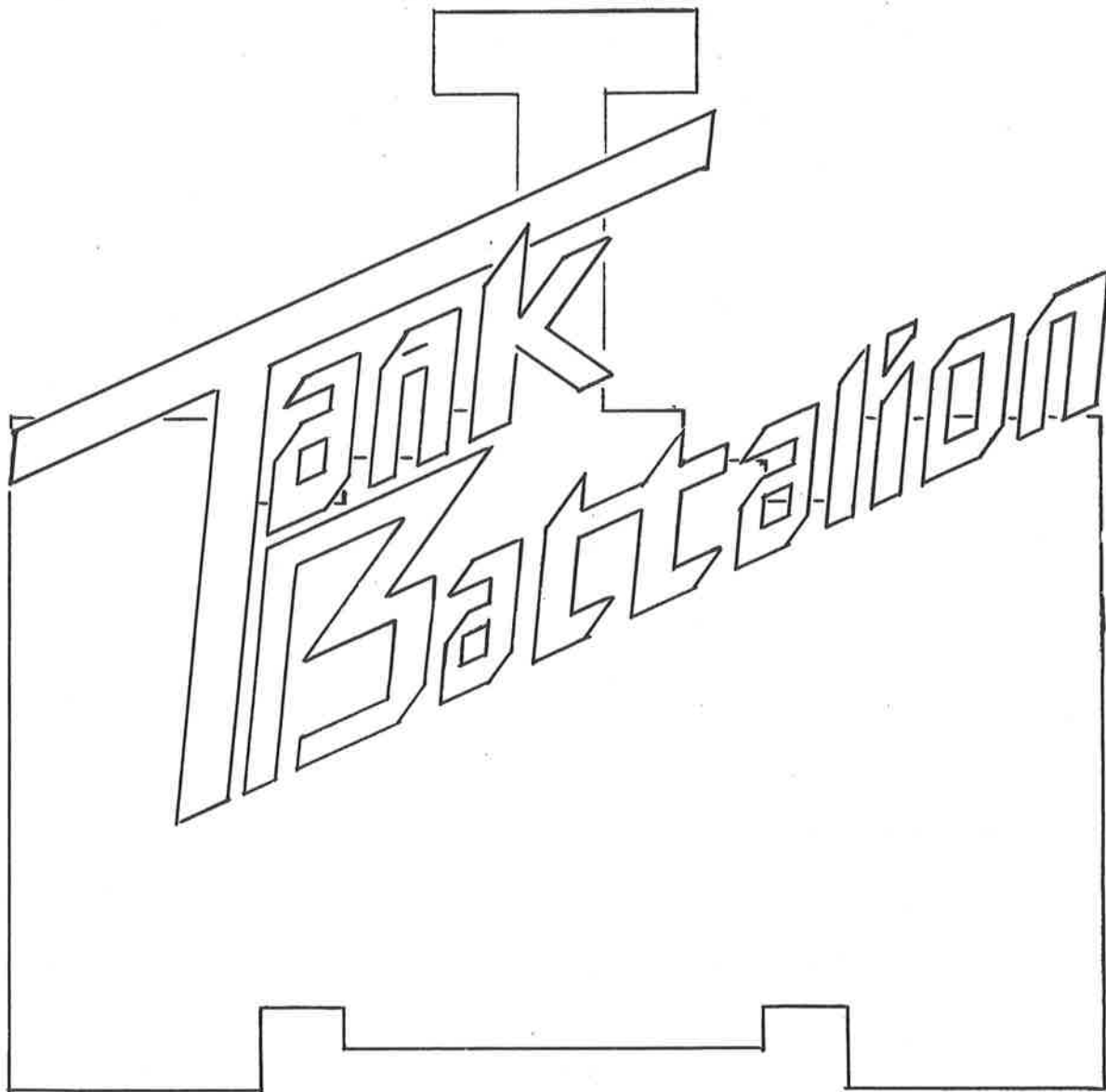


GamePlan, inc.

GAME PLAN, INC.
1515 W. Fullerton Avenue
Addison, Illinois 60101
Telephone: (312) 628-8200
TLX 20-6098



WARNING

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions manual, may cause interference to radio communications. As temporarily permitted by regulation it has not been tested for compliance [with the limits for Class A computing devices] pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area is likely to cause interference in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

TANK BATTALION

INSTALLATION

1. Visually inspect all connectors to insure none have become loose or broken in shipment.
2. Install 4 provided leg levelers to bottom of cabinet and level cabinet.
3. The power is controlled by a switch located on top of the cabinet plug into A.C. only 115 volt 60 cycle.

