

WILLIAMS

16-3030-101  
MARCH 1, 1985

# 1942™

## INSTRUCTION MANUAL

For service...

Call your authorized  
WILLIAMS distributor

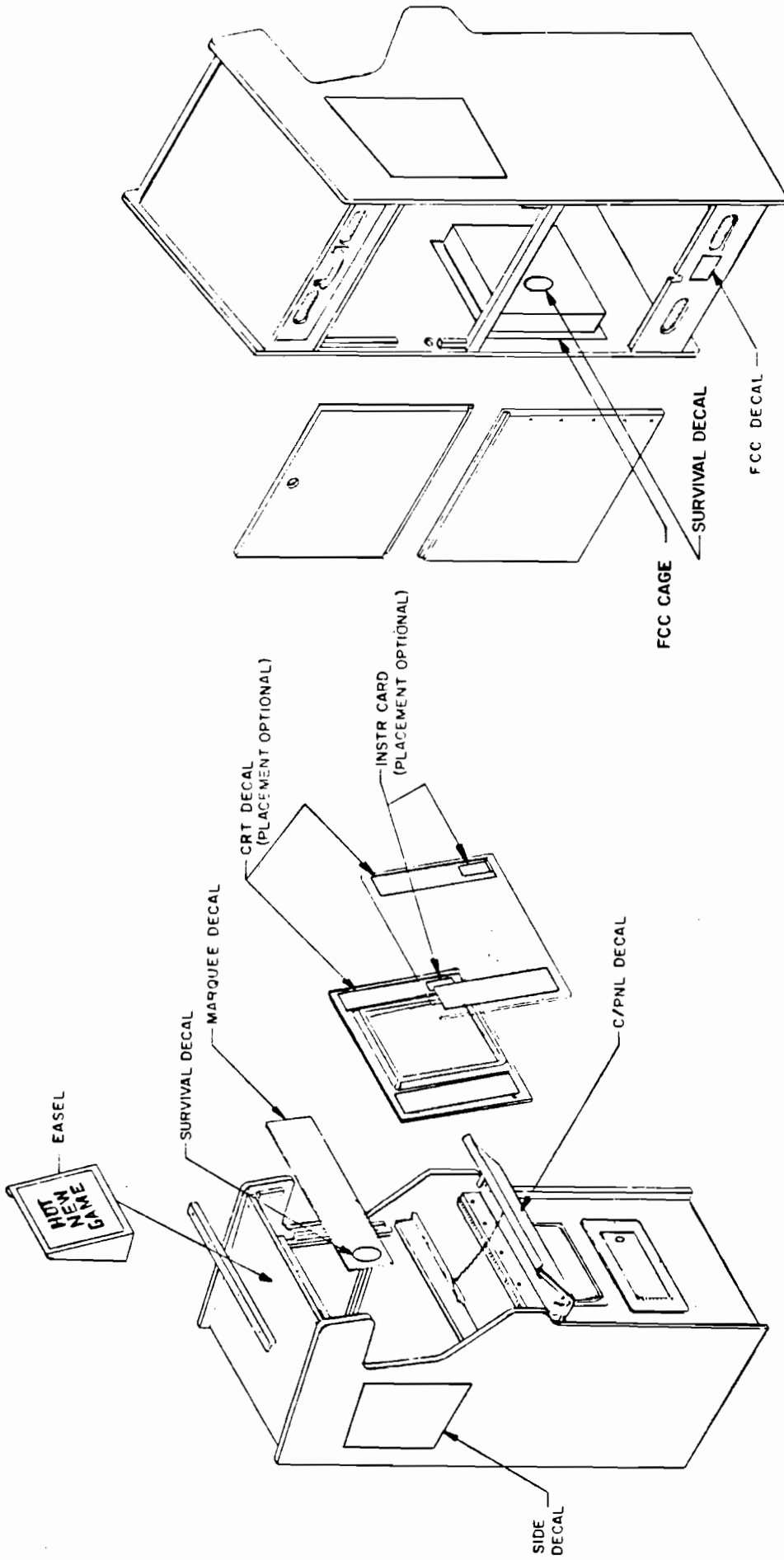
*Williams*®   
**ELECTRONICS, INC.**



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# DECAL LOCATIONS



#### WARNING

Parts salvaged from an old game are required to complete your kit. These salvaged parts **MUST** operate perfectly, or the converted game cannot perform properly or safely. **ALWAYS** repair circuitboard malfunctions and cabinet damage before conversion is attempted.

#### CAUTION: POWER SUPPLY

Be sure the power supply from your old game is capable of +5VDC at 5A and +12VDC at 1A. These operating voltages are necessary for your kit.

Your power supply must be F.C.C. approved.

#### NOTICE: MONITOR

1. This kit is not intended for use with X-Y monitors. Suitable monitors have vertically-mounted CRTs and raster electronics with inputs for red, green and blue video as well as negative sync. (These inputs should be compatible with TTL logic levels.)
2. This game's horizontal sweep lasts 50 microseconds. This time constant may not be compatible with monitors designed to display a 40-microsecond video signal. Using this game with a 40-microsecond monitor will probably result in horizontal overscan (loss of some of the video display on the left and right sides of the screen). Consult your monitor's manufacturer on how to convert your monitor, or use a 50-microsecond monitor.

#### NOTICE

Make sure you clean and lubricate your old coin mechanisms. Servicing them is crucial to this game's earnings and operation!

