

SEGA®



# ALTERED BEAST

Installation/Owner's Manual

SEGA Enterprises, Inc.

by:

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The Federal Communication Commission requires the verification of game kits. This game kit will meet these requirements when installed in accordance with the instructions in this Manual and using only components and materials supplied with this kit.

## System Requirements

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- Power Supply:**
- Input voltage 90 VAC to 135 VAC 60 Hz
  - +5 volts at 6 amps
  - +12 volts at 2 amps
  - Overvoltage protected at +5.8 volts
  - Current limit set at 8 amps

- RFI Line Filter:**
1. If a switching power supply is used:
    - Current rating of 6 amps
    - Frequency attenuation of the following:

.15 MHz	40db
.5 MHz	65db
1.0 MHz	65db
5.0 MHz	55db
10.0 MHz	50db
30.0 MHz	50db
  2. If a linear power supply is used:
    - Current rating of 5 amps
    - Frequency attenuation of the following:

.15 MHz	6db
.5 MHz	19db
1.0 MHz	28db
5.0 MHz	42db
10.0 MHz	45db
30.0 MHz	50db

- Miscellaneous:**
- Line Fuse: 4 amp 120 VAC
  - Speaker: 8 ohms 10 watt
  - On/Off Switch: 6 amp 120 VAC
  - Isolation Transformer: 115 VAC primary, 115 VAC secondary, 100 watts
  - Coin Door: Dual coin acceptors
  - Coin Meter: +5 Volt DC
  - Power Cord: Three conductor with ground
  - Color Monitor:
    - Video input 1 volt to 5 volt peak-to-peak positive polarity
    - Sync TTL negative polarity separate horizontal and vertical
    - Horizontal frequency 15.750 KHz
    - Vertical frequency 60 Hz
    - Video bandwidth 12MHz or greater
    - Horizontal mounted
    - Recommended size 19 inch

## Tools Required

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- Drill
- Hole cutter 1-3/16"
- Phillips screw driver
- Flat blade screw driver
- Small flat blade screw driver
- Scissors
- Sand paper
- Paint
- X-acto knife
- Wood patch

## Cabinet Preparation

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1. Remove old PCB, and all existing game harnesses.
2. Remove and disassemble the control panel.
3. Remove any side decals, monitor bezel, and marquee.
4. Using sandpaper and/or paint thinner, clean and smooth the cabinet for paint preparation. Use wood patch to fill any knicks or flaws in the cabinet.
5. Paint cabinet if required.
6. Wipe down and vacuum cabinet as necessary.

**NOTE:** You are building a new game, not just changing an old one. A nice, clean, and new looking conversion not only earns better, but lasts longer.

## Kit Component Verification

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Verify each component with the kit list provided to assure your kit is complete. If any part is missing after the inventory is taken, please contact your distributor, and provide to them the following information:

1. Kit serial number
2. Part number and description of missing item/s
3. Date received

### Kit List

Part Number	Quantity	Description
0002-0000	2	#6 x 3/8 P/h Phil Tek
0002-0001	4	#6 x 3/4 P/H Phil "AB" SMS
0312-0000	8	1/4-20 x 1 3/4 Carr/Bolt Black
0502-0000	8	1/4-20 Hexnut
0612-0000	8	1/4 Split Lock Washer
0692-0000	8	1/4 Flat Washer 1/2 OD
2112-0000	2	Wire Nut #18 x 2
2521-0003	1	Monitor Bezel
4201-0003	1	Manual Altered Beast
	1	License Seal Altered Beast
4210-7120	1	Altered Beast Switch Setting Sheet
4231-0011	1	Altered Beast Marquee Plex
4231-0012	2	Altered Beast Side Art
4231-0013	1	Altered Beast Control Panel Overlay
4231-0008	1	Control Panel Clear Plex
4231-0014	1	Altered Beast Label Sheet (See List)
		(1) Test, Service, Volume Sticker
		(1) Joy Stick Sticker
		(2) Jump Stickers
		(2) Punch Stickers
		(1) Play Inst Sticker
		(2) Kick Stickers
		(1) Start 1 Player Sticker
		(1) Start 2 Player Sticker
		(1) FCC Sticker (Kit)
4750-0049	1	Volume Control 100 Ohm 10 Watt
5090-5028	2	PB Spst Switch Momentary
5091-0001	2	Joy Stick 8 Way (Spring Type)
5091-0004-01	3	PB Spst Control Panel (Red)
5091-0004-02	2	PB Spst Control Panel (White)
5091-0004-03	3	PB Spst Control Panel (Blue)
6002-0002	1	16B Kit Harness
6010-0043	1	Knob
833-6660-OIT	1	Altered Beast Game PCB
9992-0000	6	4" Tie Wrap
KRO-1721-KT	1	Service Switch Bracket

## Installation Procedure

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- |                      |   |
|----------------------|---|
| <b>Monitor Bezel</b> | 1. Locate MONITOR BEZEL (2521-0003). Measure the size of existing monitor bezel or the required size to fit and cut cardboard monitor bezel to size.(see figure 1)  |
| <b>License Seal</b>  | 2. Locate ALTERED BEAST LICENSE SEAL and place seal as shown of in figure 1. Install Monitor Bezel on game cabinet. <b>Note:</b> Verify that the License Seal will be visible when the bezel is installed on game cabinet.  |
| <b>Side Decal</b>    | 3. Locate ALTERED BEAST SIDE ART (4231-0012). Install on the left and right side panels of the cabinet (see figure 1). <b>Note:</b> A mixture of slightly soapy water can be used on the cabinet to position the artwork as desired. A squeegee may be used to remove any wrinkles in the artwork if soapy water is used.   |
| <b>Marquee Plex</b>  | 4. Locate ALTERED BEAST MARQUEE PLEX (4231-0011). Measure the size of existing marquee plex or required size to fit and trim the Altered Beast marquee plex to size. Install on cabinet. (see figure 1)   |
| <b>Control Panel</b> | 5. Locate ALTERED BEAST CONTROL PANEL OVERLAY (4231-0013). Measure the size required and cut the control panel overlay to fit the existing control panel.<br><br>6. Define the location of the player push buttons and joystick(s) on the control panel. (see figure 2)<br><br>7. Cut holes in control panel to locate buttons and joystick(s). See template for button and joystick. (see figure 3)<br><br>8. Install the "ONE PLAYER START" label and the "TWO PLAYER START" label on the control panel overlay. (see figure 2)<br><br>9. Install player control button labels, PUNCH, KICK, and JUMP on the control panel overlay. (see figure 2)<br><br>10. Install the JOYSTICK label(s) on the control panel overlay. (see figure 2)<br><br>11. Locate the CONTROL PANEL CLEAR PLEX (4231-0008) and cut holes into the plex to match the holes cut into the control panel. Then trim as required to protect the control panel overlay and labels. <b>Note:</b> this clear plex overlay can be used to protect unused holes in the control panel from player punctures. (see figure 2)<br><br>12. Install RED buttons (5091-0004-01) in the player 1 location for JUMP, PUNCH and KICK. (see figure 2) |

13. Install BLUE buttons (5091-0004-03) in the player 2 location for JUMP, PUNCH and KICK. (see figure 2)
14. Install WHITE buttons (5091-0004-02) in 1 PLAYER START and 2 PLAYER START locations. (see figure 2)

**NOTE:** When buttons are securely placed and tightened in the control panel assembly, a small amount of clear RTV Silicone may be placed on two or three areas of the lock-nut to keep the switches from being unscrewed from the top of the panel. (see figure 3)

15. Locate the JOYSTICK(S) (5091-0001). This package consists of the following six components.
  - a. Preassembled joystick(s) base assembly with microswitches
  - b. E-ring
  - c. Black knob & shaft
  - d. 2" Dia. washer
  - e. Actuator plastic
  - f. Pivot cone

The final assembly of the joystick(s) must be performed after the joystick(s) base assembly is mounted on the control panel. Locate the following:

- |   |        |
|---|--------|
| a. 1/4-20 X 1 3/4 Carr/Bolt Black (0312-0000) | (8 ea) |
| b. 1/4-20 Hexnut (0502-0000)                  | (8 ea) |
| c. 1/4 Flat Washer 1/2" OD (0692-0000)        | (8 ea) |
| d. 1/4 Split Lock Washer (0612-0000)          | (8 ea) |

Use the above components to secure the Joystick base assembly to the control panel. (see figure 2)

The final assembly of the joystick(s) is performed by:

- a. Placing the 2" Dia. washer over the Black knob & shaft.
- b. Install the Pivot cone on the shaft, note proper orientation.
- c. Install the Black knob & shaft assembly through the joystick(s) base assembly on the control panel.
- d. Install the Actuator micro/switch on the shaft, note proper orientation.
- e. Install the E-ring on the shaft to secure the assembly.

