71MHz RB-DATV
Getting Started
on the new Band

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New 4m allocation

- 70.5-71.5MHz
- 100W ERP maximum power
- 20m maximum aerial height
- Annual NoV from RSGB for full licensees
- Maximum channel width 500kHz
- Not in Scotland or within 40km of Scottish border/coast

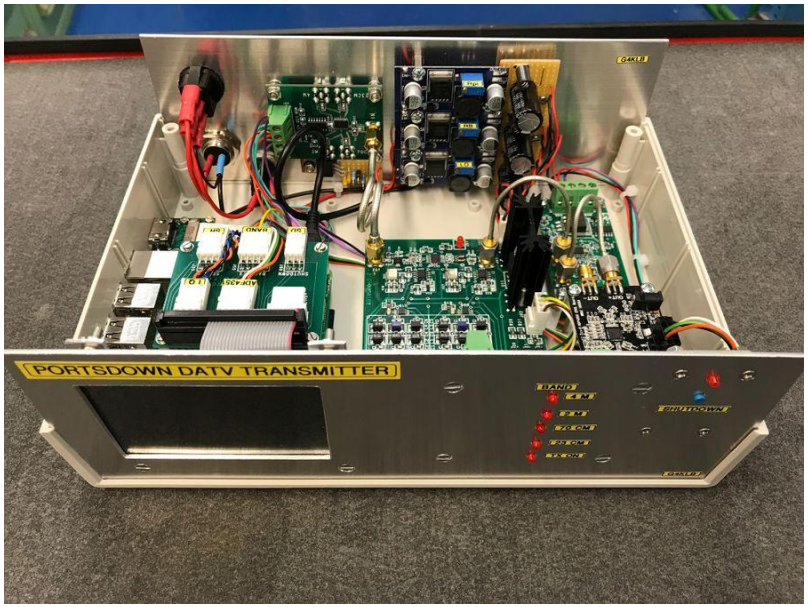
71MHz RB-DATV

- 71MHz centre frequency
- DVB-S or S2 modulation
- Codec MPEG2, H264 or H265
- Symbol rates 333, 250 & 125 ks/s
- FEC 7/8
- Sound usually disabled

Transmitters

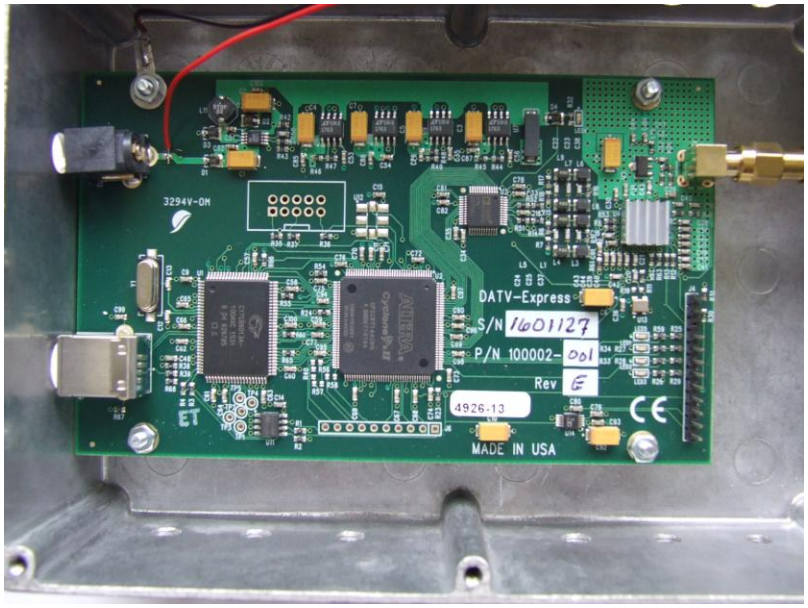
- Two options are available;
- BATC Portsdown; a current project subject to much development effort with new features frequently added.
- DATV Express; no longer produced but very good if you have one.
- Future options may include various SDR boards such as Lime-SDR, ADALM Pluto etc.

