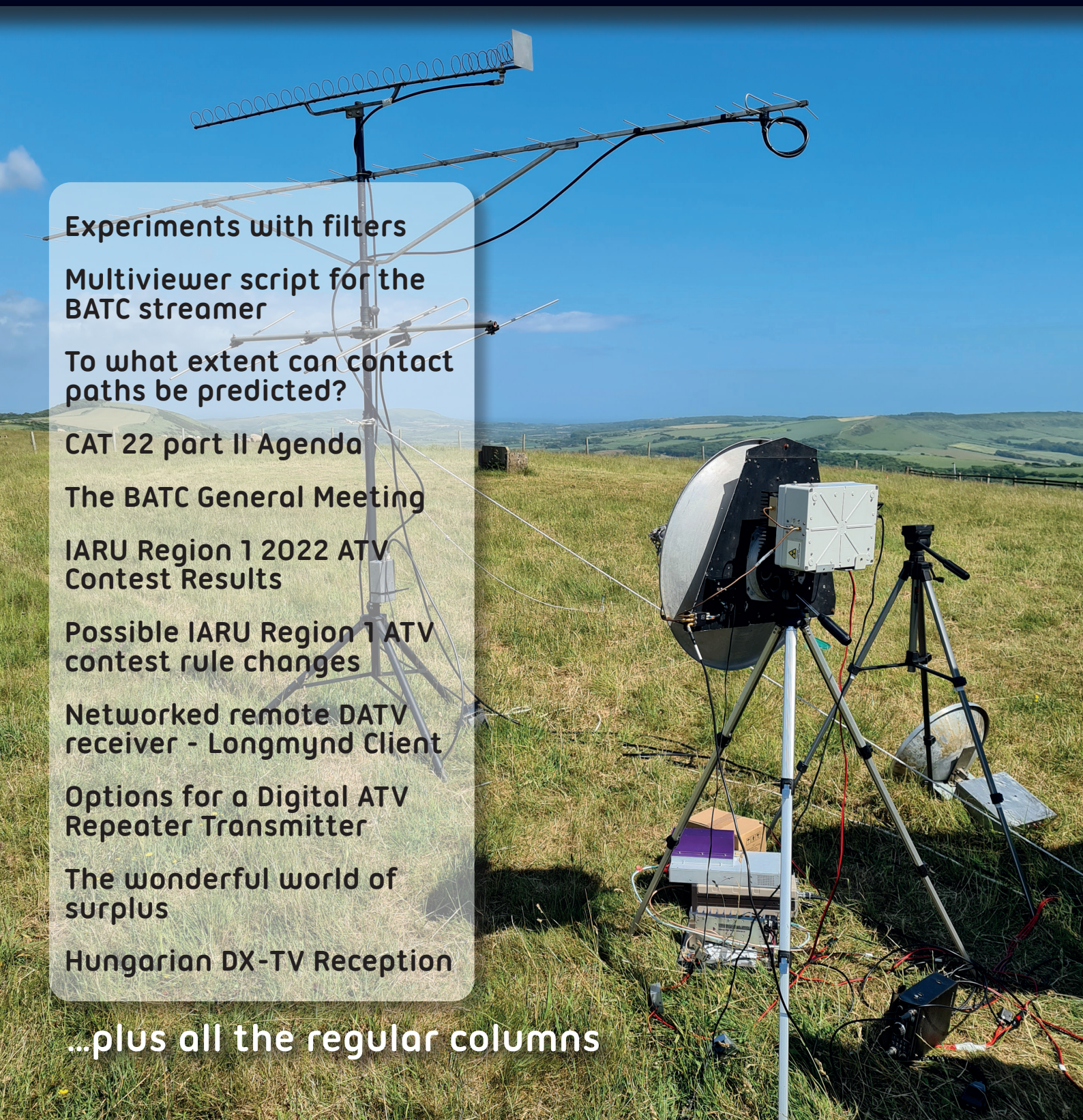
The British Amateur Television Club

CQ-TV

No. 277 – Autumn 2022



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CQ-TV 277

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Contributions

Contributions for publication or for constructive comment are welcome. The preferred method of communication is by email; all relevant committee email addresses are published in CQ-TV.

Alternatively you can write to us at:
BATC Secretary, 12 Petrel Croft, Kempshott, Basingstoke, Hampshire, RG22 5JY, UK

Contributing authors should note that we aim to publish CQ-TV quarterly in March, June, September and December.

The deadlines for each issue are:
Spring - Please submit by February 28th
Summer - Please submit by May 31st
Autumn - Please submit by August 31st
Winter - Please submit by November 30th

Please submit your contribution as soon as you can before the deadline date. Do not wait for the deadline if you have something to publish as it is easier to prepare page layouts where we have contributions in advance.

Contributions can be in almost any file format - except Microsoft Publisher! MS Word is preferred. Pictures should be submitted in high quality as separate files. Pictures embedded in a file are difficult to extract for publication however if you do wish to demonstrate your completed layout, a sample of your finalised work should be submitted at the same time.

Please note the implications of submitting an article detailed in the 'Legal Niceties'

BATC

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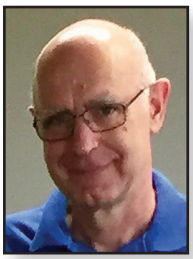


From the Chairmen...

Dave Crump G8GKQ & Martin Charman G4FKK

It seems the four years since I was elected as chairman has passed in a flash.

Looking back, it's not hard to see why, with the QO-100 transponder coming online and enabling more experimentation in digital ATV than we have seen in the previous 20 years. Add to that moving house, riding out the Covid pandemic, running ATV conventions and driving Portsdown development and I might be able to claim to have been busy.

But a lot of the BATC activity has been a great team effort. I'd particularly like to thank Noel G8GTZ (secretary), Brian G8GQS (treasurer) and the rest of the committee for their incredible support. I won't be stepping away from the BATC; my number one task now is to take over the treasurer role from Brian. Big shoes to fill.

Brian has been our Treasurer since 1984, having joined the Committee 10 years earlier. I was pleased that we were able to recognise his service to the BATC with the presentation of the Grant Dixon Award at CAT 22. It is very well deserved and I am pleased that Brian will remain on the committee to advise us in the years ahead.

My last task is to thank Martin G4FKK for agreeing to join the committee and lead us for the next few years as chairman. I hope that he enjoys the role as much as I have.

Thanks to all the members for your support.

Dave, G8GKQ

Well, what an honour to find myself not only voted onto the committee, but also chairman of the illustrious BATC during CAT22. I'm very grateful to all the members who attended CAT and to the committee for their kind words and warm welcome to the fold. I'd especially like to thank our outgoing chairman for all the great work he has done and continues to do for the development of amateur television in general and the BATC in particular. These will be large shoes to fill indeed.

A brief bit of background. I took and passed the RAE and Post Office morse test in 1976, when I should have been concentrating on my first year of A-levels and was issued with my G4FKK callsign in September of that year. I started off on 160m using AM and CW and, after a couple of years, managed to get onto 70cm using 10 Watts of black and white AM television.

The ATV was curtailed when I started work at Marconi Specialised Components where I ended up as a development engineer in their VHF/UHF oscillator division. I then moved to the BBC's Research Department as a laboratory engineer in the Service Planning Section.

Apart from a 13-year stint as chief engineer at JazzFM and a few years working for a satellite broadcasting company in Madrid, I've spent a large part of my life working for the BBC in various, mainly broadcast radio studio-based, roles at the BBC.

▶ *Brian G8GQS presented with the Grant Dixon Award*

I've always been active on amateur radio and am a very keen home-brewer but only got back into amateur television relatively recently with the advent of QO100 and the indispensable Portsdown DATV transmitter/receiver/test-laboratory.

The BATC is packed with information, expertise and helpful advice via the wiki, forum and direct contact so don't let the breakneck speed of technological development dissuade you from "giving it a go"; there's always someone to help and/or advice.

Martin, G4FKK

The Listing

new and renewing members

Rob Burn G8NXG

Well, another quarter of a year has whizzed by and thankfully we were able to successfully host Part One of CAT22 this summer. As advised elsewhere in CQ-TV, Part Two is scheduled to be held during October and promises to be another interesting day of talks and demonstrations.

I am pleased to report that in terms of membership subscriptions the BATC continues to have the support of around 1400 members; thank you to everyone who continues to support the club and help to maintain that figure!

The BATC also continues to attract new members from all over the world, something that is great to note and a situation which certainty helps to enhance the appeal of ATV. In fact, membership is open to anyone, anywhere who has an interest in amateur TV. Although perhaps a niche interest in the general amateur radio world, these days the term 'Amateur TV' is quite broad and suggests an interest in anything related to ATV, from creating a video to stream, restoring vintage TV equipment, SSTV, to DATV transmission, repeaters and so forth. The list goes on and there is certainly something within the ATV hobby which satisfies all kinds of associated interests.

The member listing itself contains the usual information about members who have joined or renewed membership and this time the period is from 1 June to 31 August. Any mistakes are usually mine (!) and it is always worthwhile writing to me should you have a query and so provide the opportunity to correct any errors.

That's it for now – hoping that the member list remains a useful resource for you.

