

TECMO BOWL™

Service Instruction Manual

TECMO

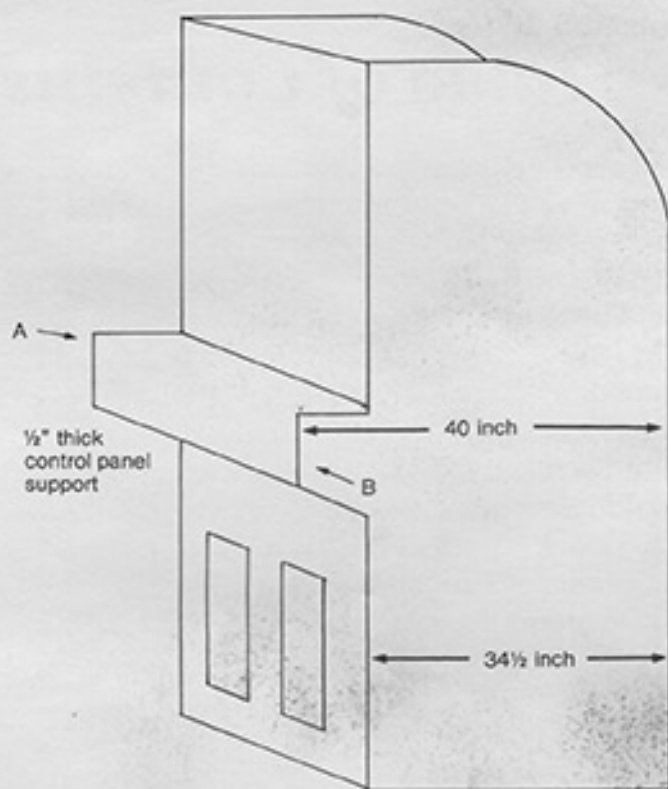
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1. SPECIFICATION

- Power Supply: 115 AC
- Power Consumption: 300W
- Weight: Approx. 430 lbs



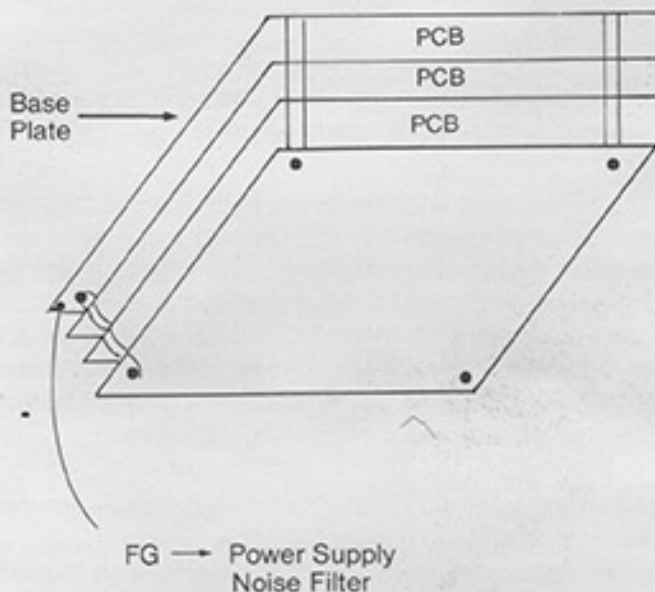
After removal of monitor and control panel, game will fit through 36" door by turning the game at an angle to clear point A then turning game again to clear point B.