BATC Portsdown



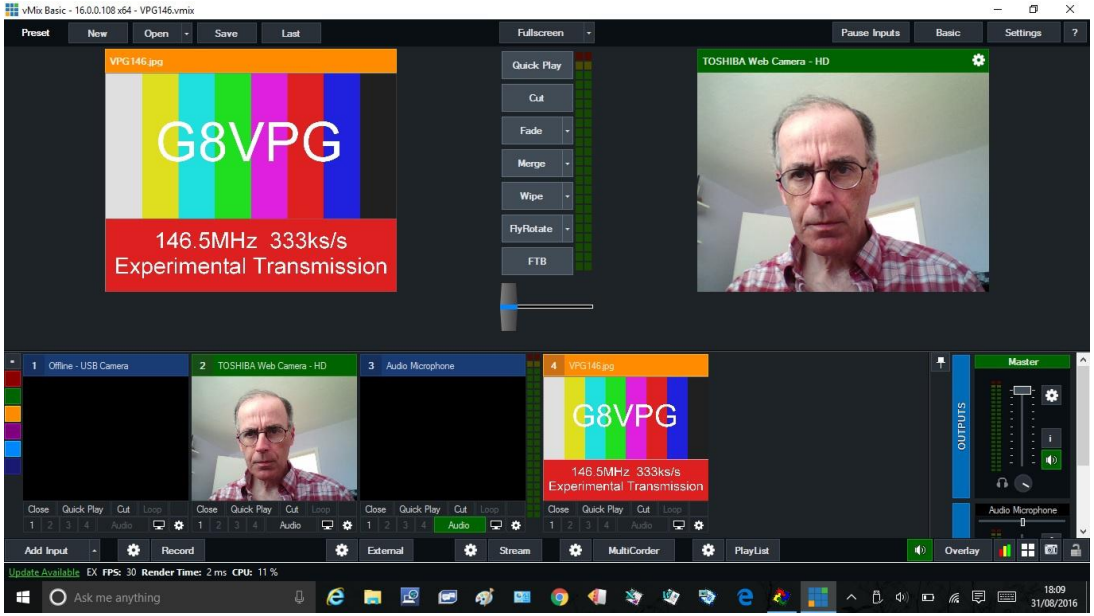
- All bands 4m to 13cm
- Symbol rates 125ks/s to 4ms/s
- MPEG2 & H264 codec’s. DVB-S only.
- BATC pcb’s & support available
- Low level output needs filtering & amplification

DATV Express



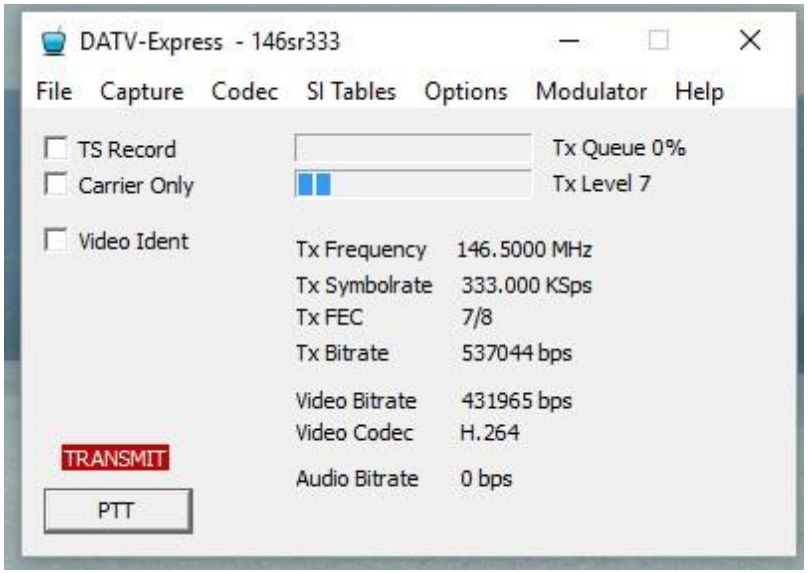
- A very flexible software defined transmitter
- All symbol rates
- All bands 70MHz to 2.45GHz from on board oscillator
- Windows control software or use BATC Portsdown

