10 GHz ATV – the forgotten band?

Noel Matthews

G8GTZ

10 GHz ATV?

- ATV on 10 GHz is not new and is easy
- Transmit
  - Modified Solfan heads on Tx
  - Bob Platts Gunmod
  - HB100
- Analogue Sat rx / Comtech
  - Bob Platts LNBs (9 GHz LO)
  - Blue cap LNBs on rx and Tx
- Penny feed or satellite dishes
  - 30 dB+ gain

10 GHz ATV Dx

- And it goes really well
- 60Km+ over Line of sight paths
- Lots of activity 20 years ago
  - CQ-TV 172
  - GI to GW (BATC Youtube)
- Plus super ducting over sea paths

The North Sea spanned on 3CMs.

By Bob Platts G8OZP

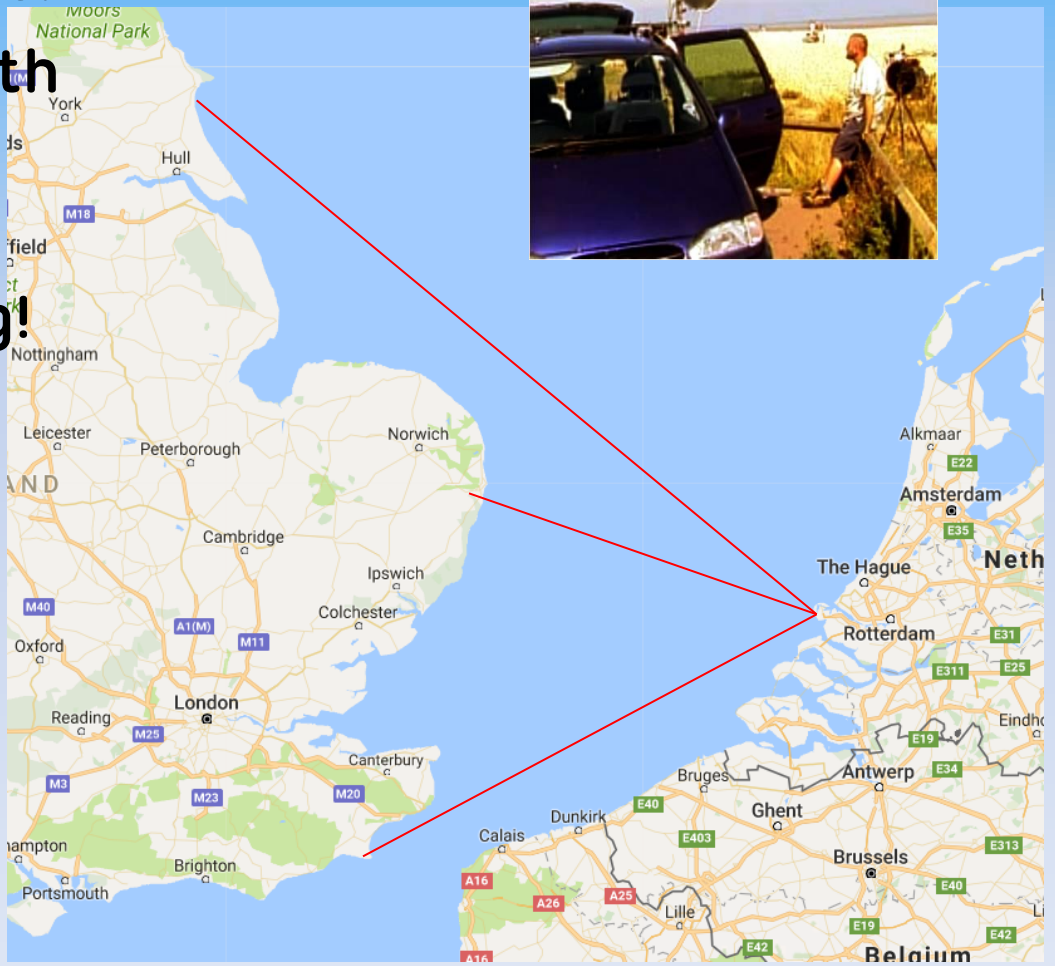
Many years of experimentation and operation culminated in a highly successful weekend of the 19th and 20th of A ugust this year with a superb 3cms contact with Hans PE1ECO.