2. WARNING

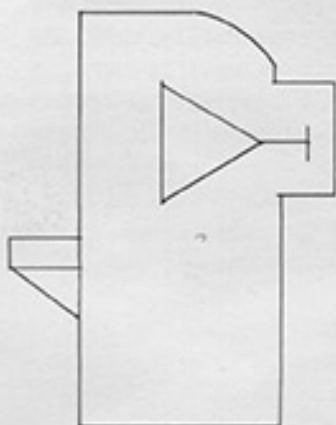
⚠ WARNING ⚠

- ★ Use of non-TECMO parts or modification of any TECMO game circuitry may adversely affect the safety of your game, and may cause injury to you and your players.
- ★ This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J or Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. 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.
- ★ Players may receive an electrical shock if this game is not properly grounded! To avoid electrical shock, do not plug in the game until it has been inspected and properly grounded. This game should only be plugged into a grounded 3-wire outlet. If you have only a 2-wire outlet, we recommend you hire a licensed electrician to install a grounded outlet. Players may receive an electrical shock if the control panel is not properly grounded! After servicing any parts on the panel, check that the grounding clip is firmly secured to the metal tab on the inside of the control panel. Only then should you lock up the game.
- ★ Before connecting the game to the AC power source, verify that the proper voltage-selection plug is installed on the game's power supply.
- ★ To avoid electrical shock, disconnect the game from the AC power source before removing or repairing any part of the game. When removing or repairing the video display, extra precautions must be taken to avoid electrical shock because high voltages may exist within the display circuitry and cathode-ray tube, (CRT) even after power has been disconnected. Do not touch internal parts of the display with your hands or metal objects! Always discharge the high voltage from the CRT before servicing this area of the game. To discharge the CRT: attach one end of a large, well-insulated, 20-kV jumper to ground. Momentarily touch the free end of the grounded jumper to the anode by sliding it under the anode cap. Wait two minutes and discharge the anode again.

3. SPECIAL PRECAUTIONS



- Printed Circuit Board (PCB) should be mounted this way to ensure noise emissions fall into FCC regulation limits.



- Take extra caution when removing the rear door to service this machine. Pull the door back slowly. **DO NOT LET THE DOOR DROP OR YOU WILL DAMAGE THE MONITOR.** After the door clears the monitor neck, you may let it down.

When replacing the rear door, first lift it to the proper level then put it on straight. Take all precautions necessary to avoid hitting the monitor neck.

NOTE: Rear door is heavy. Be sure to clear monitor neck before letting it down.

4. CAUTIONS

(1) Removal of Back Door

- Extreme care should be taken when removing rear door of cabinet. Pull straight off until door clears monitor neck then let it down. **DO NOT** open rear door without taking proper precautions.

(2) Care in Usage

- Care should be taken to avoid dragging or dropping the machine when transporting to prevent damage to the CRT.
- Use fuse of indicated rating.
- As high voltage is present in the monitor and TV PCB, adjustments or repairs should be left up to a serviceman and should never be touched by the layman.

(3) Care in Handling

- Always turn off the power supply switch before handling.
- Avoid inserting and pulling the plug in rapid succession.
- Do not check the IC board circuit with a tester.
- Avoid rough handling in transportation; the picture tube is fragile.

(4) Installation

- As the video game is for "indoor use", do not install outdoors.
- When installing, avoid the following places.
 - a) Near indoor pools or showers
 - b) Where leaks exist
 - c) Under direct sunlight
 - d) Near heaters or other heat emitting devices
 - e) Near hazardous items (volatile fluids, gas cylinders, etc.)
 - f) Where vibrations are severe (near construction sites where jack hammers, etc. are used)
 - g) Inclined places
 - h) Near fire extinguishing equipment
 - i) Near emergency exits

• Caution:

To prevent electric shock do not use this (polarized) plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

In case the machine does not work properly after the power switch is turned on, make sure the proper voltage exists at the line cord.

(5) **Trouble Shooting**

When it is believed that trouble has developed, always confirm the following items.

- Is the fuse intact? (Always use fuse of the designated rating.) When the replaced fuse burns out again, this will indicate that another component is defective.
- Are there any poor connections (connectors) or open circuits? Special care must be taken to ensure connectors are firmly inserted. Troubles due to faulty contacts can be considered from various sources.

NOTE: Always turn off the power when inserting or removing the connectors.

- There will be times when a normal picture will not appear when the power supply switch is turned on. As this may sometimes be corrected by a setting of the control circuit, turn power supply switch on and off several times.
- When testing meters, switches, etc. with a tester, always first pull the IC board connectors.

(6) **Caution**

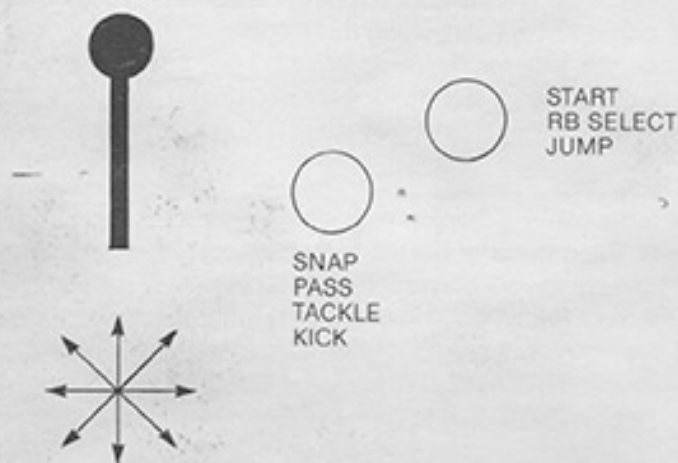
"This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation." However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna
- Relocate the computer with respect to the receiver
- Move the computer away from the receiver
- Plug the computer into a different outlet so that computer and receiver are on different branch circuits

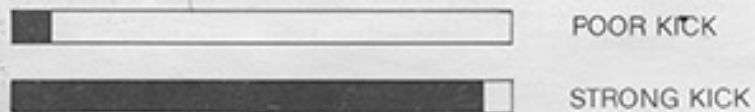
If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the US Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.