VMix



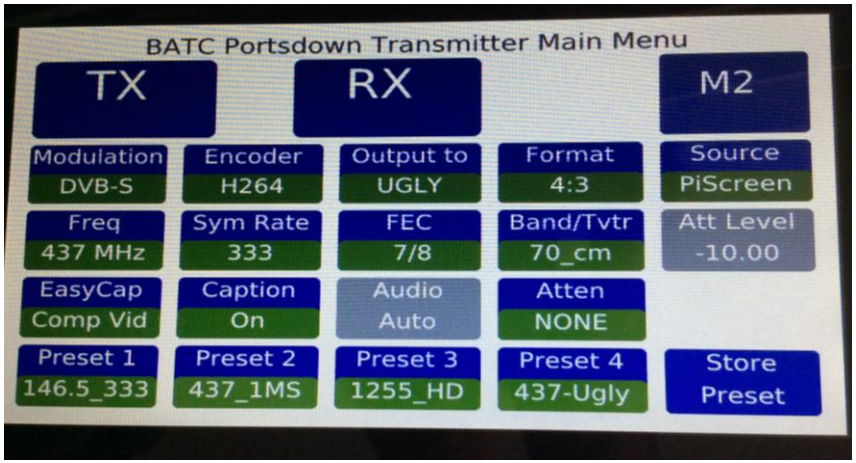
- Free version of Vmix just requires registration
- Simple way to mix camera's, JPEG pictures for test cards & audio
- Can be used to drive Portsdown or DATV Express

Express DVB-S Transmitter



- Capture video from VMix or direct from camera or capture card
- Simple to adjust all settings
- Can save settings files for quick changes

Portsdown Control of DATV Express

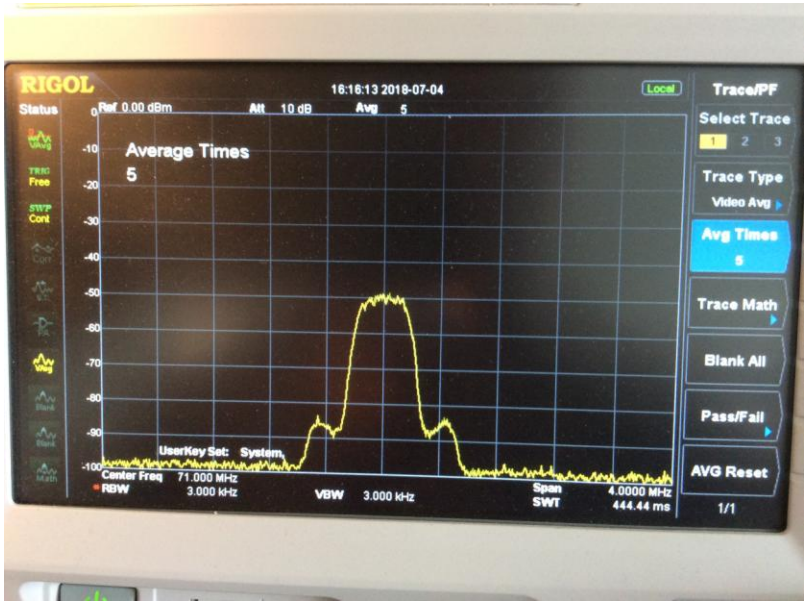


- Portsdown can control DATV Express - no need for another computer
- Composite input using EZcap, testcards, contest numbers etc.

Amplification & Filtering

- All digital transmitters have low level outputs, typically 1-10mW
- Require harmonic filtering
- Require very linear Class A amplification
- Amplifiers must be severely de-rated to maintain linearity

Test Equipment



- A Spectrum analyser is essential to check output waveform
- Otherwise follow settings & ratings established by others

