



Taito™

## Conversion Kit For Horizontal Monitor Games



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Joystick  
Buttons (6)  
Wiring Harness  
FCC Enclosure  
Marquee  
Monitor Graphic  
Side Graphics (2)  
Control Panel Overlay  
Control Panel Instruction Decals

### **USER INFORMATION**

## **WARNING**

### **F. C. C. REGULATION COMPLIANCE**

THE P.C. BOARD CAGE SUPPLIED WITH THIS CONVERSION KIT MUST BE UTILIZED AND TERMINATED TO GROUND AT THE TIME OF INSTALLATION.

THIS IS TO AVOID RADIO FREQUENCY RADIATION AND COMPLY WITH THE LIMITS FOR A CLASS "A" COMPUTING DEVICE PURSUANT TO SUB-PART "J" OF PART 15 OF F.C.C. 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.

# **GUARDIAN**

## **CONVERSION INSTRUCTIONS**

The KITKORP *GUARDIAN* Conversion Kit will fit into any cabinet with a horizontal-mount color rasterscan monitor and a power supply that can deliver +5 volts DC and +12 volts DC. The control panel requires buttons for Player 1 and 2 Start, left and right "Punch" buttons, left and right "Kick" buttons, and an eight-way joystick.

Before you start, be sure the monitor and power supply are both working. Conversion will also be somewhat easier if the monitor has inputs for the negative composite sync signal which is generated by the *GUARDIAN* printed circuit board set.

Vacuum out the inside of the game cabinet. Remove the old game harness. Leave the AC wiring harness to the monitor, transformer, fluorescent light, etc.

Strip off the old game side decals and do cabinet repair or paint touch-up if needed. Clean the outside cabinet.

Go to the old game control panel and remove the old buttons and joystick. Remove the old overlay, if any. Refer to the "Suggested Control Panel Layout" (Illust. 1) to see if you need to add any holes to the control panel or plug extra holes.

Apply the new *GUARDIAN* control panel overlay carefully and evenly. With a sharp razor or exacto knife, cut away the excess around the edges of the control panel. Cut out the holes for the buttons and joystick.

Apply the new *GUARDIAN* button labels and control panel graphics. See "Suggested Control Panel Layout" (Illust. 1) for best positioning of "Punch" and "Kick" buttons.

Mount the new *GUARDIAN* cable harness inside the cabinet. Note that some wires on the cable harness are heavier gauge than the others. These wires all go to the power supply and are heavier gauge to insure good power distribution. We suggest you use *all* these wires to the power supply for best game operation.

The *sync* wire to the monitor goes to *both* the *negative horizontal* and *negative vertical* sync inputs. These inputs are usually at a 3-pin connector on the monitor. Chances are good that the game cabinet is wired this way already. You may want to use the existing connectors on the monitor. See Illust. 2.

If the monitor in your cabinet has only *positive* sync inputs, the negative sync output from the *GUARDIAN* boards can be inverted by a simple hookup using a 74LSO4 IC. To invert the sync, cut the sync wire to the monitor about 8 inches from the 3-pin monitor sync plug. Solder this end of the sync wire to pin 2 of the 74LSO4. Solder the other end of the sync wire (going back to the PC boards) to pin 1 of the IC. Solder a length of wire to pin 14 of the IC and run it to the +5 volt DC power supply or to the +5 volt DC wire on the cable harness connector. Solder a length of wire to pin 7 of the IC and tie it to a DC ground, either at the power supply or at the cable harness connector. For neatness and safety, glue the back of the IC to the monitor frame or game cabinet. Be sure none of the pins on the IC or wires are shorting to each other or to the monitor frame. Finally, remove the sync wires from pins 2 and 3 of the 3-pin connector on the monitor and transfer them to pins 5 and 6 of the 6-pin connector on the monitor (See Illust. 3). Move the ground wire from pin 1

(continued)

INSTRUCTIONS (continued)

on the 3-pin connector to pin 4 on the 6-pin connector. Before you power up the monitor, recheck your wiring.

Now wire the control panel, speaker, and coinswitches. If you want to hook up a coin meter, you will need to tap into the coinswitch wire (See Illust. 4) since there is no output from the board for a coin counter.