### **Service Switch Assembly**

16. Locate SERVICE SWITCH BRACKET (KR0-1721-KT) and install two PUSH BUTTON SPST SWITCH MOMENTARY (5090-5028) into bracket as shown in figure 4.
17. Locate VOLUME CONTROL 100 OHM 10 WATT (4750-0049) and install into service switch bracket as shown in figure 4.
18. Locate TEST, SERVICE, VOLUME STICKER and place on the service switch bracket as shown in figure 4.

19. Locate KNOB 1/8" SHAFT (6010-0043) and install on shaft of volume control 100 ohm 10 watt as shown in figure 4.
20. Install the Service Switch Assembly using 2 ea #6 x 3/8 P/H PHIL TEK screws (0002-0000) in the cabinet at either of the following locations (see figure 5):
  - On top of the steel enclosure for the Cash Box, inside the coin door.  
**Note:** The TEK screws have a drill point and will drill through the steel enclosure.
  - Inside to the left of the coin door, mounted to the wood cabinet.

### **Harness Installation**

21. Locate 16B KIT HARNESS (6002-0002) and install as shown in figure 5. Use the provided (6 ea) 4" TIE WRAP (9992-0000) to secure the harness.
22. Connect the harness to the POWER SUPPLY as follows: (see figure 6)
  - a. Twisted ORANGE wires to +5 volt source.
  - b. Twisted PINK wires to +12 volt source.
  - c. Twisted BLACK wires to GND source.
23. Connect the harness to the COIN DOOR as follows: (see figure 7.)
  - a. Connect the GRAY wire's faston to coin chute 2 acceptor microswitch COMMON terminal.
  - b. Connect the BROWN wire's faston to coin chute 1 acceptor microswitch COMMON terminal.
  - c. Connect a BLACK wire's faston to coin chute 2 acceptor microswitch NORMALLY OPEN terminal. Use the faston that is nearest the harness break out.
  - d. Connect the next BLACK wire's faston to coin chute 1 coin acceptor microswitch NORMALLY OPEN terminal.
  - e. Connect the other two BLACK wire's faston to the two lamps on the coin door.
  - f. Connect the two ORANGE wire's faston to the two lamps on the coin door. The orange wires supply +5 volts to the lamps and the black wires supply the return.
24. Connect the harness to the COIN METER by using two WIRE NUTS (2112-0000). (see figure 8) **Note:** Some coin meters have an internal diode. Connect the ORANGE wire to the "+" terminal of the meter and the WHITE wire to the "-" terminal.
25. Connect the harness to the SERVICE SWITCH ASSEMBLY as follows: (see figure 4.)
  - a. Connect the two BLACK wire's fastons to a terminal of each PUSH BUTTON.
  - b. Connect the GREEN wire's faston to the SERVICE SWITCH.
  - c. Connect the BROWN wire's faston to the TEST SWITCH.
  - d. Connect the WHITE wire's faston to the terminal of the VOLUME CONTROL that is nearest the center of the bracket.
  - e. Connect the YELLOW wire's faston that goes to the speaker to the center terminal of the VOLUME CONTROL.
  - f. Connect the GRAY wire's faston that is routed to the 56 pin connector to the outer most terminal of the VOLUME CONTROL.



26. Connect the harness to the CONTROL PANEL as follows:
- Route and connect the daisy chained BLACK wire to the terminal of the PLAYER PUSH BUTTONS and JOYSTICK as shown in figure 9.
  - Connect the control panel harness wires as follows: (figure 10)

GREEN	TO	PLAYER 1	JOYSTICK UP
YELLOW	TO	PLAYER 1	JOYSTICK DOWN
RED	TO	PLAYER 1	JOYSTICK RIGHT
BLUE	TO	PLAYER 1	JOYSTICK LEFT
GRAY	TO	PLAYER 1	KICK
WHITE	TO	PLAYER 1	JUMP
BROWN	TO	PLAYER 1	PUNCH
RED	TO	PLAYER 1	START
GREEN/BLK	TO	PLAYER 2	JOYSTICK DOWN
YELLOW/BLK	TO	PLAYER 2	JOYSTICK UP
RED/BLK	TO	PLAYER 2	JOYSTICK RIGHT
BLUE/BLK	TO	PLAYER 2	JOYSTICK LEFT
GRAY/BLK	TO	PLAYER 2	KICK
WHITE/BLK	TO	PLAYER 2	JUMP
BROWN/BLK	TO	PLAYER 2	PUNCH
BLUE	TO	PLAYER 2	START

- Route the harness wires securely to prevent any binding or damage to harness.

27. Connect the two connectors for sync and video to the MONITOR as shown in figure 11.

28. Connect the routed speaker wires, YELLOW and GRAY, to the speaker. Check the routing for security.

### **Cabinet 115 VAC System Grounding**

29. Locate the GROUND lead (green) of the 115 volt input power Line (see figure 12). This must be connected to all components of the game system. This is a safety requirement for the players' protection. This AC GROUND must be of #18 AWG wire or larger. (see figure 12 for the proper routing of the wire)

### **Cabinet System Checkout**

30. Apply power to cabinet system and check for the following voltages. If any voltage is incorrect, remove power and correct problem before proceeding any further.
- + 5 Volts on pins 3,4,C, and D of the 56 pin PCB connector.
  - + 12 Volts on pins 5 and E of the 56 pin PCB connector.
  - No voltage present on any other pins of the 56 pin PCB connector.
31. Check that the monitor has power. This can be accomplished by observing the glow of the filament inside the neck of the picture tube.
32. Check that the Marquee lamp has power.
33. Check that the system ON/OFF switch functions properly.

**WARNING: PROCEED ONLY IF THE ABOVE CHECKS ARE CORRECT**

## **Altered Beast Printed Circuit Board Installation**

34. Locate the ALTERED BEAST GAME PCB (834-4696) and install the logic PCB inside the cabinet (see figure 5). Use (4 ea) #6 x 3/4 P/H PHIL "AB" SMS (0002-0001) to secure the PCB through its' mounting feet.
35. Locate the ALTERED BEAST SWITCH SETTING SHEET. Place this sheet on the inside of the game so that it is visible when the back door is removed or opened. This will allow the DIP SWITCH OPTIONS to be handy when service or changes in options is required.
36. Connect the 56 pin connector to the PCB with the label on the same side as the components on the PCB. The 56 pin connector is marked with "COMPONENT SIDE".

**NOTE:** The proper orientation of the connector (see figure 13). If not connected properly, the system will not function and damage can occur to the PCB.

## **Logic Board and Complete System Checkout**

37. Apply power to the system and observe that the logic PCB functions. If a video picture is not present proceed to "IN CASE OF DIFFICULTY" portion of this manual. When corrected, return to this point and continue.
38. Press the TEST BUTTON to enter the test menu. Individual tests can be entered by moving the 1P Joystick up or down. Press test button a second time to enter desired test.
  - **Memory test:**  
Individual tests as follows:
    - **ROM test** (tests game program)
    - **Fix RAM test** (tests video RAM dealing with numbers & letters, etc.)
    - **Scroll RAM test** (tests video RAM dealing with background, etc.)
    - **Color RAM test** (tests color RAM on PCB)
    - **Scratch RAM test** (tests all program memory on PCB)
  - **Input test:**  
Tests all player inputs.
  - **Sound test:**  
Select individual sound check areas by 1P up/down. Select individual sounds in an area by 1P right/left.
  - **CRT test:**  
Displays color bar and grid size so monitor adjustment can be made for color, focus, size, brightness, etc.
  - **DIP switch test:**  
Displays current DIP switch options and allows switches to be made with power on to change game options.
  - **Bookkeeping:**  
Shows all coin in data, game times, high and low scores, etc.
  - **Back-up RAM clear:**  
Clears all bookkeeping data.
  - **Exit:**  
When arrow is lined up with this, press test to return to normal game mode.

