

# SOCCER

by  
RAMTEK - 1973

## C O N T E N T S

- I. INTRODUCTION
- II. INSTALLATION AND MAINTENANCE
- III. GENERAL DESCRIPTION
- IV. GENERAL TROUBLESHOOTING TECHNIQUES
- V. TELEVISION SCHEMATICS

## ILLUSTRATIONS

- FIGURE 1 BLOCK DIAGRAM AND INTERCONNECT
- FIGURE 2 PRINTED CIRCUIT BOARD CONNECTOR LAYOUT
- FIGURE 3 TELEVISION MONITOR CONNECTOR LAYOUT

I. INTRODUCTION

Ramtek's Amusement Devices are engineered to provide the highest degree of reliability using the most advanced techniques known to the industry. All solid state circuitry insures years of dependable service.

II. INSTALLATION AND MAINTENANCE

A. Any shipping container that appears damaged should be unpacked with the Carrier Agent present. Carefully inspect the unit for external damage, then remove the back cover and inspect for internal damage. If any damage is found, notify the Carrier and Ramtek Corporation immediately. Retain containers for Carrier inspection.

B. No routine maintenance or special installation procedures are required. Contrast, brightness, horizontal hold and vertical hold controls are mounted at the rear of the T.V. monitor and are identified by a sticker affixed to the inside of the cabinet. The volume control is mounted on the left side of the monitor. All controls are accessible from the rear of the cabinet and require no special tools.

III. GENERAL DESCRIPTION

The Soccer Amusement Device consists of five working components, a television monitor, a logic printed circuit board, four controls (potentiometers) an A.C. reset, relay, and a coin counter. Their functions are described as follows:

A. Television Monitor

1. Provides a visual display.
2. Provides the audio portion of the game.
3. Provides +5 volts for the logic board.

- B. Logic Board
  - 1. Generates the game.
  - 2. Provides the necessary signals to drive the television monitor.
- C. Front Panel Controls (Potentiometers)
  - 1. The potentiometers control the positions of the players on the television screen.
- D. A.C. Relay
  - 1. Insures that a free play cannot be gained by disconnecting and reconnecting A.C. power.
- E. Coin Counter
  - 1. An electric non-resettable counter that registers each coin that passes through the coin mechanism.

#### IV.

##### GENERAL TROUBLESHOOTING TECHNIQUES

A thorough visual inspection should be performed before further steps are taken. Particular attention should be paid to broken wires, loose integrated circuits and missing components.

The next step should be to check the +5 volts D.C. to the logic printed circuit board. Any standard volt meter may be used. The measurement should be made at the board between the red wire (+5 VDC) and the green wire (ground). Care must be taken not to short the two terminals together. A reading of 4.75 volts to 5.25 volts is acceptable. If this is not the case, steps must be taken to bring the voltage within the specified limits before proceeding.

A non adjustable +5 volt power supply is employed in the television monitor. It is located on the left side of the monitor. A voltage measurement across C48 should be taken. A reading of +10 volts D.C. to +11.5 volts D.C. is acceptable, if this is not the case, the fault probably is either C47, C48, D15, D16, D17, D18, or T4. If the voltage reading falls

within the specified range, IC1 (an F7805 or LM309) is a fault and must be replaced.

The front panel controls (potentiometers) can cause three, and only three, symptoms. Jumpy players, players that do not move, or not enough player travel. In all three cases, one or all potentiometers must be replaced or cleaned.

Assuming no broken wires, no loose or missing integrated circuits, a good +5 volt D.C. supply and operable controls, the problem must be in either the television or the logic printed circuit board.

The problem now is to isolate the malfunction to the logic printed circuit board or the television monitor.

Any symptom relating solely to the play of the game, i.e., no ball, missing or too many players, missing center line, ball not round, multiple balls, improper scoring, ball not traveling correctly, etc., demands replacement of the board.

If a known good spare board is available the problem can be easily pinpointed by plugging the spare board in. If the new board does not clear the problem up the trouble is in the T.V.

If a spare board is not available the problem may be a little more difficult to pinpoint, but may, however, be isolated by disconnecting selectively certain wires.