It all started back in 1987 with my first GASFET. 3cms RX, which together with a 10mW Gunn diode transmitter proved that despite some of the views of pundits and some 'experts' wide band ATV communication using low power (10mW) was possible over paths of greater than about 50 miles. A none line of sight contact over a path length of 74Km by the means of scatter from the top of an intervening hill encouraged me to peruse experimentation of 3cms ATV further.

Before to long, a distance of 142Km, line of sight was achieved from near Gloucester, down the Bristol Channel to Exmoor. The weather was typical summer sunny periods with showers. Some of the showers were very heavy and strong QSB was noted on the path. This was put down to the heavy rain cells. Then a path of 274Km from the top of Beachy Head to Start point in Devon was attempted. This path had recently been worked on SSB with only a few milli watts, so an attempt was considered worth while. Despite the excellent fine weather the attempt proved unsuccessful with only very weak syncs being seen. If nothing else it proved what was already known by the 'experts', that is that wide band width signals (ATV) require far higher ERPs and highly sensitive RX's to achieve long distance communications, then only over LOS. paths. (Satellites bear this out).

10GHz Dx

- All paths are at sea level
- Warm summer days with inversion
  - Cold sea / warm air
- Ships block the ducting!
- G8OZP
  - Suffolk
  - Yorks
- G8GTZ
  - Dungeness to Rotterdam
  - 250Km



10GHz FM – 250Kms

15 years later...

- Then along came digital
  - 23cms, 70cms
  - 146MHz and R
- And Narrow b
  - With IFs at.....

The SAME Frequencies as we transmit DATV!

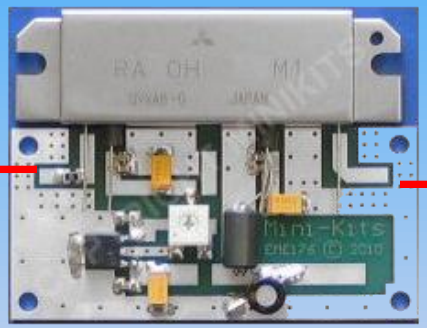
Microwave DATV

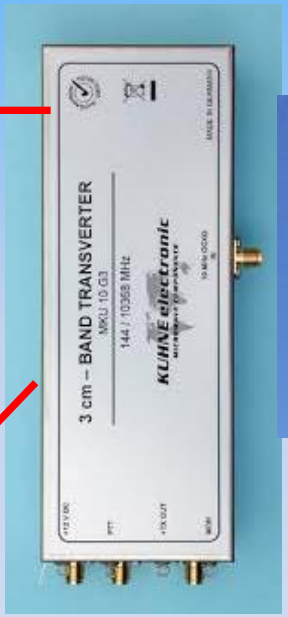
- Need linear transverter for DATV
  - FM ATV can be multiplied up
- Most microwave transverters use 144 or 432 as an IF
  - 2.3, 3.4, 5.6, 10GHz, 24 GHz
- DATV systems cover 144 and 432MHz
- So what happens if we drive the transverter with DATV?
  - It works!
  - Just a few system issues

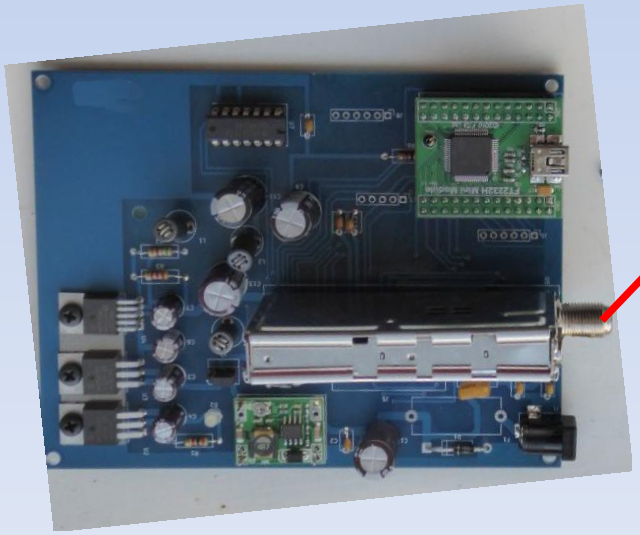
Microwave DATV

- Transmit
  - Most transverters need 1 watt drive
  - Need to back off drive by 6 dB
  - Shoulders are not SO critical
- Receive
  - Using transverter makes dish feed easy
  - Frequency problem solved by using Serit
  - Will tune directly to the IF @144 or 432MHz
  - May need more gain on Serit input
- Dual mode
  - Narrow band is useful for alignment
- Switching
  - It gets complicated!
  - Volts on tx vs volts on Rx!!