## CONVERSION INSTRUCTIONS

### NOTICE

Use this checklist to be sure your kit is complete!

### NOTICE

Blank control panels for WILLIAMS' games are available through your WILLIAMS distributor.

### PARTS PROVIDED

<input type="checkbox"/>	control-panel overlay	31-1341-3030	(1)
<input type="checkbox"/>	CRT-glass decal	31-1343-3030	(2)
<input type="checkbox"/>	easel	08-7434	(1)
<input type="checkbox"/>	FCC cage with CPU board	D-10694	(1)
<input type="checkbox"/>	instruction card	16-3030-1	(1)
<input type="checkbox"/>	joystick assembly	20-9319	(1)
<input type="checkbox"/>	marquee decal	31-1342-3030	(1)
<input type="checkbox"/>	miscellaneous control-panel decals	31-1348-3030	(1 set)
<input type="checkbox"/>	Phillips wood-screw #6x1/2 P-RH	4206-01016-08	(4)
<input type="checkbox"/>	"Declare war" decal	31-1346-3030	(1)
<input type="checkbox"/>	player-button assembly	C-9214-9 & C-9214-16	(1 each)
<input type="checkbox"/>	side decal	31-1344-3030	(2)
<input type="checkbox"/>	wiring harness	H-10695	(1)

### RECOMMENDED TOOLS AND SUPPLIES

- black and gray semi-gloss paint
- electric drill
- electric screwdriver
  
- grease pencil or marker
- hex driver
- 180-grit sandpaper (sander)
  
- Phillips screwdriver
- pliers
- razor knife
  
- soldering iron and solder
- wire cutters

#### A. Cabinet Modifications

- [ ] 1. First inspect your old cabinet. Remove foreign objects and fill in gouges with quick-hardening wood putty. Sand the cabinet and wipe it clean.
- [ ] 2. Refer to the decal-layout sheet. If the kit decal doesn't cover the old graphics, repaint your cabinet with semi-gloss paint; gray sides and black front . Games with woodgrain sides: Remove the old decals and clean the game so that no residue of old glue is left behind.
- [ ] 3. SIDE DECALS: Pencil a line roughly at the top of the old graphic. Lightly moisten the cabinet with soapy water or glass cleaner. Apply the decal starting at the top and work down. After the decal is in place, use a piece of the foam packaging as a squeegee and smooth the sticker down. Use a razor blade or needle to pop air bubbles in the decals. Allow 12 hours for your sticker's adhesive to set. Remove masking.
- [ ] 4. Position the FCC sticker near the power cord.
- [ ] 5. Inspect your CRT glass for cigarette burns and scratches. If the CRT glass is unacceptable, replace it with clear or smoked acrylic. Place one CRT decal on the right and one on the left side. Be careful not to cover the monitor.
- [ ] 6. Put your instruction card in the center of the CRT decals on either the right or left side of the monitor.

#### B. Marquee Modifications

- [ ] 7. MARQUEE OVERLAY. We recommend using a new piece of clear acrylic in place of your old marquee. With the overlay on top of an old marquee, the marquee may not transmit light as well as it did with the old game.
- [ ] 8. Refer to the decal layout. Remove the old marquee. Lift the backing from the left edge of the marquee decal. Letting the overlay hang over the edge of the glass, stick down one edge on the new glass (or old marquee glass). Check to see that the game name is centered and that it's square with the top of the glass.
- [ ] 9. Spray glass cleaner on the marquee. With one hand, peel the backing a few inches at a time. Rub down the overlay with your other hand. Where each corner of the overlay hangs over the glass, cut a 45-degree diagonal with a razor knife. Bend the marquee overlay behind the glass. Replace the marquee in the game. Your new marquee won't have any edges to be peeled off.
- [ ] 10. If old graphics show through your marquee overlay, disconnect the marquee light.

### C. Control-Panel Modifications

- [ ] 11. Remove control-panel buttons or joysticks. Clean and sand any imperfections on the old vinyl material, or remove old vinyl.
- [ ] 12. Place the template on the control panel and use it to help you design your control panel.
- [ ] 13. Leave your 1 and 2-player START button-holes where they are. Drill holes as needed for the joystick and other buttons. Plug old holes with wood blocks, putty, cardboard or epoxy. File the new holes smooth. Blank WILLIAMS control panels are available from your authorized WILLIAMS distributor.
- [ ] 14. Remove the backing from the top of the control-panel overlay. Carefully place the overlay on top of the old control panel. Try not to get any bubbles under the vinyl.
- [ ] 15. After the overlay is on securely, use a razor knife to cut holes for your buttons and joystick. Player-1 and Player-2 START stickers go next to the appropriate buttons. A joystick-direction decal goes around your joystick opening. Position FIRE and LOOP stickers according to the template. Return your components to the control panel and tighten them down.
- [ ] 16. If your control panel is too thick for the kit's buttons, remove the switches from the buttons and shim them with the enclosed spacers.

### D. Installing Interboard Wiring

- [ ] 17. Disconnect the old wiring-harness from the CPU board. Using the schematic drawings from your old game, carefully note the function of each wire. Label the wires if this helps.
- [ ] 18. Carefully remove the circuitboards and the metal circuitboard panel. Keep the transformer chassis in the game.
- [ ] 19. Leaving several inches of wire at each connector, cut the wires near the game's coin door, monitor, player panel, power supply and speaker. DON'T CUT the other side of these same wires (that is, at the CPU-board end).
- [ ] 20. Following the schematic drawings for your kit, solder the coin-door, monitor, player panel, power-supply and speaker wires to the new CPU-board harness. Using electrical tape, be sure to insulate all splices.
- [ ] 21. If your game has series-pass transistors for the power supply on a separate heatsink, remount the metal heatsink beside the power-supply board.
- [ ] 22. Check and clean the input jack on the power-supply board. Replace any burned or damaged pins.