CAUTION

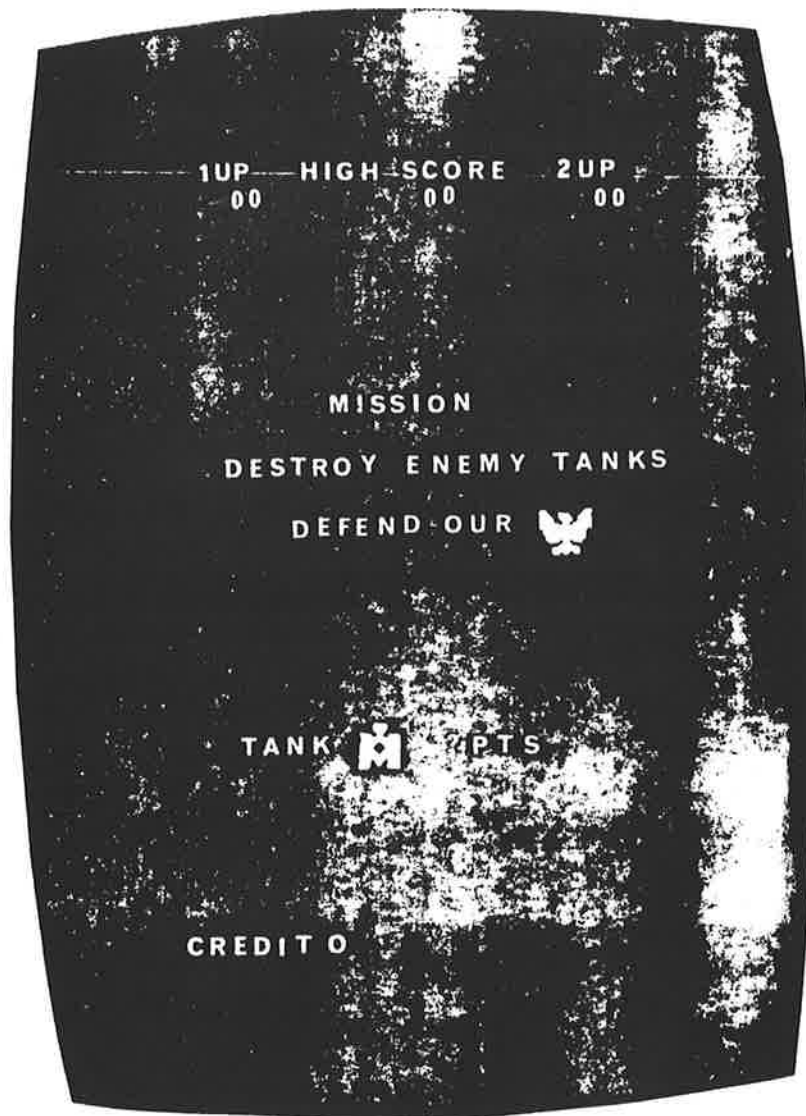
1. Do not install this game in places directly exposed to sunlight or excessive heat, to prevent rising internal temperatures.
2. High voltage runs the monitor. Therefore only persons familiar with safety measures should make any adjustments.
3. As with any solid state games the power should be turned off before replacing any parts or disconnecting any plugs.
4. Always take boards to distributor for repair, do not attempt to make any repairs with volt-ohmmeter or other test equipment as the internal voltage of such equipment may damage the circuitry.

TO REMOVE CONTROL PANEL FOR SERVICE

1. Open coin box door.
2. Unplug control panel jack located to the left of coin box opening.
3. Unlatch (2) clamps located on each side of cabinet.
4. Remove control panel for service.

GAME PLAY

- * One or two players can play.
- * Coinage & Game time operator adjustable. (see change of Option Switch)
- * Figure 3-1 shows the screen immediately after the machine is plugged in. This screen is called Attract Mode.



ATTRACT MODE

SCREEN DISPLAY

1st player
score display

high
score

2nd player
score display

1UP
2650

HIGH SCORE
12200

2UP
1950

enemy tanks
enter here

enemy tanks
enter here

enemy tanks

protective
barriers

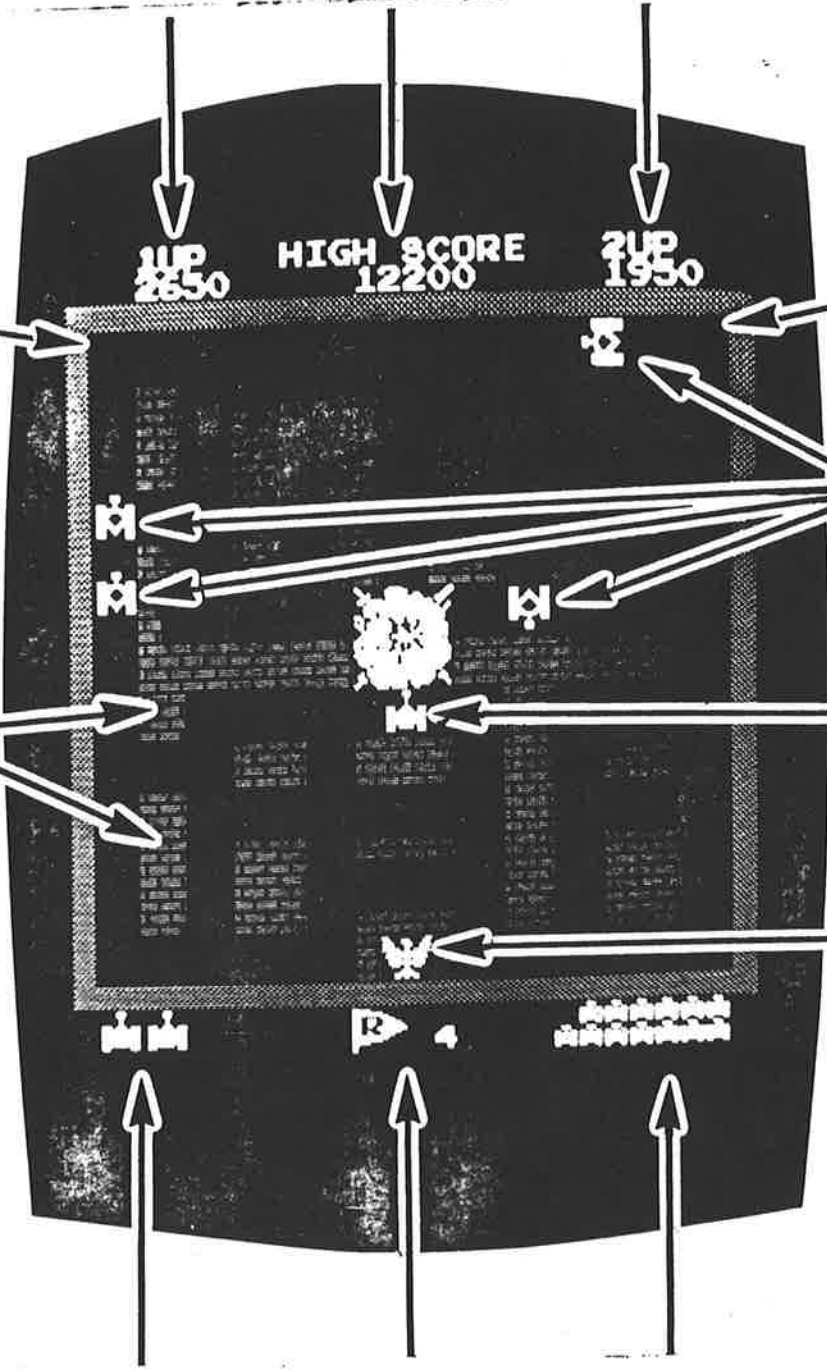
player tank

headquarters

remaining
player tanks

indicates
round no.