Australia		
Denis Pittaway	VK3YLH	Belgrave Heights
Bob Reid	VK3BVR	Box Hill North
Tony Falla	VK3KKP	Castlemaine
Alfred Edwards	VK2YAC	Colyton
Neil Muscat	VK3BCU	Delahey
Keith Bainbridge	VK6KB	Eden Hill
Richard Searles	VK3VRS	Fountain Gate
Hilary Bridel	VK2AZ	Glenmore Park
Robert Williams	VK3IE	St Albans
Simon Judge	VK3ZSJ	Tooradin
Austria		
Peter Stiassny	OE1PYW	Pressbaum
Paul Clay	OE8PCK	Viktring
Hans Alberer	OE1HAW	Wien
Hans Schmid	OE1SSB	Wien
Belgium		
Corne Van der Kloot	ON7MOR	Kalmthout
Germain Schepens	ON4SG	Koksijde
Ioic Dremaux	ON5LDX	Mons
Rudy Pycke	ON6PY	Oudenaarde
Lucien Brouckaert	ON7TU	Pittem
Guido Depraetere	ON1AFB	Sint-Denijs
Luc van Achte	ON4AOL	Stekene
Denmark		
Peter Bystrup Jensen	OZ1PBJ	Aalestrup

Estonia		
Eiko Priidel	ES1EPR	Tallinn
France		
Xavier Debert	F4IYT	Antibes
Philippe Cappelle	F5AOD	Chatillon-le-Duc
Bricout Dany	F5IDK	Recquignies
Saitner Gerard	F5GQ	Roquevaire
Didier Petry	F4IXV	Schoeneck
Jean Philippe Paulino	F1TMY	Varilhes
Germany		
Hans Haller	DD5KP	Berlin
Reinhard Burtschick		Berlin
Rainer Floesser	DL5NBZ	Nuremberg
Guenther Krauss	DC9VD	Saarbrücken
Ireland		
Michael Goss	EI2JM	Arklow
Paddy Ronaghan	EI6CV	Cavan
John Good		Dublin
Ronnie McGrane (ITAC)	EI9ED	Kells
Italy		
Roberto De Dona	IU3ISP	Sospirolo (BL)
Alessandro Mattiuzzi	IZ3CTS	Vittorio Veneto
Japan		
Masahumi Negishi	JR1AVO	Sano
Katsumi Morita	JA3RVS	Wakayama

Netherlands		
Joop van Schaik	PE1BIA	Bergen Op Zoom
Erik Straus	PA3EGX	Bilthoven
Alle de Jong	PE0AJF	Den Hoorn
Arnold Vogelaar	PE1AMH	Haarlem
Bert Harms	PA3AOD	Hooghalen
Peter Bakker	PA0CDY	Noordwijkerhout
Terence Theijn	PD3T	Pijnacker
F.C. Trevor Gale	PA2TG	Rijnsburg
Jaap Zondervan	PA0OLD	Sint Annaparochie
Poll van der Wouw	PA3BYV	Vlagtwedde
John Nieuwerth	PE1LON	Wilhelminaoord
New Zealand		
Keith McRoberts	ZL2TKM	Nelson
Norway		
Hans-Petter Falao	LA9UI	Tromsø
Portugal		
Jacinto Rebelo	CU2ED	Sao Miguel – Acores
Spain		
Antonio Navarro	EA3CNO	Barcelona
Juan Piqueras	EA3TA	Sabadell
Sweden		
Jörgen Overgaard	SM4WWG	Fjugesta
Rudolf Erik Gaspar	SA0BDC	Södertälje
Ulf Jordan	SM0WSA	Upplands Vasby
UK		
Pawel Markiewicz	M7TSA	Abram, Wigan
Graham Felton	GW0FEM	Amlwch
David Shaw	M5TXJ	Appleby-in-Westmorland
Ralph Moyle	G0UWB	Banbury
John Manley	M1CNJ	Banbury
Roland Rodgerson	G0OUC	Barnsley
David Cromie	GIOWCE	Belfast
Raymond Bowring	GI8RKC	Belfast
Michael Senior	G4EFO	Billingshurst
Graham Perry	G0GEP	Birmingham
Chris Simpson	G7LCW	Boston
Alan Mcdowell	G0KOO	Boston
Geoffrey Towler	G4NGS	Brentwood.
Viv Green	G1IXE	Bristol
Andy Rennison	G8LIR	Bury
Charlie Morrison	GI4FUE	Carrickfergus
James Colwill	G0DQH	Chandlers Ford
Peter Townrow	G6LTB	Cheltenham
John Houldridge	G6KYD	Chessington
Robert Kerby	G0CHK	Chichester
Roger Killick	G8KWR	Congleton
James Welsh	G4YLB	Darwen
Steve Cooper	G3YTI	Darwen
Kenneth Aspden	G8WZW	Darwen
Andrew Hood	GM7GDE	East Kilbride
Kevin Wheatley	M0KHZ	Egremont
John Bailey	M0MTW	Ely
Dacre Munro	G1INH	Enniskillen
Neil Whiting	G4BRK	Garford, Abingdon
Steve Barrett	G4HTZ	Great Wakering
David Pykett	G0IIQ	Grimsby
Simon Kennedy	G0FCU	Guildford
Graham Smith	G4NMD	Guildford
David Austen	G1EHF	Hampshire
Michael Scott	G3LYP	High Wycombe
Stephen Craig	GI8WHP	Larne
David Crye	G6BSK	Leamington Spa
Mike Harriman	G4SJX	Leicester
Steve Greaves	2E0XAY	Leicester Forest East
Dave Davy	G6EWP	Lincoln
James Alexander	MW1BAJ	Llanelli
Joan Easdown	2E0HIZ	Maidstone
Elizabeth Thompson		Malvern
Paul Entwistle	G8AFC	Manchester
Dennis Anderson	G6YBC	Manchester
Trevor McKee	MI0TBV	Mossley
Paul Nickalls	G8AQA	Much Wenlock
Nigel Walker	G8AYC	Newbury
Peter Grannell	G4TQB	Newcastle-under-Lyme.
Paul Bowen	M0PNN	Newport
John Tomkiss	M0JGQ	Northampton
Robin Carter	G4NDM	Nottingham
Gwil Jones	GW6PVK	Nr Wrexham
Andy Brooker	G4WGZ	Orpington
Christopher James	G1JXS	Oxford
Ron Harrison	G8DVR	Partington
Anthony Stone	G3UIS	Poulton-Le-Fylde
Phil Hayes	M0PIT	Roade
Geoff Boyce	M1AHN	Ross-on-Wye
Will Brennan	M0GVB	Rustington
Andrew Amos	M0VVA	Saffron Walden
Steve Porter	G4NHP	Sidcup
John Mccarthy	G7JTT	Southampton

Mark Johnson	G4ZRT	Southampton
Mark Longson	G0NMY	Stoke On Trent.
Alan Mayhew	G8TQK	Sutton
Derek Linford	G1INC	Sutton Coldfield
Dennis Fitch	G8IMN	Sutton Coldfield
Derek Blight	G0PGL	Taunton
Peter Johnson	G4LXC	Tunbridge Wells
Stuart Le Poer Trench-Brown	G7DTG	Warminster
Mike Isherwood	G4VSS	Warrington
Glen Turner	G7MNP	Warrington
David Hall	G8CLI	Warwick
David Jennings	2E0HHZ	Welling
John Marlow	G1ORP	Welshpool
Gary Heald	G0VLJ	Weymouth
Robbie Kiger	M1ROK	Wigan
Nicholas Harrold	G4IMO	Wisbech

Gordon Brindle	M0OQO	Witney
Ray Davis	M0DTM	Wolverhampton
US		
Chris Arnesen	KU7PDX	Aloha
William R Eberle	AB0MY	Boulder
Mark Culross	K5COW	Fort Worth
Charlie Short	K9BIF	Goshen, In
Ronald Fredricks	K8DMR	Jenison
Ed Olague	K5OLA	Laveen
Michael McClanahan	KA5TDA	Moore
Gary Grivna	K0GX	Oak Grove
Ken Konechy	W6HHC	Orange
Norman Thorn	K6UU	Redondo Beach
Richard Diehl	KJ6RNL	San Jose
Ben Carlucci	W2NYC	San Jose
Joe Barcelona	WB6RIY	San Jose
Jim Nagle	KF4OD	West Palm Beach

Derek G. Whitehead GW3FDZ (SK)

Derek G. Whitehead GW3FDZ died on 24th July 2022 aged 92.

He started in ATV in 1958 by building a flying spot scanner (no cameras then) and a valve (832a) transmitter on 70cms.

His first two-way QSO was from Llandudno to John GW3JGA, in Prestatyn, a 15 mile path.

In the 1960s Derek took up a post with the Dew Line radar sites in the Artic Circle and his ATV activity was restricted to periods of leave.

In one period he went portable to the Isle of Man and operated on 70cms as GD3FDZ making the first GD-GW ATV QSO of 87 miles.

In 2000, together with Bill MW1WEJ, he built the GB3GW ATV repeater and remained its keeper until its closure.

His recent technical interests included long distance TV reception, also solar and wind power generation at his hillside cottage in mid-Wales.

