



Exidy Targ Test Rom

The Targ Test Rom aids in the diagnosis of problems with the three Targ PCBs.

Installation:

Replace the ROM at location 7A with the Targ Test Rom. The ROM should be of the same type as the other program roms installed in the board, 2716(+5v), or TMS2716(+5v,-5v,+12v).

Dependencies:

The Targ Test Rom **REQUIRES** that a valid Targ rom (upright or cocktail version) be present at location 6A. This is for two reasons:

First, the character set displayed on the screen is copied from this rom and the 2k available in a 2716 doesn't allow me the space to incorporate this into the test rom itself.

Second, this rom defines the hardware vectors which tell the processor what address to begin executing commands (\$3000).

Hardware vectors:

\$3FFA = NMI vector (NMI=non maskable interrupts)

\$3FFC = Reset vector

\$3FFE = IRQ vector

When this rom missing or incorrect, the screen displays a rug pattern (see image below) and the spectar sound plays. If you encounter these symptoms, check 6A.

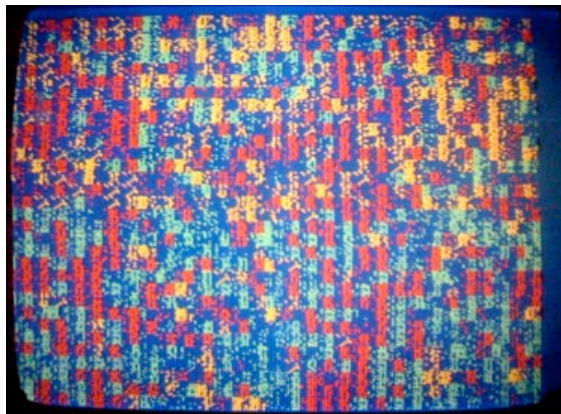
How To Use:

Power on the machine.

The first ram/rom test should appear.

Press any button or move the joystick to advance to the next test.

Test Rom Walkthrough:



Zero Page Ram Test

Since having non-functioning Zero Page Ram would not allow most of the routines in the Test Rom to work, we test it first, being sure to not use any of this ram in the tests. We test from \$00 - \$FF, three times, writing alternating patterns of "0101" and "1010" to each ram and then reading and comparing it to verify the ram is working.

If the ram at 5A (low 4-bits) doesn't pass the Shoot and Spectar sounds are played.

If the ram at 4A (high 4-bits) doesn't pass the Crash and Spectar sounds are played.

If either of these errors occurs (or rom 6A isn't installed) the screen display will look like the image above.

Control Panel Check

After a bit of setup we do a quick test of the control panel if anything is "on". If this is the case, I assume that there is a stuck input and we go straight to the control panel tests. A stuck control panel input won't allow us to advance through the other tests.



RAM Tests

We then test the PCB's screen ram and character ram, three times for each ram. We again write alternating patterns of "0101" and "1010" to each ram and then read and compare our result to verify the ram is working. Flashes of vertical lines on the screen will confirm that data is being written to those memory locations.

NOTE: I've noticed that the ram tests can fail on hardware that isn't "warmed up". If many of the rams fail or you encounter other odd behavior (crashing or sprites displayed randomly). Wait a minute or so and power cycle the machine to see if this clears up the problems.

ROM Tests

These tests EOR each byte in a ram together to get a unique checksum for each rom. This is done for the test rom as well. The roms are checked for both the upright and cocktail versions of the game. Passing roms identified as upright versions display PASSED, cocktail versions display PASSED CT.

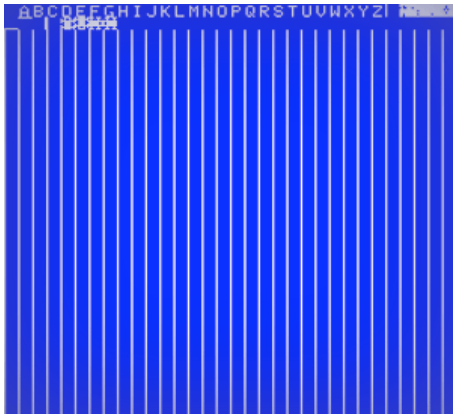


Video Test 1:

This test shows the complete video character set \$00-\$3F followed by the rest of the screen filled with character \$3D.