39. Set up game options as shown in figure 14.
- a. DIP SWITCH 1 on PCB sets up the number of coins per credit
  - b. DIP SWITCH 2 on PCB sets up the following:

<b>Advertise Sound</b>	- Set to ON	- 2 on
<b>Number of Players</b>	- Set to 3	- 3 off, 4 off
<b>Player Meter</b>	- Set to 3	- 5 off, 6 off
<b>Game Difficulty</b>	- Set to Normal	- 7 off, 8 off
40. Functionally test the game by:
- a. VERIFY that coin drops register proper credit/s and the COIN METER OPERATES.
  - b. VERIFY that the proper number of lives is given for each CREDIT.
  - c. VERIFY that the JOYSTICK MOVES the player left, right, and down.
  - d. VERIFY that each PUNCH BUTTON functions.
  - e. VERIFY that each KICK BUTTON functions.
  - f. VERIFY that each JUMP BUTTON functions.
41. Locate the Kit SERIAL NUMBER STICKER and FCC STICKER. Install these stickers on the rear of the game cabinet. (see figure 1)

INSTALLATION IS COMPLETE

## In Case of Difficulty

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- Check A.C. line cord
- Check line fuse
- Check monitor brightness
- Check power switch and/or interlock switch
- Check all solder connections on line filter and transformer
- Check for proper orientation of the 56 pin PCB connector

- Check all PCB to monitor connections
- Check power supply voltage on PCB

- Check monitor brightness
- Check all PCB to monitor connections

- Monitor needs degaussing
- Check for proper wiring between PCB and monitor
- Check monitor adjustment and adjust if necessary

- Check monitor ground is properly connected to monitor
- Be certain sync inputs are properly connected to monitor
- Check horizontal hold adjustment

- Check horizontal and/or vertical hold adjustments
- Check for proper wiring of sync from PCB to monitor

- Check volume control potentiometer adjustment
- Check for +12 volts on edge connector of PCB
- Check wiring from PCB to speaker
- Check speaker for low resistance between the "+" and "-" tabs

- Check wiring to speaker for bad solder connections.
- Check sound with another speaker

- Check ground connection to switch/es
- Check wiring between PCB and switch/es for proper connection
- Check switch/es with an ohmmeter to verify proper operation

- Check wiring between PCB and switches for proper orientation
- Check wiring for shorts between switch inputs

- Check wiring to coin meter
- Check that +5 volts is on "+" side of meter
- Verify a +5 volt meter is used

- Verify that a meter with a diode is used
- If no diode is built in meter a 1N4004 can be used across the meter.  
Cathode to "+" side of meter and anode to "-" side of meter

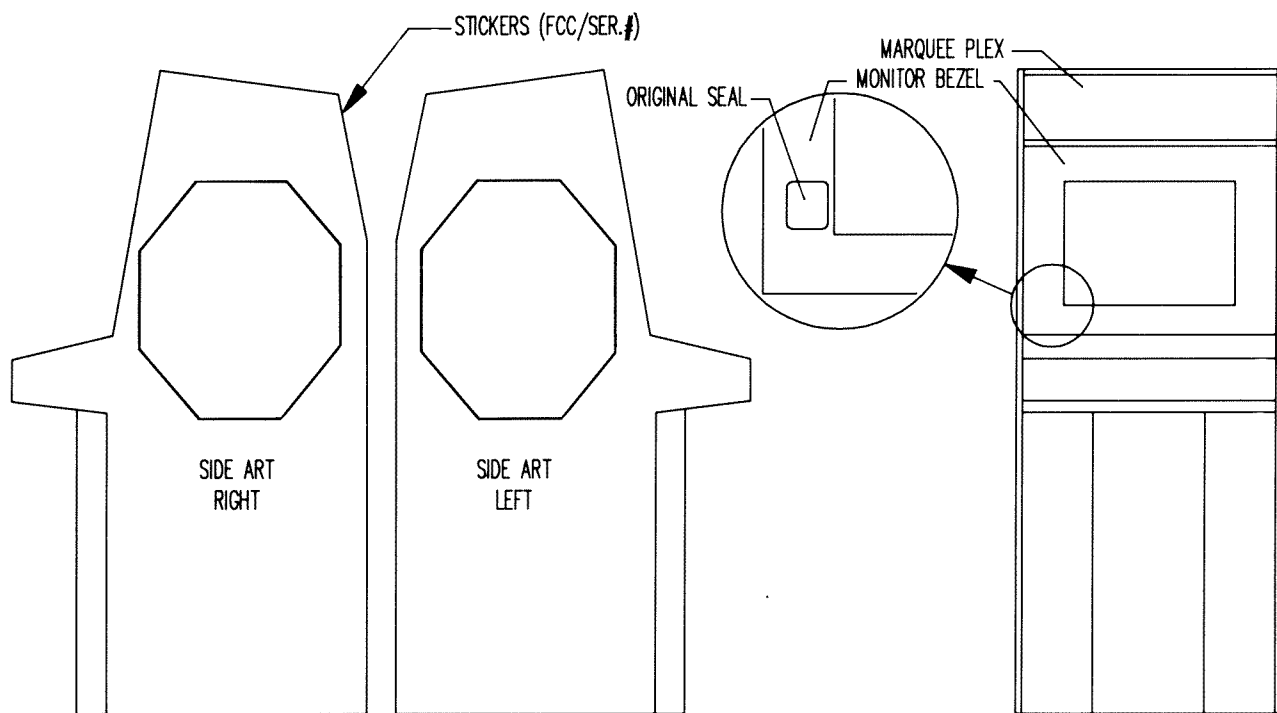
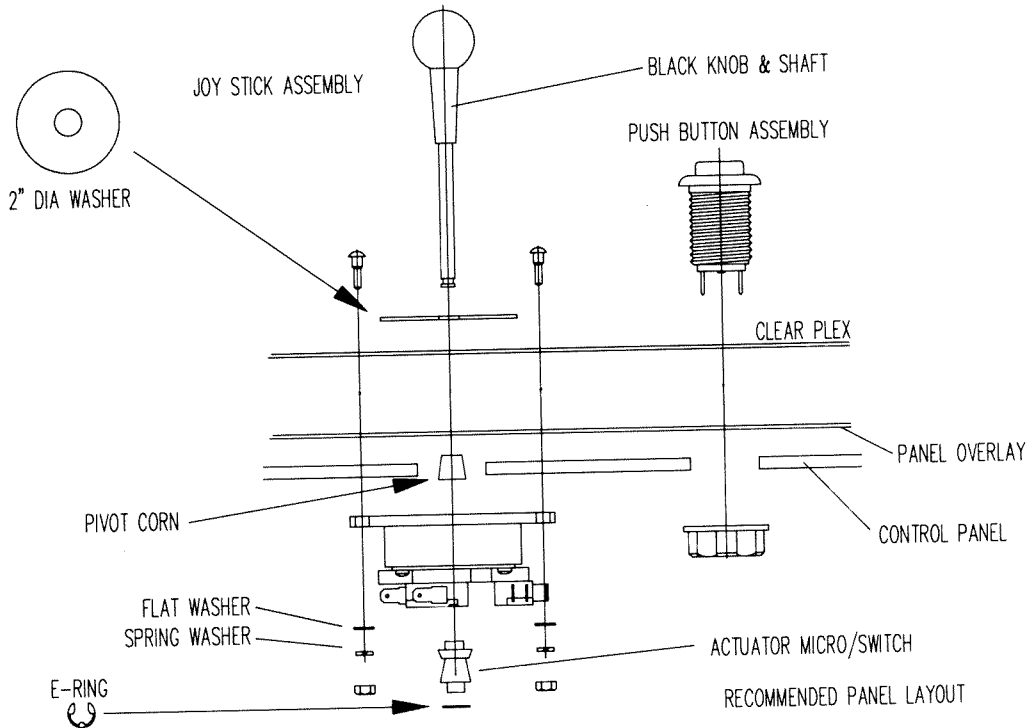