If your coin door has general illumination lamps that have been disconnected, you can usually power them from the -5 volt DC supply which is available on most power supplies. Never operate these lights from the +5 volt DC supply in parallel with the PC boards.

Any unused ground wires (one spare is provided) from the cable harness connector should be connected to the power supply DC ground.

Before installing the *GUARDIAN* PC boards, look them over. Be sure all the plug-in IC's are firmly seated, and ribbon cables plugged in properly. Set the dipswitches (See the Dipswitch Setting Chart) to the factory-recommended settings (or your own settings, if you prefer). Mount the PC boards on the cabinet wall and attach the cable harness connector. Recheck your wiring. Most important, make sure all the power supply wires are connected to the correct power supply outputs. Install the RF enclosure and power up the game.

If the picture comes up inverted, toggle the "Screen Invert" switch on the dipswitches. Power up again. The picture should come up correctly.

If there is no audio at first, check your speaker connections and the +12 volt DC supply wires for proper connection. If these are OK, tie the power supply DC ground to the AC line earth ground and power up again. The audio should come up. In addition, check the volume control.

Check the +5 volt DC supply on the PC boards or at the cable harness connector and adjust this voltage so that it is between +5.1 and +5.25 volts DC. This will prevent lockup problems and give a clear picture.

Adjust the volume control to suit the game's surroundings. Adjust the monitor for proper centering and size (so that credits and score are visible), correct brightness (so that there are no diagonal retrace lines and so that the picture does not look washed out), and black level (not on all monitors). Colors should be crisp.

If you have not done so, cut the *GUARDIAN* marquee to size and install it. Apply the instruction decal to the monitor plex or control panel. Your *GUARDIAN* game is now ready to earn income.

# DIPSWITCH SETTINGS

DIPSWITCH 1		1	2	3	4	5	6	7	8
* COINS/CREDITS	1/1						OFF	OFF	OFF
	1/2						OFF	OFF	ON
	1/3						OFF	ON	OFF
	2/1						OFF	ON	ON
	2/3						ON	OFF	OFF
	3/1						ON	OFF	ON
	FREE PLAY							ON	ON
ATTRACT MODE SOUND	YES					OFF			
	NO					ON			
GAME TYPE	TABLE				OFF				
	UPRIGHT				ON				
SCREEN INVERT					OFF				
					ON				
DIPSWITCH TEST	YES		ON						
	NO		OFF						
NOT USED		OFF							

DIPSWITCH 2		1	2	3	4	5	6	7	8
* GUARDIANS PER GAME	3							OFF	OFF
	5							OFF	ON
	1							ON	OFF
	2							ON	ON
GAME DIFFICULTY	EASY					OFF	OFF		
	MEDIUM					OFF	ON		
	HARD					ON	OFF		
	DIFFICULT					ON	ON		
* EXTRA GUARDIAN	50,000 PTS.			OFF	OFF				
	100,000 PTS.			OFF	ON				
	150,000 PTS.			ON	OFF				
	200,000 PTS.			ON	ON				
NOT USED		OFF	OFF	OFF					

