

# 240p Test Suite

## Instruction Booklet

### Credits

- Concept: Artemio Urbina (Twitter: @Artemio)
- Code: Damian Yerrick (Twitter: @PinoBatch)
- Main menu graphics: Damian Yerrick
- Portrait in Shadow sprite test: darryl.revok
- Hill zone background: mikeljmoftt
- Extra patterns and collaboration: Konsolkongen & [shmps]
- "Crowd" bytebeat player: Kragen & rainwarrior

© 2011–2018 Artemio Urbina  
© 2015–2020 Damian Yerrick

This program is free software: you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA.

Thank you for selecting the 240p Test Suite Game Pak for your Nintendo Entertainment System. Please read this manual to ensure maximum enjoyment of your new game. Be sure to save this booklet for future reference.

### Precautions

- A Game Pak is a high-precision piece of electronics. Don't drop it, and don't take it apart. Don't touch the edge connector with your fingers or otherwise let it get wet or dirty. Always turn off the Control Deck's power before inserting or removing a Game Pak.
- To fix a blank or scrambled screen, turn the power off and remove and reinsert the Game Pak. If that doesn't work, don't blow on the edge connector. Instead, clean the edge connector with a cotton swab soaked in water or isopropyl rubbing alcohol and then dry it with the other end.
- A small fraction of the population is sensitive to flashing lights and other things commonly seen in video games. If you have had seizures, ask a health care professional before playing video games. To minimize the risk, play with the lights on and don't sit too close to the screen.
- Playing too long can hurt your eyes and hands. Make sure to take a few minutes' break every hour. If you start to feel sick or sore, take a nap.
- Leaving a still image on the screen too long may cause the image to be permanently burned into the screen. This can happen with games' score indicators or with a game that's left on pause too long. It can even happen with regular TV, with the channel's logo or the ball game's score in the corner. Cathode ray tube (CRT) front and rear projection TVs appear to be the most affected, with plasma TVs and direct view CRT TVs less so. LCDs and LCD projectors don't appear to suffer from noticeable burn-in. So if you're leaving a game on pause more than a couple minutes, turn the TV off.

### About 240p Test Suite

Most video game consoles prior to 1999 output a 240-line progressive (240p) video signal. Though it has nonstandard timing compared to broadcast TV, most TVs from the 1980s can display it. However, many flat-panel TVs from 2007 and later have trouble with 240p video.

The 240p Test Suite is a homebrew application for video game consoles that helps evaluate compatibility of upscalers and other video processors, either stand-alone or built into a TV, with retro consoles' video. It also provides tools for calibrating black and white levels, colors, and picture size for accurate reproduction across displays. These have been tested with video processors on real hardware and a variety of displays, including CRTs and arcade monitors via RGB.

MDFourier is a tool to compare audio signatures and generate graphs that show how they differ. A tone generator produces a signal for recording from the console, and the analysis program compares the frequencies to a reference recording and displays the results.

## Controller functions

Control 240p Test Suite with controller 1.  
The Zapper test uses a Zapper in port 2.



### In menus and help

- Control Pad  $\leftarrow \rightarrow$ : Turn page
- Control Pad  $\uparrow \downarrow$ : Move cursor
- A Button: Choose option
- B Button: Go to previous menu
- Start Button: Show help for menu

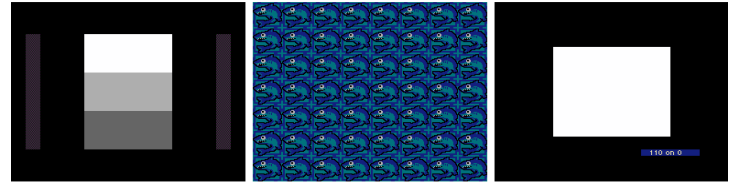
### In an activity

- Control Pad, A, Select: Control activity
- Start Button: Show help for activity
- B Button: Close activity

Gus, the character at left, was an esports instructor until game publishers cracked down on the esports academies in June 2012 and July 2013. Then he became a home theater installer.