Figure 1



### CONTROL PANEL TOP VIEW



### SUGGESTED LAYOUT AND HOLE SIZES (TOP VIEW)

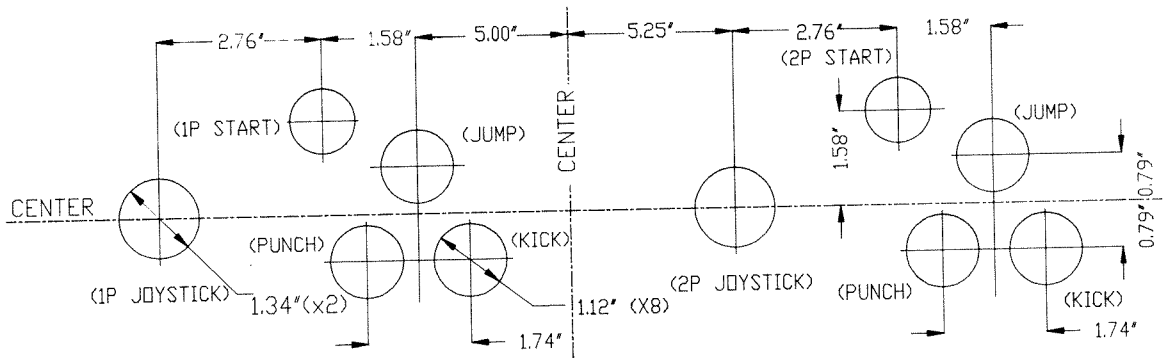


Figure 2

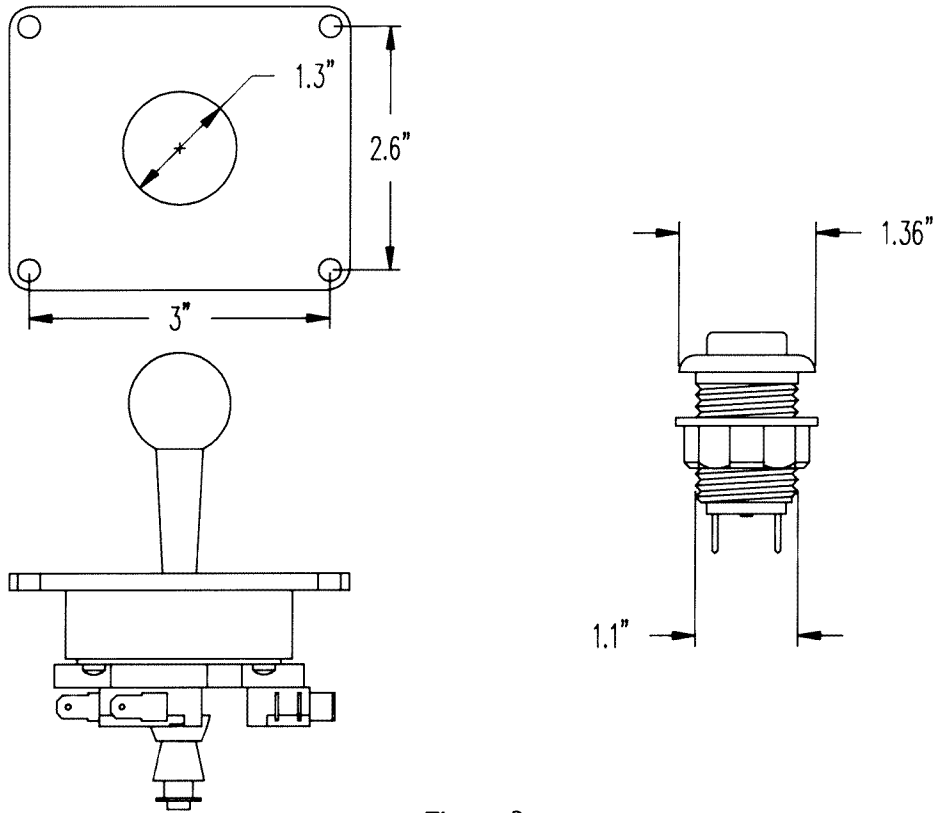


Figure 3

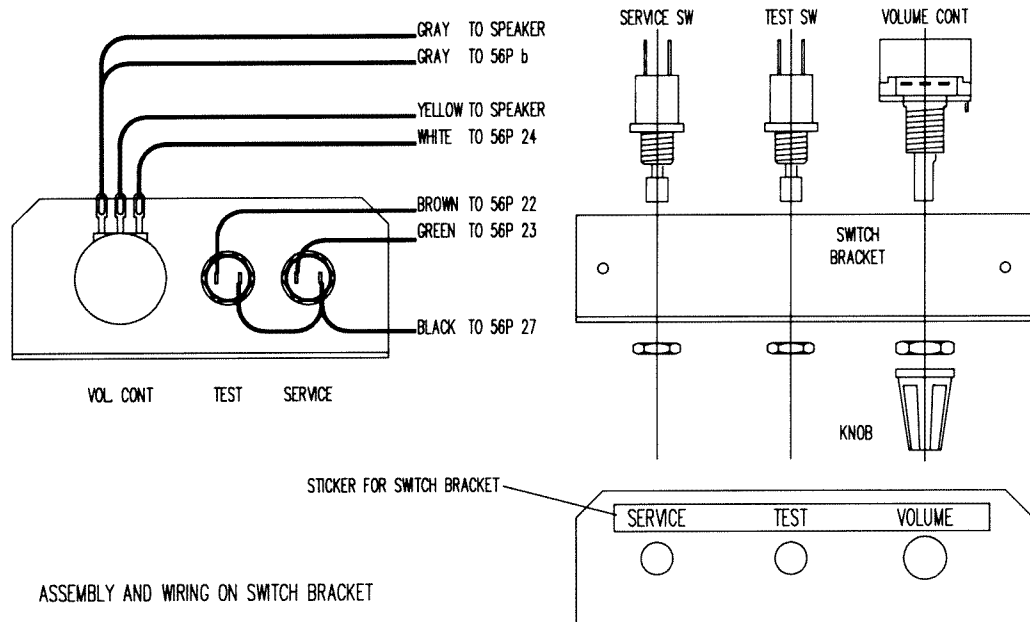
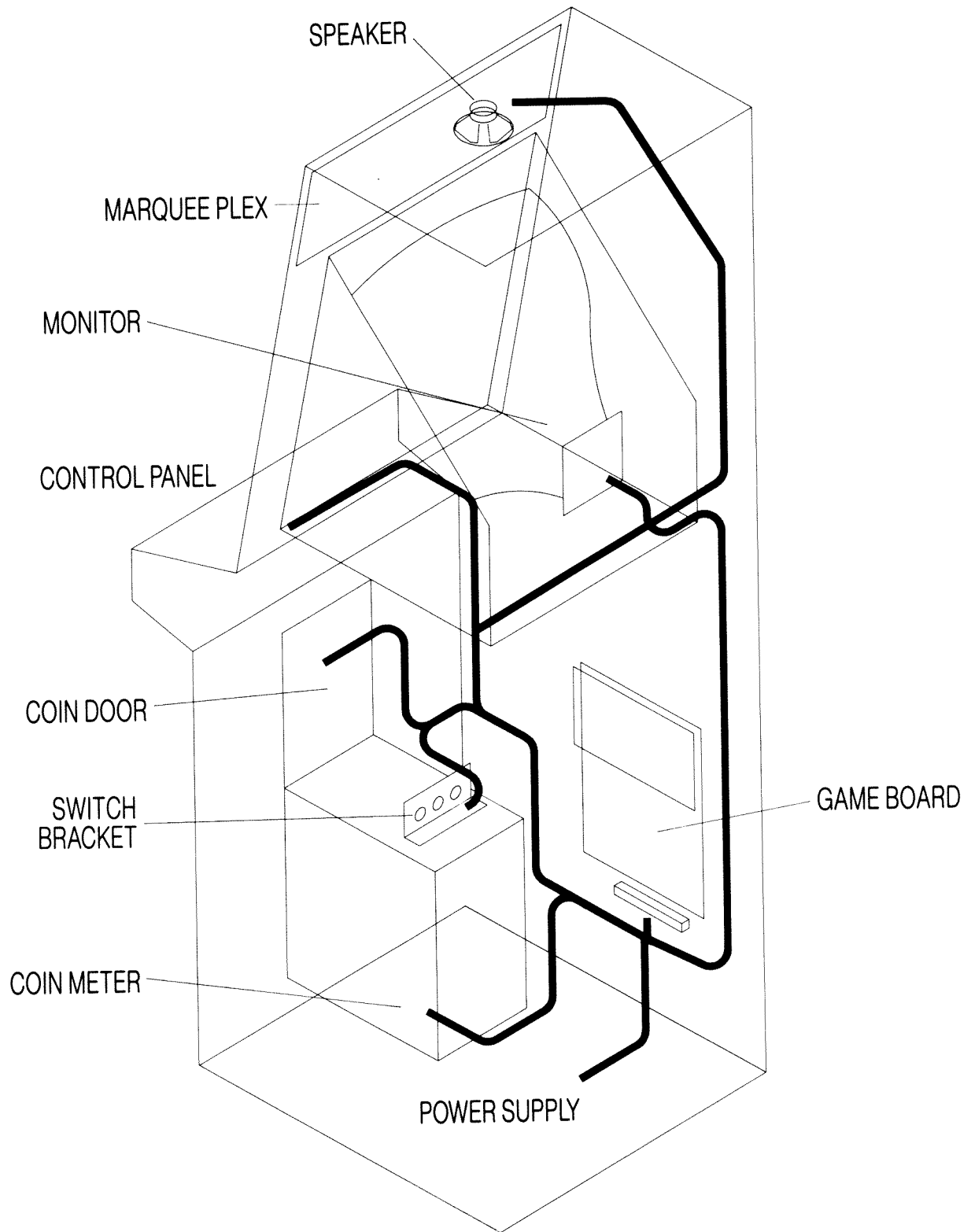