5. CONTROL FUNCTIONS



- **Joystick:** Control your player with the 8-directional joystick. Use the joystick to shake off a tackler with a rapid back and forth motion.
- **Snap:** Press to hike the ball to the Quarterback
- **Pass:** Press to throw the football to a Receiver
- **Tackle:** Press to make a diving tackle on an opponent
- **Kick:** Press to determine how far your kick will go. Time your press to obtain maximum length of yellow stripe.



- **Start:** Press after inserting coin to begin play
- **RB Select:** Press to change position of a Receiver or Defensive Back before the snap of the football
- **Jump:** Press to jump for a pass or to avoid tacklers

6. HOW TO PLAY

- 1, 2, 3 or 4 players may play TECMO BOWL™ at the same time.
- Choose one of the four players and insert coin. Additional players may buy-in at any time. Each player is credited more playing time by inserting more coins.
- Blue and purple men play for the Wildcats.
Red and yellow men play for the Bulldogs.
- Press the START BUTTON for your player.

(1) 1 Player vs. Computer

Your Receiver is the blinking man on your team. Use the RB SELECT BUTTON to choose the position for this Receiver. Each press of the the button changes him one position. You are the Quarterback. Control the movement of your player with the JOYSTICK. When you are ready to begin play, press the SNAP BUTTON. Your Receiver will automatically run a pass pattern. Press the PASS BUTTON to throw the football to this Receiver when he is open. Once the Receiver has caught the pass, his movement is controlled with the JOYSTICK. By pressing the JUMP BUTTON, the Receiver may jump to receive a pass. You can use the JOYSTICK to shake off a tackler. If you decide to run the ball, your Receiver will block for you.

(2) 2 Players

• Player vs. Opponent

One player is offensive team. Game play is the same as for 1 Player vs. Computer. Second player is defensive team. Before the offense snaps the ball, the defensive player may select his team position by pressing the RB SELECT BUTTON. If it is an obvious pass play, he may wish to stay in the backfield. If it is an obvious run, he may wish to play on the defensive line. One press of the button moves one position. After the ball is in play the defensive player can no longer change positions. Press the TACKLE BUTTON to make a diving tackle. Use the JUMP BUTTON to jump for passes or to dodge tacklers.

• 2 Players vs. Computer

Both players are on the same team. If offensive, one is the Quarterback, the other the Receiver. After each play, these positions are switched. By pressing the RB SELECT BUTTON, the Receiver may choose his position. After he is set, the Quarterback presses the SNAP BUTTON to begin play. If both players are defensive, each is free to select a defensive position using his RB SELECT BUTTON.

(3) 3 Players

Two players are one team vs. one player and the computer on the second team.

(4) 4 Players

Two players vs. two players.

7. MAINTENANCE

(1) Push Button Blade Switch

- Adjust the blade switch contacts for correct gaps.
- When the blade is bent, straighten it by using the blade adjusting rod.

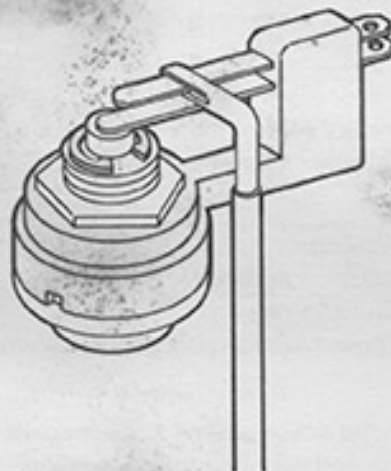


Fig.7 Blade Adjuster

⚠ WARNING ⚠

To prevent an electrical shock hazard, unplug the game prior to performing any maintenance.