## E. Installing the FCC Cage

- [ ] 23. Using the screws (supplied), mount the FCC cage inside the game on either the back door or on one of the walls. While installing the FCC cage, DO NOT OPEN IT.
- [ ] 24. Remove one of the screws holding the transformer, the power-supply board, the perforated cage and the mounting plate for the FCC cage. Replacing these screws, secure a ground braid or wire between each part. The perforated cage and the mounting plate for the FCC cage MUST be grounded separately.
- [ ] 25. Plug the new wiring harness into the new CPU board. Support the harness as necessary with plastic wireguides.

## Game Operation

### STARTING YOUR GAME

INSERT COINS. The game allocates an adjustable number of credits per coin and displays this number on the CRT. Factory settings are one credit per quarter. Players are allowed to buy in (continue on the last wave they played) for an additional quarter. At factory settings, when two credits are displayed, pressing 2-PLAYER START initiates a two-player game.

### PLAYER CONTROLS

THE FIRE BUTTON operates the machine gun.

THE LOOP BUTTON helps the player elude the enemy. The number of loops flown each wave (initially limited to three) is the basis for a point award when the player returns his plane to its carrier.

THE JOYSTICK maneuvers the plane.

## Playing The Game

IT'S A DOGFIGHT like no other. The brave player's up against seven squadrons of enemy planes! To protect himself he has his lightning wits and his controls...trusty joystick of course...plus FIRE and LOOP buttons. Look out over there at three o'clock! It's starting!

- \* When a player destroys a complete red-enemy squadron (all planes of one color), POW appears on the screen.
- \* When a player destroys the heavy bomber, the bomber wave ends.
- \* At the end of the game the screen indicates the number of enemy planes shot down and the percentage destroyed.
- \* If a player destroys all enemy planes of the red color, POW appears on the screen. However if an enemy plane shoots down the player's aircraft, the enemy squadron under attack (all planes of one color) returns to the skies.
- \* Bonus planes are added to the player's squadron at 20,000 points, 80,000 points and after every succeeding 80,000 points.

- \* BUY-IN FEATURE. After completing a game, players are invited to "buy in" or continue where they left off. Continued games are more challenging than original games. So continued games tend to involve skilled players at the level they prefer and to increase collections. To buy in, a player inserts his next coin while "CONTINUE GAME" appears on the screen. Then he holds the fire button and pushes start.

PLAYING TIPS

- \* POINTS depend on the percentage of enemy planes destroyed. (Bonus points will be different if a player's plane is on an aircraft carrier.)

Example: 90%.....10,000 Points

- \* LOOPS. In any wave the player can only loop three times (number of loops is displayed on the bottom of the screen). The number of loops adds bonus points when the player returns his plane to the aircraft carrier.

Example: 1 Loop.....1,000 Points

- \* EXTRA POWER. If the player destroys all enemy planes of one color, POW appears on the screen. Touching the Power Unit gives the player an advantage that depends on the color of planes shot down...

Green Planes.....Player's plane becomes a 4-shooter  
 Yellow Planes.....One loop is added  
 Orange Planes.....Enemy plane stops shooting for 15 seconds  
 White Planes.....All enemy planes are destroyed  
 Gray Planes.....Shield is added to player's plane  
 Black Planes.....Player's squadron gains a plane  
 Red Planes.....Points

## Easel

FOLD AND ASSEMBLE the easel and apply the DECLARE WAR decal. Attract players' attention! Set the easel on top of the finished game.

## Optimize Your Profits!

THOROUGH RESEARCH shows that two and a half minute games both satisfy players and also keep the quarters flowing.

If games aren't running about two and a half minutes long, then collections probably aren't at their peak. You'll want to tailor your game to your location. The trick is to adjust a few DIP switches. (See the chart in this book.) It's easy!

## Game Adjustments

USE THE DIP-SWITCH BANKS. Game adjustments are made with DIP-switch bank A and DIP-switch bank B on the CPU board. Select your options from the DIP-Switch Table in this book. Then turn the game off.

FOR EACH NEW SETTING, you'll have to change the position of one to three switches on a single DIP-switch bank. Use a pen or small screwdriver to operate the switches. Now for the multiple-choice section. Choose one or more:

- [ ] For a shorter game, increase the scores at which players achieve bonus points. For a longer game, reduce these scores. (Use DIP-switch bank A, switches 3 and 4.)
- [ ] For a shorter game, raise the difficulty level. For a longer game, reduce it. (Use DIP-switch bank B, switches 2 and 3.)
- [ ] Customize game pricing to suit your location. (Use DIP-switch bank A, switches 6 through 8.)

## Diagnostics

Your game includes a Diagnostic Mode that checks operation and helps you make adjustments to insure optimum performance.

ENTERING DIAGNOSTIC MODE. Turn the game off. Use a pen or small screwdriver to turn on DIP-switch 5 of DIP-switch bank B on the CPU board. The machine will start in the Diagnostic Mode when you turn it on. Diagnostic Mode consists of eleven independent tests.