#### A. No Audio

Remove the orange audio wire from the edge connector (on board). Then remove the black video wire from the edge connector and touch it momentarily to the terminal that the audio wire was on.

#### B. Audio Hums

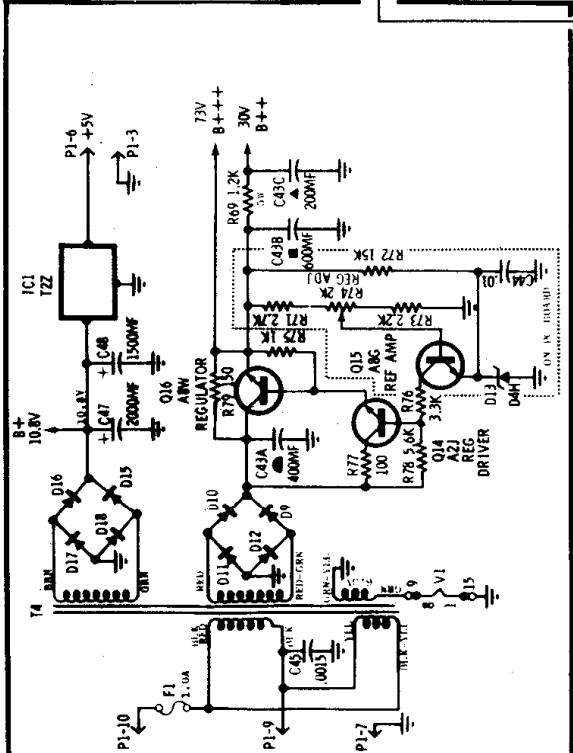
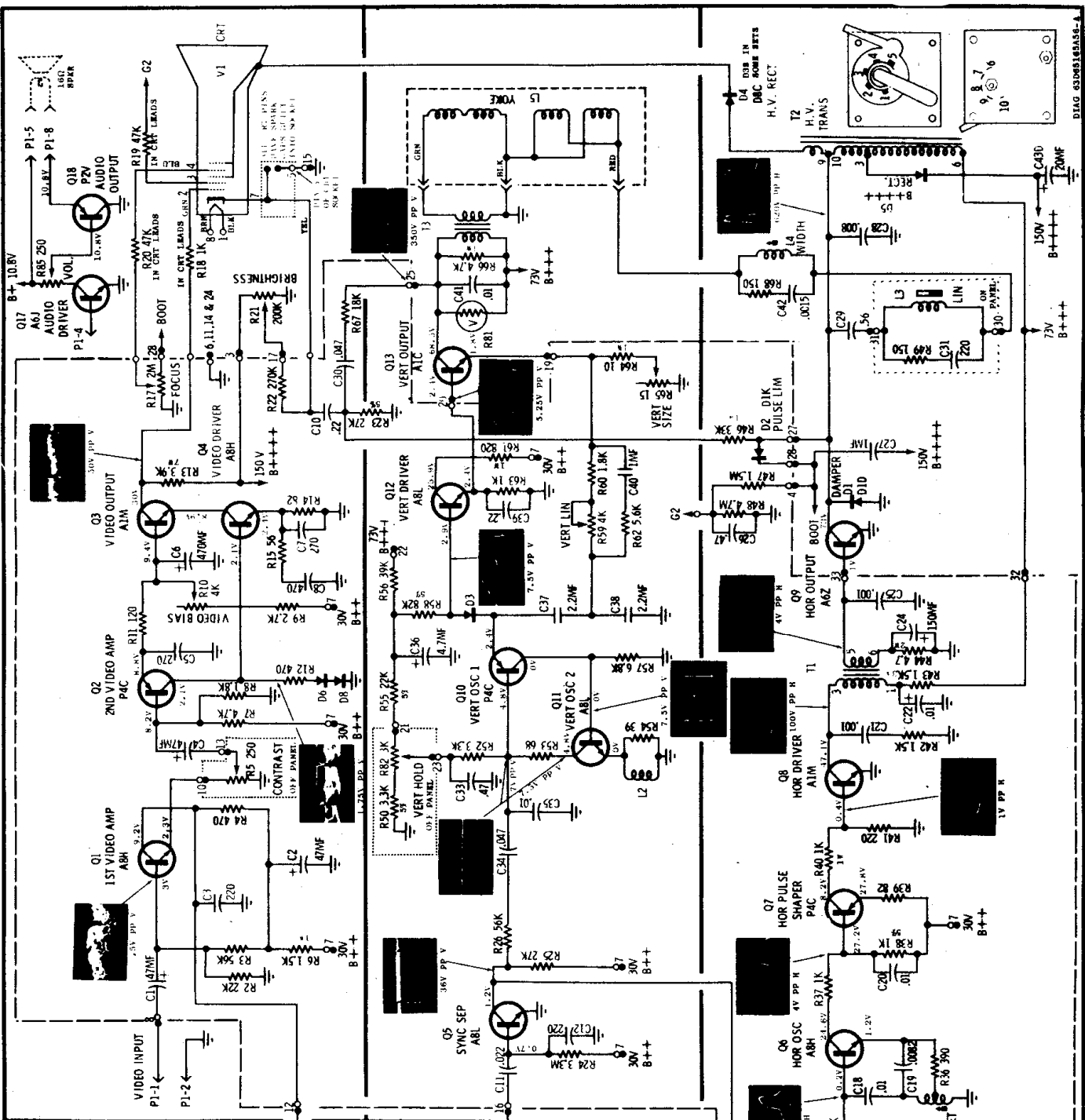
Remove the orange audio wire from the edge connector. If the hum persists, the problem is with the television. If the hum disappears, the problem is with the board.