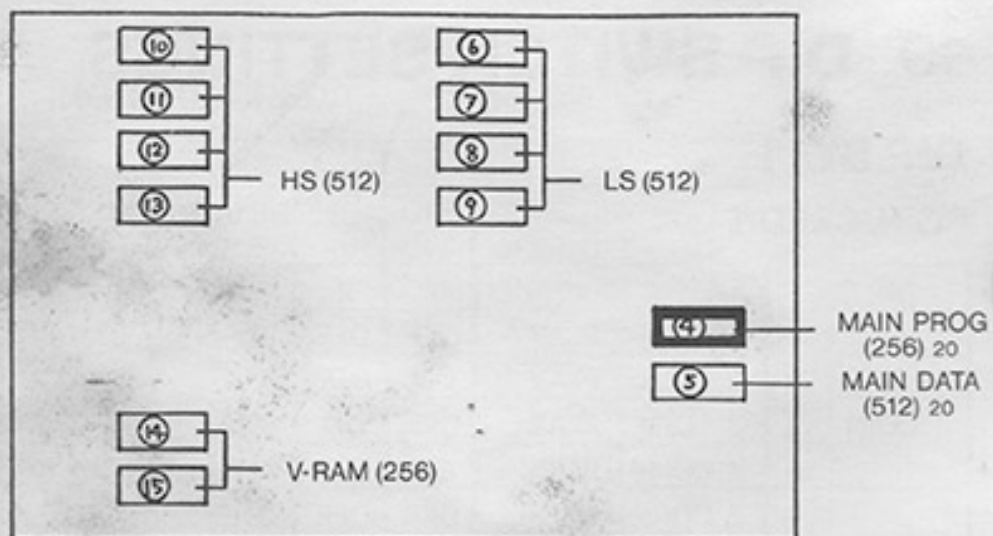
- Take out carbon deposits on the blade switch by using a clean cloth, etc.
- ### (2) Inspecting the Joystick
- Check the joysticks for wear. In case wear is excessive, replace the necessary parts. If a micro-switch is not working correctly, please replace it.
 - Check for loosening of the 4 hold down bolts. If they are loose, tighten them down and apply anaerobic locktite to the bolt threads.

8. TROUBLE SHOOTING

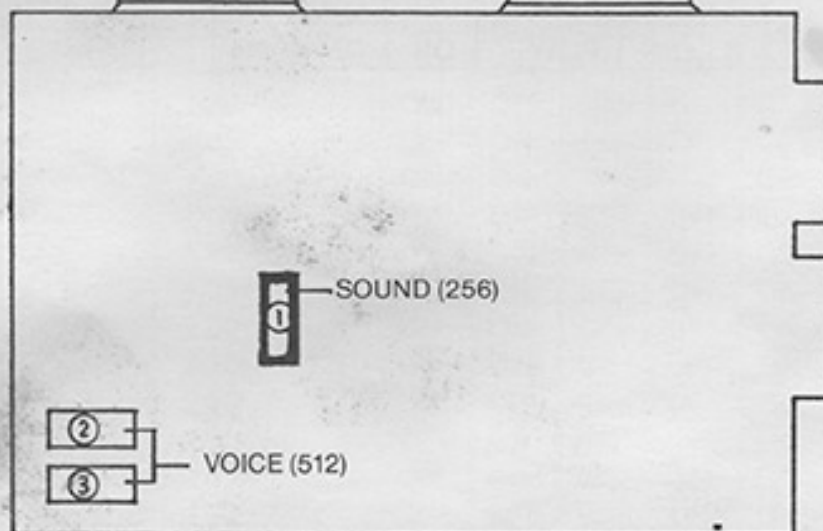
- (1) When the power switch has been turned ON after inserting the power plug into the outlet, no action ensues
 - Check if the power source voltage is 115 V.
 - Check if the plug has been normally inserted.
 - Check if fuses have blown.
- (2) When the power switch is in the ON state
 - The joystick lamp and the coin slot lamp do not come on.
 - a) Check if the filament is off.
 - b) Check if voltage in the secondary side of the insulator-type transformer is normal at 12V AC.
 - c) Check each connector if its contact is normal.
 - No image appears on the CRT
 - a) Check if the CRT heater is glowing.
 - b) Check if power is supplied from the secondary side of the insulator-type transformer.
 - c) Check if the CRT itself is malfunctioning.
 - d) Check if the main PCB's 5V power source pilot lamp is lit, and 5V is being supplied from the DC power source.
 - Images appear on the CRT, but the action seems to be incorrect.
 - a) Check if the main PCB is supplied 4.5 - 5.5V of DC voltage.
 - b) Check if there is improper contact for the J2 connector.
 - After turning power ON, ROM-RAM check is displayed on the video displays. In case any ROM or RAM fails, replace it.
 - The cross-hatch on the video display is not normal.
 - a) Adjust the knob for voltage supplied to the CRT, and the CRT's horizontal and vertical sync knobs.
 - The game is not credited even when a coin is inserted.
 - a) Check if the coin is stopped up.
 - b) Check if the coin mechanism or the coin micro-switch is malfunctioning.
 - 'Player Start or Pass' cannot be performed.
 - a) Check if there is improper contact for the push button blade switch.