**TIP:** To skip straight to MDFourier tone generator, hold the Start Button while turning on the power or while pressing the Reset Button.

## Available tests

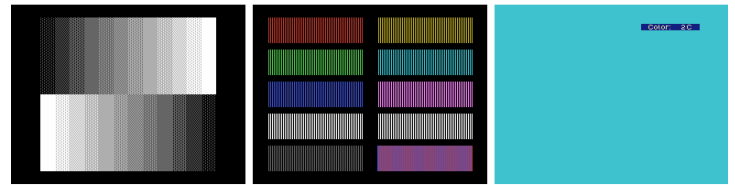


**PLUGE (picture line-up generation equipment) and IRE**  
Adjust brightness or black level



### Color bars

Adjust contrast, saturation, and tint

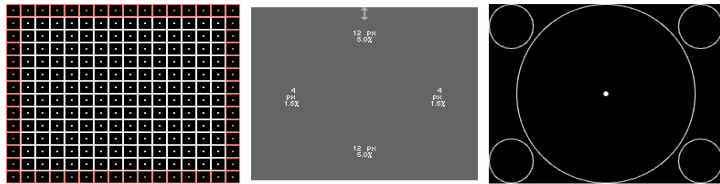


**Gray ramp:** Adjust color temperature and gamma

**Color bleed:** Diagnose color resampling problems

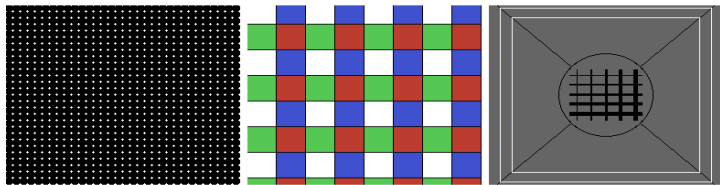
**Solid color:** Diagnose 60 Hz audio buzz and signal loss from black screen transition

## More tests



**Grid and Overscan:** Measure how much of each side a TV cuts off

**Linearity:** Measure consistency of shapes across the screen



**Convergence:** Align red, green, and blue components

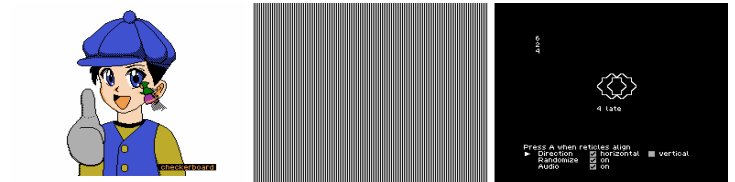
**Sharpness:** Adjust edge enhancement



**Chroma crosstalk:** Show an artifact of NTSC NES composite out

**CPU clock speed:** Adjust an overclock modification

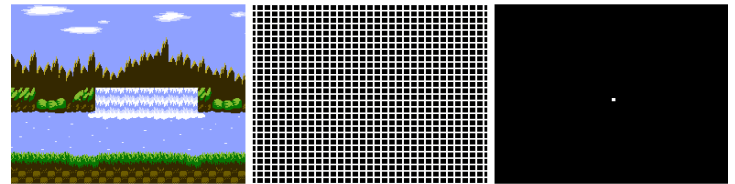
**Stopwatch:** Measure lag difference between TVs, detect dropped frames, or time a workout



**Shadow sprite:** Test flicker and stripe transparency that may confuse scalers

**Full screen stripes:** Measure consistent pixel width in a scaler

**Manual lag test:** Line up reticles to get a feel for a scaler's delay



**Scroll test:** Measure dropped frames, cadence detection, motion interpolation, and shape consistency

**Backlight zones:** Find dimming zones in an LED-lit LCD



**Sound test:** Play frequencies through each APU output pin

**Audio sync:** Animation to measure delay between audio and video

**Zapper test:** Measure whether the light gun sees the TV