10GHz DATV system





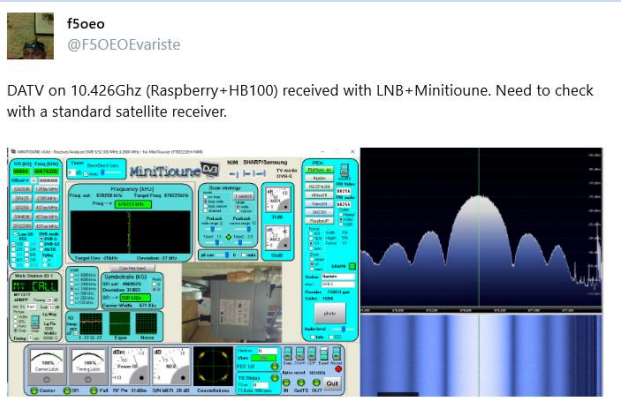


Results

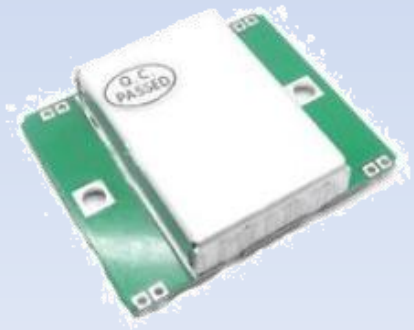
- First test VHF NFD 2016
  - 92KM
- RB-TV and DATV
  - Best DX is 138KM
  - 2Ms with 23dB MER!
- Lot of margin in hand
  - 200+Km should be easy!

Other solutions

- Low cost transverters
  - W1GHZ
- HB100 sensor module
  - <£5 from ebay
  - Can be used for FM
  - F5OEO DATV!

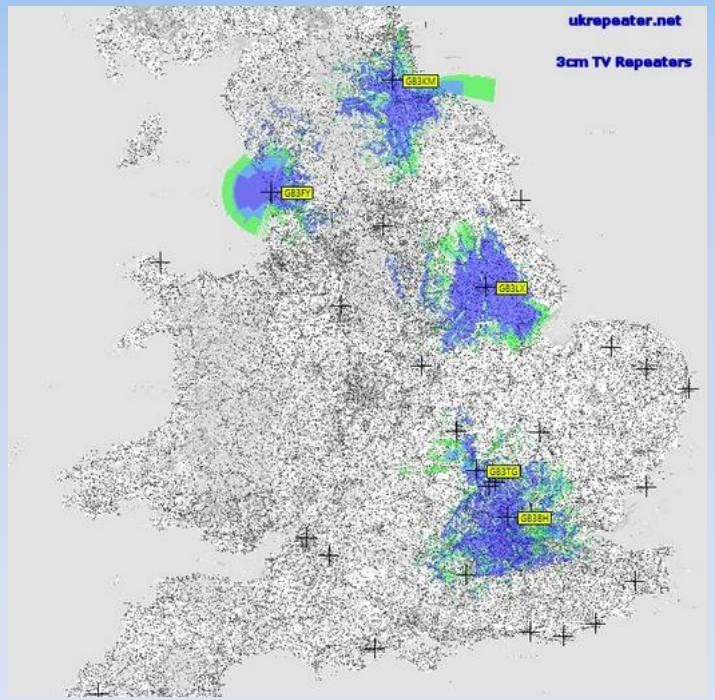


- Stand alone Rx is very easy
  - Octagon PLL LNB in to Serit
- Dishes and feeds
  - Loads of published designs
  - Sky mini dishes work really well (30dB+)



FM is not dead!

- There are a number of 10GHz ATV repeaters
  - GB3VL
  - GB3FY (often seen in IoM)
  - GB3BH
  - GB3AT
  - GB3TG
  - GB3XY
  - GB3KM input
- GB3AT just got an NoV!



10GHz – give it a go

- A bit of a forgotten band
- FM is easy
- DATV costs a bit more but great to experiment
  - Pluto plus ADF 4351 as a transmitter?