remaining
enemy tanks

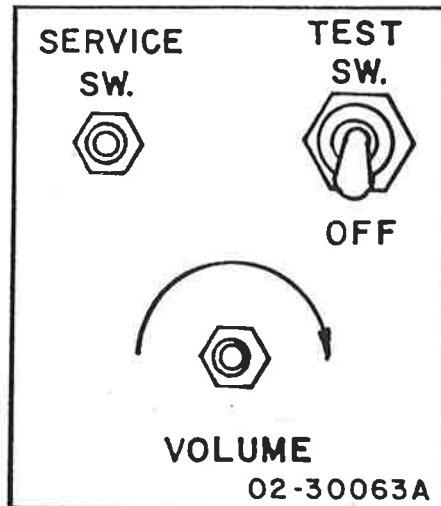


4. How to Play and Score

- * The player battles with attacking enemy tanks, defending his headquarters while destroying as many enemy tanks as he can.
- * The player can drive his tank left, right, up, and down with the 4-way lever.
- * The player can fire one shell at a time. He cannot fire again until the last shell is still on the screen.
- * The player's shells stay visible on the screen until;
 - 1- they hit an enemy tank or the protective barrier, or
 - 2- they collide with an enemy shell, or
 - 3- they strike the outer wall, or
 - 4- they are absorbed in an explosion.
- * The enemy tanks enter the screen from the upper left and right hand corners of the screen and gradually close in on the player tank and on headquarters. The enemy tanks can fire up to two shells onto the screen at a time.
- * The fighting becomes fiercer as time goes by and as the number of remaining enemy tanks decreases.
- * Each round is complete when 20 enemy tanks have been destroyed. The number of remaining enemy tanks is displayed in the lower right-hand corner of the playing screen.
- * The score for destroying an enemy tank increases depending on how close the player tank is to the enemy tank --the shorter the range, the higher the score. Also, the score is higher if the player hits the enemy tank in the front.

Here are the possible scores:

- frontal hits: 800, 300, 150, or 60 points
- side or rear hits: 300, 150, 60, or 30 points.



1. SERVICE BUTTON

For purposes of repair or adjustment the game can be test-played without advancing the coin counter by use of this button.

2. SELF-TEST

A self-test function is installed in this game. Preferably, the tests should be performed on a regular basis.

1. AUTOMATIC SELF-TEST

A test of the PCB is automatically performed every time the game's power supply is turned on. If there are no irregularities, the game goes immediately into the attract mode, but otherwise, the test repeats itself and the words "BAD ROM" or "BAD RAM" appear on the screen. As explained below, further tests should be performed for volume and on the assorted switches, etc.

* Contact your dealer if the self-test shows any defects.

2. FURTHER TESTS BY SELF-TEST SWITCH

The test switch is a toggle switch located behind the front door. Self-test series begins automatically when switch is pushed to "ON".

- A. Numbers of letters will flash on the screen for approximately 3 seconds during the test mode. During this period the PCB test is being performed. if the PCB is good the following information will be displayed on the screen.

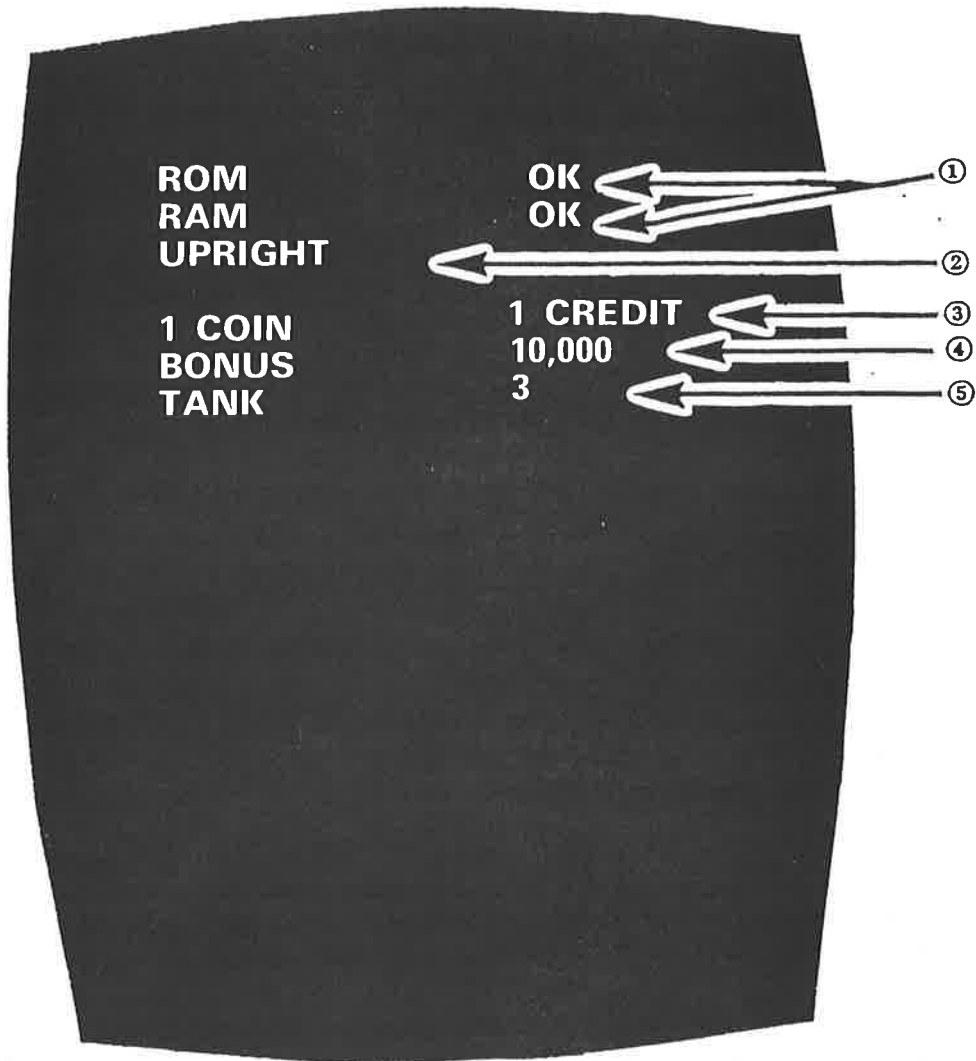


Fig. 5-3 Test Mode

- ① Ram/Rom Test

If the Rams and Roms are good, "OK" will be displayed on the screen, but if any of the Rams or Roms are faulty, a number indicating the faulty, a number indicating the faulty Rams or Rom will be displayed.

