

## Animated Test Cards – Brian Jordan – G4EWJ

### 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 uses a JPEG image of your choice and floats balloons over it and also has an optional sliding text banner at the bottom of the screen.

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 only works 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 file on screen.

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

There is a sample video 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.

Thanks to G4KLB and G8GKQ for helping with the testing.

## 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).

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 and reboot.

## Installing the Program

The files required on the RPi are:

<b>tcanim1v04</b>	the executable program
<b>tcademo1v04.sh</b>	a shell (.BAT) file to run the demo
<b>testcard640.jpg</b>	a sample test card

Make the files executable:

**sudo chmod +x tcanim1v04 tcademo1v04.sh**

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

## Starting the Demo

Type: **`./tcademo1v04.sh`**

The **`.sh`** file contains:

**`./tcanim1v04 testcard640.jpg 40 52 "CQ" "This text will appear on the sliding banner."`**

`testcard640.jpg` is the test card image.

40 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.

"CQ" is the text that will appear on the balloons. The limit is 4 characters. Use "" if no balloon text is required.

"This text will appear on the sliding banner." is the banner text. The limit is 1000 characters. Use "" for the banner text if a banner is not required.

When started, the program shows the test card alone for a few seconds, then fires a salvo of large balloons and then settles down to firing smaller balloons and showing the text banner.

This sequence repeats after 5 minutes. Hit CTRL-C to stop the program.

## Producing Your Own Test Card

The Windows program PAINT 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.

## 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**  
**./tcademo1v04.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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