WILLIAMS

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STILL CRAZY R

SERVICE MANUAL

For service...

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WILLIAMS
Electronics, Inc.
3401 N. California Ave.
Chicago, IL 60618

ROM Summary

IC	DESCRIPTION	TYPE	NUMBER	BOARD	PART NO.
Game ROM 2	ROM 4Kx8	2764	IC20	CPU	A-5343-10704
Sound/Speech ROM	ROM 16Kx8	27128	IC49	CPU	A-5343-10705

Control Locations

THE ON-OFF SWITCH is on the top of the cabinet on the left side as you face the game.

THE VOLUME CONTROL is accessible through the coin door on the rear cabinet-wall.

DIAGNOSTIC SWITCHES. ADVANCE, AUTO-UP/MANUAL-DOWN, and HIGH-SCORE RESET switches are located on the back of the coin door. Refer to Adjustment Procedures and Diagnostic Procedures for operation.

THE MEMORY-PROTECT SWITCH must be open to clear bookkeeping totals and to make game adjustments. This switch is on the inside of the coin-door frame. It automatically opens when the coin door opens.

THE CPU DIAGNOSTIC-SWITCH operates the Memory-Chip Test explained in Diagnostic Procedures. This switch is on one edge of the CPU Board near a microprocessor (large socketed) chip.

THE SOUND DIAGNOSTIC-SWITCH is on the CPU Board near the batteries. This switch is used to initiate the Sound Self-Test. Refer to Diagnostic Procedures.

Game Operation

GAME-OVER MODE. Turn the game ON. While the display alternates between the most recent score and the High-Score-To-Date, the GAME-OVER lamp lights. All playfield-lamps cycle in Attract Mode.

CREDIT POSTING. Insert coins. A sound is produced and the number of credits is displayed. If maximum credits* are exceeded by coin or High-Score-To-Date, credits are posted correctly.

GAME START. Push the CREDIT button. A start-up tune is played, the SCORE window reads 0 and the BATCH window reads 1.

END OF GAME. Match digits* appear in the display. Credit* is awarded for a match. Match, High-Score-To-Date, and Game-Over sounds are made as appropriate. One replay is awarded for each score you beat in the display.

*indicates adjustable feature

Get as many balls up into the still as you can by using:
1. the boat
2. the fry pan
3. the pipe
4. the cannon

The more balls you have in the still, the further the revenuers will tumble down the hill.

If the revenuers reach the still before any balls are accumulated, the game is over.

Power Turn-On And Game Setup

WARNING

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 line cord, and DO NOT cut off the ground pin.

WARNING

FCC STICKER. Check the back of your game to see that an FCC-certification sticker was attached to your game at the factory. All games that leave WILLIAMS' plants are certified. As the sticker is proof of this fact, legal repercussions to the owner and distributor of the game may result if the sticker is missing. If you receive any WILLIAMS game (manufactured after December 1982) that has no FCC sticker, call WILLIAMS for advice or write us a note on your game-registration card.

WARNING

PLAYFIELD GLASS. The playfield glass used on STILL CRAZY has unique dimensions: 23-3/4 x 37 x 3/16". This is tempered glass. For safety's sake, NEVER use window glass.

ENTERING GAME-OVER MODE. With the coin door closed, plug the game in and turn it ON. The game should come on in Game-Over Mode.

1. If the game comes on in the Bookkeeping Mode (display showing the game-identification number), turn the game OFF and ON again.

   A. If the game now comes on in Game-Over Mode, bookkeeping totals have been reset to zero.

   B. If the game still comes on in Bookkeeping Mode, open the coin door and turn the game OFF and ON twice. (This is an indication of batteries being removed with the power OFF or of batteries coming loose during shipment. A game without battery power will revert to factory settings.) Any changes from factory settings must be re-entered using procedures from this booklet.