- ② UPRIGHT-type

- ③ Game Fee Setting

In the above, 1 coin per 1 play.

- ④ Bonus Adjustment

- ⑤ Number of Tanks per Game

NOTE: The above ②, ③, and ④ are operator-adjustable.

B. SWITCH TEST

The(4) four position control, start buttons (1 player, 2 player), can be checked at this stage. Each switch, if normal, should produce a game sound when pressed or moved.

Return the self-test switch to the OFF POSITION.

C. VOLUME ADJUSTMENT (see p. 10)

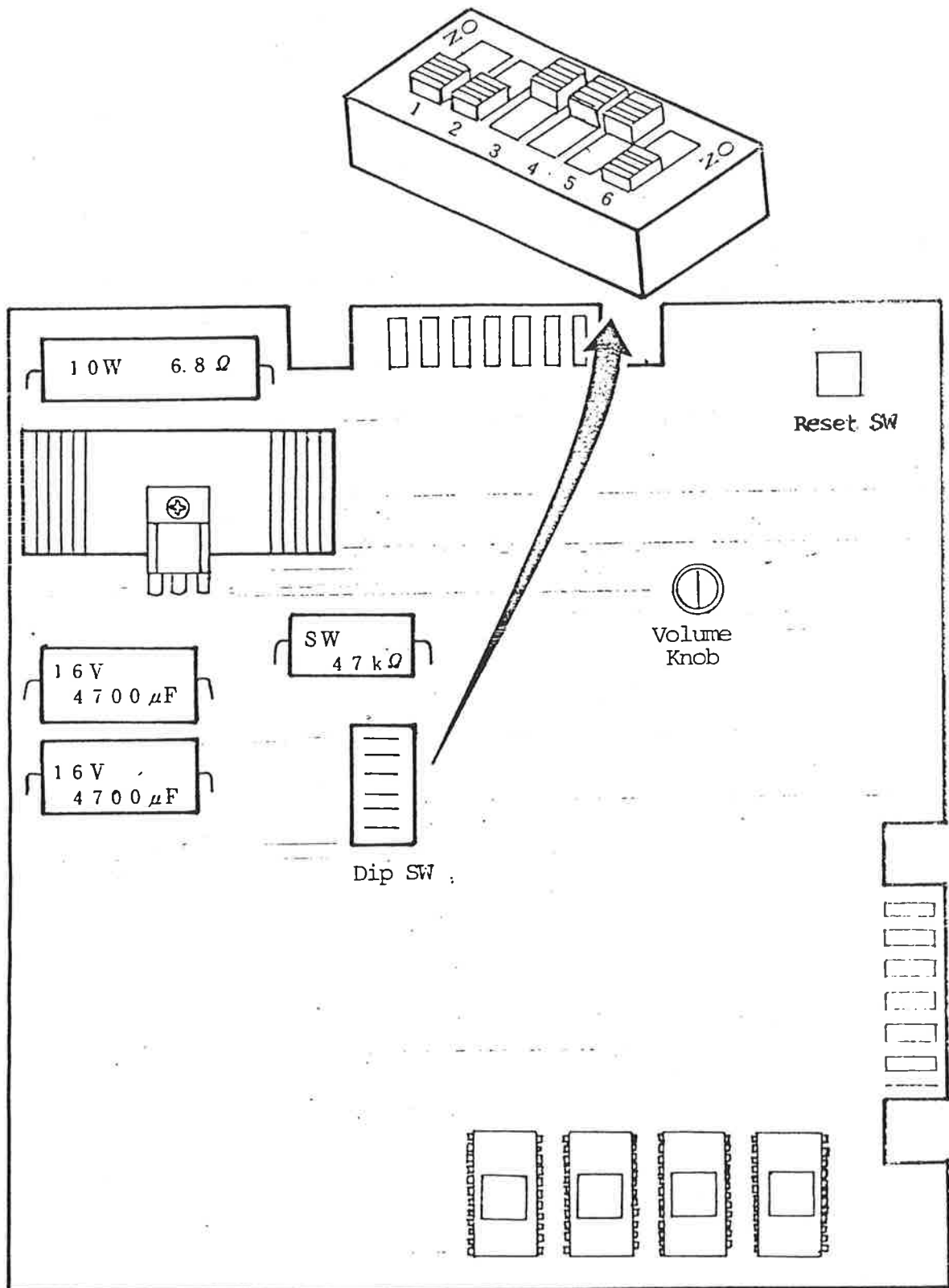
Volume can be adjusted by either one of two knobs-- one on the PCB and one behind the selector door.

D. OPTION SWITCH

The option switch is mounted on the PCB. The number of Tanks per game, the game fee, and the bonus points can be changed with this switch. This switch should not be used while the game is connected to its power source. After changing options, the test described in 3(2) above should be performed and the changes confirmed. There is also a game-reset switch on the PCB.