Figure 4



SUGGESTED HARNESS ROUTING

Figure 5



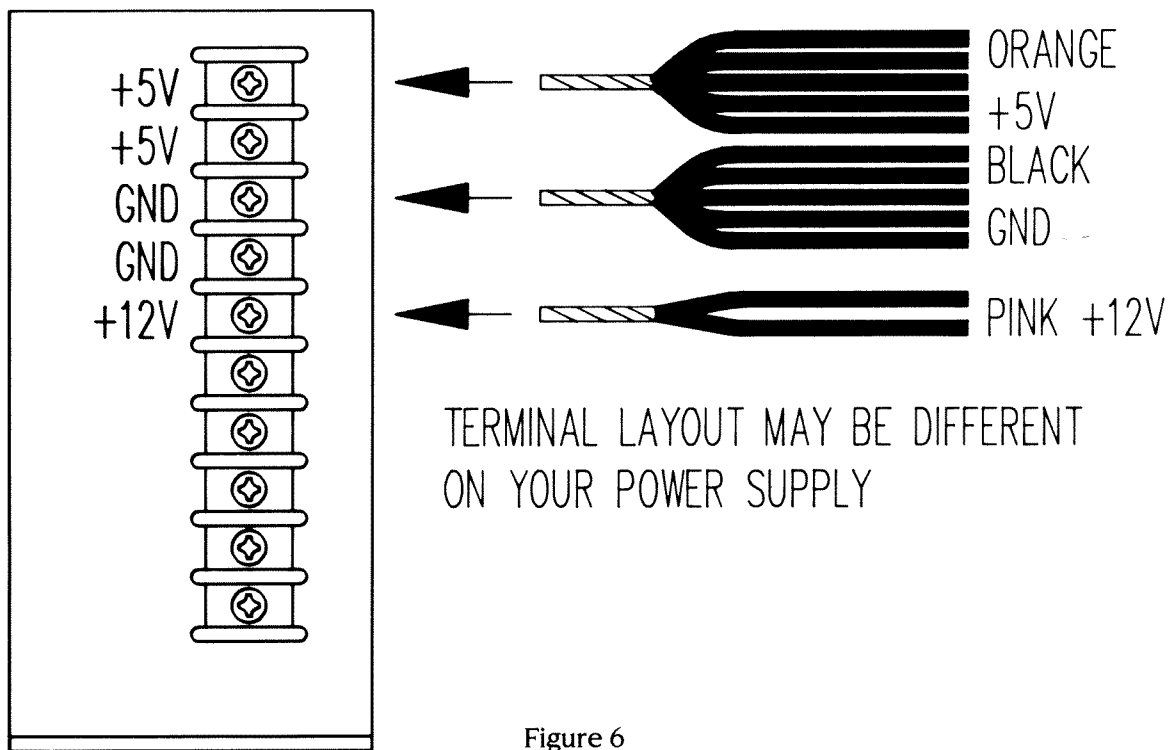


Figure 6

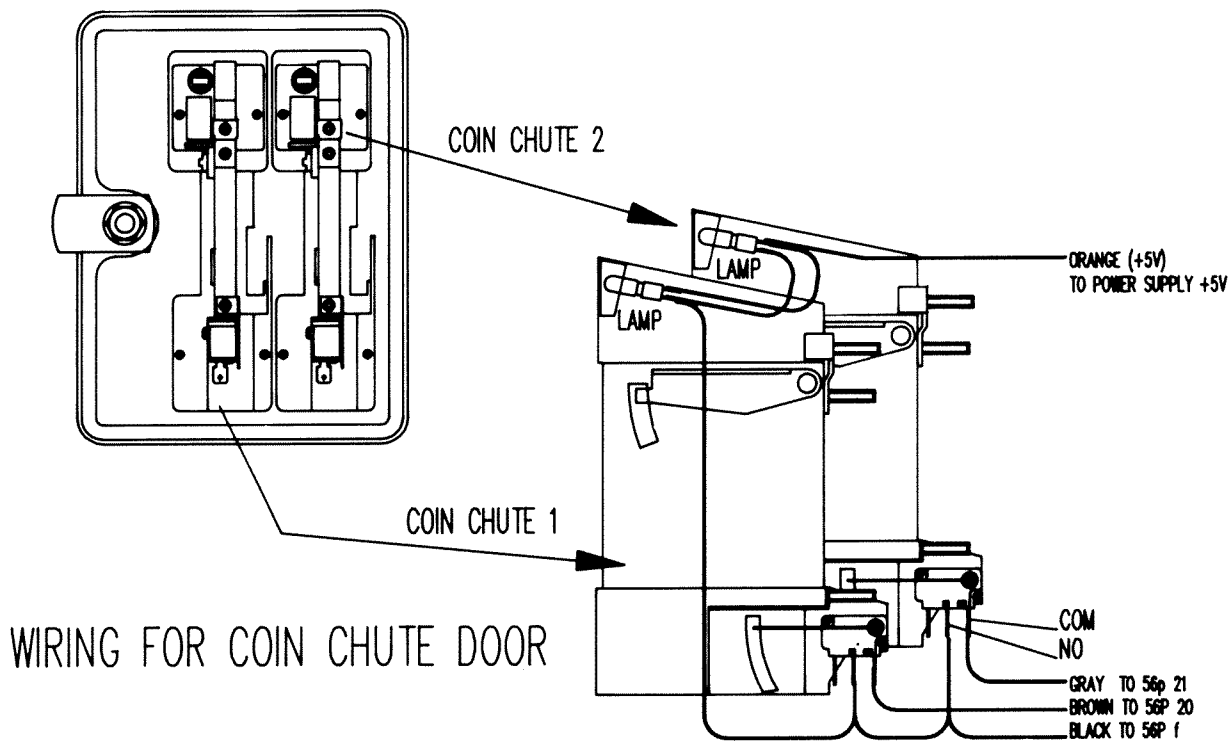


Figure 7

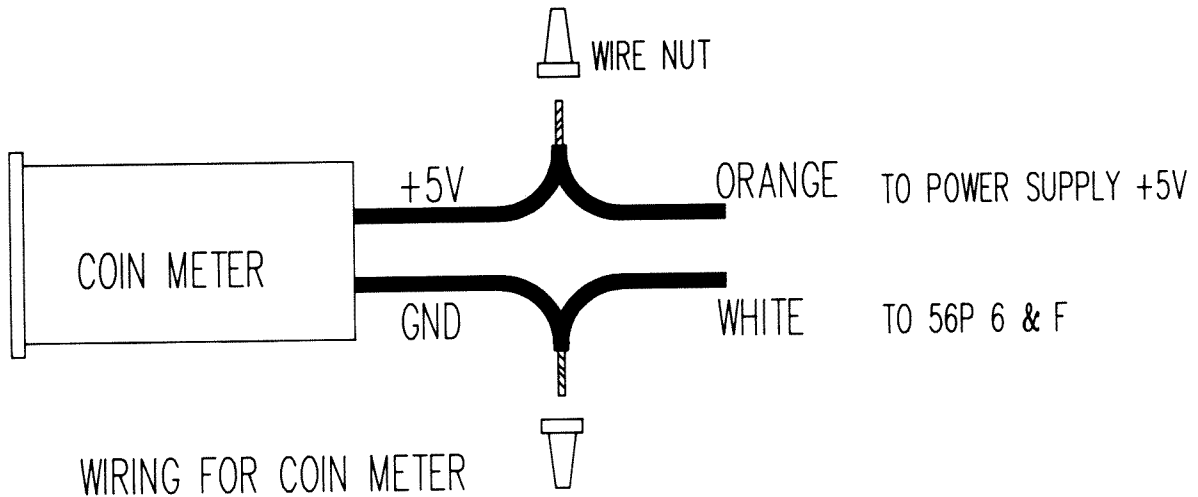