Activity and Contests

Clive Reynolds G3GJA

BGM Awards Presentation

The BGM in August saw awards presented to winners and runners up in the following competitions:

▶ *IARU Region 1 UK Leader 2022 Noel G8GTZ*

▶ *IARU Region 1 UK 2nd Place 2022: Dave G8GKQ (presented by Clive G3GJA - confusing, I know! - Ed)*

▶ *BATC VHF Leader 2022: Graham G3VKV (Sorry, I didn't get a photo, as Graham wasn't present - Ed)*

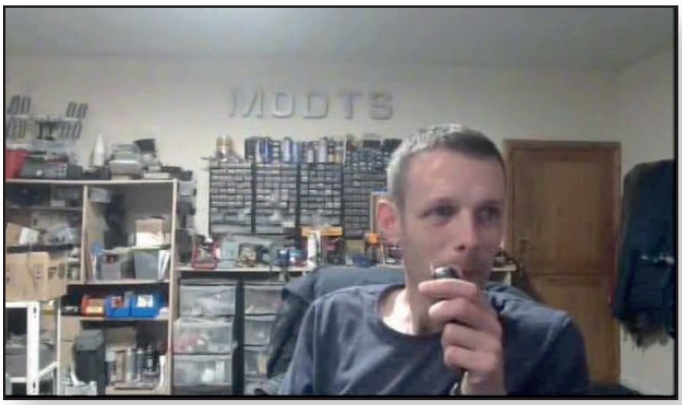
▶ *2021 6m Activity Ladder: Noel G8GTZ*

▶ *Christmas Activity Ladder: Ken G8VDP (accepted by G3GJA)*

▶ *Christmas 2021 Repeater Competition: accepted by G3GJA on behalf of the East Yorkshire Repeater Group*

Activity helped by Tropo Propagation

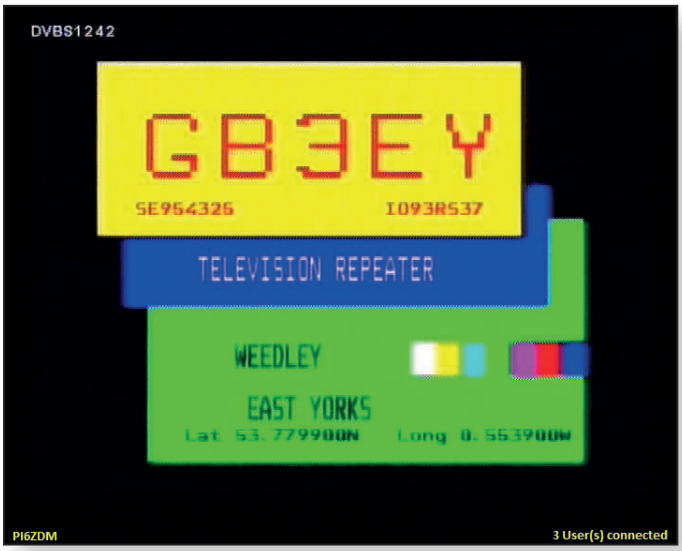
Some good tropo propagation was on offer during the week ending on the 14th August which coincided with an Activity Weekend. It was mainly north-south along the North Sea coast allowing G0KOO near Boston, Lincs to work into GB3EY in East Yorkshire. Rob M0DTS also go into EY from home, south west of Middlesborough, path with just 50W. The path is obstructed by the 1200' high North York Moors, just seven miles from Rob, but he did have help from his 3m dish!



▶ *M0DTS using 50W to access GB3EY on the 12th August*

Paths across the North Sea into western Holland were good for a while with PE1TER getting into Yorkshire and GB3EY was received by the PI6ZDM repeater in Zaandam.

▶ *PE1TER as received via GB3EY*



▶ *GB3EY into the PI6ZDM repeater*

Rob's haul for the August Activity Weekend was impressive:

Stations worked	23cm repeaters seen	3cm repeaters seen
G4YTV - 1-way 70cm, 2-way 23cm	GB3EY	GB3LX
G6ZVE - 2-way 23cm, 1-way 3cm	GB3GG	PI6HLM
G0KOO - 1-way 70cm, 2-way 23cm, 2-way 3cm	GB3TN	PI6ATV
G4CPE - 2-way 70cm, 2-way 23cm	GB3TV	PI6ZDM
G0MJW - 1-way 70cm	GB3EN	PI6ZTM
G4FVP - 2-way 70cm, 2-way 23cm	GB3YT	
	GB3TT	
	GB3VL	
	GB3PV	

On the 14th, Richard G4YTV in East Yorkshire bagged Clive G4FVP in Darlington on 23cms over a path of 112km. The path included the highest parts of the North York Moors, so there was some extreme ducting

The remaining Activity Weekends this year	
8th & 9th Oct 2022	23cms & up
12th & 13th Nov 2022	70cms + 23 cms
10th & 11th Dec	2m & down + 23cms

Finally, please remember that the 70cm and 6cm Activity Ladders are still running and are awaiting your contacts!

Experiments with filters

or more 'self-training' in action

Gareth, G4XAT

The Nokia Dolphin PAs that were around as surplus a few years ago are excellent solutions for 70cms DATV – the PA will run around 70 Watts flat-out directly from the output of a Pluto. Along the way I picked up a pair for very reasonable money – Eddie Stobart's loss is my gain.

They are beautifully built and have three nice little RX 'front ends'. Based on Rob, M0DTS's experiments, I isolated one and tuned it up for 70cms. Gain is around 12dB once the changes have been made and they also benefit from helical filters on the output that pass around a 30MHz BW, tweakable up to include 437MHz.

Rob suggested that two could be used for additional gain, but I felt I would be amplifying stuff my RX front end didn't need. What I needed was something even narrower. At a club junk sale I spotted what looked like some sort of diplexer unit, blessed with decent quality cavities and a lot of BNC leads doing the interconnection.

I did, of course, buy it.

Investigations with a noise source (one of those eBay units with three stages of gain after the noise diode) and a spectrum analyser showed that they were configured as notch filters, good ones at that, all silver plated and tuneable over the 70cms band +/- 20MHz.

Great if I wanted to notch out some interfering signal, but what I really wanted was a nice narrow band-pass filter to go with additional pre-amplification for my 70cms DATV.

▶ *Insertion loss of the homemade helical at low level*

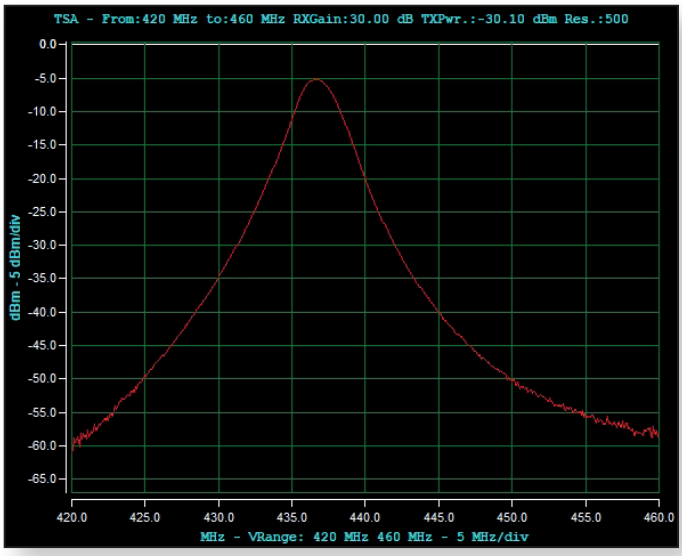
Many years ago I built a large cavity filter to notch out the notorious 138MHz pager interference when trying to receive NOAA weather satellites on 137MHz, so some Google research came up with suitable probe lengths as a starting point and eBay provided a pair of panel mount SMA connectors.

Much measuring and marking out followed and some wire bending produced something I could test.

With the existing coil of wire (the resonant part) the filter tuned around 24cms, but with quite high insertion losses, possibly due to inappropriate probe lengths at that frequency. So I removed the existing coil and wound one with a lot more turns on it.

This resonated nicely within the 70cms area and showed the way forward. I wound a similar coil, this time using some 16g silver-plated wire and was rewarded with exactly what I hoped for, a narrow pass-band of around 750kHz and steep skirts down to about -30dB at 20MHz wide.

Some additional research on YouTube also showed how probe orientation/coupling affected the bandwidth and skirt shape. The change to thicker and silver plated wire also reduced the insertion losses significantly and initial tests suggest something around -4dB.



▶ *Steep skirts and acceptable loss – eBay triple helical*

With a filter as tight as this and one of the ubiquitous eBay DC-6GHz amplifier boards (plenty of gain at 70cms) I should be able to improve my receive capability or at

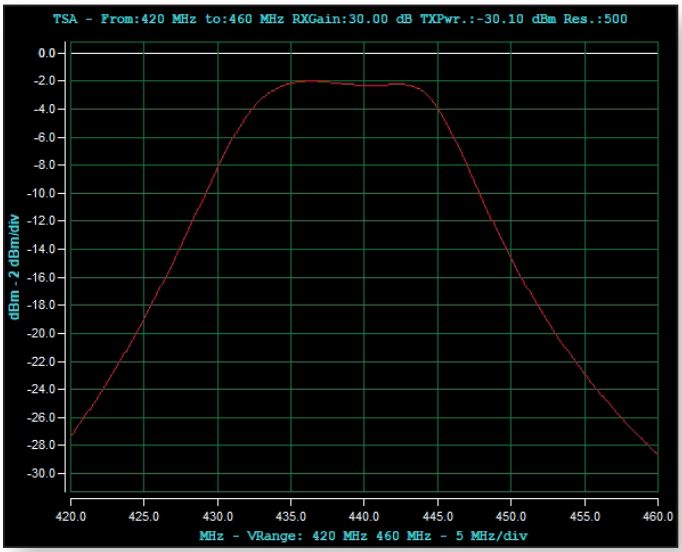
least keep out the terrestrial stuff from confusing either my Knucker (not much extra gain needed) or Minitiouner front ends.