	<u>RAM</u>		<u>CHECK</u>		<u>LOC</u>
	<u>ADDR</u>		<u>WR</u>	<u>RD</u>	
W-RAM 1 =	- OK -		* *	* *	N09
W-RAM 2 =	- OK -		* *	* *	N10
C-RAM =	- OK -		* *	* *	D02
S-RAM =	- OK -		* *	* *	A09

LEVER = NEXT

Figure 1. RAM Test

(1) RAM TEST

THE RAMS ARE AUTOMATICALLY CHECKED before the other ten tests start. When a RAM error is detected, the display identifies the bad RAM with NG instead of OK. (Of course power, buss or clock problems may cause a good RAM to appear bad.) Tests can't proceed if all RAMs don't check OK. After the RAM check is over, move the joystick to display the test menu.

<u>TEST</u>	<u>MENU</u>
01	INPUT
02	OUTPUT
03	HARD COLOR
04	SOFT COLOR: CHAR
05	SOFT COLOR: SCROLL
06	DOT CROSS HATCH
07	CHAR
08	SCROLL
09	OBJECT
10	SOUND

F: EXEC

Figure 2. Diagnostic Menu

TEST METHOD

The next ten tests are performed using the joystick lever and the FIRE (F) button. A status message appears at the bottom of the screen...

F : FIRE button

JOYSTICK...

RT: To increase numbers displayed on the screen, move right.

LT: To decrease numbers displayed on the screen, move left.

EXEC: A test is being executed.

END: The test is concluded.

LEVER & F: You're using the joystick and FIRE button simultaneously.

THE RED SYMBOL is the cursor. Use the joystick to move the cursor beside the desired test. Now push FIRE.

## (2) INPUT TEST

Tests 2 and 3 help you evaluate the game's I-O port. Test 2 lets you see if switch operation is being recognized by the computer. When you press a switch, a 1 should be displayed (among the zeros on the right half of the INPUT TEST screen). When that switch is released, a 0 replaces the 1. Similarly when a DIP switch is ON, a 1 should be displayed and when OFF, 0 should appear.

## (3) OUTPUT TEST

Check the outputs. Move the cursor and set any bit on or off by pushing FIRE. Look for stuck bits. (D1 and D0 of address C806 can't be changed since they're permanently set to 1.)

## (3) HARD COLOR (MONITOR) TEST

"Hard color" refers to your game's hardware. Of course your game's hardware for displaying colors is the monitor. That's what this test helps you check. Colors are displayed. Do you like what you see? If so, go ahead to the next test. Otherwise it's time to adjust your monitor's screen, black-level, cathode-drive and cutoff controls. You can use test 7 (crosshatch pattern) for the rest of your monitor-setup chores.

## (5) SOFT COLOR (CHARACTER) TEST

The soft (software) color test examines your video RAMs by displaying characters. Missing or incorrect characters may indicate a bad video RAM.

OTHER CHIPS that share the same address or data buss as your video RAMs may also cause character malfunctions. In addition, bad clock signals that normally enable (CE, WE, etc.) strobe or select (CS1, RAS, CAS, etc.) RAM functions might cause a good RAM chip to malfunction.

USE YOUR LOGIC PROBE and check the neighborhood of the suspected RAM for missing logic pulses.

## (6) SOFT COLOR: SCROLL (ROM) TEST

This test displays the scrolling colors. Check for missing or incorrect colors. If you find a malfunction, suspect a bad ROM (but don't forget to check buss and clock signals used by the ROM).

## (7) CROSSHATCH SCREEN

The crosshatch screen helps you optimize your monitor's purity, linearity, focus, and convergence. Picture size and position can also be tweaked while you're displaying this screen. Push FIRE for the next test.

(8) CHAR Test

This test displays the game's character patterns. Check for missing characters. If you find a malfunction, suspect a bad ROM (but don't forget to check buss and clock signals used by the ROM).

(9) SCROLL Test

This test displays the game's scrolling patterns. If any pattern is missing, suspect a bad ROM (but don't forget to check buss and clock signals used by the ROM).

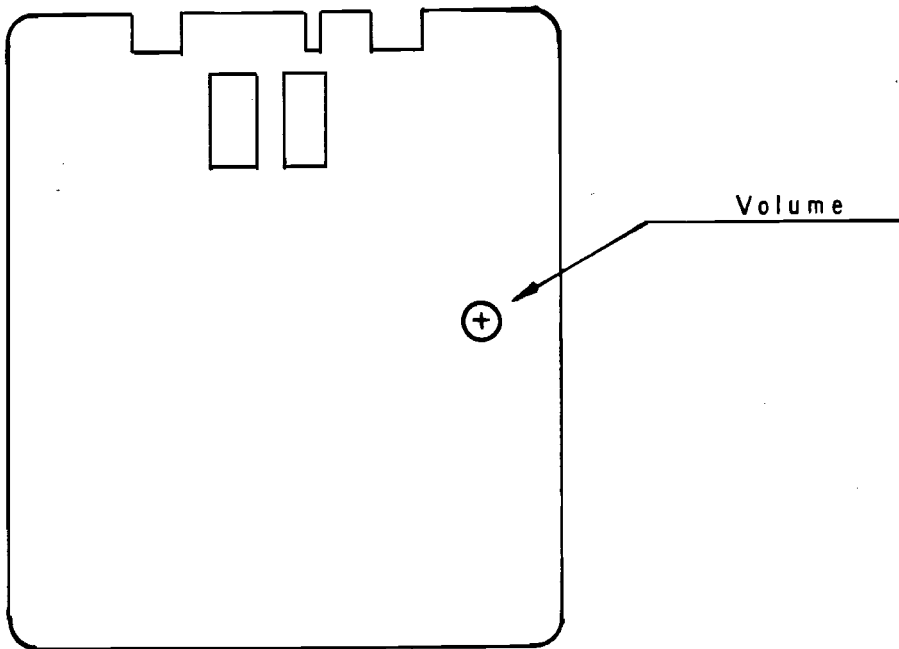
(10) OBJECT Test

This test displays the object patterns used in this machine. If any pattern is missing, suspect a bad ROM (but don't forget to check buss and clock signals used by the ROM).