2. If the game still comes on in Bookkeeping Mode, troubleshoot the game.

*indicates adjustable feature

Bookkeeping Mode
(Functions 01-17)

1. Remove the backglass.

2. Set the AUTO-UP/MANUAL-DOWN switch to AUTO-UP and press ADVANCE. The game-identification number is indicated in the PLAYER-1 display.

3. Press ADVANCE to display desired functions on the left side of the display (See the Bookkeeping Table below). Now record the corresponding totals (number of coins and total paid-credits) from the right side of the display. (To review a total that has been advanced past, use MANUAL-DOWN and press ADVANCE).

4. Use MANUAL-DOWN and press ADVANCE to display Function 50 on the left side of the display.

5. Returning to Game-Over Mode:

   A. Use AUTO-UP and press ADVANCE.

   B. OR: To zero bookkeeping totals and return to Game-Over Mode, (1) use AUTO-UP, (2) press the credit button to display 35 on the right side of the display and (3) press ADVANCE.

BOOKKEEPING TABLE

FUNCTION ON LEFT SIDE OF DISPLAY	FUNCTION DESCRIPTION	VALUE OF FUNCTION ON RIGHT SIDE OF DISPLAY*
-	GAME I.D.	2543 1
01	COINS, LEFT CHUTE (closest to coin door hinge)	47
02	COINS, CENTER CHUTE	26
03	COINS, RIGHT CHUTE	100
04	TOTAL PAID-CREDITS	173
05	SPECIAL CREDITS	9
06	REPLAY-SCORE CREDITS	4
07	MATCH CREDITS	2
08*	(1) TOTAL CREDITS; (2) FREE CREDITS; (3) % FREE CREDITS	1 151; 2 15; 3 10
09	TOTAL EXTRA BALLS	0
10	BALL TIME IN MINUTES	03 86
11	TOTAL INNINGS PLAYED	0453
12	CURRENT HIGH-SCORE-TO-DATE	50
13*	BACKUP HIGH-SCORE-TO-DATE (CREDITS AWARDED)	50 0006
14*	REPLAY 1 SCORE (TIMES EXCEEDED)	0004

NOTES

1. Values shown for functions 1 through 14 are merely examples.

2. FUNCTION 8: Three values alternate in the top display.

3. FUNCTIONS 13 & 14: The value in parentheses alternates in the bottom display.

Game-Adjustment Procedure
(Functions 13-41)

Coin door must be open to change settings

1. Remove the backglass.

2. Use AUTO-UP and press ADVANCE. The game-identification number is indicated in the display.

3. To raise the function number in the display, use AUTO-UP and push ADVANCE. To lower the function number, use MANUAL-DOWN and push ADVANCE.

4. With the desired function indicated on the left side of the display, raise the value on the right side of the display by using AUTO-UP and pressing the credit button. Reduce the value by using MANUAL-DOWN and pressing the credit button. The value left on the right side of the display is the new setting. Refer to the Game-Adjustment Table and the Pricing Table.

5. ADVANCE to the next function and then repeat the previous step until all adjustments have been made.

6. Press ADVANCE until Function 50 is indicated in the display. From Function 50 you can return to Game-Over Mode or restore factory settings. Perform either of the following steps as desired.

7. To return to Game-Over Mode use AUTO-UP and press ADVANCE.

8. To restore factory settings and zero bookkeeping totals:
   A. Using AUTO-UP press the CREDIT button until 45 is indicated in the display.
   B. Press ADVANCE. The game displays its game-identification number.
   C. Use MANUAL-DOWN and press ADVANCE to indicate function 50.
   D. Use AUTO-UP and press ADVANCE.

Resetting High-Score-To-Date

1. Using the GAME-ADJUSTMENT PROCEDURE above, set function 13 to the desired reset-value.

2. In Game-Over Mode, press HIGH-SCORE RESET until scores come up on the display.

Factory Bookkeeping-Totals
(Functions 42-49)

The factory bookkeeping-functions are not assigned.

