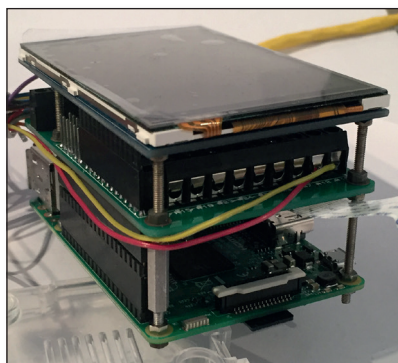# The Portsdown
Digital Amateur Television Project

The Portsdown DATV project provides an easy way to "get on air" with Digital ATV at relatively low cost. The Portsdown system enables amateur radio operators with little or no knowledge of Digital ATV to construct the hardware elements, load and configure the software and use the system to send live Digital ATV signals across town on their existing aerials. It includes the new Reduced Bandwidth modes and the ability to receive and transmit to local repeaters using the more traditional 2 and 4 Msymbol DATV modes.

- ▶ Symbol rates to include the Reduced Bandwidth (RB-TV) modes and "normal" DATV modes

- ▶ Frequency coverage of 146 MHz, 437 MHz and 1.2 GHz bands

- ▶ Cost-effective stand-alone (not PC based) Digital TV Transmit solution

- ▶ Analogue video input to allow use of camcorders and mixing desks

- ▶ Use of commonly available components and modules

- ▶ Modular construction enabling a step-by-step system build and easy trouble-shooting

- ▶ Designed to encourage home construction

- ▶ Fully documented and supported including easy software installation and upgrades

- ▶ Flexible receive solution based around readily available software and hardware

At the heart of the Portsdown transmitter is a Raspberry Pi 3 (RPi) computer running a BATC customised version of the F5OEO rpidatv software. The RPi 3 was chosen because it is relatively low cost, has an on-board MPEG-4 (H264) encoder and versatile hardware interface (GPIO) capabilities. The system is controlled using a simple touch screen interface; no keyboard, mouse or monitor are required. If the touch screen is not available, the system can be controlled using an external PC connected over a wired or wi-fi network.

The Portsdown filter modulator board is available as a ready built unit or a blank PCB from the BATC shop. The Portsdown RPi software is capable of controlling an external ADF4351 synthesizer module to give outputs on 146 MHz, 437MHz and 1.2 GHz amateur bands.

Just like any other DATV transmitter, the Portsdown has a relatively low output power (10 milliwatts maximum) and will need bandpass filters and drivers / amplifiers on the output - there's lot of designs around for sale or easy home construction and more details can be found on the BATC wiki.
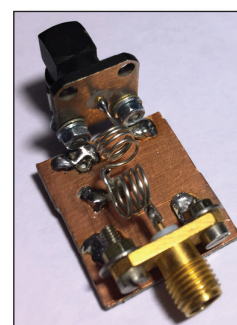
The Portsdown receiver is based around the Tutioune receive software from F6DZP and the BATC USB minituner hardware project. Components are available from the BATC shop, including the new tuner module from Serit which enables continuous coverage from 146 to 2650 MHz without the need for external receive converters.