(11) SOUND TEST

You can make adjustments to the sound effects with this test. Also, if your sound section is malfunctioning, this test helps you locate the problem. Choose options 00 through 1F by moving the joystick. Listen for incorrect, missing or duplicated sounds.

- A. If all sounds are incorrect, the problem could be a bad RAM or ROM.
- B. If all sounds are missing, the problem could be analog...
  - 1. leaky electrolytics that normally couple audio signals to the speaker;
  - 2. a bad power-amplifier chip (last IC before the speaker);
  - 3. AC or incorrect DC voltages on amplifier-power pins.
- C. If all sounds are missing, the problem could also be digital...
  - 1. suspect a bad D-to-A converter,
  - 2. a bad crystal,
  - 3. a bad sound-microprocessor,
  - 4. or a bad chip (buffer, PIA, etc.) that handles data or addresses.
- D. If only a few sounds are missing or duplicated, suspect a digital problem such as open or shorted sound-select (address) lines.



#### ADJUSTMENTS:

1. Game adjustments are made using switches contained in DIP Switches A and B on the CPU Board. Using a pen or a small screwdriver, move switches to desired positions of OFF or ON. After Making adjustments, turn your game on and off to reset the CPU.
2. Volume adjustments are made by rotating the knob indicated in the above drawing.

#### NOTE:

When making adjustments, you need not open the FCC Cage. There are slots provided to make the required adjustments.

Here are your SOUND-TEST options...

- 00 Disables sound effects 01, 0F, 11, 12, 15-19 and 1A
- 01 B29 propeller ON (Use FIRE to enable)
- 02 B29 explosion
  
- 03 Ricocheting enemy bullets
- 04 Enemy plane exploding
- 05 Player's firing sound
  
- 06 Player's circling sound
- 07 Sound when taking a POW
- 08 Sound when player receives a bonus plane
  
- 09 Typewriter
- 0A Coin-insert sound
- 0B B29 propeller OFF
  
- 0C Player's propeller OFF
- 0D Player's plane taking off
- 0E Player's plane landing
  
- 0F Player's propeller ON (Use FIRE to enable)
- 10 Music OFF
- 11 Background music
  
- 12 Starting music
- 13 Bonus wave music (at beginning of wave)
- 14 Background music when heavy bomber appears
  
- 15 Bonus-wave clearing music
- 16 Game-over music
- 17 6th-place and under music
  
- 18 Top-score music
- 19 2nd to 5th-place music
- 1A Starting music when heavy bomber appears
  
- 1B Typewriter ringing-sound
- 1C Unused
- 1D Unused
  
- 1E Unused
- 1F Unused

Entering Game-Over Mode

When you desire to end the Test Mode, turn the game off. Now set DIP-switch 5 of DIP-switch bank B to OFF and power up.



# 1942 MAIN HARNESS CONNECTIONS

WIRE GUAGE	FUNCTION	WIRE COLOR	PIN	PIN	WIRE COLOR	FUNCTION	WIRE GUAGE
18	Gnd	BLK	A	1	BLK	GND	18
18	+5 VDC	GRY	B	2	GRY	+5 VDC	18
18	+12 VDC	GRY-YEL	C	3	GRY-YEL	+12 VDC	18
-	NOT USED	N.C.	D	4	N.C.	NOT USED	-
22	SPKR -	BLK-RED	E	5	N.C.	NOT USED	-
22	SPKR +	RED-BLK	F	6	N.C.	NOT USED	-
-	NOT USED	N.C.	H	7	N.C.	NOT USED	-
-	KEY	KEY	J	8	KEY	KEY	-
22	SHOOT SW 1P	ORG-BRN	K	9	ORG-RED	UP SW 1P	22
22	DOWN SW 1P	ORG	L	10	ORG-YEL	LEPT SW 1P	22
22	RIGHT SW 1P	ORG-GRN	M	11	BLK	GND	18
22	SHOOT SW 2P COCKTAIL	RED-BRN	N	12	RED	UP SW 2P COCKTAIL	22
22	DOWN SW 2P COCKTAIL	RED-ORN	P	13	RED-YEL	LEPT SW 2P Cocktail	22
22	RIGHT SW 2P COCKTAIL	RED-GRN	R	14	BLK	GND	18
22	2 PLAYER SW	YEL-BLU	S	15	N.C.	NOT USED	-
22	1 PLAYER SW	YEL-GRN	T	16	N.C.	NOT USED	-
22	COIN SW	WHT-BLU	U	17	N.C.	NOT USED	-
-	NOT USED	N.C.	V	18	N.C.	NOT USED	-
-	NOT USED	N.C.	W	19	ORG-BLU	LOOP 1P	22
-	NOT USED	N.C.	X	20	RED-BLU	LOOP 2P COCKTAIL	22
-	NOT USED	N.C.	Y	21	SHIELD WIRE	** VIDEO GND	24
24	** VIDEO SYNC	WHT	Z	22	RED	** VIDEO RED	24
24	** VIDEO GRN	GRN	a	23	BLU	** VIDEO BLU	24
-	NOT USED	N.C.	b	24	N.C.	NOT USED	-
-	NOT USED	N.C.	c	25	N.C.	NOT USED	-
-	NOT USED	N.C.	d	26	N.C.	NOT USED	-
18	+5 VDC	GRY	e	27	GRY	+5 VDC	18
18	GND	BLK	f	28	BLK	GND	18