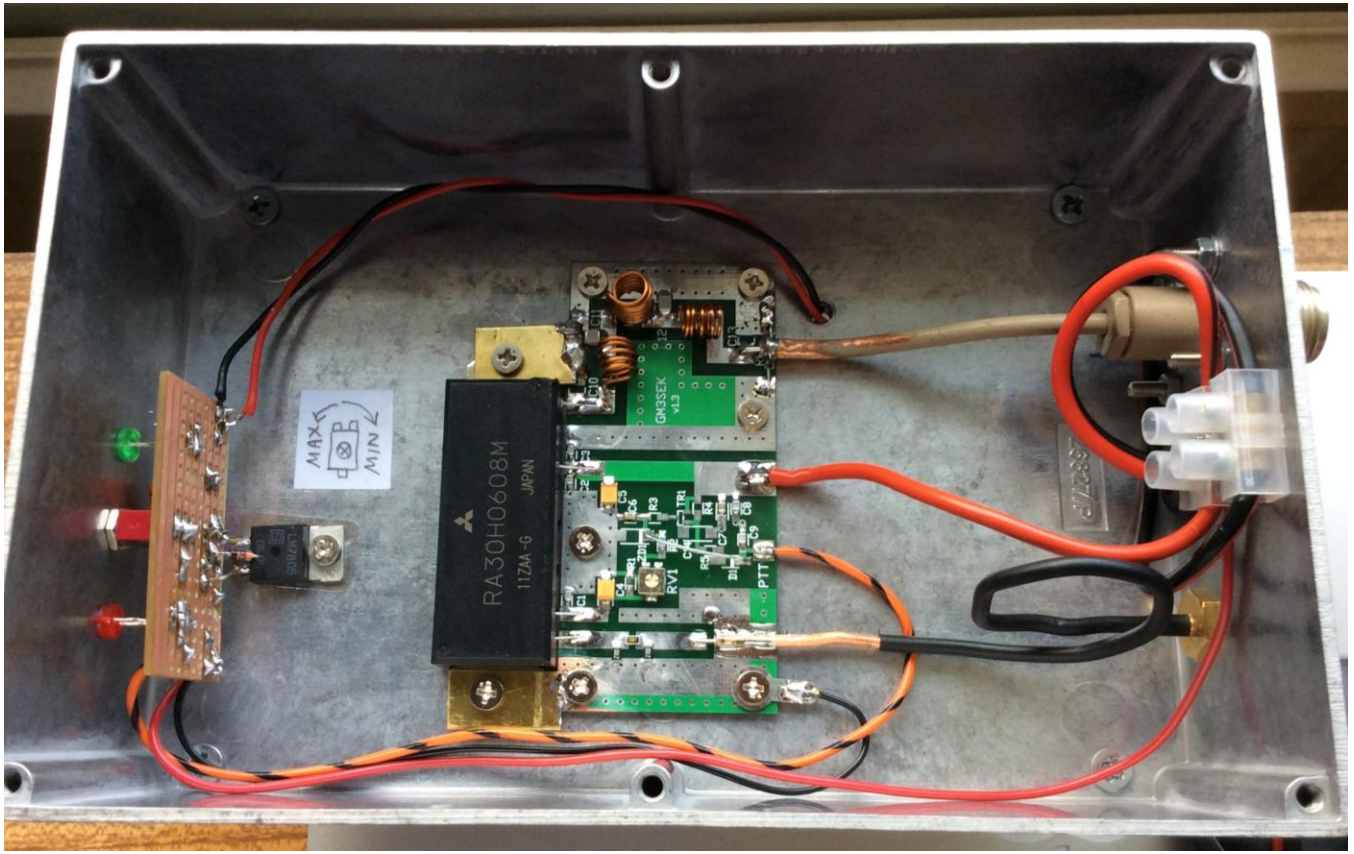
Mitsubishi RA30H0608M

- Module rated at 30W
- PCB available from G4DDK
- Module available from Anglia Live
- Low pass filter on output
- Will produce up to 20W DATV from DATV Express or Portsdown with shoulders about 35dB down
- 3-4A quiescent current for linear operation hence good heatsink required

Mitsubishi RA30H0608M

- Read technical paper by GM3SEK available on G4DDK's website
- Earthing of module fixing screws to PCB is very important for stable output
- Thermal heatsinking of module needs careful attention. Best if module base is flattened on belt sander and not over-tightened on heatsink