From my basic measurements using an eBay noise source and my SA I got a 0dB passband of around 600kHz, -20dB around 12MHz and -30dB 40MHz. A fascinating experiment and I hope a useful addition to the RF armoury.

But then I re-watched Noel's CAT21 presentation about RX front-end gain and had a thought was the high level of signal I was injecting perhaps just bypassing the filter mechanism? When discussed on a QO-100 net, Mike G0MJW also mentioned that helical wound coils in such filters had a lower Q than the more conventional coaxial cavities beloved of repeater owner/operators. Clouds of doubt began to cross my vision.

So I re-visited the filter and used a much-attenuated noise source. Sure enough, the insertion loss was now a whopping -12dB.

Oh, dear, how sad … carry on.



▶ *Passband from 437 F1DJO & F6GQM CQ-TV 245 p 32*

Fortunately the BATC Wiki provided some inspiration in the form of a simple interdigital filter design by F1DJO and F6GQM first published in CQ-TV 245. I had stock of the tiny precision trimmer capacitors (salvaged from a nice bag of military surplus 'junk') and some silver plated copper wire.

▶ *Inside the eBay triple helical*

The box parts were made from some double sided PCB material. Careful tweaking produced identical results to the article, so I was back in business. You could say that I 'learned about filters from that' (I did) but as happens, a chance eBay browse spotted a surplus filter with an even narrower bandwidth and steeper filter slopes.

So I bought it, the vendor kindly re-tuned it to 437MHz before delivery. On checking, it needed a further tweak to get it spot-on and it is indeed a 'better' filter. I think the three screen-grabs tell the story. There is some irony in the fact that it contains helical inductors…

For interest is also shown the passband of an eBay SAW filter, not bad and certainly compact. *https://www.ebay.co.uk/itm/313889592164?ViewItem=&item=313889592164*

▶ *eBay SAW Filter – good for keeping terrestrial DTV signals out*

Multiviewer script for the BATC streamer

Gary Shipton VK2CRJ

How often have you had a look at some of the active streams on the BATC streamer to see if anything is happening? There used to be a multiview page at BATC but that disappeared some time ago along with the old streamer.

I thought it might be useful to create a multiview display on my PC showing a number of streams that could occupy all or a part of my screen to keep an eye on what's going on. It was also a good exercise to learn something about Windows batch scripts.

I decided to base it on ffplay, which is included when you install ffmpeg, as a simple command line player that seems to be more reliable than VLC at starting up. A simple command line to show a stream with ffplay is:

```
ffplay rtmp://rtmp.batc.org.uk/live/gb3ut
```

The script takes a list of callsigns and displays them in raster scan order. Players are displayed in a rectangle on the screen defined by a top-left co-ordinate, in pixels, and a bottom-right co-ordinate.

The number of players to display in a row can also be changed. The player width is then calculated based on the rectangle width and the player height for a 16:9 aspect ratio. The player has a banner along the top by default which is used to show the callsign. The script is calculating the top left co-ordinates for each player so they fit together perfectly on the screen.

Streams will start to decode and display after a few seconds, inactive streams don't show any player window. A stream that becomes inactive will freeze on the last frame which is useful to see if a stream was active when you were not looking. A stream that just has audio only shows a waterfall display.

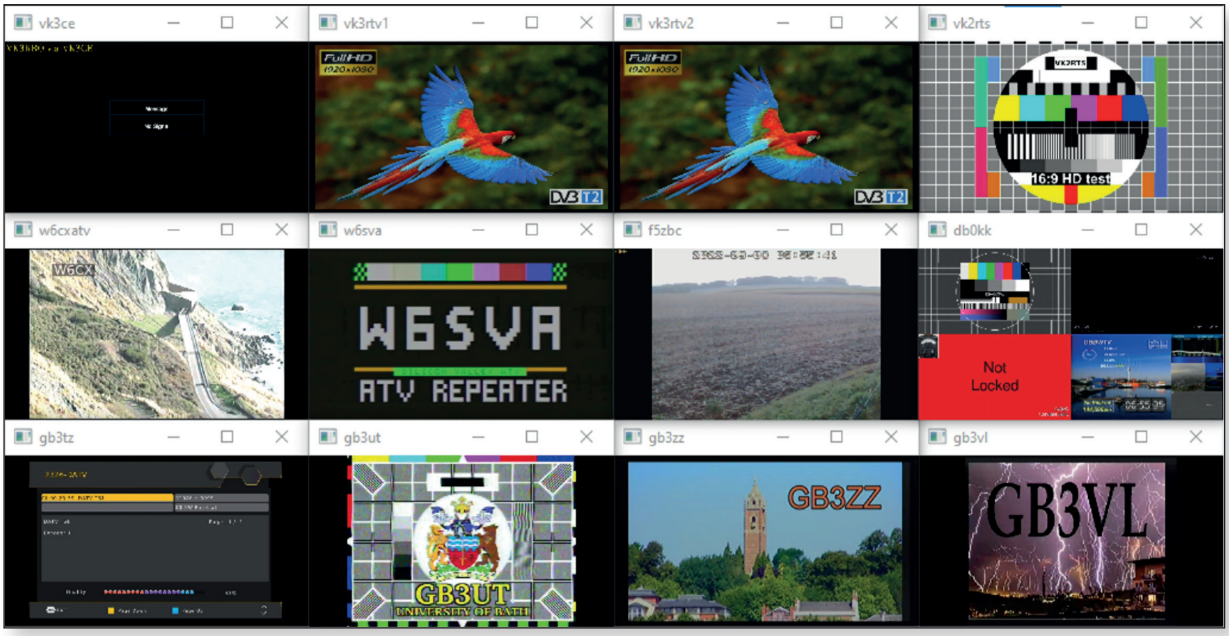
If you want to organise by country per row, just add some text in the callsign list that will never stream to act as placeholders e.g. gb3tz gb3ut xxx yyy.

At startup, all volume controls are set to zero. The player keyboard shortcuts can be used by moving the mouse over a player and clicking it to make it active. 0 increases the volume, 9 decreases it and m toggles the mute. Close the cmd window to shut down all the players.

To get ffplay, go to the ffmpeg web site (*https://ffmpeg.org/download.html*) and click on the blue Windows box. You will need a program like 7zip to extract the files. Then locate the /bin directory which contains the three files ffmpeg.exe, ffprobe.exe and ffplay.exe and set a path to this.

One way is to search (in the task bar) for advanced settings and start system properties (control panel). Click environment variables, select Path in User variables, Edit, New and enter the full path and OK. Re-start computer so the update takes effect.

Copy-and-paste the script from the CQ-TV pdf to a .txt file and rename it after to a .bat file. Leave it on your desktop or create a link to it so it's easy to start up the multiviewer with a double click.



```
:: This script requires ffplay to be installed and its path set
@ECHO off
ECHO Windows multiview player using ffplay by Gary VK2CRJ, 01/09/22
SETLOCAL EnableDelayedExpansion

:::::::::: User settings ::::::::::::::::::::::::
SET "server=rtmp://rtmp.batc.org.uk/live/"
SET /A y0 =  0        &:: Top of player region
SET /A x0 =  600      &:: Left of player region
SET /A y1 =  1080     &:: Bottom of player region
SET /A x1 =  1920     &:: Right of player region
SET /A numx = 4       &:: Number of players per row
::::::::::::::::::::::::::::::::::::::::::::::::::

SET /A xw = (x1 - x0) / numx          &:: Player video window width
SET /A yw = xw * 9 / 16               &:: Player video window height
SET /A yb = 30                        &:: Player banner height
SET "flags=-volume 0 -loglevel error" &:: Volume 9 down, 0 up, m toggle mute

:: List of stream callsigns. The ^ is the line continuation character and just for convenience.
:: These will display in raster scan order
SET list=vk3ce vk3rtv1 vk3rtv2 vk2rts^
         gb3tz gb3ut gb3jv gb3vl^
         w6cxatv w6sva f5zbc db0kk

WHERE /Q "ffplay" &:: Check ffplay exists
IF %ERRORLEVEL% NEQ 0 (
    ECHO Error: ffplay not found, please check the path
    PAUSE
    EXIT /B
)

ECHO Please wait a few seconds for the streams to start decoding
SET /A i = 0
FOR %%a IN (%list%) DO (
    SET /A xdiv = i / numx
    SET /A xmod = i %% numx
    SET /A xpos = xmod * xw + x0
    SET /A ypos = xdiv * yw + yb * "(xdiv + 1)" + y0
    SET /A bot  = ypos + yw
    SET url=%server%%%a
    IF !bot! LEQ %y1% (
        START /B ffplay -top !ypos! -left !xpos! -y %yw% -x %xw% %flags% -window_title %%a !url!
    )

    SET /A i += 1
)

PAUSE
```

To what extent can contact paths be predicted?

