BULLET MARK

OPERATION
and
SERVICE INFORMATION

SEGA

THE SYMBOL FOR QUALITY ORIENTED ARCADE GAMES

CONTENTS

INTRODUCTION

The Sega Bullet Mark consists of a gun cabinet, T.V. Cabinet, connecting rail, T.V. monitor, printed circuit boards, inner-connected wiring and various circuit components. The T.V. monitor is a Motorola type XM701-10A. T.V. circuit problems can be solved by using standard T.V. trouble-shooting techniques. The Bullet Mark, because of its advanced solid state circuitry, will require very little maintenance other than cleaning, lubricating and T.V. monitor adjustment.

DESCRIPTION:

Four series of targets appear sequentially on a TV screen....balloons, tanks, pirates and jet aircraft. The easiest of the targets to hit are the balloons which are assigned a 7 point rating, followed by the tanks at 15 points, the pirates at 30 points and the jet aircraft at 45 points. For each hit, these points are recorded on a digital read out; for each miss, 1 to 3 points (depending upon the target series) is subtracted from the player's score. Perfect score is 979. When played as a two-player game, a score of 800 (can be adjusted to 600) by either player automatically extends game into an additional balloon series.

Machine guns can be fired in single shot or burst, complete with the recoil effect of the actual gun. Each player has his own set of bullet marks.

SPECIFICATIONS

Power Requirements   —   120 volts   —   60 hertz
       stand by   —   170 watts   —   2 amps
       maximum   —   250 watts   —   3 amps

Dimensions   —   gun cabinet   —   40″ wide x 48 ″ high
               t v. cabinet   —   33″wide x 41 ″ high
               set up   —   40 ″ wide x 10 ′ deep

Net Weight   —   gun cabinet   —   250 lbs.
               t.v. cabinet   —   100 lbs.
               connecting rail —   50 lbs.

Number of Players   —   1 or 2 @ 25 cents per player

Game Time   —   Pre-set at approximately 65 seconds; can be adjusted to a maximum of 140 seconds (see page 8 for adjustment).

Fuses   — 110 V line   —   5 amp
         t.v. monitor   —   1.5 amp
         5 volt   —   5 amp
         6 volt   —   1 amp
         13 volt   —   5 amp
         audio   —   2 amp

Lamps   — No. 0.084A   —   14 Volt
         No. 55   —   6 Volt

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GENERAL SYSTEM DESCRIPTION

The Sega Bullet Mark consists of the following components.

Part Number	Quantity	Description
PT-0321	1	Motor Drive Circuit PCB
PT-0295	1	Oscillator - PCB
PT-0286	2	Switch Unit - PCB
DB-4602	1	Power Amplifier PCB
94360X-P	1	A to D Convertor PCB
PT-0298	1	Power Supply
94396X-P	1	Tone Generator PCB
94359X-P	1	Logic Board PCB
520001	1	Motorola TV Monitor Type XM 701-10A

INSTALLATION INSTRUCTIONS

1. Bullet Mark is contained in 3 cartons:

    a.   TV Cabinet
    b.   Gun Cabinet
    c.   Connecting Rail

2. Remove back door of gun cabinet. Keys are tied to guns. Remove coin box. All install-
    ation hardware, TV keys, and mounting feet are in this box.

3. Install 4 feet on gun cabinet and 4 feet on TV cabinet. Engage only three threads and
    adjust and lock as last item of installation.

4. Remove back door of TV cabinet and remove connecting cables. Doors are tacked with
    4 screws. Extra screws are in coin box in gun cabinet.. It is only necessary to tack back
    door with 4 screws, however, others are provided.

5. Set connecting rail in position in which game is to be located. Either end of rail can be
    used with each cabinet.

6. Push cable bundle through connecting rail from TV end. Cables are tied to help push
    bundle through. Do not thrust cable in channel.