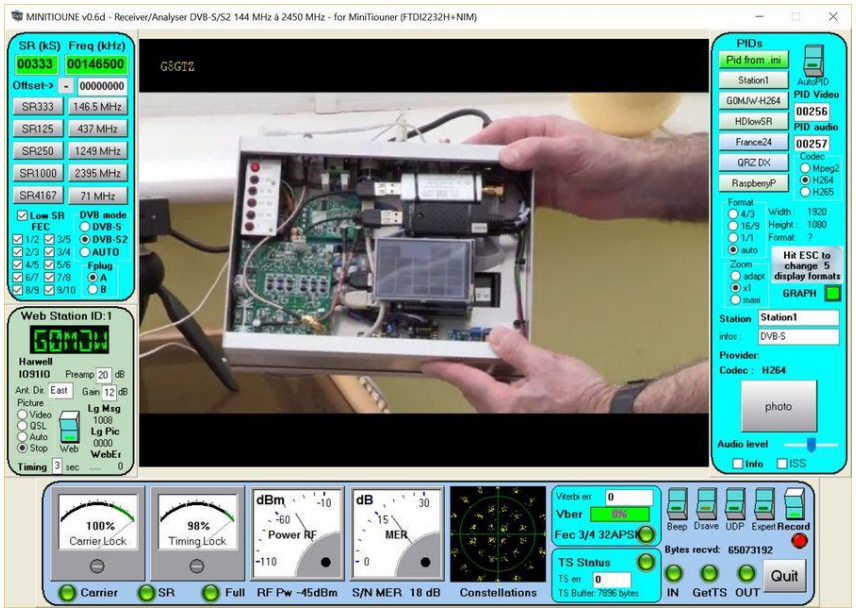
Mitsubishi RA30H0608M



RB-DATV Reception

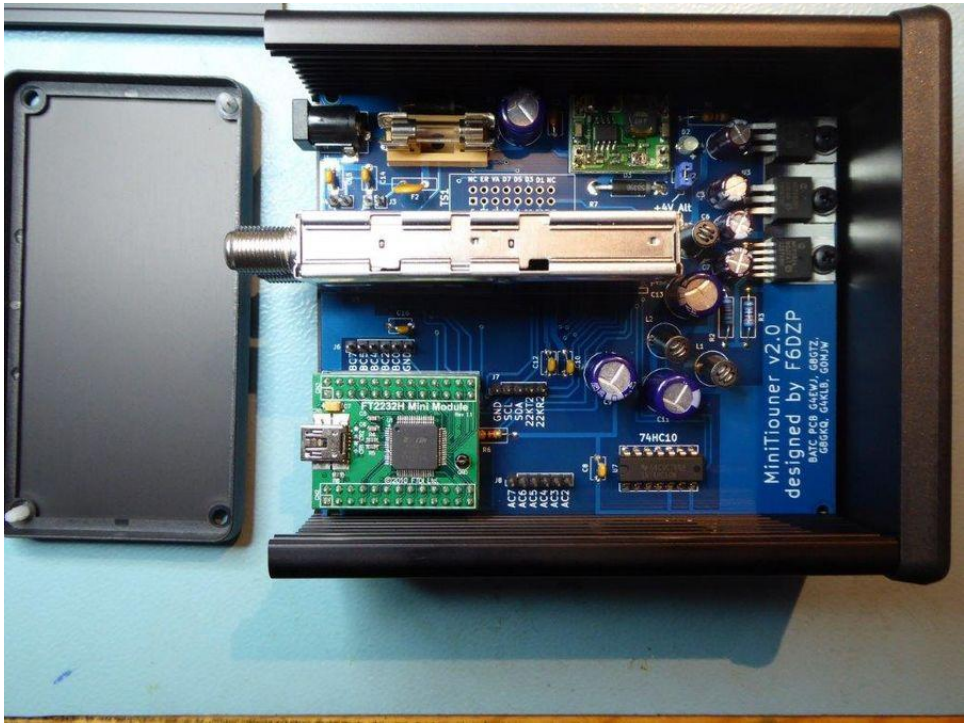
- Standard satellite receivers are unsuitable for RB-TV reception
- Receive to 2Ms/s, some 1Ms/s at best
- Another idea is needed for RB-DATV

Minitioune



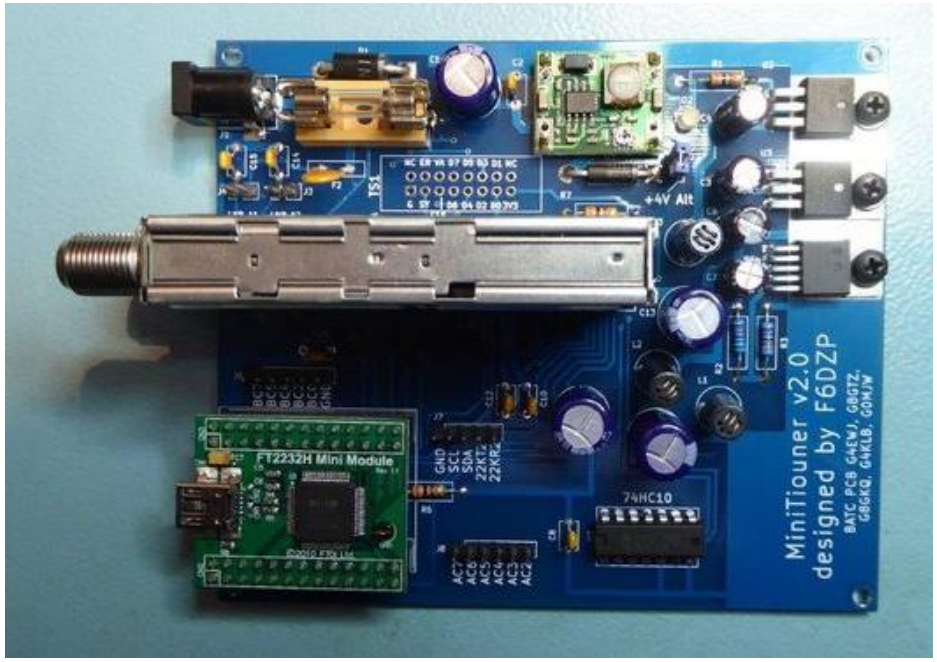
- A software based receiver is needed for RB-DATV
- Minitioune is used by most ATVers
- Can also use an RTL Dongle & Lean DVB with Portsdown