\*\* FROM SHIELDED CABLE H-10046-1

MOLEX DBL SIDED EDGE CONNECTOR  
HOUSING: 5790-10799-00  
TERMINAL PIN: 5822-09770-00  
KEY: 5823-10763-00

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28							
A	B	C	D	E	F	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z	a	b	c	d	e	f							
							KEY																											

DIP-Switch Table

DIP-SWITCH BANK A

ADJUSTMENT	OPTIONS	1	2	3	4	5	6	7	8
NUMBER OF PLAYERS	5	ON	ON						
	2	ON	OFF						
	1	OFF	ON						
	3	OFF	OFF						
BONUS	30,000/100,000/OVER 100,000	ON	ON						
POINTS	30,000/80,000/OVER 80,000	ON	OFF						
	20,000/100,000/OVER 100,000	OFF	ON						
	20,000/80,000/OVER 80,000	OFF	OFF						
TYPE	UPRIGHT					ON			
	TABLE					OFF			
COIN 1	FREE PLAY						ON	ON	ON
	1 CREDIT - 4 COINS						ON	ON	OFF
	1 CREDIT - 3 COINS						ON	OFF	ON
	3 CREDIT - 2 COINS						ON	OFF	OFF
	1 CREDIT - 2 COINS						OFF	ON	ON
	4 CREDIT - 1 COIN						OFF	ON	OFF
	2 CREDIT - 1 COIN						OFF	OFF	ON
	1 CREDIT - 1 COIN						OFF	OFF	OFF
RECOMMENDED SETTINGS		ON	OFF	OFF	OFF	ON	OFF	OFF	OFF

DIP-Switch Table

DIP-SWITCH BANK B

ADJUSTMENT	OPTIONS	1	2	3	4	5	6	7	8
PORTRAIT	STOP	ON							
	STOP	OFF							
DIFFICULTY	VERY DIFFICULT		ON	ON					
	DIFFICULT		ON	ON					
	EASY		OFF	ON					
	NORMAL		OFF	OFF					
COIN 2	SAME AS COIN 1								
REVERSE PICTURE	NORMAL				OFF				
	REVERSE				ON				
TEST MODE	NORMAL					OFF			
	TEST MODE					ON			
RECOMMENDED SETTINGS		OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

# JOYSTICK ASSEMBLY

1. Refer to FIG. 1 before starting installation.
2. For normal replacement of Ball Handle, Spring and/or Switch Actuator, disregard steps 3, 4, and 5 below.

## INSTALLATION INSTRUCTIONS

1. From inside of game, remove E-ring from Ball Handle Shaft.
2. Pull Ball Handle out of Joystick Assembly and remove Switch Actuator and Spring from inside of game.
3. Remove Joystick Assembly from Control Panel of game.
4. Replace 2" washer.
5. Fasten Joystick Assembly to Control Panel of game.
6. Insert new Ball Handle through Control Panel and Joystick Assembly.
7. From inside the game, push Spring and appropriate Switch Actuator over end of Ball Handle Shaft and secure with E-ring.