Chris van den Berg PA3CRX

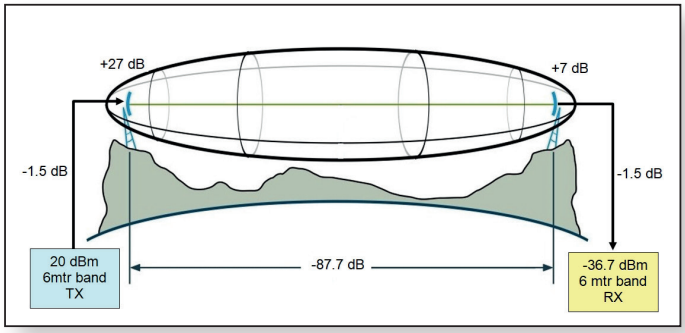
At higher frequencies people quickly think it's only line-of-sight contacts - if you can see each other - the contact succeeds, otherwise it doesn't.

This article shows that it is not all that simple and sometimes rather predictable if the signal will arrive with the wanted signal strength at the other station. Mind you, this article focuses on recognisable main issues.

Practical example

A transmitted signal of 100 mW corresponds to 20 dBm. Some signal is lost via the piece of coax (and plugs), for example 1.5 dB. The transmitting antenna has a certain gain, for example 27 dBi. The signal through the air to the other antenna is also attenuated, which we could call 'free space loss'. This depends on the frequency and distance. If we assume a frequency of 5780 MHz and a distance of 100 meters, the 'free space loss' attenuation is 87.7 dB.

So it arrives at the receiving antenna (for example a ring element with a reflecting metal plate) with some 7 dBi gain. Again 1.5 dB is lost in the cable and connectors and the remaining signal arrives at the receiver. The sum looks like this: 20 - 1.5 + 27 - 87.7 + 7 - 1.5 = - 36.7 dBm.



▶ *Calculating with dB's and graphical presentation of the Fresnel zone.*

If the receiver needs a signal of -80 dBm to show a noise-free signal, then there is a considerable surplus of signal, in this case 43.3 dB. This means as more free space loss is allowed, the distance can therefore be increased considerably.

At 14.5 km the free space loss is 131 dB, we then have a signal left of -80 dBm, just what the sensitivity of my six centimetre receiver is to show a visible video image.

With a satellite dish with a gain of 27 dB in the six centimetre band and the opposite station with a poor antenna, a considerable distance can be bridged.

The same applies to repeaters. An omnidirectional antenna with a gain of 13 dBi is already significant.

So if you want to reach such a repeater with 100 mW and you have a line-of-sight, depending on the distance, you can see some additional antenna gain is needed.

With the link budget calculator (link below) it is easy to play with the different parameters. For example find out what the distance could be if both stations had a dish with 27 dBi gain.

Unfortunately, RF signals travel (more or less) in a straight line in space. At the horizon, the signal will also go straight ahead, thus effectively limiting the distance. However, regular refraction bends signals often slightly toward Earth ('k factor') allowing them to travel beyond the optical horizon. Temperature and air pressure at different altitudes are responsible for this. (More on this in a later article)

Fresnel zone

Between the transmitting antenna and the receiving antenna, the signal looks like an elongated cigar and is called the Fresnel zone.

The diameter of the Fresnel zone depends on the frequency and the distance. At a higher frequency, the diameter of the Fresnel zone is smaller.

If 60% of that cigar diameter arrives at the receiver, there is only little extra attenuation compared to the unblocked path damping. However, if the Fresnel zone is covered to a larger extent, the losses increase rapidly.

So an example with the horizon. A location has been chosen close to the ground and the antennas can just 'see' each other. Here half of the Fresnel zone (50%) is covered and there is no guarantee that the contact will happen.

One of the antennas (or both) should be placed higher to have the Fresnel zone sufficiently clear. That is also the reason that talkback over a few km between handhelds could be difficult, while a repeater much further away could be used without any problem - after all, the repeater antenna is placed high.

In both cases the antennas 'see' each other, but in one case the Fresnel zone is covered and in the other situation not.

We even noticed that the talkback in the two-meter band was unsuccessful while the contact with the 6 cm equipment was P5. The Fresnel zone for the two-meter band has a much larger diameter then for the six-centimetre band and therefore more then 60% blocked.

Height differences in the earth's surface

Often, hills form a barricade in the path. It will be clear if a hill is between the transmitter and receiver antenna, the Fresnel zone will be covered by the hill in question and the contact is not possible.

Placing the transmitting or receiving antenna on the hill obviously increases the area to be reached enormously. At both lower and higher frequencies, the Fresnel zone is unobstructed from a large distance, until the next hill or the horizon. Unfortunately, the hills in question are (in the Netherlands) often provided with forests.

Absorption

Besides free space loss, restriction by the earth (horizon) and hills, very little signal remains after going through vegetation.

This effect is stronger at higher frequencies. A well-known effect is that of a bush or tree that grows in front of a satellite dish in a few years. The signal immediately becomes weaker.

A test over only 20 meters with and without a hedge between the antennas made a noise-free signal at 5780 MHz completely disappear. Just one houseplant between the antennas already halves the signal strength.

Of course, the Fresnel zone also reappears here: close to the transmitting and receiving antennas, the cigar is small in diameter and the signal is considerably attenuated.

If the distance is larger, the tree, shrub or houseplant will block a much smaller part of the Fresnel zone, so that the effect will be much less or not even noticed. The effect of trees is even influenced by the species (needle, foliage), season (with leaves more damping) and also the wind strength and direction! If the leaves move in a certain direction, they allow the signal to pass better.

A local station who always receives a repeater on 2387 MHz - some 50 km away - noticed he used a different heading in the winter than during the summer. This effect could be caused by trees.

Reflection

Buildings, bridges, noise barriers, aircraft, even raindrops at higher frequencies are all obstacles that block the signal.

In addition to absorption, a part will also be reflected. Tests on 13 and nine-centimetres demonstrated that if a direct contact is obstructed, the contact is possible by pointing both antennas at another common (for both) visible high point. The distance may be much larger, but the contact will happen.

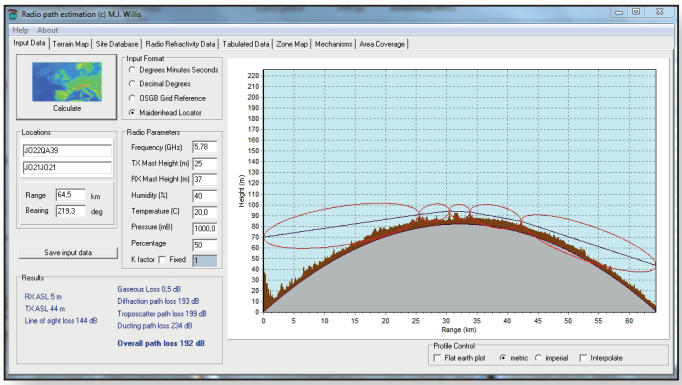
During ATV activity weekends several stations leaves the transmitter on for some time, even when the contact is unsuccessful. Then, suddenly, a picture shows up for a very short moment. Therefore several stations even record what they receive so they are able to watch the recording afterwards, frame by frame.

It is likely aircraft are responsible for this event. Aircraft scatter is often used for phone contacts on higher frequencies, over hundreds of km. For ATV such distances are not seen by aircraft scatter. With a rather low plane height, it could just extend the horizon by such reflection. Links below to find out where planes are to investigate in what way they influence your signals.

Diffraction

'Diffraction' is an effect that can occur with tall buildings or obstacles such as mountain tops. The signal will bent around (especially sharp) corners.

We experienced that if buildings are on the involved hill (so sharper corners) this really could make the difference. Google 'knife edge diffraction' for more information.



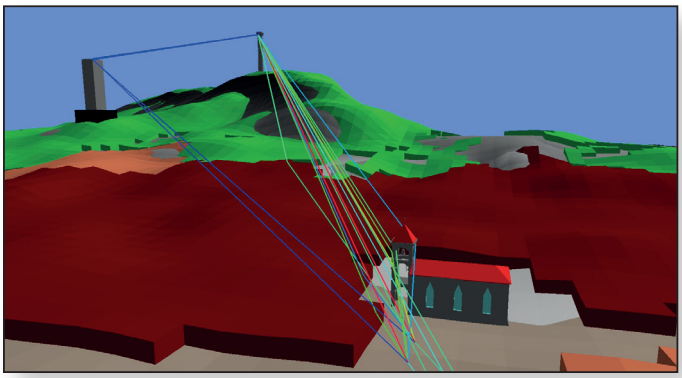
▶ *Example of diffraction, showing more Fresnel zones in series, generated by software 'Path Profile'.*

This will be often accompanied by considerable attenuation, but a signal will indeed pass/around it. (Wet) leaves have sharp edges, as do wind turbines. Elevating the antenna to radiate to treetops (scattering) is certainly beneficial if trees obstruct the signal path. Moving around and elevating the antenna with a portable station even on ground level showed positive results while transmitting between buildings or in a garden blocked by high trees.

Multi-path

The previous image suggests that the signal only travels one way to the other station. The practice, of course, is different.

The signal paths mentioned above ensure that the signals arrive at different strengths and different time delays.