Minitiouner version 2



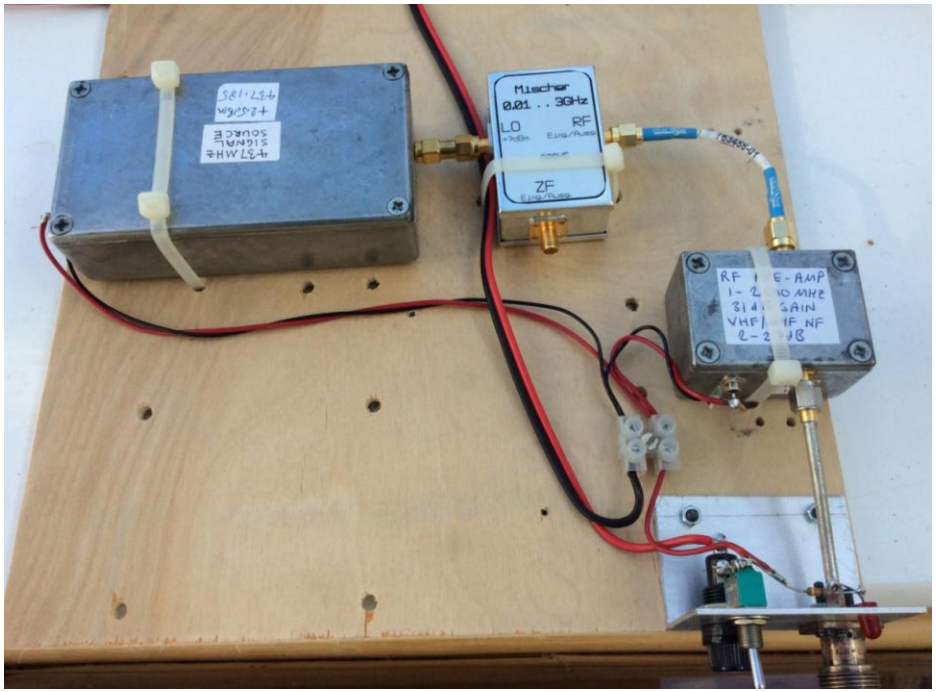
- DVB-S & S2
- Codecs MPEG2, H264 & H265
- Up to 32 APSK
- All symbol rates

BATC Minitiouner version 2



- BATC PCB available
- FTDI USB Module available from BATC
- BATC Serit tuner module tunes 143-2450MHz
- 1V regulator also available from BATC