7. Place TV Cabinet on end of rail and loosely inset one bolt into hole in rail, from inside
    of cabinet in bottom. Pull connectors through square holes in bottom and connect to
    matching colors in TV cabinet. Connect the short cable bundle to the TV Chassis.

8. Place gun cabinet on connecting rail and position with one bolt.

9. Pull cable through square hole in bottom of gun cabinet, cut cable ties on end, and con-
    nect to matching colors. There should be eight (8) cables to connect.

10. Install balance of bolts to connect both cabinets to rail and tighten.

11. Position power cord through TV cabinet square hole and out open end of rail.

12. Install both TV and gun cabinet doors.

13. Plug in and turn on power switch located at bottom left side of gun cabinet.

14. IMPORTANT!! A Serial number tag is affixed to the back of the TV cabinet. The same
    serial number is marked inside the gun cabinet on the shelf adjacent to the meter. It is
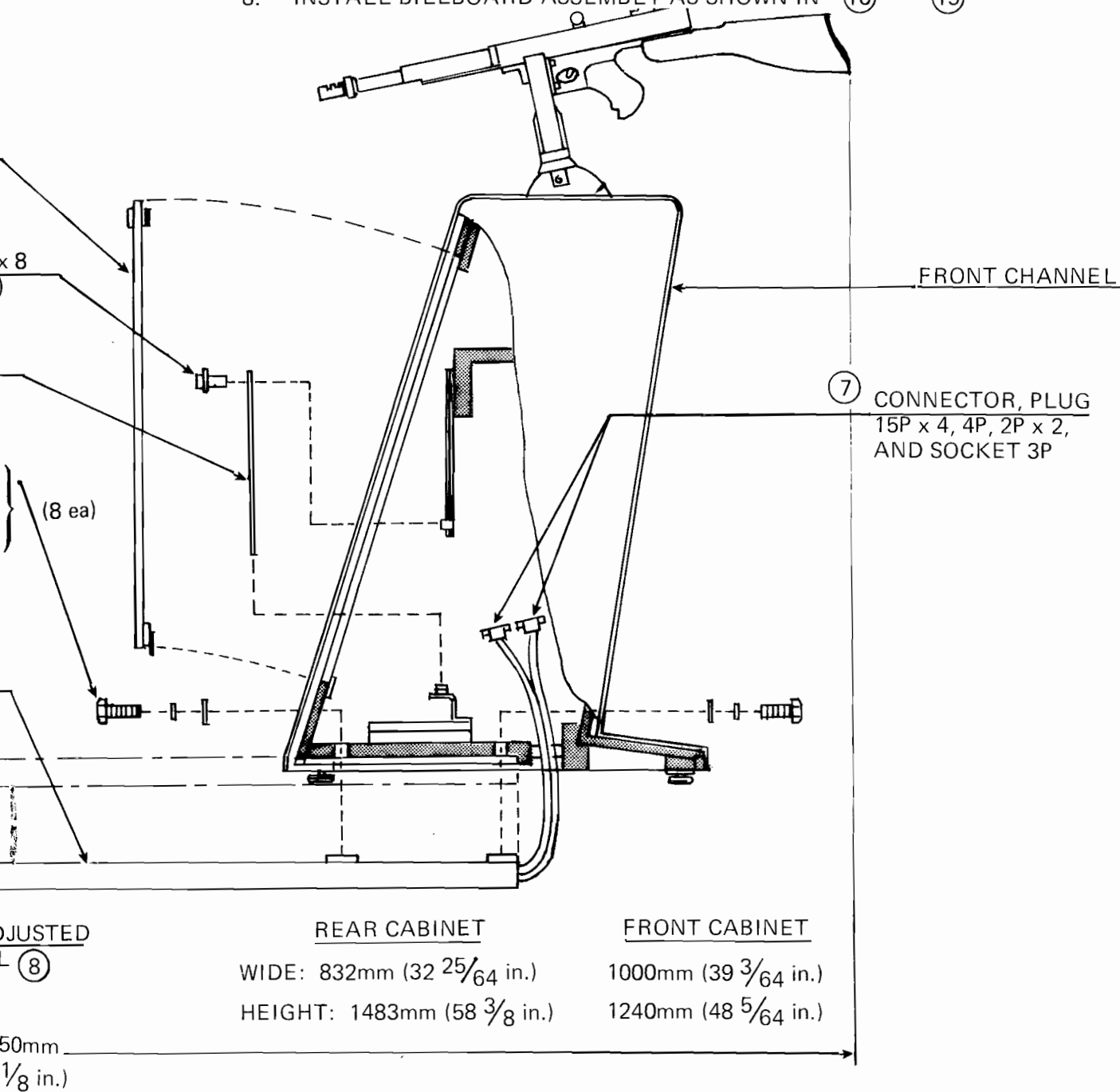   best that the TV Cabinet and Gun Cabinet remain as matched sets.