▶ *Example of several paths that the signal will travel.*

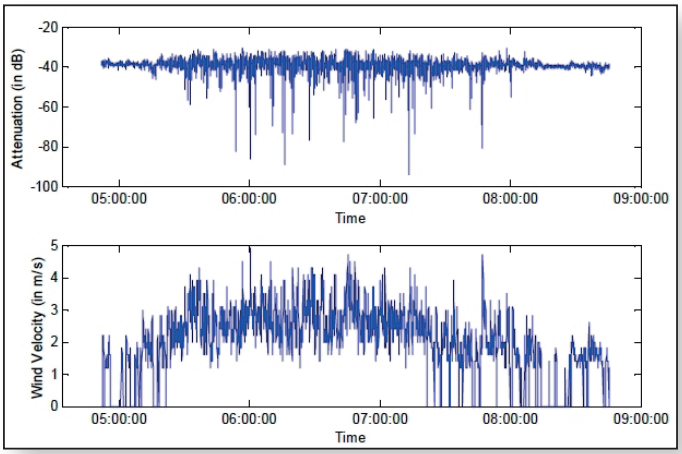
Especially with FM ATV signals, these time delays are visible in the image. The signal can therefore be fine in terms of strength, while the image is not really nice, synchronises poorly or with picture distortion etc.

The influence of trees and wind on path damping

An interesting study is about fading of RF signals by vegetation in the frequency bands 2.45, 5.15, 29 and 60 GHz. Two of these bands are very close to amateur bands. Test trails have been set up over a short distance (110 and 63.9 metres), with deciduous and coniferous trees, both with leaves and without.

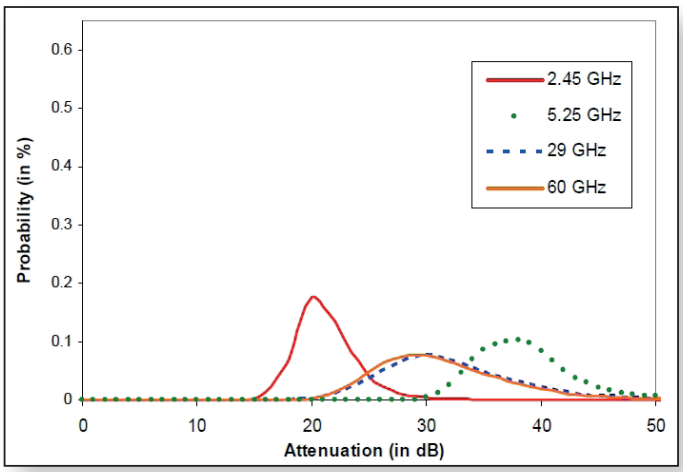
Actually, not much more has been done than to send signals over the path at the various frequencies and to register the signal strength and the wind strength at the same time.

Subsequently, graphs were made and coherence established. The measurements are shown in the following figure.



▶ *Signal strength at 5.25 GHz in relation to the wind speed.*

The correlation is clear in these situations - more wind means variation in signal strength, mainly greater attenuation. In addition, the spread has been plotted for the different measured frequencies, showing the effect is different for the different frequencies.



▶ *Spread in path losses in leaf-losing trees (deciduous trees).*

The spread seen at 5.25 GHz is actually the same as the previous figure. In addition, measurements were made with a spectrum analyser, very close to the carrier wave. The measurements showed that the signal was modulated by the moving leaves. The resulting signals are 30 dB lower than the carrier wave, so whether they cause disturbance in an ATV image will have to be further investigated. Some conclusions in this study:

- It has been shown that the strength of a signal between two and 60 GHz through trees is frequency and wind speed dependent
- That the attenuation is greater if the physical dimensions of the obstacles in the vegetation are the same as the wavelength

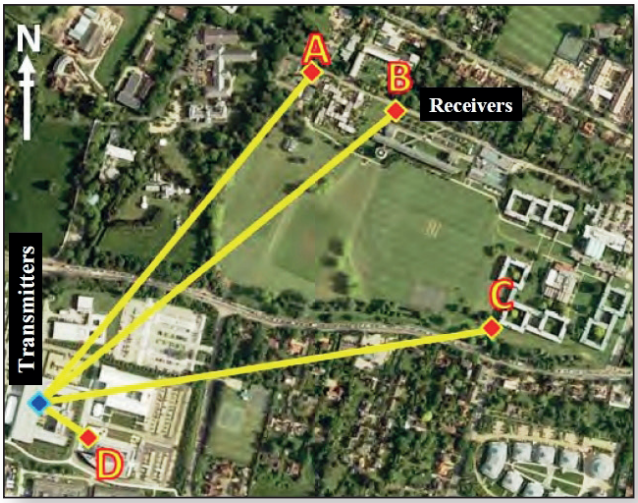
The research itself seems to me to be somewhat limited to substantiate these conclusions.

For example, it would have been nice if a second path (without vegetation) had been performed as a reference measurement at the same time as the measurement. Also the conclusion about the relationship between the dimensions of the leaves/needles in relation to the wavelength - if that relationship is really there, it must also be easy to determine with more measurements, other trees, if the leaves are still emerging (and are therefore smaller) etc.

What is also noticeable is that with more wind, not only more weakening occurs, but sometimes also less. It is therefore easy to explain that contacts that fail when there is no wind, suddenly succeed when the wind starts to blow. Link to this study below.

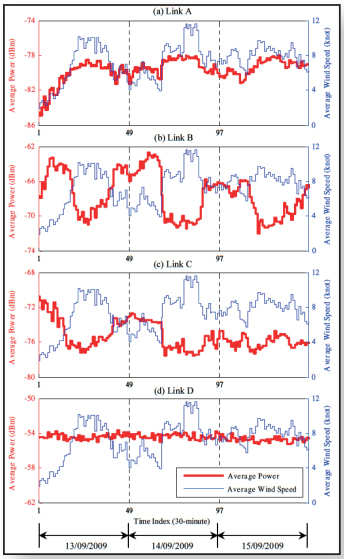
Another study continues with vegetation and the wind: it even includes the wind direction. Here too, long-term measurements were performed in a typical urban area with vegetation.

One transmitter at 5.8 GHz and three receivers. The paths are about 600 meters and the vegetation is at different distances from the receivers. There is also a line of sight over 100 meters away.



▶ *The four paths in Cambridge, three of which are through leafy trees.*

While the visual contact showed virtually no fluctuation in signal strength, two paths resulted in less signal as the wind strength increased, with one path the opposite (more wind is more signal).

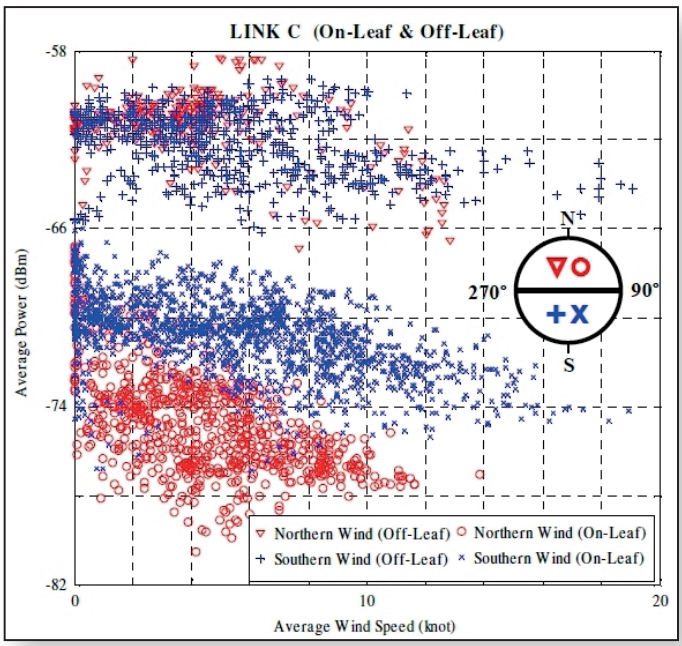


▶ *Average signal strength in relation to wind speed (trees in leaf), paths A to D.*

Trees without leaves give less damping and the wind direction then plays almost no role. Which means that the leaves (and the direction in which they move) really cause the damping. The correlation between these parameters are very interesting to look at.

The effect and tipping point are different for the different wind directions. It is also clearly recognised in this research that the received signals arrive at the receivers via different paths.

- Diffraction at the top of the vegetation
- Ground reflection under the vegetation
- Reflection between the vegetation itself



▶ *Correlation between average signal strength, average wind speed and average wind direction of path C (with and without leaves).*

The different paths have different lengths, so that the phases of the signals amplify or attenuate each other when received. Link to this study below.

Rain, snow, humidity, especially at real high frequencies, also influence the received signal.

It's definitely interesting to study the local situation (at home?) and can be carried out yourself with relatively simple equipment. Especially when we use already software to receive DATV stations, it should be possible to record the signal strength over a longer time period to monitor a path.

One could also consider experiments to, for example, examine the effects of using different polarisations.

Software

An easy-to-use calculation tool is available on the Internet for free space loss -the RF link budget calculator (link below). Fill out data and it will show how much signal is left on the receiving side. However, the Fresnel zone is not taken into account here.

Another calculation tool is available for the Fresnel zone. The Fresnel Zone calculator (link below) neatly indicates whether the horizon is in the way at a chosen distance.