71MHz upconverter

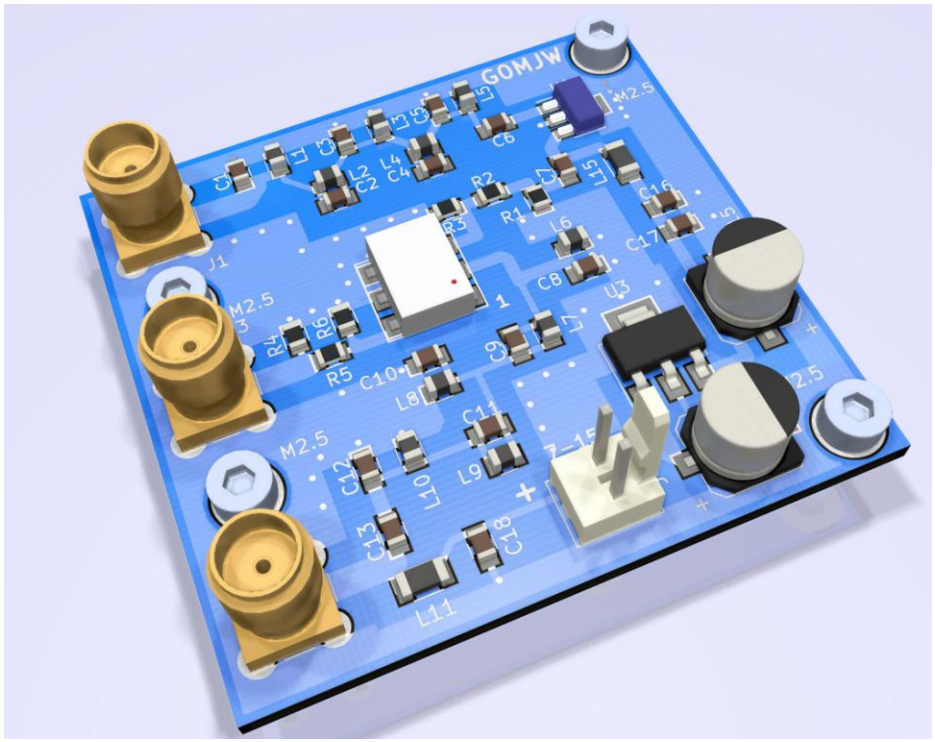


- Need to convert 71MHz up to Minitioune range
- Homebrew upconverter assembled from various parts
- Commercial items also available

71MHz up-converter

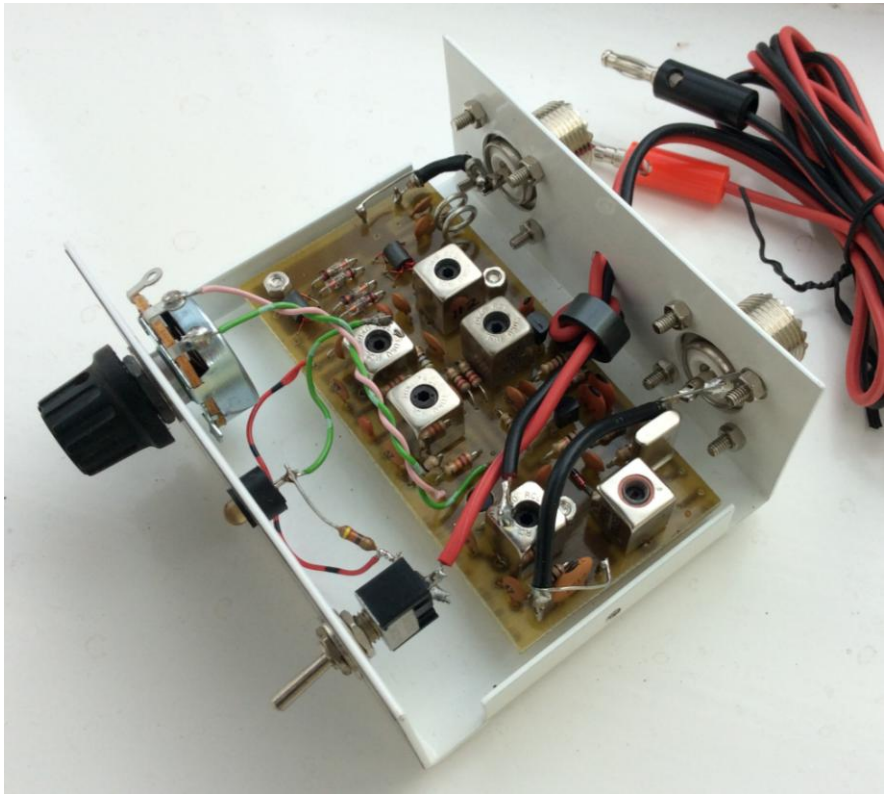
- Global up-converter mixes 71MHz up to 1071MHz
- Also works for 146.5MHz
- Needs pre-amp & filtering
- This one was £15 at a rally!

G0MJW/BATC up-converter



- Mixes 71MHz up to 437MHz
- Includes pre-amp & filtering
- Needs separate local oscillator - Portsdown
- PCB available