Figure 8

CONTROL PANEL REAR VIEW

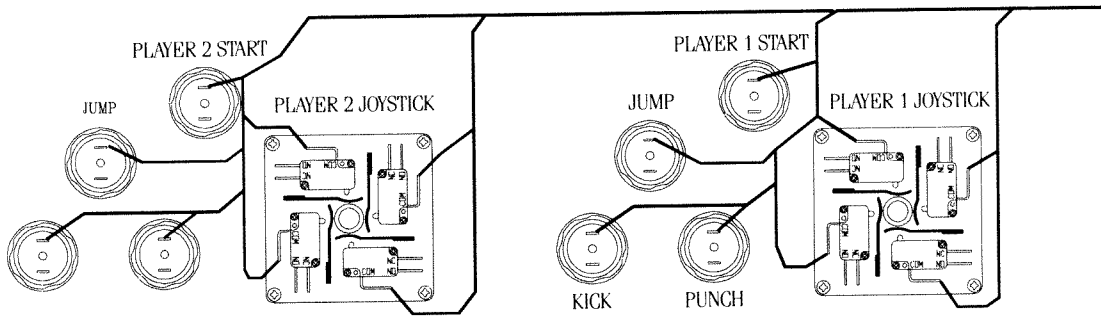


Figure 9

CONTROL PANEL REAR VIEW

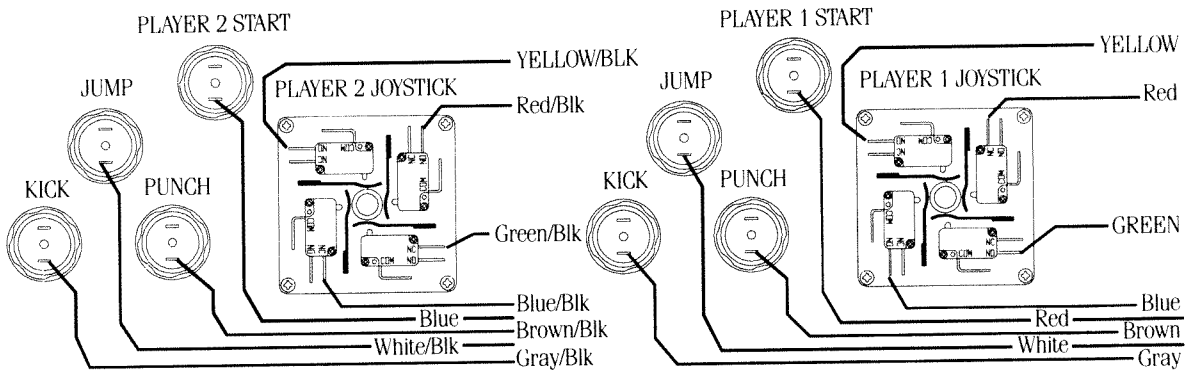


Figure 10

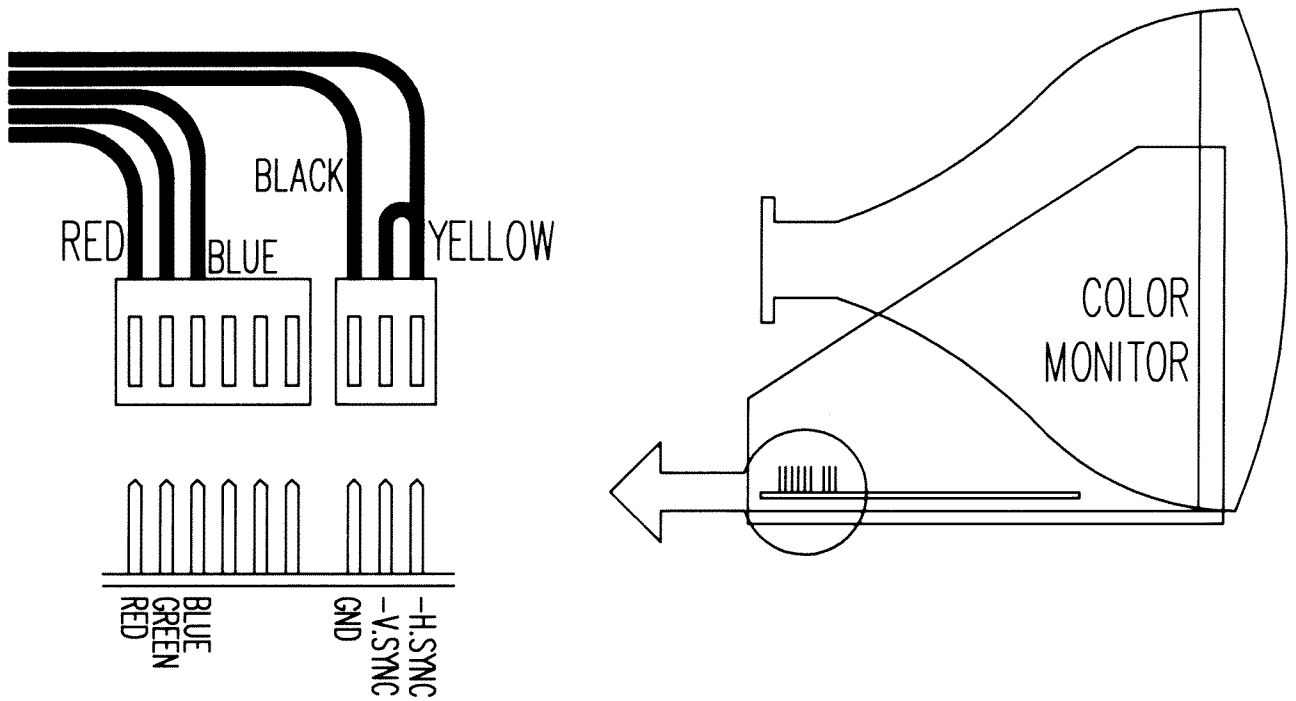