INST. NO. 276	INSTALLATION INSTRUCTIONS, FOR SEGA BULLET MARK
	HOW TO ASSEMBLE THE BULLET MARK

(14) CARRIAGE BOLT
M5 x 25 (111-717)

SPRING WASHER
M5 (144-090)   (4 ea)

NUT M5 (133-090)

(10) BILLBOARD BACK PLATE
(PT-0347)

(3 in.)
75mm

(13) BILLBOARD BRACKET
(PT-0261) (2 ea)

(11) BILLBOARD
(PT-0346)

WOOD SCREW
3.5 x 13 (122-085) (8 ea)

(3) BACK DOOR
(PT-0327)

(15) REAR CABINET

(4) M. SCREW M4 x 8
(111-887) (2 ea)

(12) BRACKET
(PT-0260) (2 ea)

(5) IC BOARD, A
(94359-P)

(1) M. SCREW M4 x 25
(111-673) (8 ea)

FLAT WASHER
(144-150) (8 ea)

(9) BOLT M8 x 30 (111-327)
FLAT WASHER, M8 (144-054)
SPRING WASHER, M8 (144-132)

(2) BACK BOARD
(PT-0263)

(8) CONNECTING CHANNEL ASS'Y
(PT-0256)

(6) CONNECTOR, SOCKET
15P x 4, 4P, 2P x 2
AND PLUG 3P

LEG ADJUSTERS SHOULD BE ADJUS
TO EXACT HEIGHT OF CHANNEL (8

3250m
(127 1/8

-4A-

ORDER OF ASSEMBLY

1. LOOSEN SCREW ① AND REMOVE BACK BOARD ②
2. REMOVE BACK DOOR
3. LOOSEN SCREW ④ AND REMOVE IC BOARD, A ⑤
4. INSERT WIRE CONNECTORS ⑥ AND ⑦ INTO THE FRONT AND REAR CABINET FROM CHANNEL ASSEMBLY ⑧
5. SECURE CHANNEL ASSEMBLY ⑧ WITH BOLT ⑨
6. CONNECT CONNECTORS ⑥ AND ⑦ TO CONNECTORS IN THE CABINET OF THE SAME COLOR
7. RE-INSTALL ⑤ , ③ AND ②
8. INSTALL BILLBOARD ASSEMBLY AS SHOWN IN ⑩ ~ ⑮

FRONT CHANNEL

⑦ CONNECTOR, PLUG
15P x 4, 4P, 2P x 2,
AND SOCKET 3P

× 8

(8 ea)

JUSTED
⑧

50mm
⅛ in.)

REAR CABINET

WIDE: 832mm (32 25/64 in.)

HEIGHT: 1483mm (58 3/8 in.)

FRONT CABINET

1000mm (39 3/64 in.)

1240mm (48 5/64 in.)

