



Self-Test

After the self-test switch is set to the on position, 12 self-test screens provide a visual and audible check of the Paperboy game circuits. Refer to Chapter 1 in the Operators Manual (TM-275) for the location of the self-test switch.

If the self-test switch is turned on during the Play or the Attract Mode, the first display to appear is Accounting Information. By pressing the right-hand throw button the self-test will then advance to the next screen, Switch Settings, and back to the 6502 Processor Test. To start with the RAM/Interrupt/ROM Test, turn off the power, turn on the self-test switch, and then turn on the power again.

RAM/Interrupt/ROM Test

This test screen displays failure information for the RAM, interrupt, and program ROM circuitry on the CPU and Video PCBs. If this test passes, the display will advance to the 6502 Processor Test.

The RAM test checks the condition of the T-11 microprocessor RAM, zero page RAM, motion object RAM, playfield RAM, alphanumeric RAM, and associated circuitry located on the Video PCB. If the RAM test fails, an error message gives the location of the failed RAM or associated circuitry on the Video PCB as shown in Figure 1.

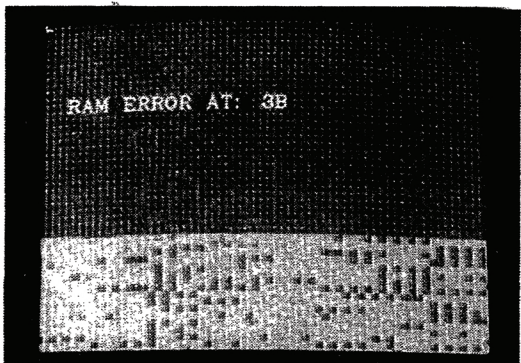


Figure 1 RAM Test Fails

If the zero-page RAM or associated circuitry fails, the screen turns red and the address of the failed component's location flashes continuously to facilitate troubleshooting.

After the RAM test passes, the interrupts on the CPU and Video PCB are checked. If the interrupt test fails, an error message (as shown in Figure 2) may appear on a green screen, which indicates a possible vertical-blanking or interrupt-logic failure.

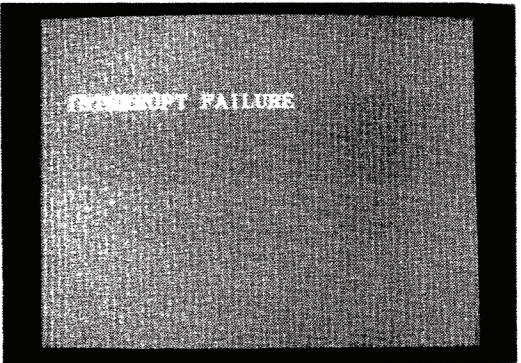


Figure 2 Interrupt Test Fails

After the interrupt test passes, all ten of the program ROMs on the CPU PCB are tested for checksums. If the ROM test fails, an error message gives the location of the failed ROM or associated circuitry (as shown in Figure 3).

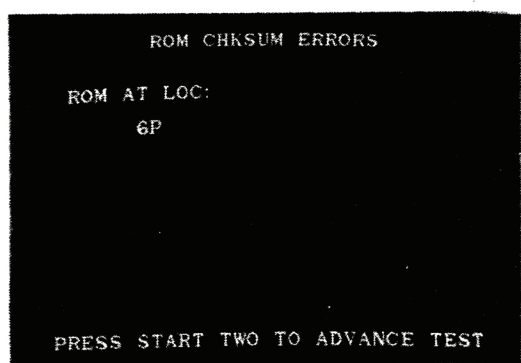


Figure 3 ROM Test Fails

6502 Processor Test

The 6502 Processor Test screen provides visual and audible information to check the condition of the 6502 sound microprocessor and associated circuitry. All functions of the sound microprocessor are checked including: RAM/ROM, interrupts, music synthesizer, sound-effects processor, and speech synthesizer. Basic communication between the T-11 (master) and the 6502 (slave) microprocessors is also checked.

NOTE

Press the right-hand throw button at any time during the 6502 processor test to advance to the Control Test.

See the Operators Manual for more information on this test, including illustrations of a reset retry and communications failure.

If the reset/communications check passes, then the condition of the 6502 microprocessor, RAM, ROM, interrupts, music (Yamaha) synthesizer, and associated circuitry is checked. If one or more of these circuits fails, an error message is displayed (as shown in Figure 4).