Spectrum up-converter

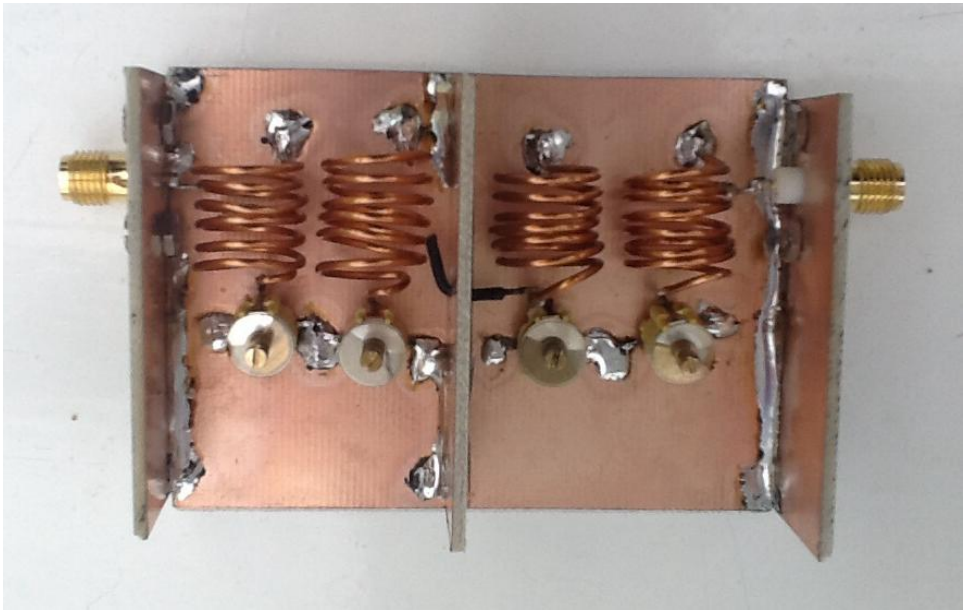


- Mixes 71MHz up to 146MHz
- Includes pre-amp
- Second harmonic of LO only 4MHz from output - needs output filtering using Pye Europa filter module

Bandpass Filter

- A good bandpass filter is important for reception
- Lots of strong signals eg; 88-108MHz FM
- These Pye low band filters are excellent if you can find them - 0.27dB insertion - 3.4MHz bandwidth at -1dB

Bandpass Filter



- You can also add capacitors to the filter used for 146.5MHz and use it for 71MHz
- Design in CQ-TV & RSGB VHF Manual

Aerials for 4m

- Aerials start to get bigger at longer wavelengths!

Aerials for 4m

- Innovantenna 3 element OWL
- Cut for 71MHz
- 0.83m boom
- 2.2m longest element
- 7.4dBi gain
- Lots of others available

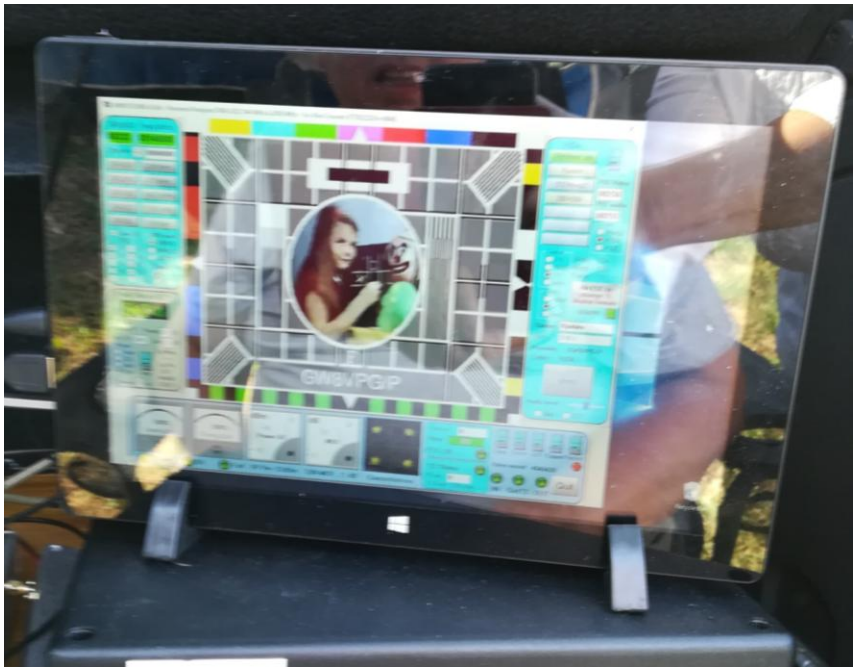
Results so far

- 4m is not the easy TV band that some people suggested a few months ago
- First tests were local across town in Luton between G0SKM, G4CPE & others
- My first portable tests were a failure

Current records

- Current records are line of sight paths from 515m high Blorenge mountain
- 87km one way to G8GTZ/P at Hack Pen
- 59km two way to G4BVK/P at Tog Hill
- MER’s in excess of 20dB were achieved

Current records



Latest attempts

- Latest attempts at non-line of sight paths over 100km have failed
- 109km Blorenge/Win Green that worked on 5.6GHz failed - WHY?
- Comparatively low aerial gain?
- Low aerial height relative to wavelength?
- A noisy band?
- What do you think?