PRINTED CIRCUIT BOARD

Basic Functions and Location

Looking through rear door of gun cabinet:

PT-0321   —   Drives gun motors - upper left side under guns

94396-P   —   Generates tones for hits of targets - lower left side rear

DB-4602   —   Audio power amplifier also supplies power to PT-0295 - lower left side front

PT-0295   —   Generates tones for gunshots and controls sound output - lower left side rear

94360   —   A to D converter, controls signal from gun pots to logic board, upper right side under gun

94359-P   —   Logic Board - largest board centered

Power Supply Board   —   Supplies voltage to all circuits except audio - lower right side

PT-0286   —   Drives scoring segment, target value lights and player up - lower left and right side of television cabinet

HOW TO ADJUST THE BULLET MARK

Adjustment of Gun No. 1

(1) Set Test Switch (Mounted on IC Board, A PT No. 94359-P) to TEST position. Bullet Mark will appear on the screen.

(2) Adjusting the gun sight to the bullet mark.

— Set toggle switch located in bottom of gun cabinet to horizontal position.

Horizontal direction — Adjust VR 5 so the right and left bullet marks are at the extreme. Align bullet marks to the gun sight by means of Control VR 1. (Make adjustment near the center of the screen.)
When proper adjustments cannot be made with VR1 and VR 5, loosen set screw (3) and adjust Horizontal Control (1).

— Set toggle switch in vertical position.
Vertical direction — Adjust VR 6 so the top and bottom bullet marks are the extreme edges. Align bullet marks to the gun sight by means of Control VR 2. (Adjust near center of Screen.)
When proper adjustments cannot be made with VR 2 and VR 6, loosen set screw (4) and adjust Vertical Control (2).
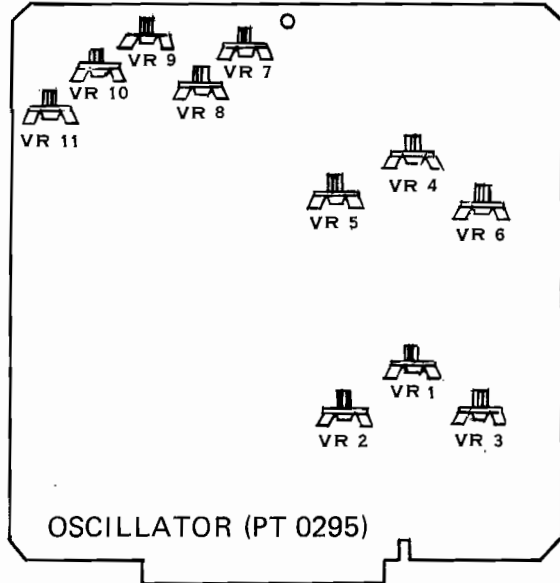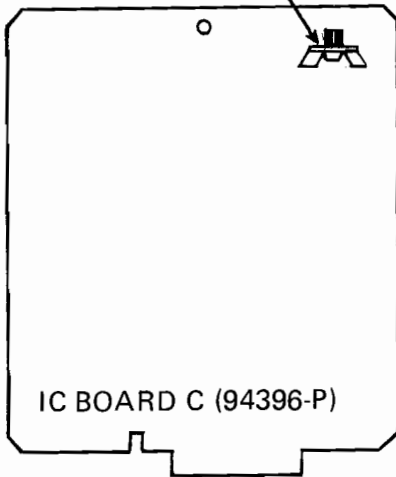
— Adjustment of Gun No. 2

Carry out adjustments in the same sequence as Gun No. 1 but adjust VR 3 and VR 7 for the horizontal bullet marks and VR 4 and VR 8 for the vertical. (3) Return Test Switch to PLAY position.
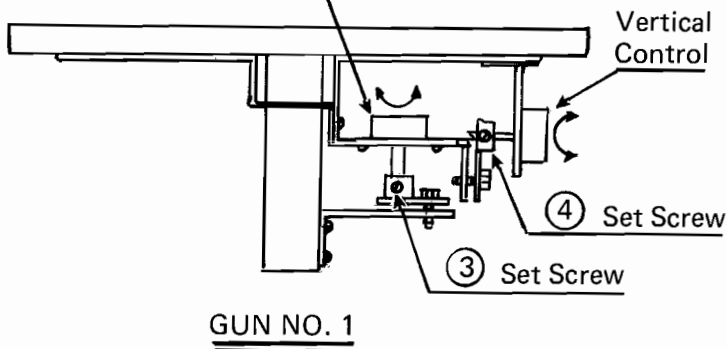
ADJUSTMENT OF VOLUME AND TONE