C. No Video

Remove the black video wire from the edge connector, (on board). Remove the orange audio wire (on board). Touch the end of the orange audio wire to the terminal that the black video wire was on. The screen should flash and have random lines through it. If it does not, the television is bad. If it does, the board is bad.

D. Game Won't Start

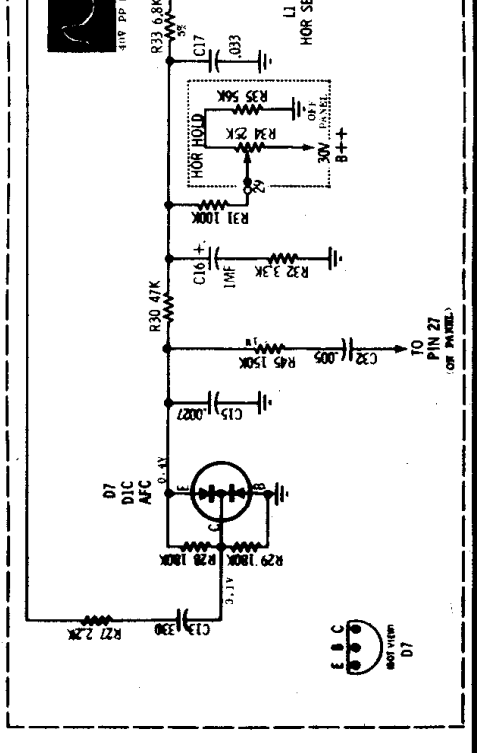
Disconnect the brown relay wire from the edge connector and try to start the game. If the game starts, the problem is the AC relay. If the game still does not start, disconnect the black (coin) wire from the edge connector. Then momentarily short the terminal that the black wire came off of to the red terminal (+5 volts D.C.). If the game starts, the problem is either with the coin acceptor wiring or with the coin acceptor microswitch. If the game still does not start, the logic printed circuit board must be replaced.