Game-Adjustment Table

FUNCTION	DESCRIPTION	FACTORY SETTING
13	BACKUP HIGH-SCORE-TO-DATE	50
14	FIRST REPLAY-SCORE (AWARD 1 CREDIT)	30
15	SECOND REPLAY-SCORE (NONE)	00
16	THIRD REPLAY-SCORE (NONE)	00
17	FOURTH REPLAY-SCORE (NONE)	00
18	MAXIMUM CREDITS	30
19	STANDARD AND CUSTOM PRICING-CONTROL (STANDARD)	00
20	LEFT COIN-SLOT MULTIPLIER	01
21	CENTER COIN-SLOT MULTIPLIER	01
22	RIGHT COIN-SLOT MULTIPLIER	01
23	COIN UNITS REQUIRED FOR CREDIT	00
24	COIN-UNITS BONUS-POINT	00
25	MINIMUM COIN UNITS	00
26	MATCH : (MATCH ON = 00), MATCH OFF = 01)	00
27	SPECIAL: (AWARDS CREDIT = 00) NO SPECIAL = 01 AWARDS POINTS = 02	00
28	REPLAY : (AWARDS CREDIT = 00) AWARDS EXTRA BALL = 01	
29	MAXIMUM PLUMB-TILTS (INCLUDING WARNINGS)	03
30		
31		
32		
33		
34	GAME-ADJUST #4 FOR ATTRACT-MODE MUSIC 00 : OFF 01 : ON	01
35-49	NOT USED	

NOTES

1. Function 13 may be set to any multiple of 10 points.

2. Setting functions 14 through 17 (replay scores) to zero disables the replay-score point.

Pricing Table

• indicates standard settings by adjusting ONLY function 19

Coin-Door Mechanism	Games/Price	FUNCTION 19	20	21	22	23	24	25
Twin-Quarter	•1/25¢, 4/$1	1	1	4	1	1	0	0
or	•1/50¢, 3/$1, 6/$2	3	1	4	1	2	4	0
Quarter,	•1/50¢, 2/75¢, 3/4x25¢, 4/$1	5	3	15	3	4	15	0
Dollar,	2/25¢, 8/$1	0	2	8	2	1	0	0
Quarter	1/25¢, 3/50¢, 6/$1	0	1	4	1	1	2	0
	1/25¢, 5/$1	0	1	4	1	1	4	0
	1/25¢	0	1	4	1	1	0	0
	1/25¢, 3/50¢, 6/4x25¢, 7/$1	0	3	14	3	2	0	0
	1/50¢	0	1	4	1	2	0	0
1DM, 5DM, 2DM	•1/1DM, 3/2DM, 10/5DM	2	9	45	18	5	45	0
	2/1DM, 5/2DM, 14/5DM	0	13	65	26	5	65	0
20¢, 50¢	1/20¢, 3/50¢	0	6	0	15	5	0	0
1F, 10F, 5F	•1/2F, 3/5F only, 8/10F only	4	1	16	6	2	0	0
25-Cent	•1/25¢, 4/1G	6	1	0	4	1	0	0
1-Guilder	1/25¢, 5/1G	0	1	0	4	1	4	0
5-Franc,	•1/5F, 2/10F	7	1	0	2	1	0	0
10-Franc	•1/10F	8	1	0	2	2	0	0
1-Franc or	1/1F, 3/2F	0	1	1	1	1	2	0
Twin 1-Franc	1/1F	0	1	1	1	1	0	0
Twin 2-Franc	•1/2F	3	1	4	1	1	0	0
10F, 20F	•1/10F, 2/20F	7	1	0	2	1	0	0
Twin 100-Yen	2/100Y	0	2	0	2	1	0	0
100L, 200L	•1/200 Lire	8	1	0	2	2	0	0
Twin 1-Sucre	1/3S, 2/5S	0	2	0	2	5	0	0
Any	•Free Play	set function 18 to 0 for free play						

Game Pricing

PRICING MADE EASY. Function 19 allows a shorthand method of setting the pricing functions. If a number from one to eight is entered into function 19, a corresponding standard setting (shown in the pricing table above) will be entered into the game. The rest of the pricing functions are automatically set for that standard.