The characters should all be red on a blue background.

If the display doesn't look like this image, see the logic probe tests [here](#) to determine the problem.



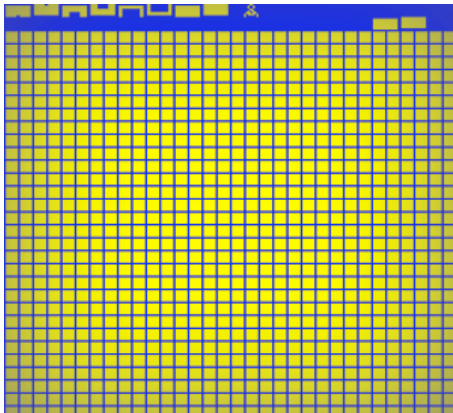
Video Test 2:

This test shows the complete video character set \$40-\$7F followed by the rest of the screen filled with character \$5B.

The characters should all be cyan on a blue background.

If the display doesn't look like this image, see the logic probe tests [here](#) to determine the problem.

(Note that this is a screen capture from Mame which displays these characters incorrectly as white - they should be light blue.)

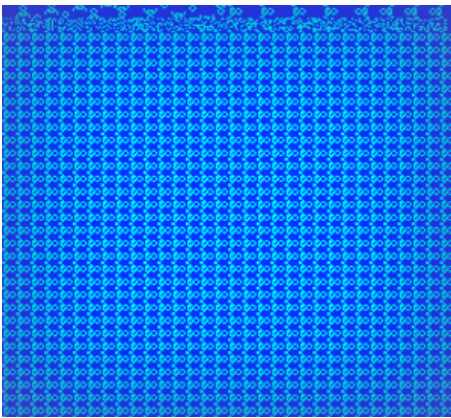


Video Test 3:

This test shows the complete video character set \$80-\$CF followed by the rest of the screen filled with character \$8C.

The characters should all be yellow on a blue background.

If the display doesn't look like this image, see the logic probe tests [here](#) to determine the problem.

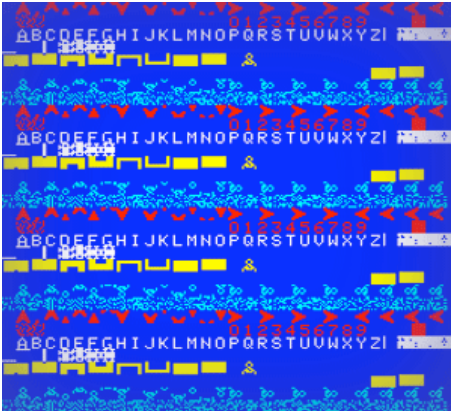


Video Test 4:

This test shows the complete video character set \$40-\$7F followed by the rest of the screen filled with character \$D0.

The characters should be light blue on a blue background.

If the display doesn't look like this image, see the logic probe tests [here](#) to determine the problem.



Video Test 5:

This test shows the complete video character set \$00-\$FF repeated four times on the screen.

Errors correspond to the following rams:

11D - Right half of first 4 lines

13D - Left half of first 4 lines

12D - Right half of last 4 lines

14D - Left half of last 4 lines



Video Test 6:

This Test shows a blank screen and can be used to troubleshoot issues with the screen's blue background.

If the display doesn't look like this image, see the logic probe tests [here](#) to determine the problem.



Sound Tests

During the Shoot, Crash and Crash Long tests the sound repeats every few seconds.

During the Spectar Slow, Spectar Fast, Music A and Music B tests the sound plays continuously.



Control Panel & DIP Switch Tests

The current status of the game's controls and dip switches are displayed in both binary and text. Engage any control to confirm its operation. Change the dip switches to confirm operation and set desired settings.