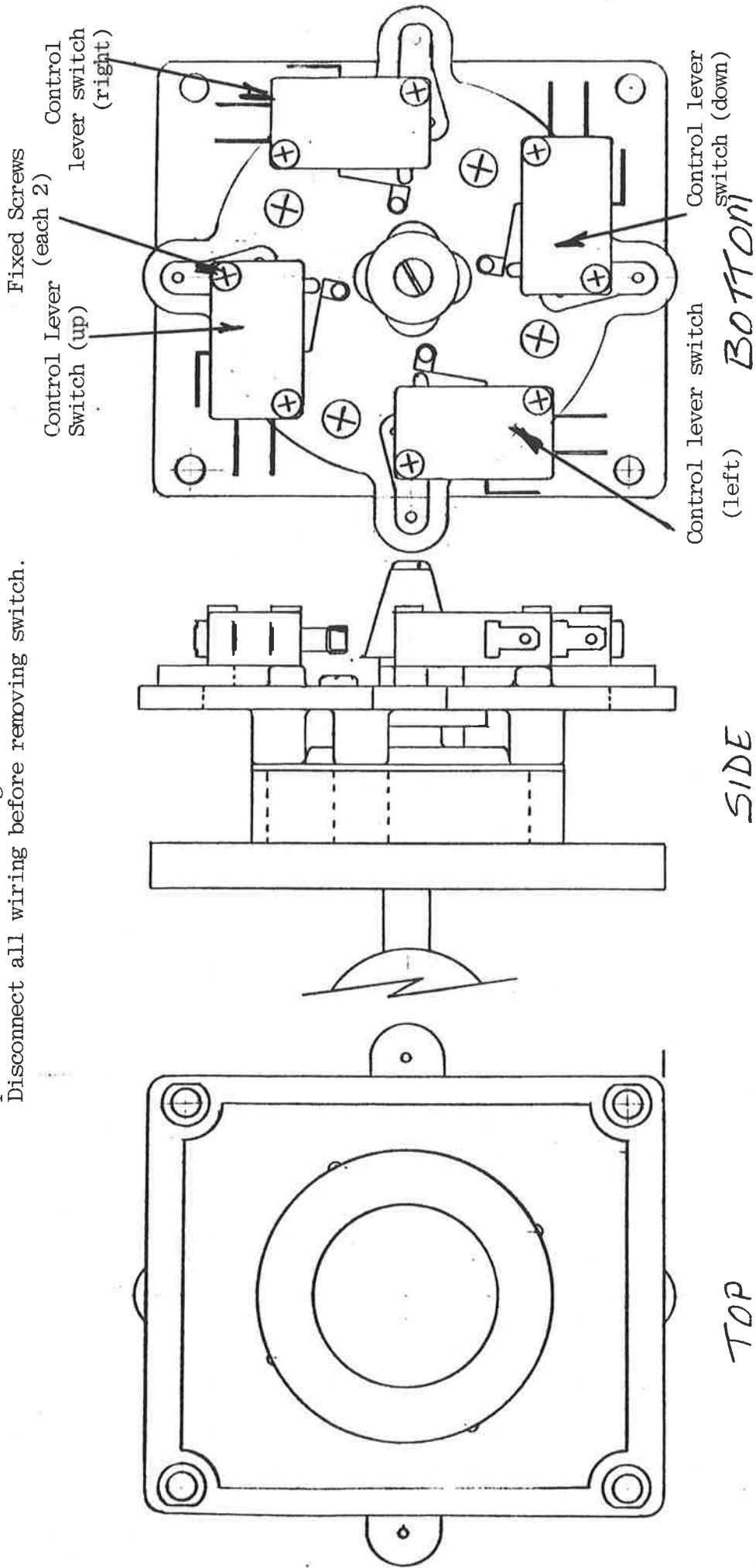
OPTION	POSITION OF SWITCHES					
	1	2	3	4	5	6
GAME FEE						NOT USED
1 coin/1 play	OFF	OFF				
1 coin/2 play	OFF	ON				
2 coin/1 play	ON	OFF				
FREE GAME	ON	ON				
BONUS POINTS						
zero			OFF	OFF		
10,000			OFF	ON		
15,000			ON	OFF		
20,000			ON	ON		
# of TANK/GAME						
2					OFF	
3					ON	
Situation at Delivery	OFF	OFF	ON	ON	ON	OFF

PCB Board



(3) REPLACING CONTROL LEVER SWITCHES

Access to control lever switches can be gained by removing control panel. The screws holding the switch are M3. Disconnect all wiring before removing switch.



22-00034N (4) req'd.

10-00221A (WICO)

(1) Power Supply

Use only on 110V AC (50/60 Hz) outlet.

Transformer A supplies 117V AC to TV monitor.

Transformer B supplies 7V AC CT to logic power and 12V AC CT to audio power.

CAUTION: Power supplied to machine must be within 95V - 110V AC.
If other large electrical machines or appliances use the same AC outlet, game may be affected or caused to malfunction.

(2) Game PCB

There are many ICs, semi-conductors, resistors and capacitors on the Game PCB. Also included is the picture forming circuitry, signal receiving circuitry (signal input) from all switches, lamp and solenoid driver, sound circuit, and control circuit for all circuitry listed above. Also included is the power supply circuit. This game is using a color monitor so the Game PCB sends three kinds of video signal (red, green & blue) and composite sync signal to the monitor.

(3) Monitor

Monitor displays picture on CRT of color video signal and composite sync signal from Game PCB. Monitor makes horizontal and vertical scanning signals from composite sync signal and supplies the power to the horizontal and vertical scanning coils and scans the electric beam. The electric beam shot from CRT electric gun is controlled by color video signal and creates picture on CRT. CRT has de-magnetizing coil for stabilizing the video colors (red, green & blue) on CRT.

CAUTION: There are many detailed electronic parts on the Game PCB and monitor. Take the following precautions when handling:

(Game PCB)

1. Power must be turned off before changing position of DIP switch and disconnecting edge connector.
2. Power must be turned off before using metal screw driver or other metal implements to adjust volume and/or re-set switch.

(Game & Monitor PCB)

1. When shipping PCBs, pack carefully in thick card-board boxes, using styrofoam or plastic air bags within to insure minimum PCB damage.
2. If the machine is not cleaned regularly (at least once a year), the accumulated dust will cause high voltage leaks. To clean, use a soft brush or spray lightly with air.
3. Never put game where it is exposed to very high or very cold temperatures or high levels of moisture/humidity. For example, do place game under direct sunshine, beside heaters or outdoors.
4. When electrical check of PCB is made, it should be one by an experienced electrician. Take special care when checking monitor with volt-ohmmeter, as monitor contains many high voltage parts.

TROUBLE-SHOOTING

Q: Check the following points before trouble-shooting or before contacting the distributor;

This video game consists of a monitor assembly, a game PCB assembly, control panel assembly and a power supply assembly. Each part is connected by wiring.

The game will not function normally when there is a malfunctioning part. Therefore check the game thoroughly before contacting the distributor if there is anything wrong. At that time, you may find that the machine is not set-up as per instructions, and you may be able to repair the malfunction yourself.