FOR CUSTOM SETTINGS first set function 19 to zero. Then set the remaining values according to the pricing table.

THE GAMES : PRICE RATIO is equivalent to the ratio X : VS,
where:
X = COIN-SLOT MULTIPLIER (the number at function 20, 21 or 22)
V = COIN VALUE
S = COIN UNITS REQUIRED FOR CREDIT (the number at function 23)

For example at factory settings with quarter chutes the variables produce 1 : 25x1 or one starting-game for 25¢.

Diagnostic Procedures

DISPLAY TEST

1. Remove the playfield glass.

2. Use MANUAL-DOWN and press ADVANCE. The display should indicate all 0's.

3. Use AUTO-UP. The displays should sequence from all 0's thru all 9's. Two comma segments should come on when the odd digits are displayed.

4. To stop cycling, use MANUAL-DOWN. Press ADVANCE to step through the tests one number at a time. Use AUTO-UP to resume cycling.

SOUND/SPEECH TEST

1. (From Display Test) Use AUTO-UP and press ADVANCE. Test 00 should be indicated on the left side of the display and the right side of the display should sequence from 07 thru 16. A different sound should be produced for each number.

2. To continuously pulse a single sound, use MANUAL-DOWN. Press ADVANCE to sequence through sounds one at a time. Use AUTO-UP to resume sequencing.

LAMP TEST

1. Refer to the Lamp-Matrix Table for lamp numbers and wiring. CPU-Board connections at jacks 1J6 (columns) and 1J7 (rows) are also shown there.

2. (From Sound Test) Use AUTO-UP and press ADVANCE. Test 01 should be indicated in the CREDITS display and all feature-lamps should flash.

SOLENOID TEST

1. Refer to the Solenoid Table for solenoid numbers and wiring. CPU-Board connections at plugs 1P11 and 1P12 are also shown there.

2. (From Lamp Test) Use AUTO-UP and press ADVANCE. Test 02 should be indicated in the CREDITS display. The MATCH display sequences from 01 through 8. Corresponding solenoids 01 through 08 are pulsed.

3. To continuously pulse a single solenoid use MANUAL-DOWN. Press ADVANCE to sequence through the solenoids one at a time. Use AUTO-UP to resume sequencing.

SWITCH TEST

1. Refer to the Switch-Matrix Table for switch numbers and wiring. CPU-Board connections at jacks 1J8 (columns) and 1J9 (rows) are also shown there.

2. (From Solenoid Test) Use AUTO-UP and press ADVANCE. Test 03 should be indicated on the left side of the display with the switch numbers sequencing on the right side of the display. As a switch number is displayed a sound is produced. As a switch is opened, its number is removed from the sequence. When all switches are open, the right side of the display is blank and the sounds stop.

3. HOLD DOWN EACH SWITCH so its number is shown at least twice. A sound is produced and a switch number is momentarily indicated in the display. If two switches in a row are indicated with only one switch closed, check for a short between column wires. For multiple indications check the column wire for a short to ground. If two switches in a column are indicated with only one switch closed, check for a short between row wires.

4. To determine whether the problem is in the playfield or the CPU Board, remove connectors 1P8 and 1P9 from the CPU Board. Now enter the Switch Test. Use a jumper wire to simulate switch operation: For example, on the Switch-Matrix Table notice that placing a jumper between 1J9-pin 1 and 1J8-pin 2 should produce an indication of switch 09 being closed.

Auto-Cycle Mode

1. The Auto-Cycle Mode permits you to check intermittent problems in the playfield, backbox, cabinet and CPU Board.

2. Set function 50 of Test 04 (Bookkeeping Mode) to 15.

3. Press ADVANCE to start the Auto-Cycle Mode. This mode repeatedly sequences through the Display Test, Sound Test (00), Lamp Test (01), and Solenoid test (02).

4. This sequence is repeated until the game is turned off and on.

Memory-Chip Test

Press the DIAGNOSTIC button on the CPU Board. The following indications are provided.