9. EPROM LOCATION

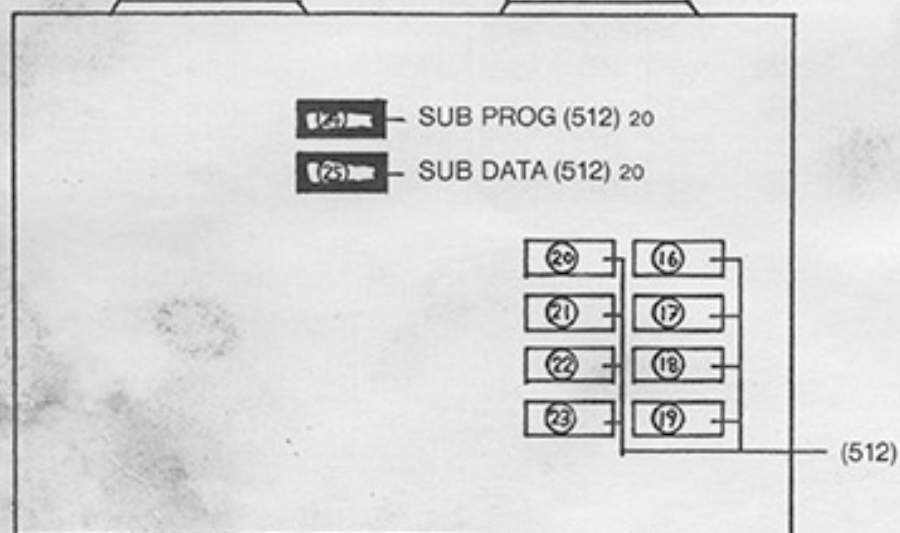
6206 - B



6202 - A



6206 - C



10. DIP SWITCH SETTINGS

DIP SW 1

COIN/CREDIT

DIP SW 1		1	2	3
	1 COIN 1 PLAY	OFF	OFF	OFF
	2 COIN 1 PLAY	ON	OFF	OFF
COIN	3 COIN 1 PLAY	OFF	ON	OFF
	4 COIN 1 PLAY	ON	ON	OFF
	5 COIN 1 PLAY	OFF	OFF	ON
	6 COIN 1 PLAY	ON	OFF	ON
	7 COIN 1 PLAY	OFF	ON	ON
	8 COIN 1 PLAY	ON	ON	ON

PLAYING TIME/CREDIT

DIP SW 1		4	5	6	7	8
MIN/CREDIT	1:00 (N)	OFF	OFF	OFF	OFF	OFF
	0:25	OFF	OFF	OFF	OFF	OFF
	0:30	OFF	ON	OFF	OFF	OFF
	0:35	ON	ON	OFF	OFF	OFF
	0:40	OFF	OFF	ON	OFF	OFF
	0:45	ON	OFF	ON	OFF	OFF
	0:50	OFF	ON	ON	OFF	OFF
	0:55	ON	ON	ON	OFF	OFF
	1:05	OFF	OFF	OFF	ON	OFF
	1:10	ON	OFF	OFF	ON	OFF
	1:15	OFF	ON	OFF	ON	OFF
	1:20	ON	ON	OFF	ON	OFF
	1:25	OFF	OFF	ON	ON	OFF
	1:30	ON	OFF	ON	ON	OFF
	1:35	OFF	ON	ON	ON	OFF
	1:40	ON	ON	ON	ON	OFF
	1:45	OFF	OFF	OFF	OFF	ON
	1:50	ON	OFF	OFF	OFF	ON
	1:55	OFF	ON	OFF	OFF	ON
	2:00	ON	ON	OFF	OFF	ON
	2:10	OFF	OFF	ON	OFF	ON
	2:20	ON	OFF	ON	OFF	ON
	2:30	OFF	ON	ON	OFF	ON
	2:40	ON	ON	ON	OFF	ON
	2:50	OFF	OFF	OFF	ON	ON
	3:00	ON	OFF	OFF	ON	ON
	3:20	OFF	ON	OFF	ON	ON
	3:40	ON	ON	OFF	ON	ON
	4:30	OFF	OFF	ON	ON	ON
	5:00	ON	OFF	ON	ON	ON
6:00	OFF	ON	ON	ON	ON	
7:00	ON	ON	ON	ON	ON	