Figure 11

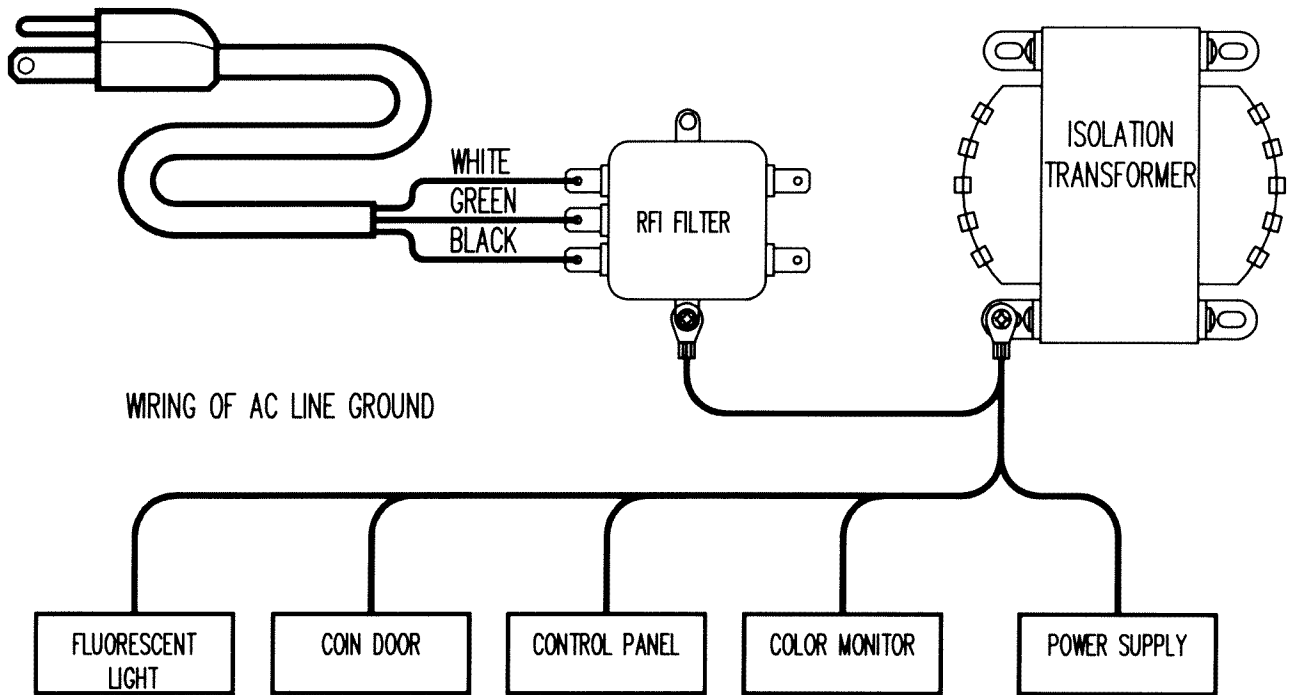


Figure 12

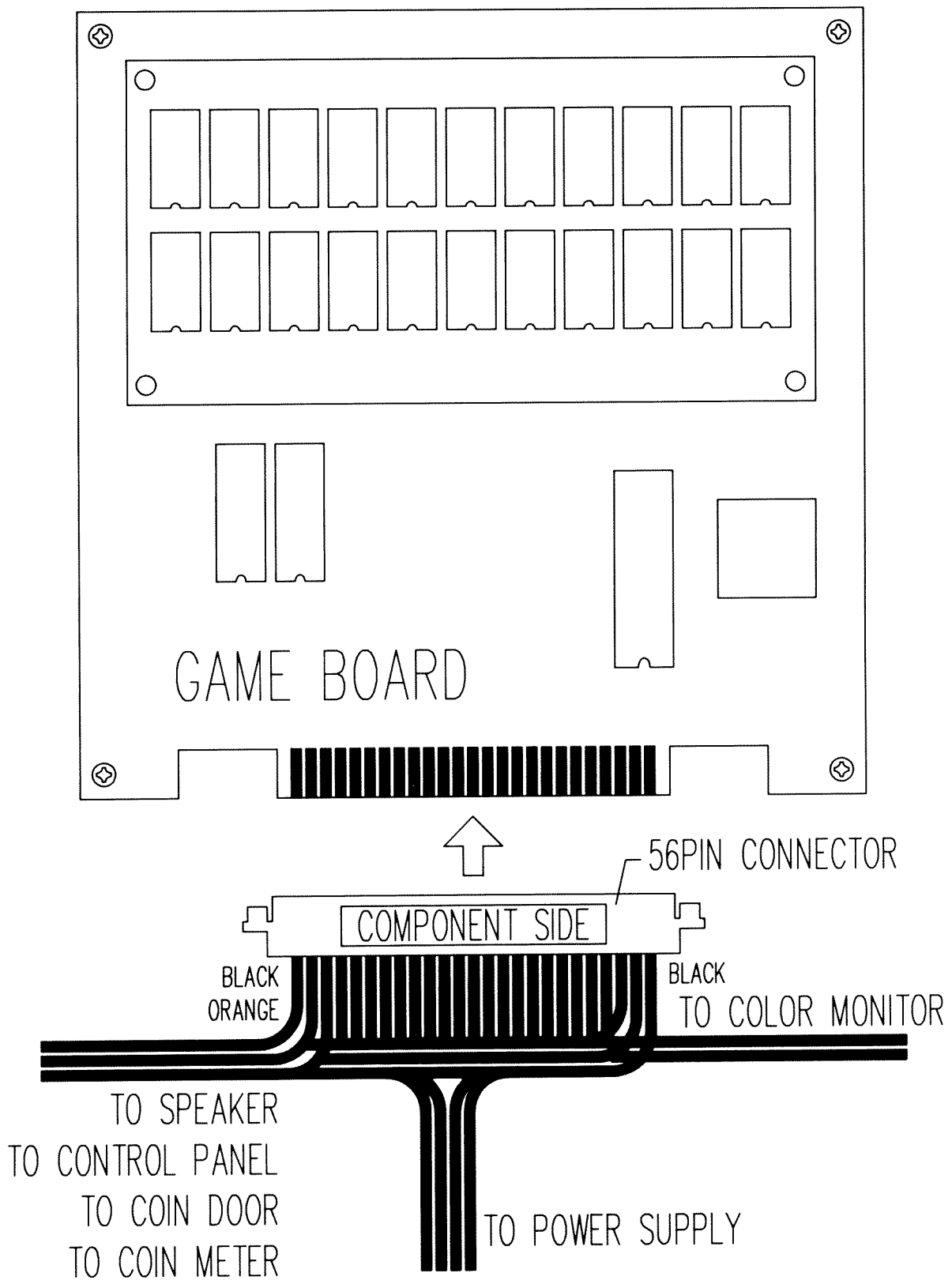
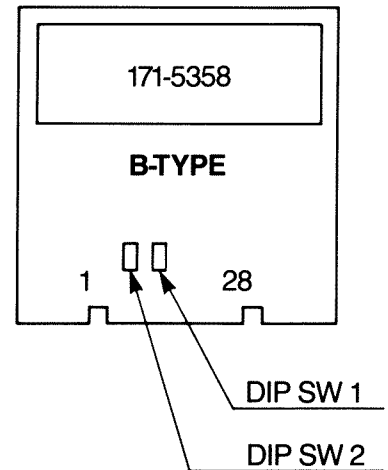
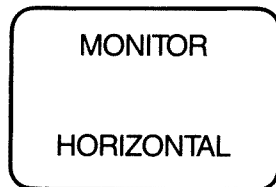