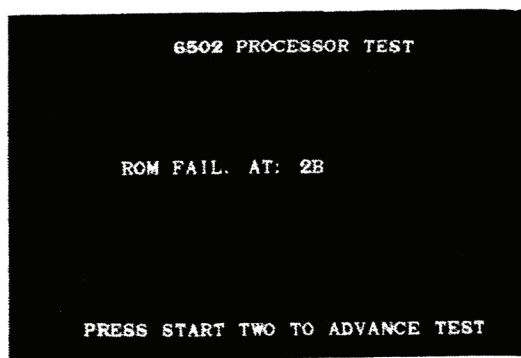


Figure 4 Music/RAM/ROM Fails

If the RAM, ROM, and music synthesizer check passes, then the music (Yamaha) synthesizer, sound-effects (POKEY) generator, and speech synthesizer sound outputs are checked. As each of these four tests is run, an appropriate message is displayed (as shown in Figure 5).

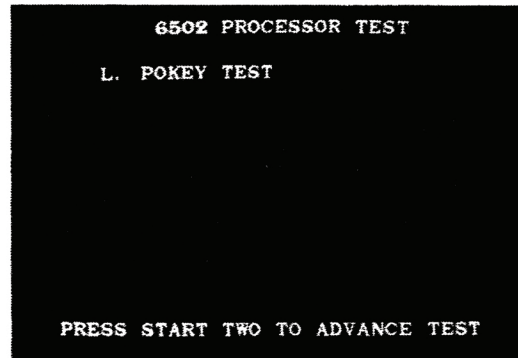


Figure 5 Sound Output

- **YAMAHA TEST** consists of eight tones in a major scale that alternate between left and right sound channels (16 tones total).
- **L. POKEY TEST** consists of four tones in a major chord that come from the left sound channel.
- **R. POKEY TEST** consists of four tones in a major chord that come from the right sound channel.
- **SPEECH TEST** consists of the phrase: "Now you have a friend in the paper business." The phrase should be clear and understandable.

After the four sound output tests are completed, the sound status messages are displayed as shown in Figure 6.

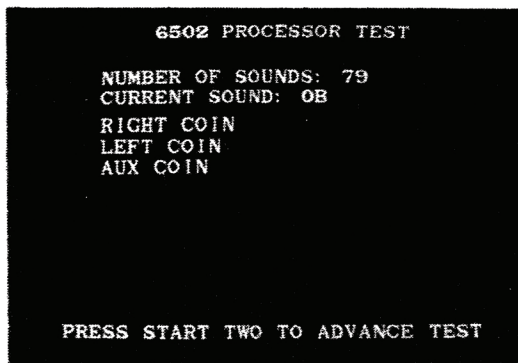


Figure 6 Sound Status

- **NUMBER OF SOUNDS** is the total number of sounds used in the Paperboy game.
- **CURRENT SOUND** is the current sound selected for playing.

Press the left-hand throw button to select the sound numbers indicated by the **CURRENT SOUND** message shown in Figure 6. Move the handle-bar control forward and backward to sequence through the selected sounds.

The sound status screen also displays the condition of the left, right, and auxiliary coin switches. Press the left and right coin switches (see Figure 1-2 in Chapter 1 of the Operators Manual for switch locations) and check the display for a corresponding **LEFT COIN** and **RIGHT COIN** message. Press the auxiliary (aux) coin switch (see Figure 1-2 in the Operators Manual for switch location), and check the display for a corresponding **AUX COIN** message.

Press the right-hand throw button to obtain the next test.

Control Test

The Control Test screen displays the condition of the horizontal and vertical potentiometers A/D converter, left hand throw switch, and associated circuitry. (It is assumed that the right-hand throw switch works because it was used to advance to this test.) The Control Test screen is also used to calibrate the handle-bar control horizontal and vertical potentiometers.

Press the left-hand throw button to obtain the Control Test screen shown in Figure 7.

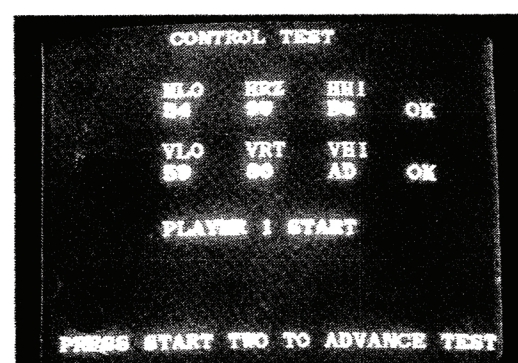


Figure 7 Control Test Passes

If the range of the horizontal and vertical potentiometers on the handle-bar control (horizontal low to horizontal high and vertical low to vertical high) is large enough, then the message **OK** is displayed next to the appropriate control range reading. If the range is too small, then the message **BAD** is displayed.