Press Player 1, Player 2 and Fire simultaneously to advance to the next screen.



Targ Test Rom Info Screen

This final screen displays version and other info about the Targ Test Rom.

Engaging any control repeats the tests from the beginning.

Download the Test ROM

The Targ Test ROM is provided free of charge to assist in (and encourage!) the diagnosis and repair of Targ games.

The Targ Test ROM is Copyright 2008 by Outerworld Media and programmed by Timothy Shiels.

Please distribute this rom only though this page: http://www.outerworldarcade.com/arcade/targ/targ_test_rom.html

Revision History:

1.0 Initial Release: 12/2008

Using the Targ Test Roms

The [Targ Test ROM's](#) video tests send known signals to the color adapter board which can be used to much more easily isolate problems.

LOGIC PROBE TESTS:

**Targ Test ROM
Screen 1:**



74LS74 (1A)
pin 5 = Low
pin 9 = Low

74LS139 (2A)
pin 4 = Pulsing
pins 5,6,7 = High

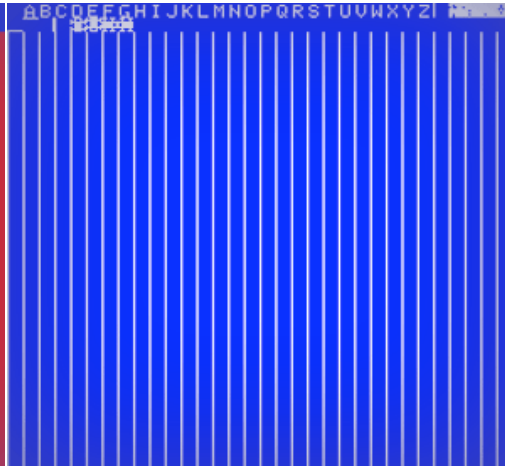
74LS148 (2B)
pins 6,7 = High
pin 9 = Pulsing

74LS151
Red (5A) pin 5 = Pulsing
Green (5B) pin 5 = Low
Blue (5C) pin 5 = Pulsing

74LS86 (6A)
pin 3 = Pulsing
pin 6 = Low
pin 8 = Pulsing

74LS174 (6B)
pin 2 = Pulsing
pin 5 = Low
pin 7 = Pulsing

**Targ Test ROM
Screen 2:**



74LS74 (1A)
pin 5 = Low
pin 9 = High

74LS139 (2A)
pin 5 = Pulsing
pins 4,6,7 = High

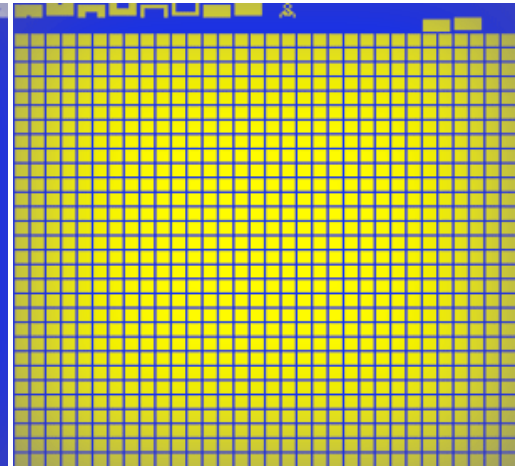
74LS148 (2B)
pins 6,9 = High
pin 7 = Pulsing

74LS151
Red (5A) pin 5 = Low
Green (5B) pin 5 = Pulsing
Blue (5C) pin 5 = High

74LS86 (6A)
pin 3 = Low
pin 6 = Pulsing
pin 8 = Low

74LS174 (6B)
pin 2 = Low
pin 5 = Pulsing
pin 7 = Low

**Targ Test ROM
Screen 3:**



74LS74 (1A)
pin 5 = High
pin 9 = Low

74LS139 (2A)
pin 6 = Pulsing
pins 4,5,7 = High

74LS148 (2B)
pins 6 = High
pin 7,9 = Pulsing

74LS151
Red (5A) pin 5 = Pulsing
Green (5B) pin 5 = Pulsing
Blue (5C) pin 5 = Pulsing