DIP SW 2

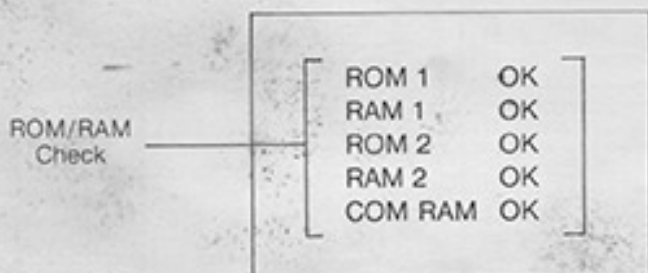
DIP SW 2		1	2	3	4	5	6	7	8
DIFFICULTY	2 MODERATE	OFF	OFF						
	1 EASY	ON	OFF						
	3 HARD	OFF	ON						
	4 HARDEST	ON	ON						
PLAYING TIME + ADD. TIME FOR EXTRA COINS	NO ADD.			OFF	OFF				
	0:02			ON	OFF				
	0:05			OFF	ON				
	0:10			ON	ON				
COUNTDOWN TIME	1 COUNT 50/60 SEC.					OFF	OFF		
	1 COUNT 45/60 SEC.					ON	OFF		
	1 COUNT 54/60 SEC.					OFF	ON		
	1 COUNT 1 SEC.					ON	ON		
DEMO SOUND	YES							OFF	
	NO							ON	
HI SCORE MEMO RESET SWITCH	YES								OFF
	NO								ON

DIP SW 3

DIP SW 3		1	2	3	4
TIME FOR EACH QUARTER	4:00	OFF	OFF		
	3:00	ON	OFF		
	5:00	OFF	ON		
	8:00	ON	ON		
BONUS TIME AWARDED	2			OFF	OFF
	1 FEW			ON	OFF
	3			OFF	ON
	4 MANY			ON	ON

11. DISPLAY CHECK

- After turning the power on, the following display check should be viewed. The display shows for 4 seconds. Push the PASS BUTTON for continued viewing.



- **ROM/RAM CHECK**

If a ROM or RAM fails, "ERROR" will be displayed. If this occurs, it must be replaced. Push the PASS BUTTON once more and the screen will change to a cross hatch.

- **CROSS HATCH CHECK**

The cross hatch check will be displayed for 4 seconds. Push the PASS BUTTON for continued viewing. Push one more time for game demonstration.