Calibration Procedure

The handle-bar control is calibrated at the factory and should recalibrate itself during game play. However, if the control does not respond correctly, calibrate as follows:

1. Press and hold down the left- and right-hand throw buttons.
2. Turn the handle-bar control to the extreme left, right, up, and down positions. Release the right-hand throw button, then the left-hand throw button.
3. Press the left-hand throw button and check the display; the control range should read **OK**. If the problem still persists, check the physical alignment of the vertical and horizontal potentiometers as described under *Aligning the Handle-Bar Control Potentiometers* in Chapter 3 of the Operators Manual.

Press the right-hand throw button to set the vertical and horizontal potentiometer calibration and obtain the next test.

Alphanumeric Test

The Alphanumeric Test screen displays the condition of the alphanumeric ROM, alphanumeric color palettes, and associated circuitry (as shown in Figure 8).

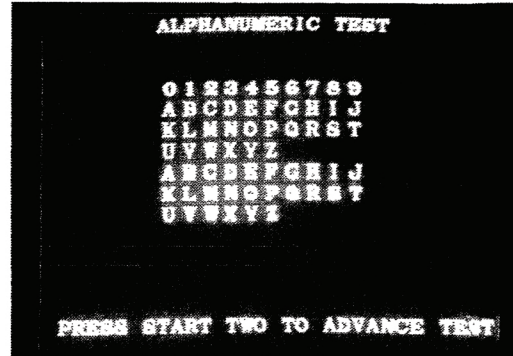


Figure 8 Alphanumeric Test

The displayed alphanumeric characters should be repeated twice, with the first set yellow and the second set blue with red specks. If first set of characters is yellow and the second set is not blue, then there may be a problem with the color palette select circuits.

Press the right-hand throw button to obtain the next test.

Scrolling Playfield Test

The Scrolling Playfield Test checks the condition of the playfield ROM, playfield display circuits, and playfield color palettes. The Scrolling Playfield Test screen appears as shown in Figure 9.

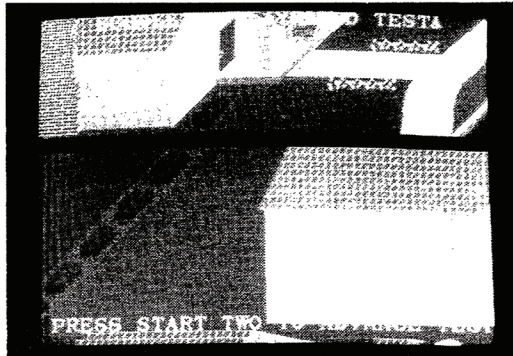


Figure 9 Scrolling Playfield Test

Move the handle-bar control up, down, right, and left; note that the display scrolls correspondingly. Press the right-hand throw button to obtain the next test.

Motion Object Test

The first Motion Object Test checks the motion object horizontal and vertical display locations, motion-object color palettes, and the motion/playfield prioritizing logic circuit. The first Motion Object Test screen appears as shown in Figure 10.

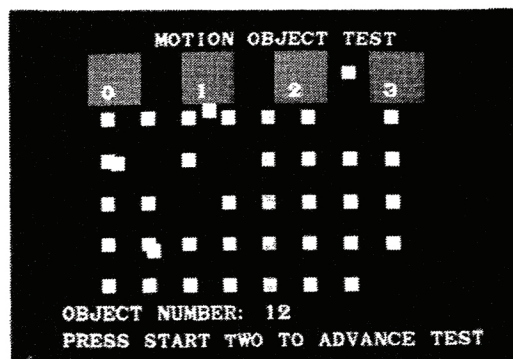


Figure 10 Motion Object Test

Refer to the Operators Manual for details of this test. Press the right-hand throw button to obtain the next test.

Motion Object Height Test

The Motion Object Height Test checks the motion object height circuit and the horizontal load disable circuit. The Motion Object Height Test screen appears as shown in Figure 11.

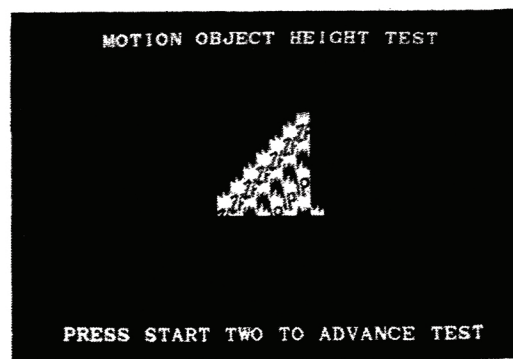


Figure 11 Motion Object Height Test

Move the handle-bar control to move the entire picture around on the screen. Press the left-hand throw button to obtain a new set of motion objects. Press the right-hand throw button to obtain the next test.