VR 1	VR 2	VR 3	No. 1 Player Shot Sound Tone
VR 4	VR 5	VR 6	No. 2 Player Shot Sound Tone
VR 7			No. 1, No. 2, Player Shot Sound Volume
VR 8			Balloon Hit Sound Volume
VR 9			Tank (Puma) Hit Sound Volume
VR 10			Pirate Hit Sound Volume
VR 11			Jets (Shark) Hit Sound Volume

HIT SOUND TONE

IC BOARD C (94396-P)

VR 9
VR 7
VR 10
VR 8
VR 11
VR 4
VR 5
VR 6
VR 1
VR 2
VR 3

OSCILLATOR (PT 0295)

Horizontal Control

Vertical Control

④ Set Screw

③ Set Screw

GUN NO. 1

GUN NO. 1   GUN NO. 2

Hrz   Vrt   Hrz   Vrt

VR 5   VR 6   VR 7   VR 8

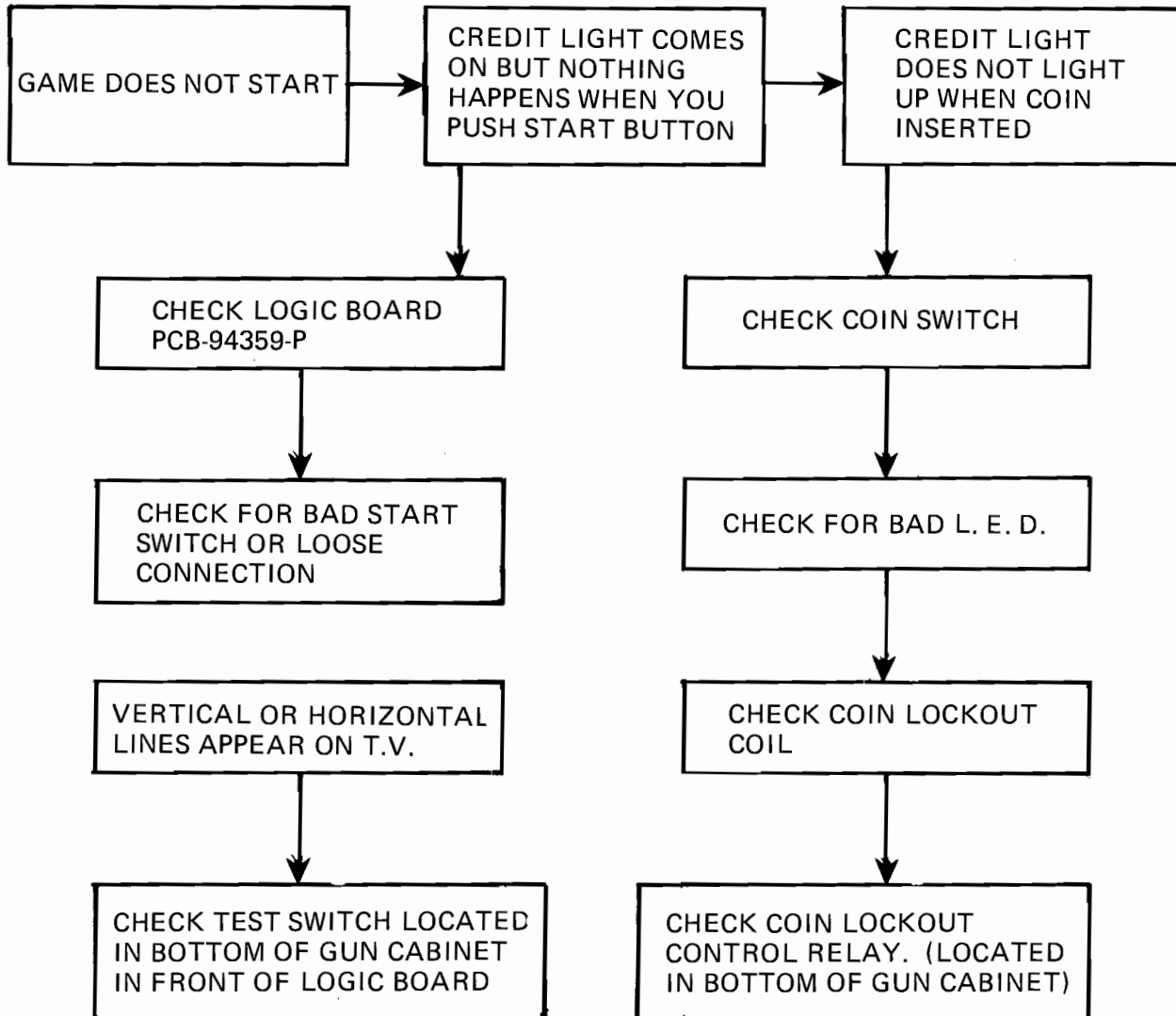VR 1   VR 2   VR 3   VR 4
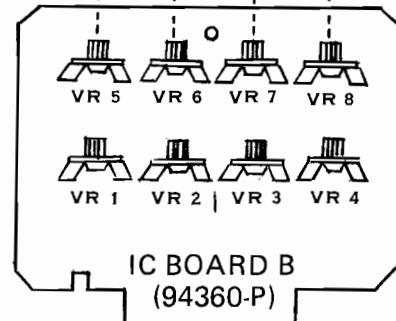
IC BOARD B
(94360-P)