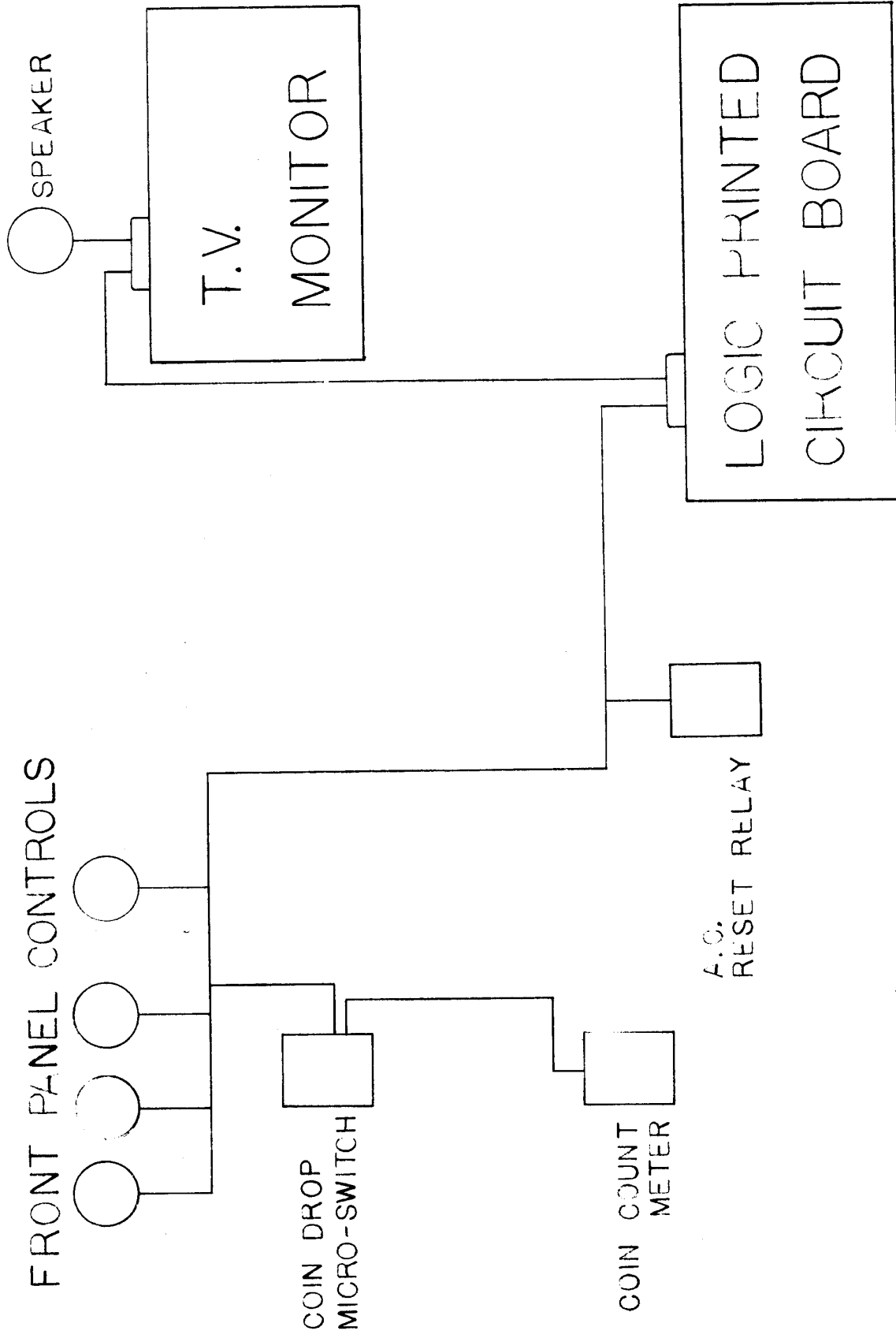
**NOTES:**

**VOLTAGE MEASUREMENTS:**

- TAKEN FROM POINT INDICATED TO CHASSIS WITH A VTVM; NO SIGNAL
- TAKEN WITH CONTRAST & BRIGHTNESS CONTROLS AT MAXIMUM; ALL OTHER CONTROLS IN NORMAL OPERATING POSITION.
- WAVEFORM MEASUREMENTS:
- TAKEN FROM POINT INDICATED TO CHASSIS WITH A WIDE-BAND OSCILLOSCOPE
- OSCILLOSCOPE SYNCED NEAR SWEEP RATE INDICATED.
- TAKEN WITH .5V PP INPUT SIGNAL; CONTRAST & BRIGHTNESS CONTROLS AT MAXIMUM; ALL OTHER CONTROLS IN NORMAL OPERATING POSITION.
- MAXIMUM; ALL OTHERS INDICATES PRINTED CIRCUIT BOARD.
- UNLESS OTHERWISE SPECIFIED, CAPACITORS' DECIMAL VALUES IN MF. ALL OTHERS COMPLETE DESCRIPTION OF CAPACITORS REFER TO PARTS LIST.
- RESISTORS ARE 10% 1/2W