First of all, in the case of a malfunctioning machine, check each component when trying to locate the problem. Check all related electrical components unless you are sure that the problem is one particular part.

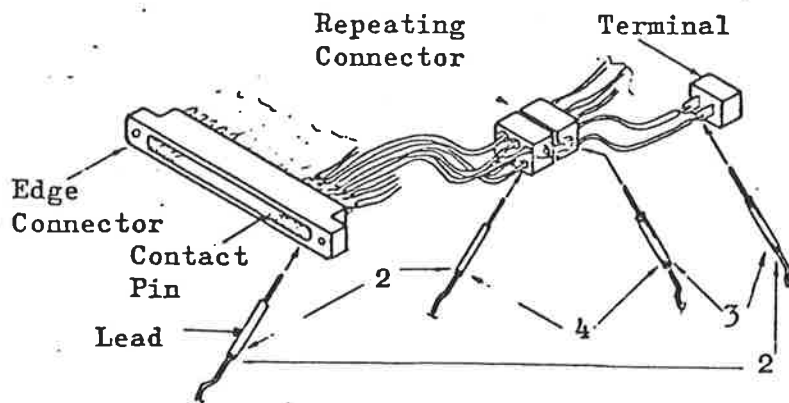
(1) VOM or volt-ohmmeter

Check the edge connector number, the repeating connector number and the wiring color, referring to the wiring diagram or schematic. The volt-ohmmeter can be used to check line voltage, transformer secondary windings, continuity, resistance and power supply voltage.

A. Wiring Check

Each electric component and edge connector on the PCB is connected by wiring and repeating connectors.

1. VOM (volt-ohmmeter) should be used. (resistance range of X10, X100)
2. Measure the resistance range between the edge connector and terminal. (Range should be 0Ω)
3. Measure the resistance range between the edge connector and the repeating connector; also between the repeating connector and the terminal.
4. If the wiring is normal, the contact of the repeating connector is probably defective.



B. Voltage Check

1. Measurement of AC voltage

Set switch to AC range. Attach one volt-ohmmeter lead to transformer CT and attach other volt-ohmmeter lead to the place you wish to measure. The voltage at the end of the harness must be the same as that of the transformer.

2. Measurement of DC voltage

Set switch to DC range. Attach black lead from volt-ohmmeter to the ground (earth) and attach red lead from volt-ohmmeter to the place you wish to measure. The voltage must be the same on both ends of the harness.

(2) Testing Techniques

1. How to test control panel & coin mechanism

Self-test switch enables you to test all switches, speaker, coin counter, lock-out coil and start lamps. If there should be any problems, test further as follows:

(A) Switch Check

The (4) four position control, start buttons (1 player, 2 player), can be checked at this stage. Each switch, if normal, should produce a game sound when pressed or moved.

Measure the VOM's resistance range (X10, X100) referring to the wiring diagram schematic.

If the self-test switch is mal-functioning, the problem will probably be found in the self-test switch, lamp, wiring, PCB or speaker.

Measure the VOM's resistance range between the contact pin which is connected to each switch and to the ground.

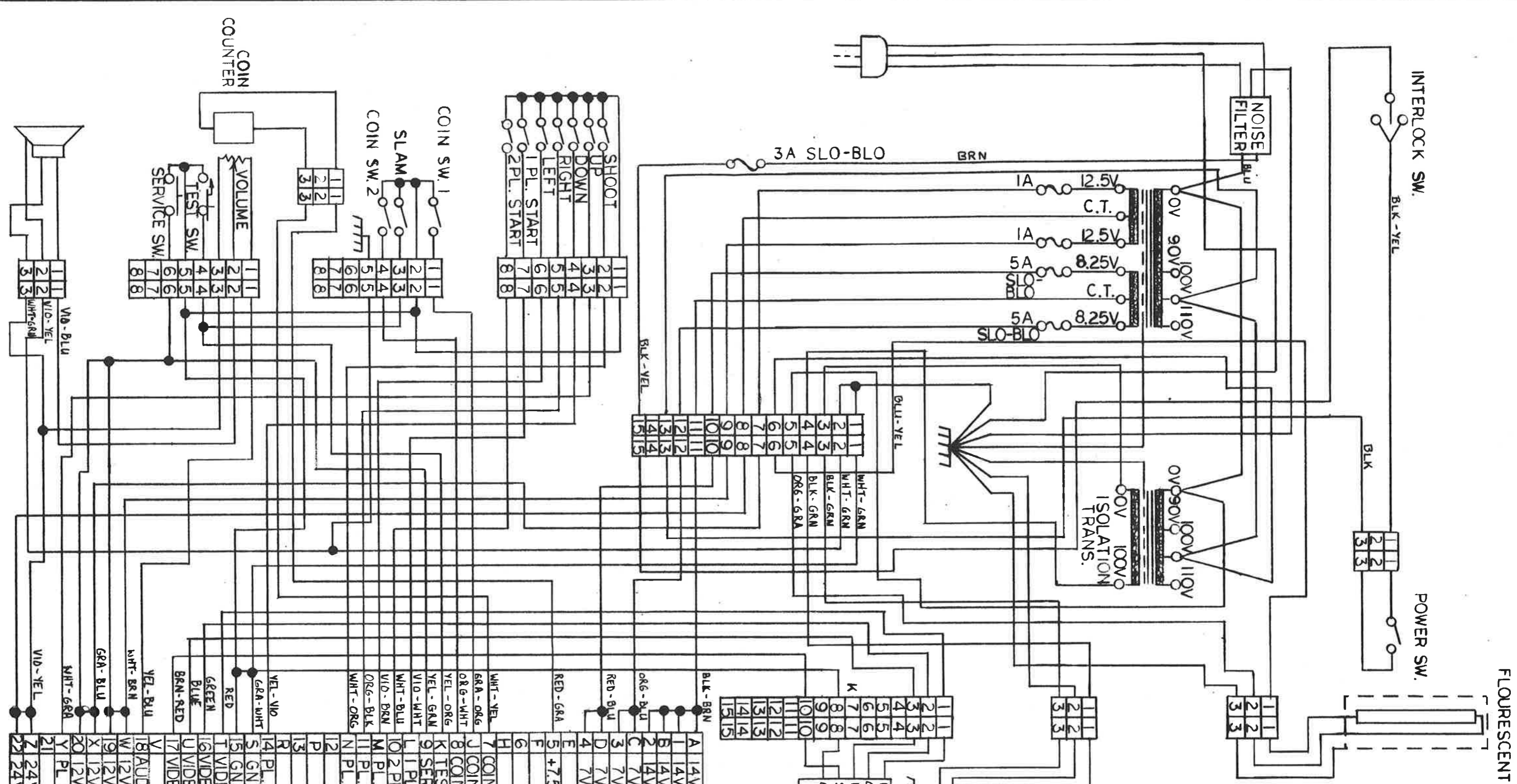
In switch 'ON' position resistance is about 0Ω .
In switch 'OFF' position resistance is about 10Ω .