Color Bar Test

The Color Bar Test checks the condition of the color RAM, video amplifiers, and associated circuitry. The Color Bar Test screen appears as shown in Figure 12.

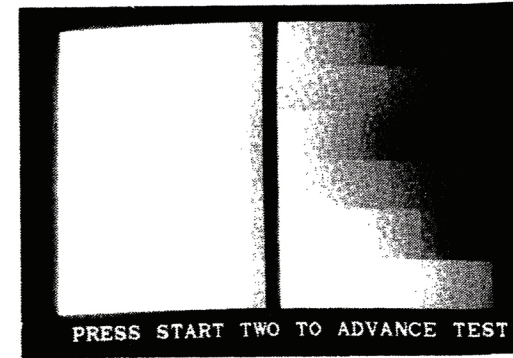


Figure 12 Color Bar Test

Sixteen vertical grey-scale bars and three groups of 16 vertical bars with shades of red, green, or blue are displayed. The brightest bar should be on the left and darkest (black) bar on the right, with a black frame around the screen. Each group of red, green, or blue should be split in half horizontally to show two fade scales. Each upper fade scale is ranged by changes in overall intensity (Z) and each lower fade scale by individual color intensity (R, G, B). This test helps to determine if white tracking is set properly (grey-scale bars range from white to grey)/Refer to the white tracking procedure in the display manual if adjustment is required.

Press the right-hand throw button to obtain the next test.

Color Purity Test

Color Purity Test consists of five color displays that check the condition of the display color-purity circuits. The first display to appear should be a red screen with the word **RED** displayed at the bottom of the screen as shown in Figure 13.

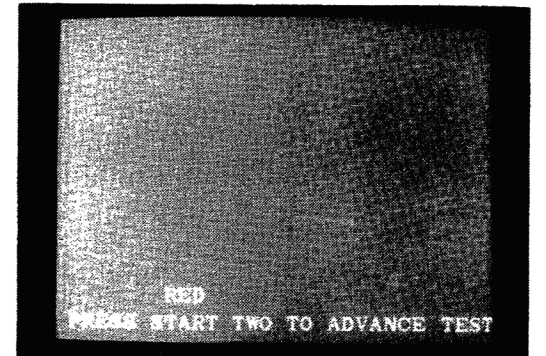


Figure 13 Color Purity Test

Press the left-hand throw button repeatedly to cycle through this test.

If the display characteristics are not correct, refer to the display manual for the color-purity adjustment procedure or the possible cause of failure.

Press the right-hand throw button to obtain the next test.

Convergence Test

The Convergence Test screen appears as shown in Figure 14.



Figure 14 Convergence Test

A violet dot pattern displays the red-to-blue convergence. Refer to the Operators Manual for more details of this test.

Press the right-hand throw button to obtain the next screen.

Accounting Information

The Accounting Information screen provides useful statistics about the game (as shown in Figure 15).

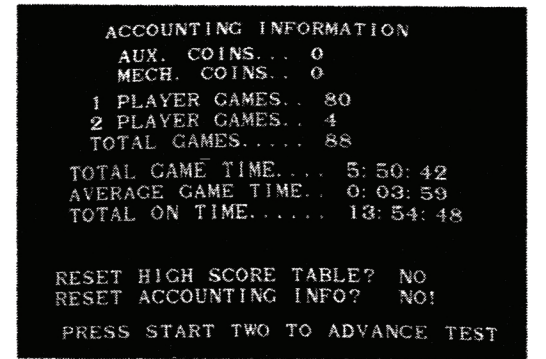


Figure 15 Accounting Information

The following game statistics appear on the Accounting Information screen:

- **AUX COIN** shows the number of coins entered through the auxiliary coin switch.
- **MECH COIN** shows the total number of coins deposited in the left and right coin mechanisms.
- **1 PLAYER GAMES** shows the number of 1-player games played.
- **2 PLAYER GAMES** shows the number of 2-player games played.
- **TOTAL GAMES** shows the total of the 1- and 2-player games played (each 2 player game is counted as two games).
- **TOTAL GAME TIME** shows the accumulated time of all the games played in hours, minutes, and seconds.
- **AVERAGE GAME TIME** shows the total game time divided by the total number of games in hours, minutes, and seconds.
- **TOTAL ON TIME** shows the total time in hours, minutes, and seconds that the game has been turned on (percent usage = total game time/total on time).