FRONT PANEL CONTROLS

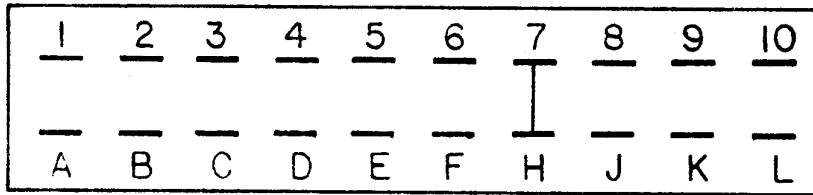


BASIC BLOCK  
DIAGRAM  
SOCCER



P.C. BOARD EDGE CONNECTOR

TOP VIEW



WIRE COLOR

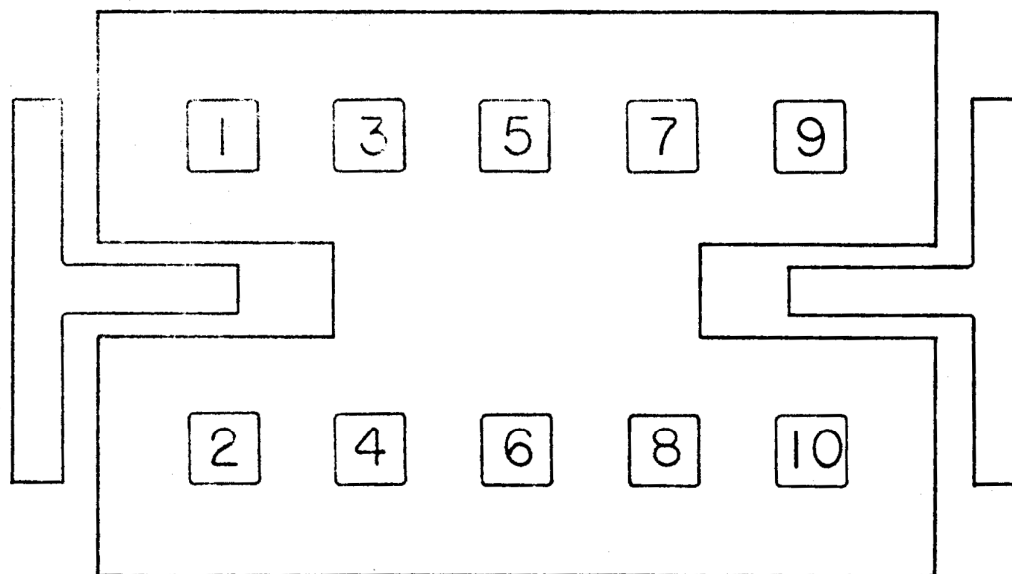
PIN NUMBERS

SIGNAL FUNCTION

RED	10	+5 VOLTS D.C. IN
GREEN	9	LOGIC GROUND IN
BLACK )	7 and H	VIDEO OUT
GREY )		
TWISTED PAIR	8	VIDEO GROUND
ORANGE	F	AUDIO OUT
YELLOW	C	CONTROL #3 OUT
BLUE	E	CONTROL #4 OUT
BLACK	6	COIN DROP IN
BROWN	4	A.C. RESET RELAY IN
VIOLET	B	CONTROL #1 OUT
GREY	D	CONTROL #2 OUT
WHITE	5	GAME START IN

TELEVISION MONITOR CONNECTOR

TOP VIEW



WIRE COLOR

PIN NUMBER

SIGNAL FUNCTION

BLACK	1	VIDEO IN
GREY	2	VIDEO GROUND
GREEN	3	LOGIC GROUND
ORANGE	4	AUDIO DRIVER OUT
BLACK	5	AUDIO IN
RED	6	+5 VOLTS OUT
GREEN	7	GROUND IN
BROWN	8	AUDIO DRIVER OUT
WHITE	9	A.C. IN
BLACK	10	A.C. IN

PICTURES



Front View



Rear Inside



Game Running



Front Inside (Manual found here)