Unless the above resistance rate is indicated, either the wiring or the switch is probably mal-functioning.

Game PCB check

	How to check	Description	Condition
Remove connector J8 from Game PCB	Connector J8 terminal #: A(1) - C(3) A(1) - D(4) Measure both terminals (7V AC)	If 6.0V - 7.0V AC is not indicated, check F2, F3 & harness. If okay, check below	—normal play impossible —no picture
	Connector J8 terminal #: Z(22) - X(20) Z(22) - W(19) Measure both terminals (12V AC)	If 11V - 13V AC is not indicated, check transformer. If okay, check below	—normal game impossible —no sound —abnormal sounds
Connect connector J8 to Game PCB	Connector J8 terminal #: A(1) - C(3) A(1) - D(4) Measure both terminals (6.5V DC)	If 6.5V - 7.5V DC is not indicated, check PCB. If okay, check below	—no picture —no sound —abnormal sound
	Connector J8 terminal #: Z(22) - X(20) Z(22) - W(19) Measure both terminals (12V AC)	If 11V - 13V AC is not indicated, check PCB. If okay, check below	—normal game impossible —no sound —abnormal sounds
	Secondary fuse(s) (F2, F3, F4, F5) are broken	Check to see if something is touching PCB and causing a short. Check PCB If okay, check below	—no picture
	Capacitor C57 (470 uF) Measure voltage of both leads (+5V DC)	If +4.8V - 5.2V DC is not indicated, check PCB. If okay, check below	—no picture —normal game impossible

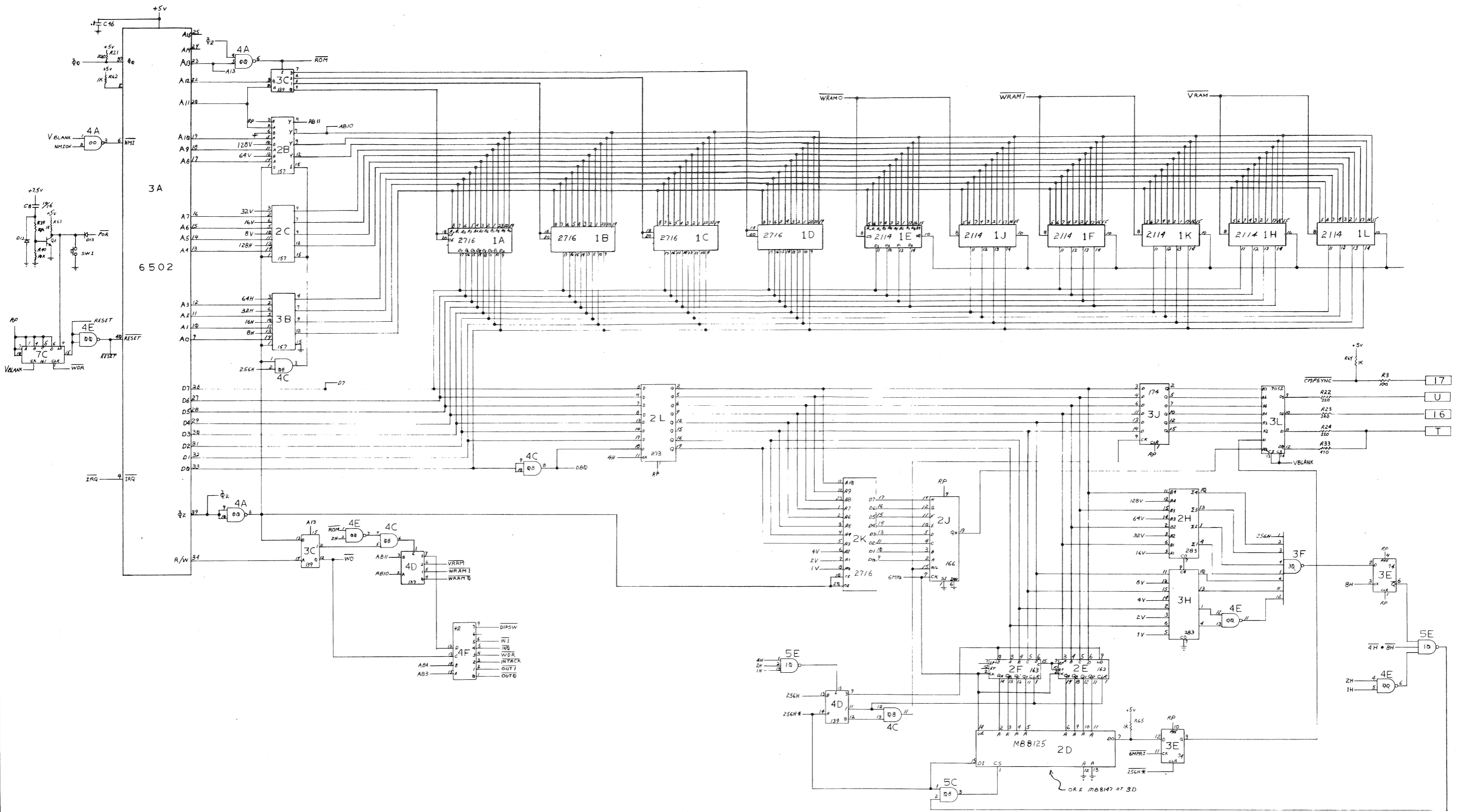
If PCB is found to be mal-functioning, BAD ROM or BAD RAM will appear on the screen.