\* FACTORY-RECOMMENDED SETTINGS

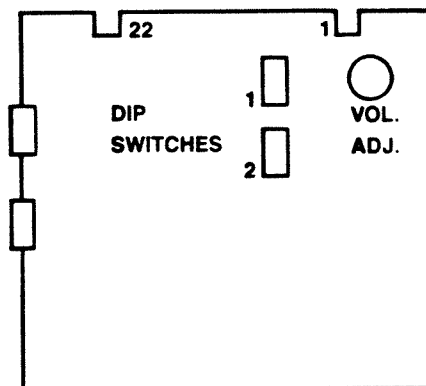
# EDGE CONNECTOR DIAGRAM

**NOTE:** All wires are *white* with color stripes as indicated.  
Terminals marked \* are optional and not wired.

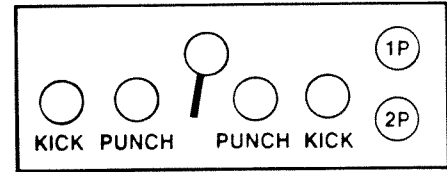
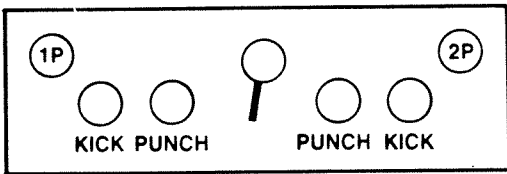
POWER SUPPLY GROUND BLK - BLK - BLK	1	A	POWER SUPPLY GROUND BLK - BLK - BLK
VIDEO GROUND BLK - BLK - BLK	2	B	GROUND BLK - BLK - BLK
+5V DC RED - BLK - BLK	3	C	+5V DC RED - BLK - BLK
+12V DC ORG - ORG - ORG	4	D	+12V DC *
SPEAKER + VIO - BRN - BRN	5	E	SPEAKER - VIO - BLK - BLK
VIDEO BLUE BLU - BLU - BLU	6	F	VIDEO GREEN GRN - GRN - GRN
VIDEO RED RED - RED - RED	7	H	
VIDEO SYNC WHT	8	J	
1P START GRY - YEL - YEL	9	K	2P START GRY - ORG - ORG
1P PUNCH GRY - RED - RED	10	L	2P PUNCH *
1P KICK GRY - GRN - GRN	11	M	2P KICK *
	12	N	
1P UP YEL - BRN - BRN	13	P	1P RIGHT YEL - GRN - GRN
1P DOWN YEL - BLU - BLU	14	R	1P LEFT YEL - RED - RED
* 2P UP	15	S	2P RIGHT *
* 2P DOWN	16	T	2P LEFT *
COIN SWITCH 1 YEL - YEL - YEL	17	U	COIN SWITCH 2 *
	18	V	
	19	W	
* +5V DC	20	X	+5V DC *
CONTROL PANEL GROUND BLK - BLK - BLK	21	Y	COIN SWITCH GROUND BLK - BLK - BLK
GROUND *	22	Z	GROUND *

**PARTS SIDE**

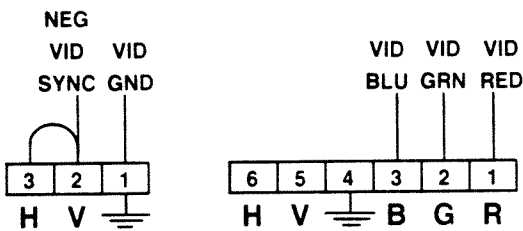
**SOLDER SIDE**



**ILLUST. 1:** Suggested Control Panel Layout

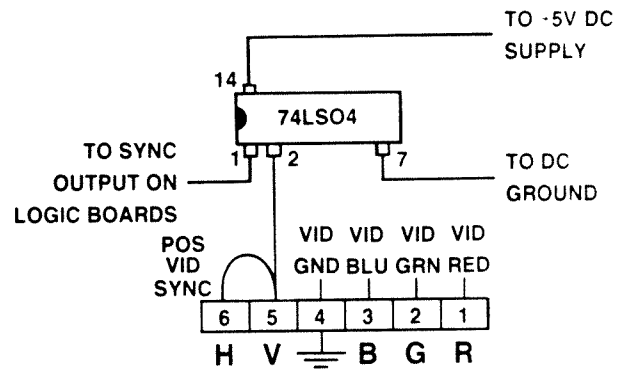


**ILLUST. 2:** Hookup on Monitor for Negative Composite Sync

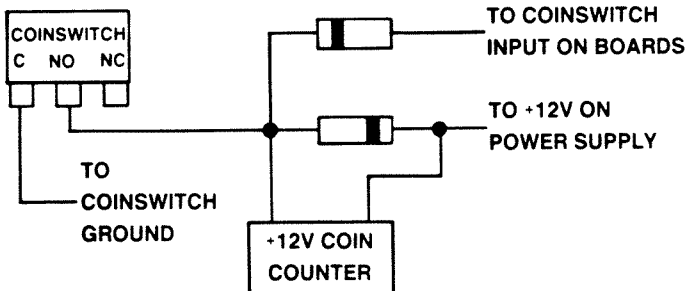


**INPUT PLUGS ON MONITOR**

**ILLUST. 3:** Modification for Positive Composite Sync



**ILLUST. 4:** Hookup for Coin Counter



**NOTE:** Diodes are IN4004 or IN5402. Pay careful attention to cathode bands on diodes. Wire carefully to avoid board damage.