12. EDGE CONNECTOR PIN-OUT

TECMO BOWL™ 44 PIN CONNECTOR J1

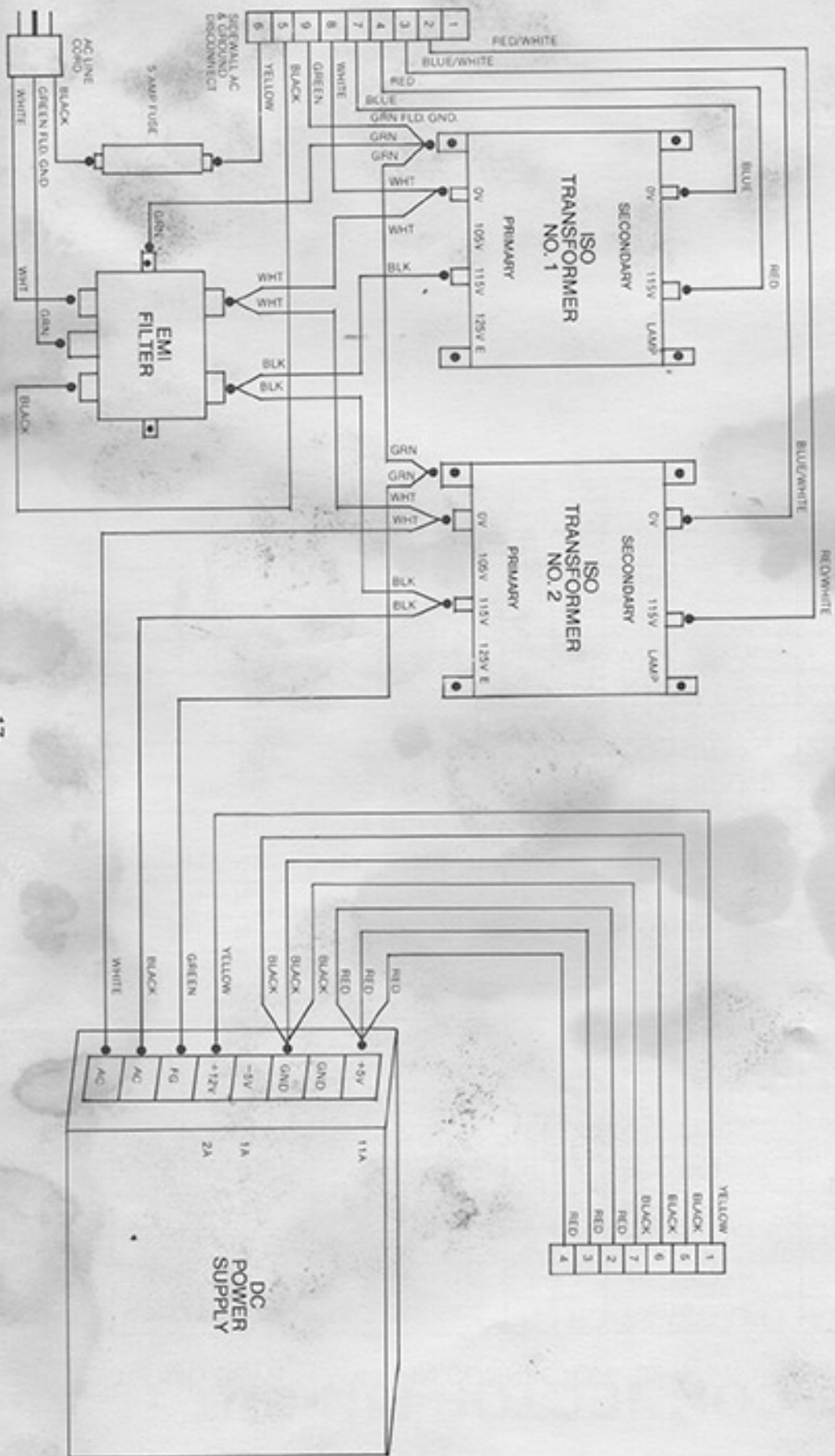
WIRE COLORS	SOLDER SIDE			PARTS SIDE	WIRE COLORS
N.C.	GND	A	1	GND	N.C.
N.C.	+5	B	2	+5	N.C.
N.C.	+12	C	3	+12	N.C.
N.C.	N.C.	KEY	KEY	N.C.	N.C.
GREEN	L - SP. +	E	5	L - SP. -	BLUE
PURPLE	R - SP. +	F	6	R - SP. -	GRAY
BLUE	VIDEO BLUE -1	H	7	VIDEO RED -1	RED
GREEN	VIDEO GRN -1	J	8	VIDEO SYNC -1	WHITE
BLACK	VIDEO GND -1	K	9	VIDEO BLUE -2	BLUE
RED	VIDEO RED -2	L	10	VIDEO GRN -2	GREEN
WHITE	VIDEO SYNC -2	M	11	VIDEO GND -2	BLACK
RED	1P - SW 2	N	12	1P - SW 1	BROWN
ORANGE	1P - UP	P	13	1P - DOWN	YELLOW
GREEN	1P - LEFT	R	14	1P - RIGHT	BLUE
BLACK	1P - GND	S	15	2P - SW 2	WHT/RED
WHT/BRN	2P - SW 1	T	16	2P - UP	WHT/ORN
WHT/YEL	2P - DOWN	U	17	2P - LEFT	WHT/GRN
WHT/BLU	2P - RIGHT	V	18	2P - GND	BLACK
GRAY/RED	3P - SW 2	W	19	3P - SW 1	GRAY/BRN
GRAY/ORN	3P - UP	X	20	3P - DOWN	GRAY/YEL
GRAY/GRN	3P - LEFT	Y	21	3P - RIGHT	GRAY/BLUE
BLACK	3P - GND	Z	22	GND	N.C.

