

Animated Test Cards - TCANIM1v15 - Notes v1

Download the package from the BATC Wiki at: https://wiki.batc.tv/RPi_Test_Card

Background

When receiving a test card transmission with digital ATV, it is not always obvious if the picture has frozen due to lack of signal, or how frequently dropouts or glitches are occurring.

The frames of video in a digital transmission are sent as a Group Of Pictures (GOP), with the first frame of a GOP containing a complete picture and the subsequent frames containing only changes from the previous frame. GOP length can vary, but 15 frames is typical.

A digital transmission will send the complete test card as the first frame of a GOP and the other frames will be padded out. If a glitch in reception occurs in the padding data, then it is quite likely that no disturbance will be seen on screen. By putting some movement into a test card, it is more likely that a reception glitch will be noticed.

With its composite video output, the Raspberry Pi is an ideal test card generator, particularly if you can obtain an RPi Zero. The TCANIM program displays one or more JPEG images of your choice and floats balloons over them and also has a sliding text banner at the bottom of the screen.

The program has been tested on models B, B+, B2 and Zero.

The RPi should be set for standard PAL output on the composite port (720x576i). The HDMI output could also be used at this resolution for the highest quality, if you have an HDMI video capture device. The program works only at 720x576 resolution.

The configuration instructions below relate to composite output. Some knowledge of the NANO editor is required.

A JPEG file of 720x576 is slightly too big and 640x480 seems the best size. The program has parameters to adjust the position of the JPEG files on screen.

TCANIM was adapted from demo programs in a graphics package called openVG. It is not necessary to install the openVG package to run TCANIM.

There is a sample video of the program output using a single image at:

<http://tinyurl.com/tcanim-mpg>

It runs smoothly when viewed on a 50Hz TV system. Viewing on a PC, or in Dropbox, can sometimes make it slightly jerky.

Configuring the RPi

Edit the RPi configuration file: **sudo nano /boot/config.txt**

Locate the line: **sdtv_mode=2**
Remove any # character at the front (# disables a line).
This selects 720x576 PAL on the composite output.

Locate the line: **#hdmi_force_hotplug=1**
Make sure that it has a # at the front, otherwise composite output will be disabled.

Save the file.

Edit the display config file: **sudo nano /etc/kbd/config**

To disable the RPi screensaver, locate the following lines and edit them if they are different from below:

```
BLANK_TIME=0  
BLANK_DPMS=off  
POWERDOWN_TIME=0
```

Save the file.

Reboot.

Installing the Program

The files required on the RPi are:

tcanim1v15	the executable program
tcademo1v15.sh	a shell (.BAT) file to run the demo
imz-10.jpg	sample images
imz-20.jpg	
imz-30.jpg	
imz-40.jpg	

Make the files executable:

```
sudo chmod +x tcanim1v15 tcademo1v15.sh
```

Copy and modify the .sh file when using your own test card.

Starting the Demo

Type: `./tcademo1v15.sh`

The `.sh` file contains:

```
./tcanim1v15 "imz*10" 48 52 "73" "Some text."
```

Specifying `imz*10` as the filename displays all files start with `imz` and ending with `.jpg` in alphabetical order at 10 second intervals.

The filename should be enclosed in double quotes. It is not necessary to specify the `.jpg` extension.

For a single file, use the filename without `*` or time.

48 and 52 are the X and Y offsets from the bottom left of the screen, that are applied to the position of the JPEG file. The offsets can be negative.

"73" is the text that will appear on the balloons. The limit is 5 characters. Use `" "` if no balloon text is required. Use `""` if balloons are not required.

"Some text." is the banner text. The limit is 65000 characters. Use `""` for the banner text if a banner is not required.

To put double quotes into the banner text, use `\`

When started, the program shows the first file for 5 seconds and then changes the file as specified and also starts the balloons and banner if selected.

The sequence continues indefinitely without restarting from the beginning.

Hit CTRL-C to stop the program.

Bug Fixed

Version 1v04 could exit with a graphics error after a few hours of operation.

Producing Your Own Test Card

The Windows program PAINTE is very useful for putting callsigns onto a test card image.

Save the image as a .BMP file while working on it, as this will avoid any loss in quality by repeated compression. Save the image as a .jpg file when it is ready to be used.

PAINTE can also crop or change the size of images, although there may be a loss of quality with the latter.

Auto Starting the Test Card

Edit the file that runs commands at start up: **sudo nano /etc/rc.local**

At the bottom of the file, there will be a line: **exit 0**

Just before this line, insert the lines: **cd /home/pi**
./tcademo1v15.sh &

The & at the end is very important. It allows the RPi to carry on past the line.

Adjust the **cd** command for wherever the files have been installed.

Stopping the Auto-started Test Card:

Once the test card is running, it takes over the screen. To stop it, there are two options:

1. Log in via **ssh** and type: **sudo killall tcanim***
2. Log in blind using a keyboard and then type the line above.

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