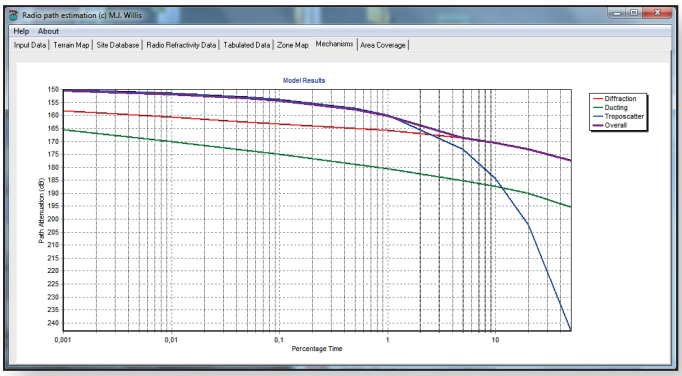
A (known) obstacle can also be entered, height and distance. If the sensitivity of the receiver is known, it can be seen how much signal is left. To find out which obstacles there are, an elevation map should be consulted.

There is also software that combine several things, such as those used to determine locations of cell-phone masts: Link Wizzart (link below).

The limitation of various programs is that not all frequencies can be selected, the curvature of the earth, buildings and forests are not taken into account. Nice to play with, but certainly useless for longer distances.

There are nicer software programs with many possibilities that, among other things, use (inconvenient to retrieve) data from NASA: Path Profile (link below).

The frequency can be chosen, the location on the transmitting and receiving side (in coordinates or QRA locator system), mast height and refraction. The result is shown graphically, the obstacles in the land, curvature of the earth, Fresnel zone and the signal attenuation that occurs, depending on the signal path.



▶ *Prediction of used propagation*

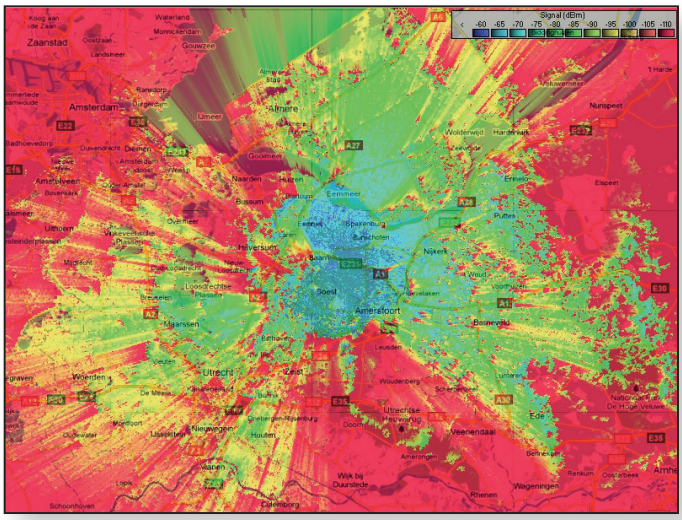
It is also possible to generate a coverage plot from a certain location (and mast height). This shown on the map (Google Earth) where the signals are weaker in which direction, for example caused by the landscape. In this way it is easy to see whether a location is suitable or less suitable.

What is unfortunately missing in this program is the buildings and vegetation, so that these unpredictable element remains.

An even nicer program is available for this: Radio Mobile (link below).

In that program extra data can be imported that includes vegetation and buildings. However, the use of this program is not easy and certainly not easy to explain in this article.

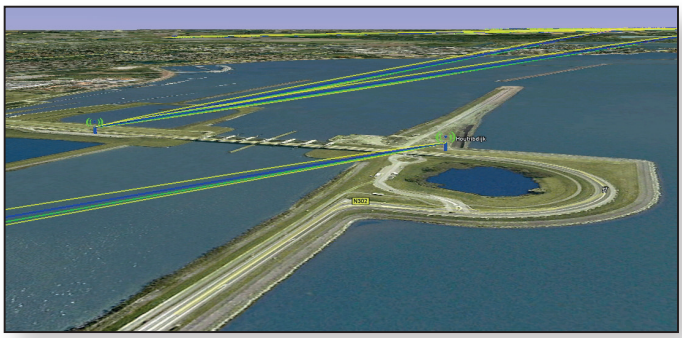
Basically, equipment must be predefined, stations must be created (co-ordinates) after which a network must be created between the stations and the equipment.
The height of the antenna (above ground level) must also be specified. After that, a lot of information is generated, like the coverage. Terrain, buildings and vegetation are downloaded from the NASA database.



▶ *Plot of what's left of 100 mW at 5780 MHz in an antenna with 13 dB gain.*

When displaying the path, for example, colours indicate whether the signal is above or below the reception level, of course everything can be defined yourself.

The various paths can also be displayed simultaneously on Google Earth, which gives a nice graphical representation that you can 'fly over'.



Professionals versus radio amateurs

Professionals want to be able to predict contacts, there must be a certain guarantee that a certain signal strength is available in 100% of the cases.

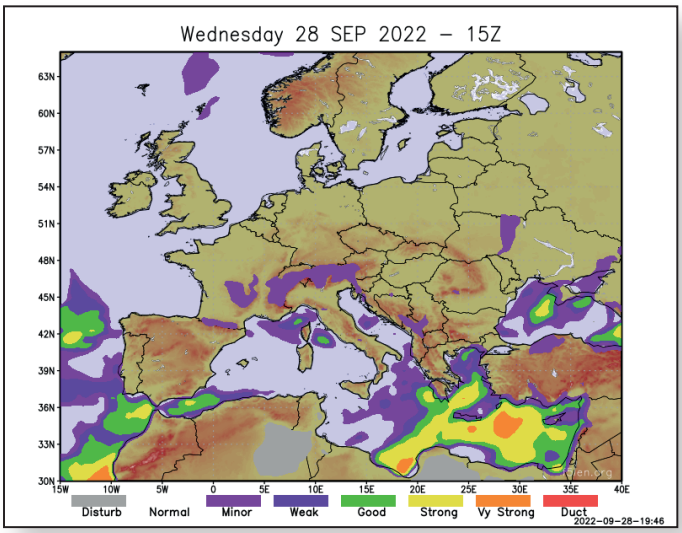
That's what most software is for and amateurs do not have that requirement.

Use is made of the poorly predictable effects in order to make the contact that is otherwise not possible, if necessary only for a very short time.

Of course, there is also the chance contacts that should be successful will not succeed.

Tropo forecast

Just like with weather forecasts, there are also 'tropo forecasts' (link below). Every click on the map adds six hours, nice to see if the propagation is going into the wanted direction.



However, as with the weather forecast, there is no guarantee whatsoever.

More?

It has also been reported that spinning wind turbines made it possible to see a repeater that normally could not be seen. Strange, when the blades are not moving they could also act as a reflecting or diffracting point. What does the spinning add, what causes this effect?

So keep experimenting, try to understand why sometimes it works and sometimes it doesn't.

It's still an interesting hobby.

Links:

- Wind and trees study: *www.pi6ats.nl/Trees%20and%20801_11.pdf*
- Wind and speed study: *www.pi6ats.nl/wind%20speed%20effect.pdf*
- Aircraft scatter, Airschout: *http://www.airscout.eu/*
- Just see where planes are: *https://www.flightradar24.com/*
- RF link budget calculator: *http://www.afar.net/rf-link-budget-calculator/*
- Fresnel Zone calculator: *http://www.afar.net/fresnel-zone-calculator/*
- Link Wizzart: *http://www.big-vienna.com/LinkWizard/*
- Path Profile: *http://www.mike-willis.com/software.html*
- Radio Mobile: *http://www.g3tvu.co.uk/Radio_Mobile.htm*
- Radio Mobile handy additional explanation: *http://radiomobile.pe1mew.nl/*
- On-line version of Radio mobile (limited functions and possibilities): *https://www.ve2dbe.com/rmonline_s.asp*
- Tropo Forecast: *http://www.dxinfocentre.com/tropo_nwe.html#day3* *http://tropo.f5len.org/forecasts-for-europe/*

The Portsdown Newsletter

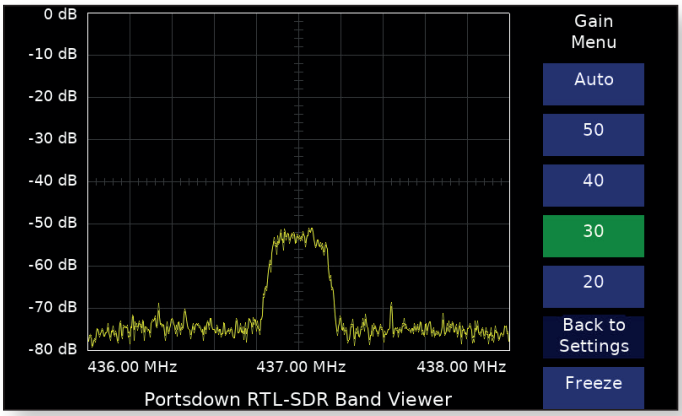
Dave Crump, G8GKQ

Thanks for all the positive feedback on the Portsdown project at CAT 22. Development of the Portsdown 4 continues, but many of the new features are not compatible with the Raspberry Pi 3 or the smaller touchscreens in the Portsdown 2020. So, although the Portsdown 2020 will continue to be supported with its current capabilities, it will not benefit from all of the new features coming to the Portsdown 4.

BandViewer

BandViewer will now work with an RTL-SDR, meaning that there is no need for an expensive LimeSDR or Pluto to use this capability. The only available span widths are 2 MHz and 1 MHz, but these are ideal for RB-TV.

RTL-SDR BandViewer (together with the Airspy and LimeSDR BandViewer) has been released for both the Portsdown 4 and the Portsdown 2020, although a seven-inch screen is required for it to work on Portsdown 2020.

