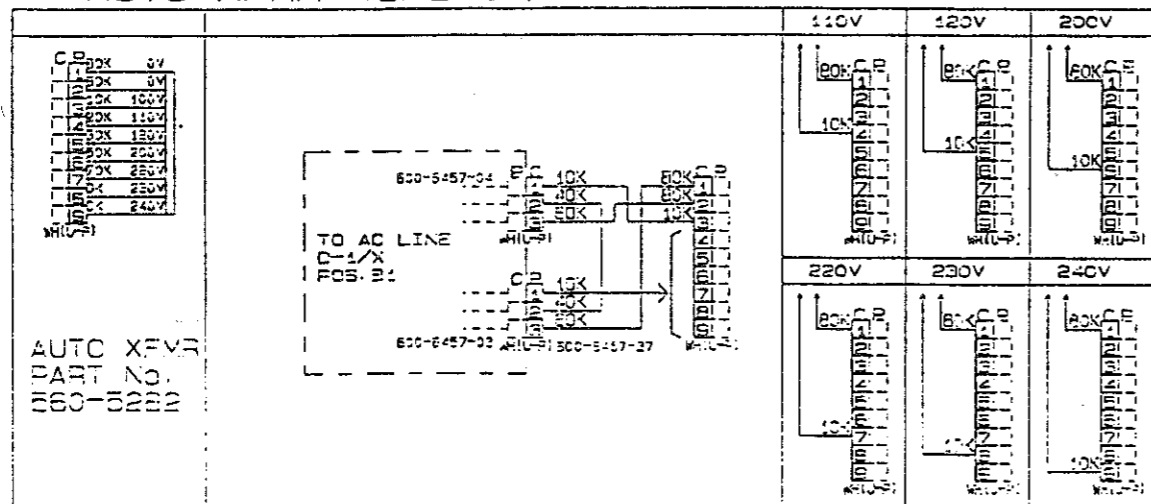| K:	AWG18, UL1015
L:	AWG20, UL1007
None:	AWG22, UL1007
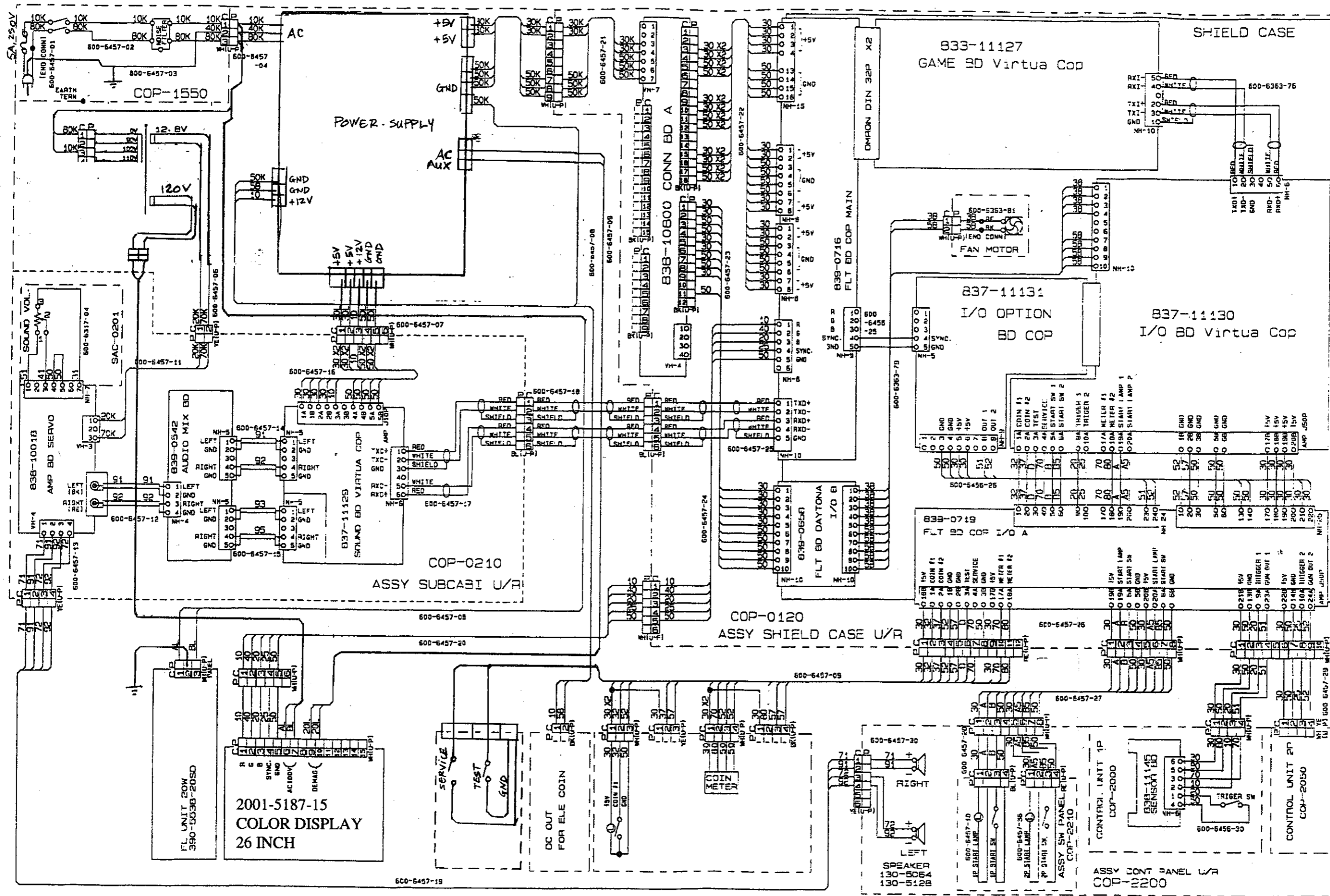
19. WIRING DIAGRAM (D-1/2)

ELECTRICAL COIN CHUTE
FOR EXPORT

QUATTRO BD

MARS COIN CHUTE MS-111

AUTO XFMR WIRING (NOT FOR US VERSION)

AUTO XFMR
PART NO.
560-5222