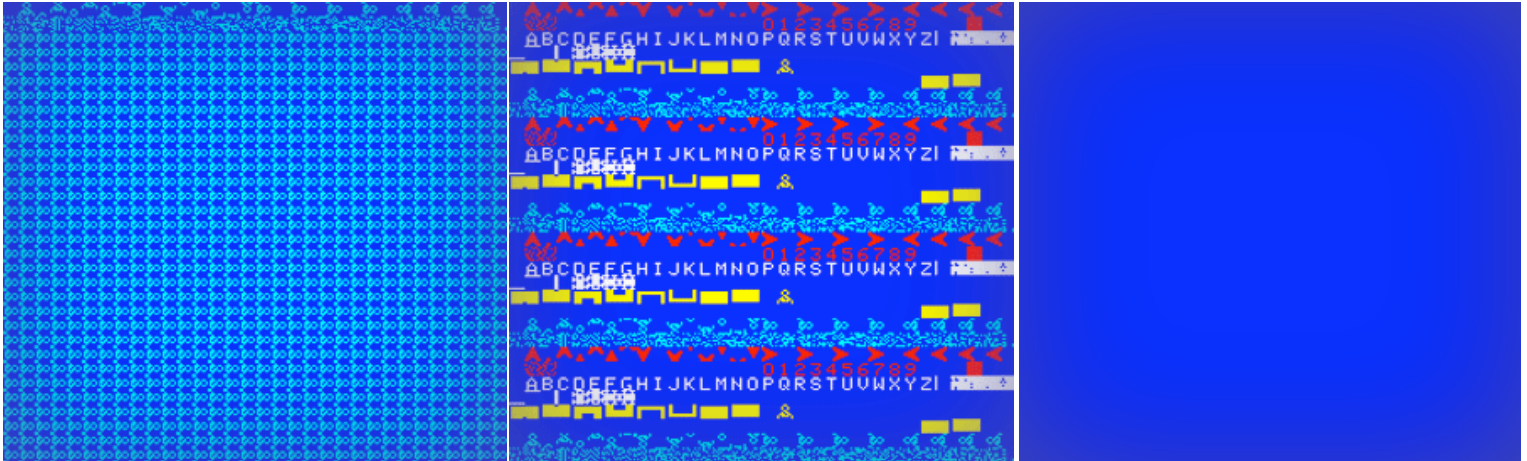
74LS86 (6A)
pin 3 = Pulsing
pin 6 = Pulsing
pin 8 = Pulsing

74LS174 (6B)
pin 2 = Pulsing
pin 5 = Pulsing
pin 7 = Pulsing

Targ Test ROM
Screen 4:

Targ Test ROM
Screen 5: (Character Set Test)

Targ Test ROM
Screen 6: (Background Test)



74LS74 (1A)

pin 5 = High
pin 9 = High

74LS139 (2A)

pin 7 = Pulsing
pins 4,5,6 = High

74LS148 (2B)

pins 7,9 = High
pin 6 = Pulsing

74LS151

Red (5A) pin 5 = Low
Green (5B) pin 5 = Pulse
Blue (5C) pin 5 = High

74LS86 (6A)

pin 3 = Low
pin 6 = Pulsing
pin 8 = High

74LS174 (6B)

pin 2 = Low
pin 5 = Pulsing
pin 7 = High

74LS74 (1A)

pin 5 = Low
pin 9 = Low

74LS139 (2A)

pins 4,5,6, 7 = High

74LS148 (2B)

pins 6,7,9 = High

74LS151

Red (5A) pin 5 = Low
Green (5B) pin 5 = Low
Blue (5C) pin 5 = High

74LS86 (6A)

pin 3 = Low
pin 6 = Low
pin 8 = High

74LS174 (6B)

pin 2 = Low
pin 5 = Low
pin 7 = High