1	14V CT	A
2	4V CT	B
3	7V AC	C
4	7V AC	D
5	+7.5VDC	E
6		F
7	COIN CTR.	H
8	COIN SW. 1	J
9	COIN SW. 2	K
10	TEST SW.	
11	SERVICE SW.	
12	1 PL. START	
13	2 PL. START	
14	PL. DOWN	
15	GND.	
16	VIDEO RED	
17	VIDEO GREEN	
18	VIDEO BLUE	
19	VIDEO SYNC	
20	VIDEO OUT	
21	12V AC	
22	12V AC	
23	12V AC	
24	24V CT	
25	24V CT	

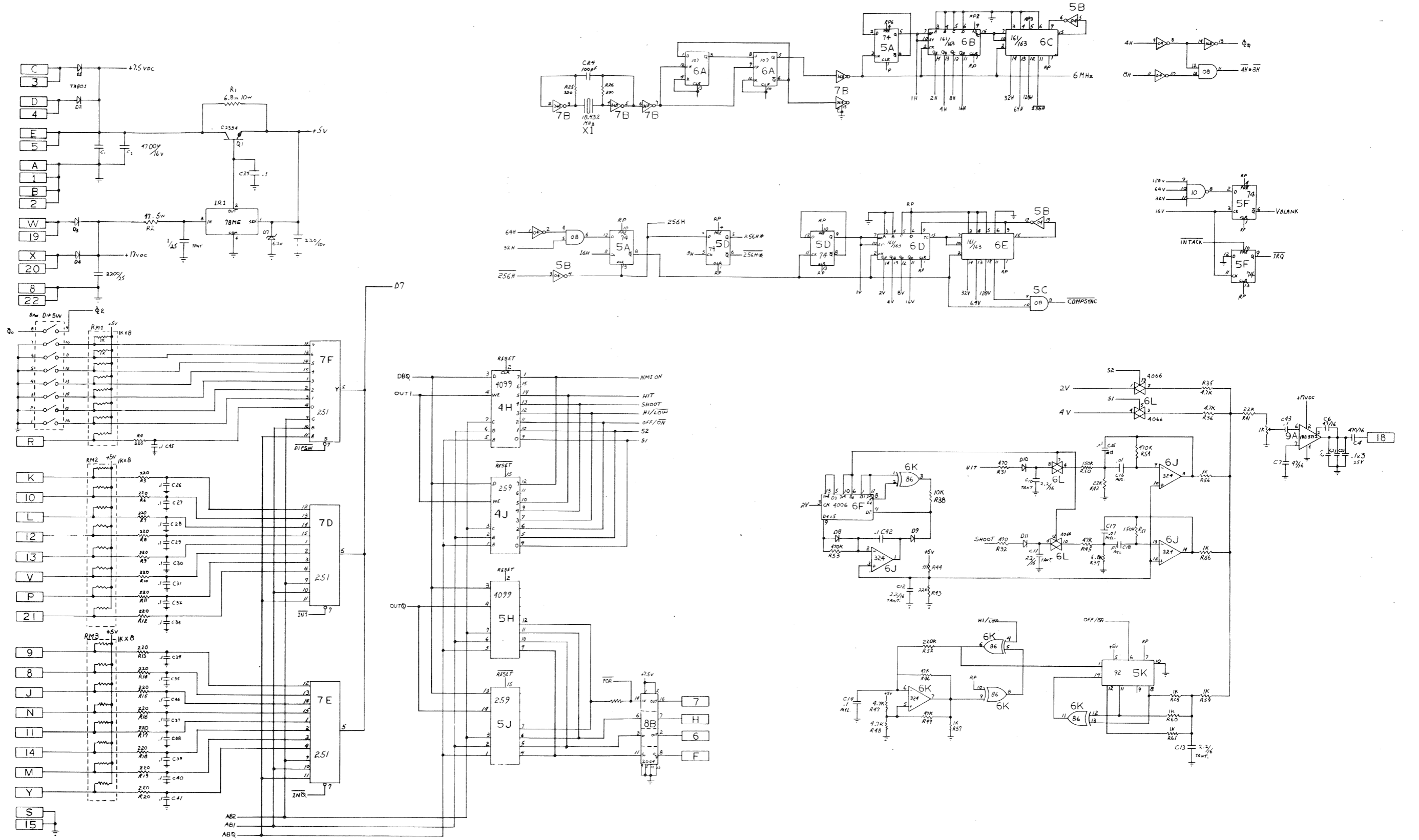
Used On		
PARTS MUST BE CLEAN AND FREE OF BURRS		
Tolerances Unless Specified		
Fractional	± .015	
Decimal	± .005	
Angles	± 1/2	
Screw Threads	Class 2	
GAME PLAN Inc. 1515 W. Fullerton Ave Addison ILL. 60101		
Scale	Finish	Drawn By J.T.T.
Date 21 FEB 81	Amt	App. By
Mat'l	Drawing Number 02-40002B	
GAME WIRING DIAGRAM TANK CATALOG		

ISSUE	CHANGE	DATE



Used On	GAME PLAN Inc. 1515 W. Fullerton Ave Addison ILL. 60101		
PARTS MUST BE CLEAN AND FREE OF BURRS	Scale	Finish	Drawn By
Tolerances Unless Specified	Date 3-24-81	Amt	App. By
Fractional ----- ± 0.015	Mat'l		Drawing Number
Decimal ----- ± 0.005	02-70033 D		
Angle ----- ± 1/2	TANK BATTALION		
Screw Threads ----- Class 2	PC BOARD SCHEMATIC 1/2		

ISSUE	CHANGE	DATE



Used On TANK BATTALION	GAME PLAN Inc. 1515 W. Fullerton Ave Addison ILL. 60101		
PARTS MUST BE CLEAN AND FREE OF BURRS	Scale	Finish	Drawn By STU
Tolerances Unless Specified	Date 4-3-81	Am't	App. By
Fractional ±.015	Mat'l	Drawing Number 02-70088 0	
Decimal ±.005	TANK BATTALION		
Angles ±1/2	PC BOARD SCHEMATIC 2/2		
Screw Threads - Class 2			

ISSUE	CHANGE	DATE