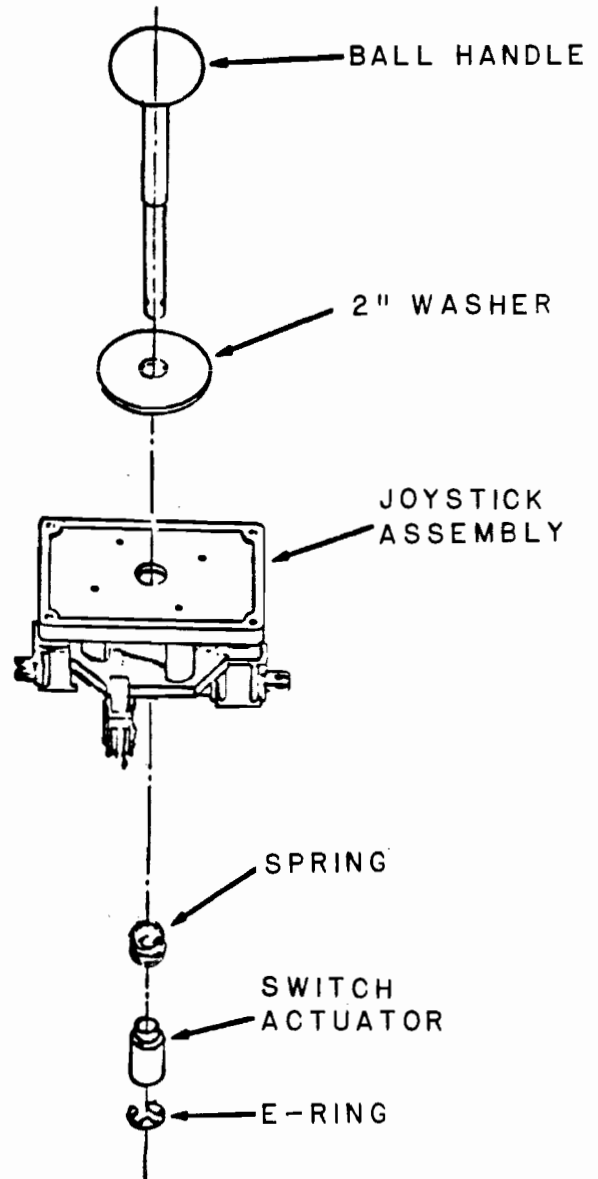


FIGURE 1

## Warnings & Notices

### WARNING

This kit is intended for use only on coin operated video games manufactured after January 1, 1983, which have been verified for compliance with the requirements in Part 15 of FCC Rules for Class A computing device. Improper connection of this kit or connection to any other coin operated video game not so manufactured or verified for compliance may cause unacceptable interference to radio and TV reception requiring the operator to take whatever steps are necessary to correct the interference. WILLIAMS ELECTRONICS, INC., takes no responsibility for kits improperly connected and those connected to games for which use is not intended.

### WARNING

FOR SAFETY AND RELIABILITY, WILLIAMS does not recommend or authorize any substitute parts or modifications of WILLIAMS equipment.

USE OF NON-WILLIAMS PARTS and modifications of game circuitry may adversely affect game play, or may cause injuries.

SUBSTITUTE PARTS OR EQUIPMENT MODIFICATIONS may void FCC type-acceptance.

SINCE THIS GAME IS PROTECTED by Federal copyright, trademark and patent laws, unauthorized game-conversions may be illegal under Federal law.

THIS "CONVERSION" PRINCIPLE ALSO APPLIES to unauthorized facsimiles of WILLIAMS equipment, logos, designs, publications, assemblies and games (or game features not deemed to be in the public domain), whether manufactured with WILLIAMS components or not.

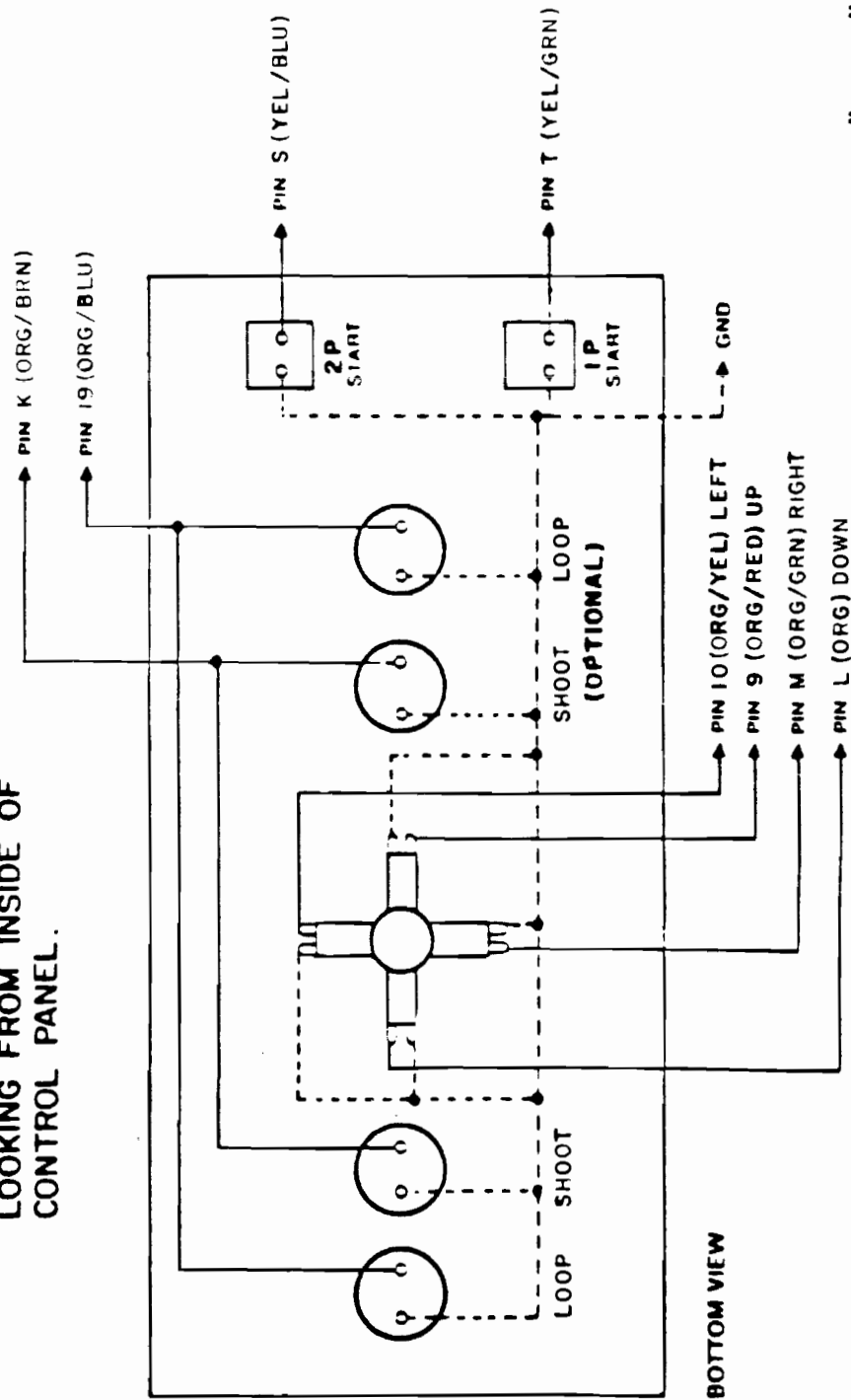
THREE-WIRE PLUG. This game must be plugged into a properly-grounded outlet to prevent shock hazard and to assure proper game operation. DO NOT use a "cheater" plug to defeat the ground pin on the power cord, and DO NOT cut off the ground pin.