ADJUSTMENTS FOR IC BOARD

1. Control VR. 1 is to adjust the time each target appears on the screen. The range of adjustment is from 15 to 35 seconds with the standard setting being 16 seconds. Game time is approximately 100 seconds (16 sec. x 4 types of targets).

2. Controls VR. 2 and VR. 3 are to adjust the target reversing time.

3. Control VR. 3 is to adjust both the target reset time and the black/white, white/black target color change over time. As VR. 2 and VR. 3 are inter-related, adjusting one will also change the other.

4. This switch is for adjusting bullet marks which will appear when set to TEST. Always set a PLAY when not adjusting.

5. This is the 600 and 800 point change over switch.

IC (TARGET)*
IC PR-03 (TANK & JET)
IC PR-02 (PUMA & SHARK)

IC BOARD A
94359-P
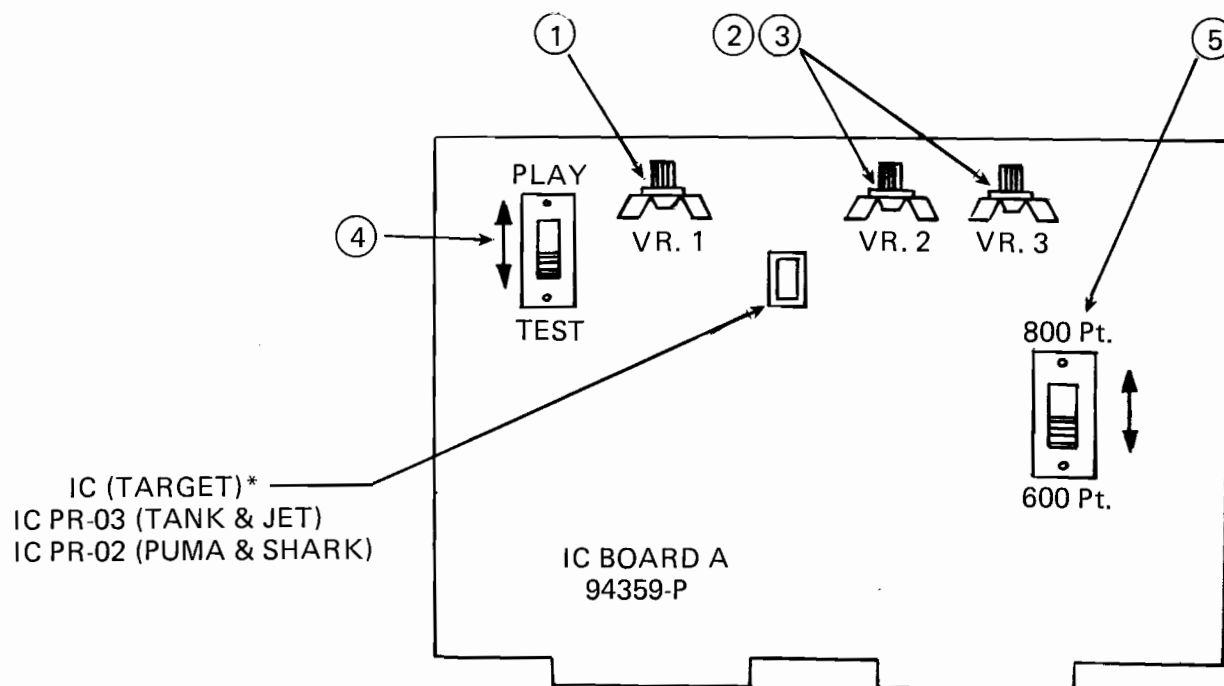
* This IV is equipped with a socket to enable change over from Tank and Jet targets to the optional puma and shark targets.

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TROUBLE SHOOTING GUIDE

THE MACHINE WILL NOT START. (NO CREDIT LIGHTS T.V. DOES NOT COME ON, COIN RETURNS.)	→ CHECK LINE CORD ON OFF SWITCH DOOR INTERLOCK SWITCHES 5 AMP LINE FUSE