The Portsdown project aims to condense many recent RB-TV and DATV initiatives into one, easy-to-build and get-on-air project. It brings DATV and RB-TV within the grasp of the average ATV operator who still values some basic hands-on construction and is looking for a project which will deliver the capability to operate on all the commonly used DATV and RB-TV modes at a reasonable cost.
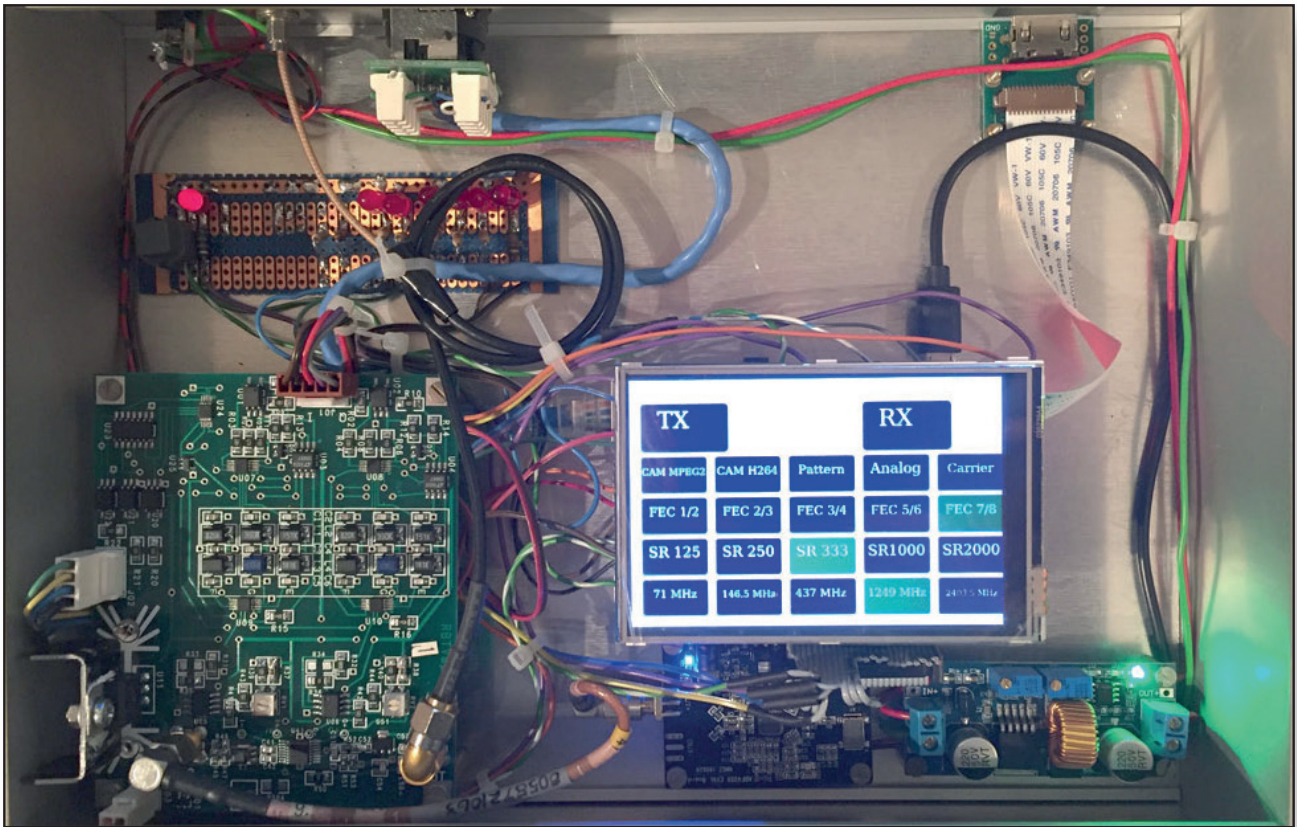
Portsdown ATV transmitter specification

Frequency coverage: 140 – 1325 MHz (operation outside this range maybe possible)

DATV Modes: DVB-S QPSK at 1/2, 2/3, 3/4, 5/6 and 7/8 FEC

Symbol rate: 125 Ks to 4 Msymbols

Typical RF output: +10dBm @ 146 and 437 MHz, +6dBm @ 1255 MHz

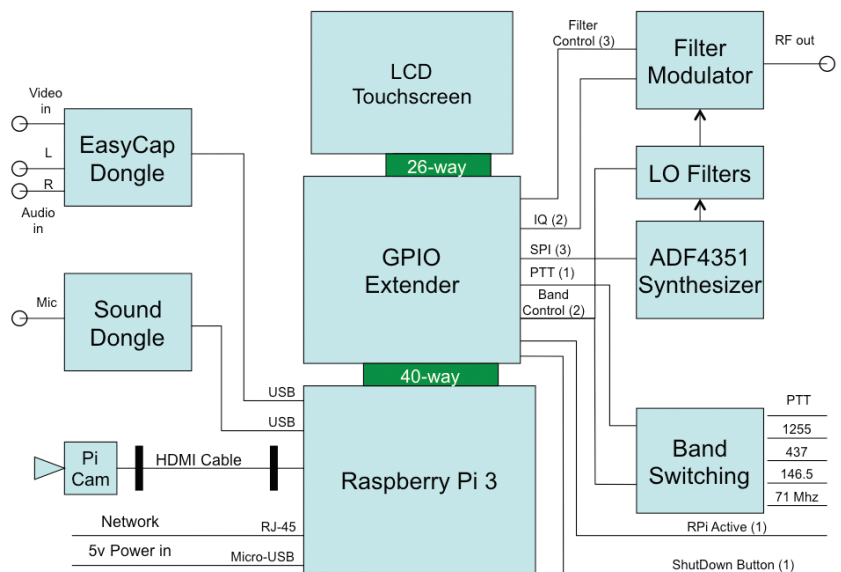**Typical MER (with LO filters):** 26 dB measured with Tutioune Version 5

Video input:

▶ Raspberry Pi camera

▶ Analogue input via EasyCap USB device

▶ Internal test sequence generator

Video Encoding: MPEG-2 and H264

Audio input: Via USB audio capture device

Control: LCD touchscreen or console menu via SSH

The Portsdown ATV Transmitter

G8GKQ 1 Feb 17

For more details go to the BATC wiki pages at
https://wiki.batc.tv/The_Portsdown_Transmitter

You can get support and discuss the project with the ATV community at the BATC forum
http://www.batc.org.uk/forum/viewforum.php?f=103