Figure 13

COIN/CREDIT OPTION SWITCH SETTING			DIP SW #1							
OPTION		1	2	3	4	5	6	7	8	
1 COIN	1 CREDIT	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
1 COIN	2 CREDITS	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	
1 COIN	3 CREDITS	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF	
1 COIN	4 CREDITS	ON	ON	ON	OFF	ON	ON	OFF	OFF	
1 COIN	5 CREDITS	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF	
1 COIN	6 CREDITS	ON	OFF	ON	OFF	ON	OFF	ON	OFF	
2 COINS	1 CREDIT	OFF	ON	ON	OFF	OFF	ON	ON	OFF	
3 COINS	1 CREDIT	ON	ON	ON	OFF	ON	ON	ON	OFF	
4 COINS	1 CREDIT	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON	
2 COINS	3 CREDITS	ON	OFF	OFF	ON	ON	OFF	OFF	ON	
2 COINS	1 CREDIT	ON	ON	OFF	ON	ON	ON	OFF	ON	
4 COINS	3 CREDITS	ON	ON	OFF	ON	ON	ON	OFF	ON	
5 COINS	3 CREDITS	ON	ON	OFF	ON	ON	ON	OFF	ON	
6 COINS	4 CREDITS	ON	ON	OFF	ON	ON	ON	OFF	ON	
1 COIN	1 CREDIT	ON	OFF	ON	ON	ON	OFF	ON	ON	
2 COINS	2 CREDITS	ON	OFF	ON	ON	ON	OFF	ON	ON	
3 COINS	3 CREDITS	ON	OFF	ON	ON	ON	OFF	ON	ON	
4 COINS	4 CREDITS	ON	OFF	ON	ON	ON	OFF	ON	ON	
5 COINS	5 CREDITS	ON	OFF	ON	ON	ON	OFF	ON	ON	
1 COIN	1 CREDIT	OFF	ON	ON	ON	OFF	ON	ON	ON	
2 COINS	3 CREDITS	OFF	ON	ON	ON	OFF	ON	ON	ON	
FREE PLAY		ON	ON	ON	ON	ON	ON	ON	ON	
			COIN SW #1				COIN SW #2			

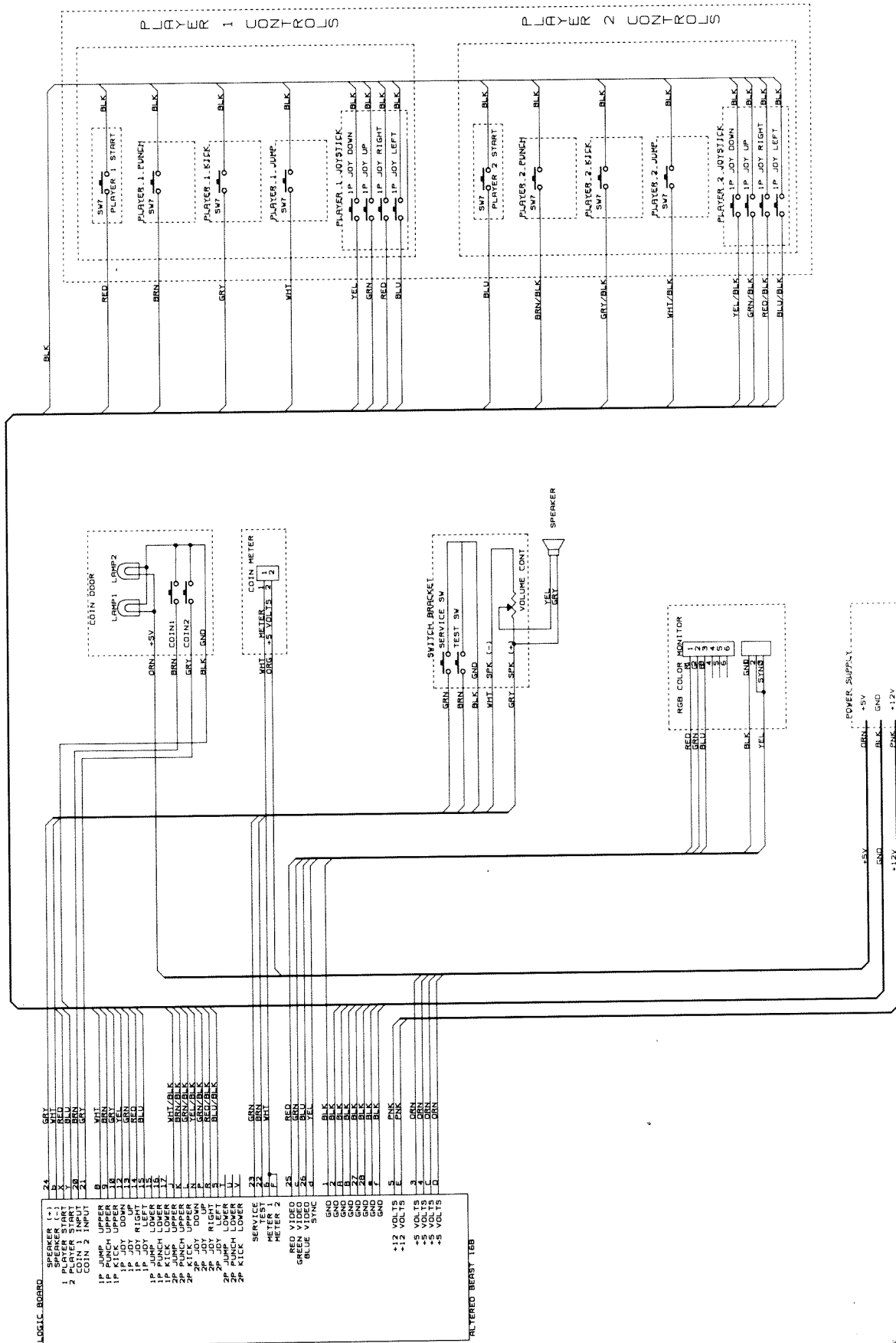


OPTION SWITCH SETTING		DIP SW #2							
OPTIONS		1	2	3	4	5	6	7	8
1 CREDIT TO START		OFF							
2 CREDITS TO START		ON							
ADVERTISE SOUND	OFF		OFF						
	ON		ON						
NUMBER OF PLAYERS	3			OFF	OFF				
	2			ON	OFF				
	4			OFF	ON				
	FREE			ON	ON				
PLAYER METER (DAMAGE)	3					OFF	OFF		
	2					ON	OFF		
	4					OFF	ON		
	5					ON	ON		
GAME DIFFICULTY	NORMAL							OFF	OFF
	EASY							ON	OFF
	HARD							OFF	ON
	HARDEST							ON	ON



PIN ASSIGNMENT		
COMPONENT SIDE		SOLDER SIDE
GND	1 A	GND
GND	2 B	GND
+5V	3 C	+5V
+5V	4 D	+5V
+12V	5 E	+12V
COIN METER 1	6 F	COIN METER 2
(NOT USED)	7 H	(NOT USED)
1P UPPER JUMP	8 J	2P UPPER JUMP
1P UPPER PUNCH	9 K	2P UPPER PUNCH
1P UPPER KICK	10 L	2P UPPER KICK
(NOT USED)	11 M	(NOT USED)
1P JOYSTICK DOWN	12 N	2P JOYSTICK DOWN
1P JOYSTICK UP	13 P	2P JOYSTICK UP
1P JOYSTICK RIGHT	14 R	2P JOYSTICK RIGHT
1P JOYSTICK LEFT	15 S	2P JOYSTICK LEFT
(NOT USED)	16 T	(NOT USED)
(NOT USED)	17 U	(NOT USED)
(NOT USED)	18 V	(NOT USED)
(NOT USED)	19 W	(NOT USED)
COIN 1	20 X	1P START
COIN 2	21 Y	2P START
TEST SW	22 Z	(NOT USED)
SERVICE SW	23 a	(NOT USED)
SPEAKER (+)	24 b	SPEAKER (-)
VIDEO RED	25 c	VIDEO GREEN
VIDEO BLUE	26 d	VIDEO SYNC
GND	27 e	GND
GND	28 f	GND

56P P:3.96 mm



Schematic Diagram