### NOTICE

1942 is a registered trademark of WILLIAMS ELECTRONICS, INC.

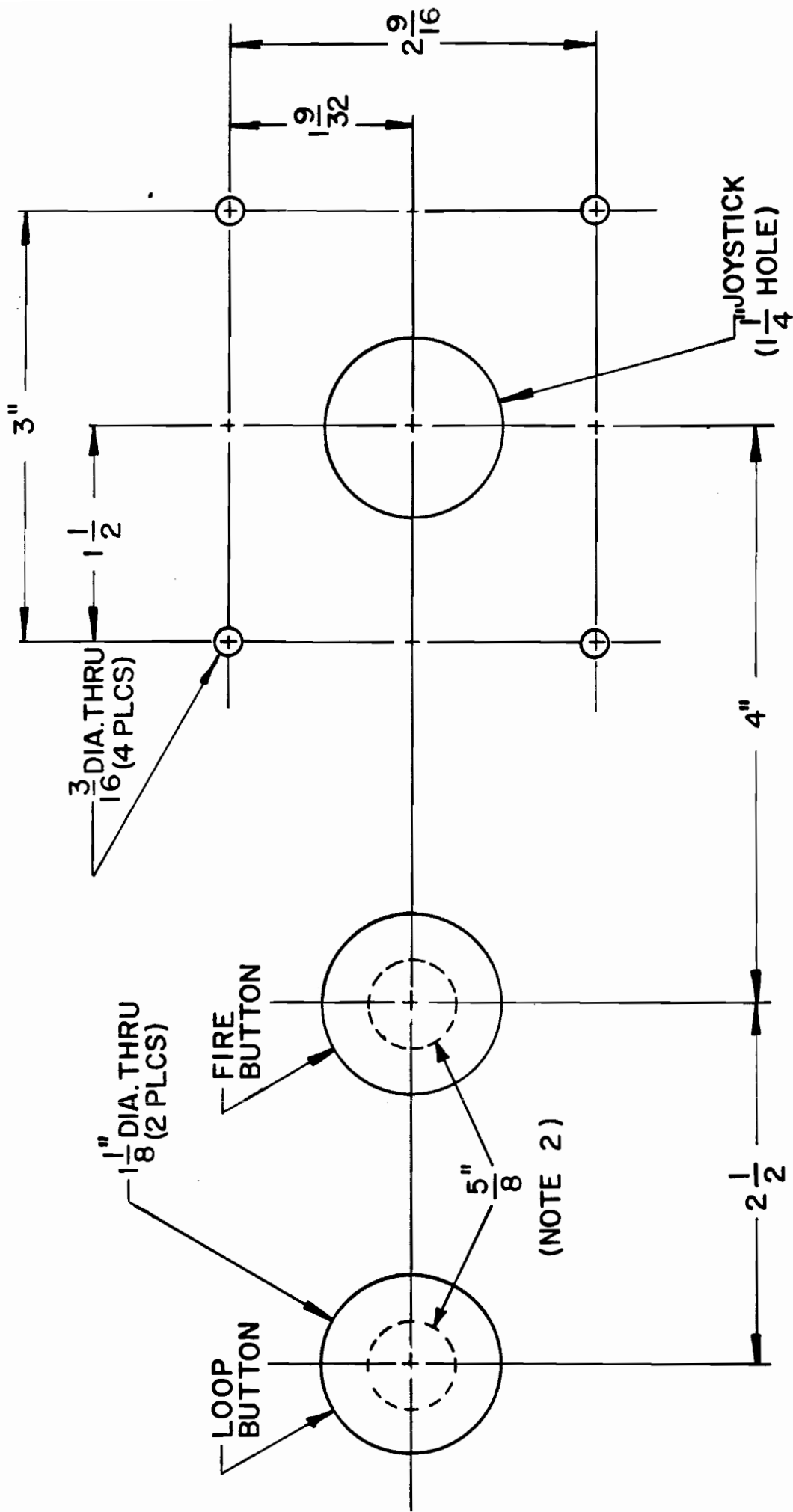
C 1985 WILLIAMS ELECTRONICS, INC.

**NOTE:**  
LOOKING FROM INSIDE OF  
CONTROL PANEL.



**BOTTOM VIEW**

**"1942"  
CONTROL PANEL  
WIRING**



**NOTE:**

1. THESE DIMENSIONS ARE TO SCALE AND REFER TO METAL CONTROL PANELS.
2. FOR WOOD CONTROL PANELS, DRILL 5/8" HOLE COMPLETELY THROUGH. THEN DRILL 1-1/8" HOLE TO 5/16" DEPTH.

**"1942"  
CONTROL PLATE  
TEMPLATE**

# CONTROL PANEL DECALS