0-test passed (game returns to Game-Over Mode)
1-IC18 CMOS RAM, memory-protect circuit faulty or CPU-Board lockup
2-IC20 Game ROM 2 faulty
3-IC20 Game ROM 2 faulty
5-Coin-door closed, memory-protect circuit faulty, or IC18 CMOS RAM faulty
No indication-IC 20 Game ROM 2 faulty

Note that "0" remaining after power turn-on indicates CPU-Board lockup.

Sound-Board Self-Test

1. PRESS THE DIAGNOSTIC BUTTON SW3 on the CPU Board. Several electronic sounds should be produced. This sequence of sounds is repeated until the game is turned OFF and back ON.

2. NO SOUND IN DIAGNOSTIC TEST (but sounds are present in the Self Test): Check the sound-select inputs (pins 2 through 9 of IC 13) to see if they pulse during Test 00.

3. NO SOUND: Check the -12V-supply voltage on the CPU Board. If this voltage is low (or AC ripple seems too high)...

   (A) check the gray and gray-green transformer secondary wires for 18.7VAC;

   (B) check the -12V filter-capacitor C7 on the CPU Board;

   (C) check for excessive AC (over 0.1 VAC) across C7 on the CPU Board.

4. STILL NO SOUND: Turn the volume control all the way up. With the game turned on, momentarily place a powered-up AC soldering-pencil on the center tap of the volume control. DO NOT use a soldering iron of over 40 watts. Cordless models will NOT work here.

   (A) If you hear a low hum, the power-amplifier chip (TDA2002), volume control and speaker are okay.

   (B) If you don't hear a hum, try the test again with the volume control turned halfway up.

Solenoid Table

SOL. NO.	FUNCTION	WIRE COLOR	CONNECTIONS CPU BOARD	CONNECTIONS PLAYFIELD	DRIVER TRANS.	SOLENOID PART NO.
01	Still Flap	GRY-BRN	1P12-1	8P3-1	Q47	SG1-23/850-DC
02	Water Wheel	GRY-RED	1P12-3	8P3-2	Q48	
03	Direction Relay	GRY-ORN	1P12-4	8P3-3	Q49	
04	Revenuer Motor	GRY-YEL	1P12-5	8P3-4	Q50	
05	Cannon Relay (U left)	BRN-RED	1P11-1	8P3-5	Q39	SFL-19-400
06	Foot Relay (L left)	BRN-BLK	1P11-3	8P3-6	Q40	SFL-19-400
07	Pipe Relay (U right)	BRN-ORN	1P11-5	8P3-7	Q41	SFL-19-400
08	Boot Relay (L right)	BRN-YEL	1P11-7	8P3-8	Q42	SFL-19-400

*NOTES

1. Typical wiring for solenoids follows.

2. Solenoid 03 has a Coinco part-number.

Lamp-Matrix Table

COLUMN / ROW	1 YEL-BRN 1J6-1	2 YEL-RED 1J6-2	3 YEL-ORN 1J6-3	4 YEL-BLK 1J6-5	5 YEL-GRN 1J6-6	6 YEL-BLU 1J6-7	7 YEL-VIO 1J6-8	8 YEL-GRY 1J6-9
RED BRN 1J7-1	CREDIT C/PANEL 1	GAME OVER (X2) 9	OUT-HOUSE (X3) 17	BEE-HIVE (X2) 25	STILL 1 33	STILL 3 41	2(X3) 49	4(X3) 57
RED-BLK 1J7-2	TILT EGG GATE 2	MUZZLE 10	STOVE (X2) 18	BEE-HIVE 26	STILL 2 34	1(X3) 42	3(X3) 50	5(X2) 58
RED-ORN 1J7-3	NOT USED 3	NOT USED 11	NOT USED 19	NOT USED 27	NOT USED 35	NOT USED 43	NOT USED 51	NOT USED 59
RED-YEL 1J7-4	NOT USED 4	NOT USED 12	NOT USED 20	NOT USED 28	NOT USED 36	NOT USED 44	NOT USED 52	NOT USED 60
RED-GRN 1J7-6	NOT USED 5	NOT USED 13	NOT USED 21	NOT USED 29	NOT USED 37	NOT USED 45	NOT USED 53	NOT USED 61
RED-BLU 1J7-7	NOT USED 6	NOT USED 14	NOT USED 22	NOT USED 30	NOT USED 38	NOT USED 46	NOT USED 54	NOT USED 62
RED-VIO 1J7-8	NOT USED 7	NOT USED 15	NOT USED 23	NOT USED 31	NOT USED 39	NOT USED 47	NOT USED 55	NOT USED 63
RED-GRY 1J7-9	NOT USED 8	NOT USED 16	NOT USED 24	NOT USED 32	NOT USED 40	NOT USED 48	NOT USED 56	NOT USED 64