The game statistics are accumulated from the first time the game is turned on or from the last time the statistics were reset. This screen is also used to reset the game statistics and the high-score table.

Resetting the Game Statistics. Reset the game statistics as follows:

1. Pull the handle-bar control downward to position the exclamation mark (!) next to the **Reset Accounting Information** message.
2. Press the left-hand throw button to change the **NO** message to **YES**.

The game statistics are reset after the right-hand throw button is pressed to leave the Accounting Information screen.

Resetting the High-Score Table. Reset the High-Score Table as follows:

1. Pull the handle-bar control upward to position the exclamation mark (!) next to the **Reset High-Score Table** message.
2. Press the left-hand throw button to change the **NO** message to **YES**.

Press the right-hand throw button to obtain the next screen (the High-Score Table will be reset).

Switch Settings

The Switch Settings screen displays the coin and game option settings of the two dual-in-line package switches at locations 6/7A and 5/6A on the CPU PCB. The Switch Settings screen appears as shown in Figure 16. Refer to Chapter 1 in the Operators Manual for detailed coin and game option setting information.

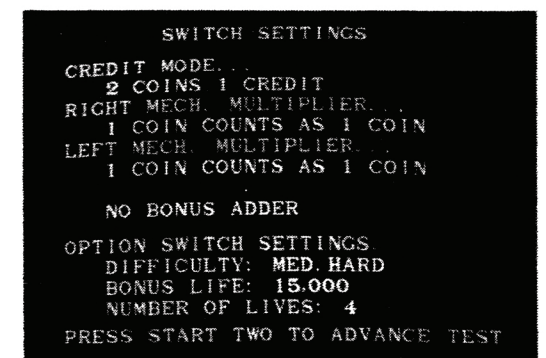


Figure 16 Switch Settings

Press the right-hand throw button to obtain the 6502 Processor Test or turn the self-test switch off to select the Attract Mode.

Option Settings

Settings for the Paperboy™ coin and game options are listed in Tables 1 and 2. Options preset at the factory are shown by the ◀ symbol; however, you can change the settings according to your needs. To verify the option selections, check the Switch Settings screen obtained in the Self-Test as described under *Switch Settings* on this label.

Table 1 Coin Options

Settings of 8-Toggle Switch on Paperboy CPU PCB (at 6/7A)								Option
1	2	3	4	5	6	7	8	
								Coins Per Credit
							Off	1 Coin 1 Credit
							Off	2 Coins 1 Credit ◀
							On	3 Coins 1 Credit
							On	4 Coins 1 Credit
								Right Coin Mechanism
			Off	Off				1 Coin Counts as 1 Coin ◀
			Off	On				1 Coin Counts as 4 Coins
			On	Off				1 Coin Counts as 5 Coins
			On	On				1 Coin Counts as 6 Coins
								Left Coin Mechanism
			Off					1 Coin Counts as 1 Coin ◀
			On					1 Coin Counts as 2 Coins
								Bonus Adder
			Off	Off	Off			No Bonus Adder ◀
			Off	Off	On			2 Coins Give 1 Extra Coin
			Off	On	Off			4 Coins Give 1 Extra Coin
			Off	On	On			4 Coins Give 2 Extra Coins
			On	Off	Off			5 Coins Give 1 Extra Coin
			On	Off	On			3 Coins Give 1 Extra Coin
			On	On	On			Free Play

◀ Manufacturer's recommended settings.

Table 2 Game Options

Settings of 8-Toggle Switch on Paperboy CPU PCB (at 5/6A)								Option
1	2	3	4	5	6	7	8	
								Difficulty
							Off	Medium Hard ◀
							Off	Easy
							On	Medium
							On	Hard
								Bonus Life Given at:
				Off	Off			15,000 points ◀
				Off	On			No bonus life
				On	Off			10,000 points
				On	On			20,000 points
								Starting Lives
				Off	Off			4 ◀
				Off	On			Demonstration mode (unlimited number of lives)
				On	Off			3
				On	On			5

◀ Manufacturer's recommended settings for American-made games.

Important Note to Operators

If the Paperboy™ Operators Manual was not included in this game when you unpacked it, contact your distributor to get a free copy. (All Atari Games manuals for coin-operated games also include complete illustrated parts lists.)