TECMO BOWL™ 44 PIN CONNECTOR J2

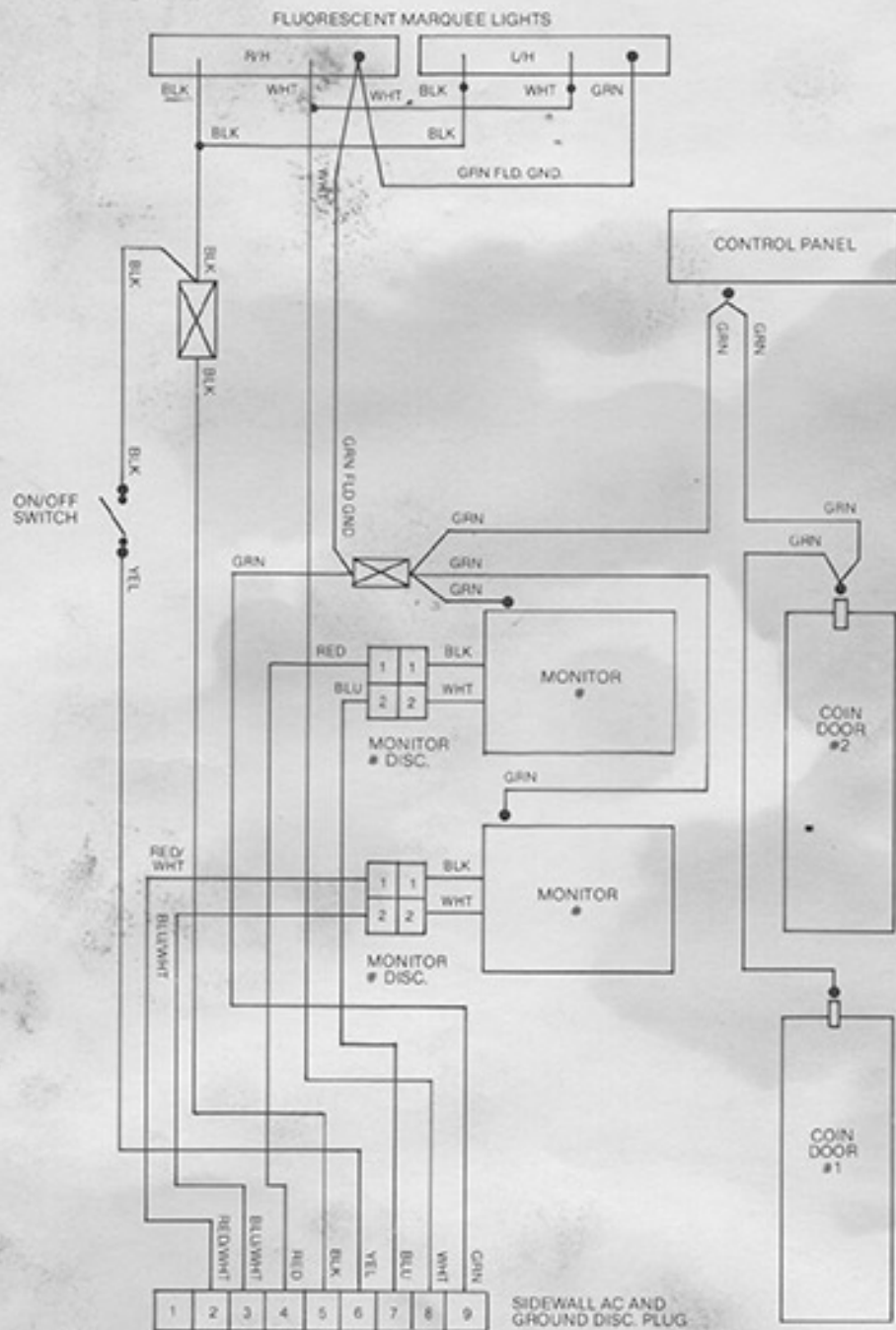
WIRE COLORS	SOLDER SIDE			PARTS SIDE	WIRE COLORS
N.C.	N.C.	A	1	4P - SW 2	PUR/RED
PUR/BRN	4P - SW 1	B	2	4P - UP	PUR/ORN
PUR/YEL	4P - DOWN	C	3	4P - LEFT	PUR/GRN
PUR/BLU	4P - RIGHT	D	4	4P - GND	BLACK
N.C.	4P - START	E	5	3P - START	N.C.
N.C.	2P - START	F	6	1P - START	N.C.
N.C.	START - GND	H	7	4P - BS	N.C.
N.C.	3P - BS	J	8	2P - BS	N.C.
N.C.	1P - BS	K	9	BS - GND	N.C.
N.C.	COIN L.O. - 1	L	10	COIN L.O. - 2	N.C.
N.C.	COIN L.O. - 3	M	11	COIN L.O. - 4	N.C.
N.C.	1P - HAND - A	N	12	2P - HAND - A	N.C.
N.C.	1P - HAND - B	P	13	2P - HAND - B	N.C.
N.C.	HAND - GND	R	14	STOP	N.C.
BROWN	SERVICE SW	S	15	COIN SW - 1	BROWN
RED	COIN SW - 2	T	16	COIN SW - 3	ORANGE
YELLOW	COIN SW - 4	U	17	COIN GND	BLACK
N.C.	N.C.	KEY	KEY	N.C.	N.C.
N.C.	+5	W	19	COIN METER	RED
YELLOW	+12	X	20	+12	YELLOW
BLK/WHT	GND	Y	21	GND	N.C.
N.C.	GND	Z	22	GND	N.C.

13. WIRING DIAGRAMS

POWER SUPPLY - WIRING DIAGRAM TECMO BOWL™



SIDEWALL AC & GROUND HARNESS TECMO BOWL™



Notes