GAME DOES NOT START → CREDIT LIGHT COMES ON BUT NOTHING HAPPENS WHEN YOU PUSH START BUTTON → CREDIT LIGHT DOES NOT LIGHT UP WHEN COIN INSERTED

↓ CHECK LOGIC BOARD PCB-94359-P

↓ CHECK COIN SWITCH

↓ CHECK FOR BAD START SWITCH OR LOOSE CONNECTION

↓ CHECK FOR BAD L. E. D.

VERTICAL OR HORIZONTAL LINES APPEAR ON T.V.

↓ CHECK COIN LOCKOUT COIL

↓ CHECK TEST SWITCH LOCATED IN BOTTOM OF GUN CABINET IN FRONT OF LOGIC BOARD

↓ CHECK COIN LOCKOUT CONTROL RELAY. (LOCATED IN BOTTOM OF GUN CABINET)

TROUBLE SHOOTING GUIDE

| MACHINE STAYS ON ONE TARGET, WILL NOT ADVANCE TO OTHER TARGETS | → | CHECK VR-1 ON PCB-94359-P FOR BAD SOLDER CONNECTION |

| LEFT OR RIGHT GUN WILL NOT FIRE | → | VIBRATOR MOTOR WORKS, BUT NO BULLET MARK APPEARS ON TV |

VIBRATOR MOTOR DOES NOT WORK

CHECK SWITCH ON VIBRATOR MOTOR CAM

CHECK PCB-0321

CHECK TRIGGER SWITCH

CHECK MOTOR

NO SOUND

SOUND ON SOME TARGETS BUT NONE OR LOW ON OTHERS

2 AMP FUSE

BAD SPEAKER OR LOOSE CONNECTION

PCB- PT-0295

CHECK VR ON PCB PT-0295, (REFER TO PAGE 7 OF ADJUSTMENTS) ADJUSTMENTS