Switch-Matrix Table

COLUMN / ROW	1 GRN-BRN 1J8-1	2 GRN-RED 1J8-2	3 GRN-ORN 1J8-3	4 GRN-YEL 1J8-4	5 GRN-BLK 1J8-5	6 GRN-BLU 1J8-7	7 GRN-VIO 1J8-8	8 GRN-GRY 1J8-9
WHT-BRN 1J9-1	TILT 1	LOWER RAMP LIMIT 9	NOT USED 17	NOT USED 25	NOT USED 33	NOT USED 41	NOT USED 49	NOT USED 57
WHT-RED 1J9-3	DOOR COIN 2	TOP DRAIN 10	NOT USED 18	NOT USED 26	NOT USED 34	NOT USED 42	NOT USED 50	NOT USED 58
WHT-ORN 1J9-4	START 3	MIDDLE R DRAIN 11	NOT USED 19	NOT USED 27	NOT USED 35	NOT USED 43	NOT USED 51	NOT USED 59
WHT-YEL 1J9-5	TOP L FLIP 4	LEVEL 1 12	NOT USED 20	NOT USED 28	NOT USED 36	NOT USED 44	NOT USED 52	NOT USED 60
WHT GRN 1J9-6	BOT L FLIP 5	LEVEL 2 13	NOT USED 21	NOT USED 29	NOT USED 37	NOT USED 45	NOT USED 53	NOT USED 61
WHT-BLU 1J9-7	TOP R FLIP 6	LEVEL 3 14	NOT USED 22	NOT USED 30	NOT USED 38	NOT USED 46	NOT USED 54	NOT USED 62
WHT-VIO 1J9-8	BOT R FLIP 7	LEVEL 4 15	NOT USED 23	NOT USED 31	NOT USED 39	NOT USED 47	NOT USED 55	NOT USED 63
WHT-GRY 1J9-9	LOW L DRAIN 8	UPPER RAMP LMT 16	NOT USED 24	NOT USED 32	NOT USED 40	NOT USED 48	NOT USED 56	NOT USED 64

Special Considerations When Replacing Circuitboards

CPU BOARD. A revision-level 8, D-9970 CPU Board must be used. Only jumpers W2, W3, W6, W7, W9, W10, W11, W13 and W16 as well as resistors R153 and R155 should be connected. Substitute W1 for W2 when a 6808 microprocessor is used instead of a 6802 microprocessor.

POWER-SUPPLY BOARD. Use the D-8345 board (equipped with relay).

DISPLAY BOARDS. Use the C-8363 board and 7-digit slave displays.

Warnings & Notices

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.

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WARNING

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been certified to comply with the limits for a Class A computing device pursuant to Subpart J of 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 correct the interference.

RF-INTERFERENCE NOTICE

CABLE PLACEMENT and ground-strap routing on this game have been designed to keep RF radiation and conduction within levels accepted by FCC regulations.

TO MAINTAIN THESE LEVELS, reposition harnesses and reconnect ground straps to their original placements if they should be disconnected during maintenance.

NOTICE

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