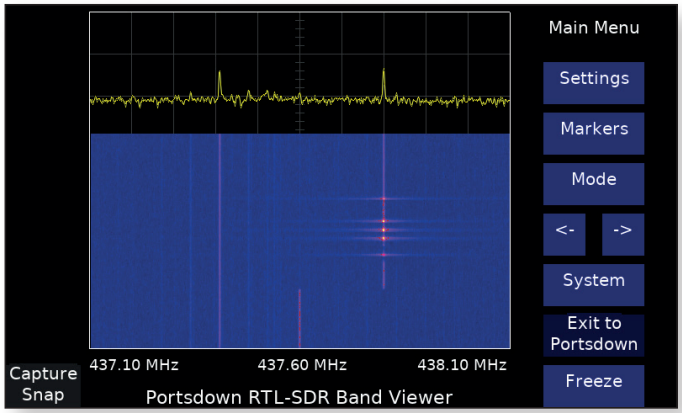


▶ *BandViewer using an RTL-SDR on Portsdown 2020*

On selection of BandViewer from menu two or the test equipment menu, the software first checks for an Airspy, then a LimeSDR and finally an RTL-SDR, and uses the first device that it detects.

BandViewer with waterfall?

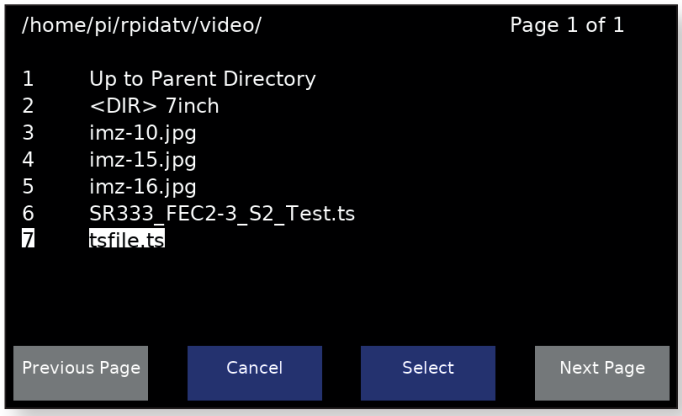
As part of another project, I have started work on a waterfall display associated with BandViewer. It is early days, and the capability is not ready for release yet, but I would be interested to hear if users think that a waterfall display would be useful?



▶ *Experimental waterfall on BandViewer (NOT RELEASED)*

TS file replay on the Portsdown 4

It is now possible to choose a TS file from the SD card to be replayed on transmission. On selection of "TS File" from the encoder menu, a new file chooser menu is displayed to allow selection of a transport stream file for replay. The chosen file will be replayed in a loop when transmit is selected.



▶ *The transport stream file chooser dialogue*

I have also included an example file for replay at 333 kS FEC 2/3. Remember that TS files will only replay correctly at one bitrate; for us that means one SR/FEC combination. You can record TS files off-air using the MiniTioune software on a PC.

I am often asked why the TS input and TS file buttons are in the "Encoder" menu, rather than the "Source" menu. This is because the encoding is set externally, so any other selection on that menu would be misleading.

Note that TS file replay is not available for the Pluto; currently it is only available for the LimeSDR and DATV Express.

Pluto issues

The poor reliability of the Pluto SDR when used with the Portsdown seems to be an ongoing issue. When the Pluto is directly connected by USB, there seem to be at least two failure modes:

- If the USB supply voltage is above 5.1v, the Pluto disconnects from USB (de-registers?) during the Portsdown boot sequence, or after any minor power transient. Setting the Raspberry Pi supply voltage so that the voltage measured on the Pluto PCB is between 4.9v and 5.0v seems to reduce the likelihood of this happening. Note that this is the reverse of the LimeSDR behaviour – it likes at least 5.1v
- If an invalid rtmp stream is sent to the Pluto (say by having an invalid video source selected on the Portsdown), then the rtmp server that listens for inputs on the Pluto stops working and needs a reboot to restart it

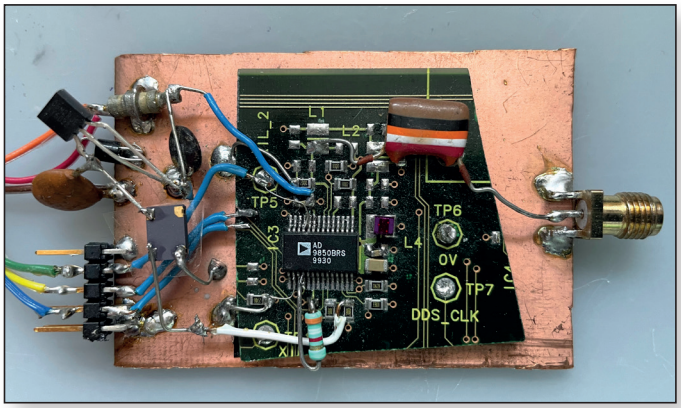
These two failure modes may also apply for network-connected Plutos, but I have not investigated.

I have modified the Portsdown software so that it greys-out the lower half of the "output to" button on menu one if the Pluto is not detected by USB. This covers the first fault condition above. However, it does also grey-out all the time when a network-connected Pluto is in use; I hope to fix this soon.

One of the irritations of using a Portsdown with the Pluto has been the in-built waiting time after a Pluto reboot. I have now added the facility to cancel the wait screen. It does not speed up the reboot, but does allow you to make the next selection.

Portsdown 4 signal generator enhancements

The Portsdown signal generator has not, until now, had any capability below 50 MHz. While dismantling some old equipment recently, I came across an AD9850, which is a direct digital synthesiser (DDS) IC for up to 50 MHz. It is also available on pre-built PCBs from eBay. My test set-up was cut from the original PCB and connected to a 120MHz clock oscillator; I will make the final installation a bit neater.



▶ *AD9850 for testing*

It was surprisingly easy to modify the Portsdown signal generator to drive the DDS, and frequencies from 1 Hz up to half the DDS clock frequency can now be generated using this output device. Full connection details can be found on the BATC Wiki – just search AD9850 in the Wiki search box.

I have also modified the Portsdown 4 signal generator software so that it can be controlled from a web browser (if enabled in the main Portsdown software).

HDMI Input

I am currently working on the use of an Elgato Camlink 4K HDMI Capture dongle for capturing HDMI inputs and transmitting them using the Portsdown (initially with the LimeSDR).

The advantages of this dongle are that it is not a "Chinese/eBay" product that is going to change its specification on a whim, and it also seems to capture HDMI in excellent quality.

The disadvantages are the high price (£99 when on special offer) and the fact that the manufacturer does not offer explicit support for Linux. However, initial indications are that it can be integrated into the Portsdown 4. It requires USB3, so will not work with Portsdown 2020

▶ *The Elgato Camlink 4K HDMI capture device*

Conclusion

That's it for this newsletter, but there are plenty more Portsdown-related projects in the pipeline.

The BATC General Meeting

Secretary - Noel Matthews G8GTZ

Below are the Minutes of the BATC General Meeting held at Coventry on 7th August2022 – these are draft until accepted by the next BATC General Meeting.

The chairman's report at the meeting can be found here: https://wiki.batc.org.uk/CAT_22_part_1

Minutes of the BATC General Meeting
Held at the Midland Air Museum on Sunday 7th August 2022 at 11:30am

1. **Apologies for absence** had been received from G8ADM, G7JTT and G8XZD. It was noted that 48 paid up BATC members were present.
2. **The Minutes of the 2018 General Meeting** were accepted unanimously as previously published. Proposed by 2E0EHH, seconded G3VZV.
3. Dave Crump made the **Chairman's report** on behalf of the committee. A copy of the slides will be made available on the BATC wiki.
4. Brian Summers gave the **Treasurer's report** and presentation of the accounts. Brian concluded by saying he wished to retire as treasurer and the Chair proposed a vote of thanks for Brian's long service to the club.
5. **Award presentation**
   The Grant Dixon Award was presented to Brian Summers for outstanding service to the BATC over the last 50 years. Brian joined the committee in 1974 and has been treasurer since 1984.

   Contest awards were presented as follows:
   - 5.6GHz ladder to Noel G8GTZ, runner up to Dave G4FRE.
   - Christmas activity contest to Ken G8VDP, runner up Clive G3GJA
   - Christmas repeater contest to GB3EY group
   - Leading station in 2022 IARU contest to Noel G8GTZ, runner up Dave G8GKQ, 3rd Neil G4LDR.
6. The amendment of constitution to increase maximum number of elected committee members to 10 was accepted unanimously by the meeting.

   Proposed by Phil G8XTW and seconded by Justin G8YTZ. The updated constitution will be published in CQ-TV and on the BATC website.
7. **Election of Committee members**.
   The following committee members were due for re-election and were willing to stand again:
   - Noel Matthews, G8GTZ
   - Ian Parker, G8XZD
   - Robert Burn, G8NXG
   - Tim Forrester, G4WIM

   It was proposed to have a block vote for re-election of committee members. Proposed by Dave M5TXJ and seconded by Paul G8AQA. Accepted unanimously by the meeting. The 4 members were then re-elected unanimously to the Committee.

   Martin Charman G4FKK had been proposed as a new Committee Member by Gareth Evans G4XAT and Alan Mayhew G8TQK; he was unanimously voted on to the Committee.

The meeting closed at 12:05

Post meeting Q&A

Dave G4FRE asked if the minutes of BATC committee meetings could be published on the website. It was agreed that this would be discussed as soon as possible at a committee meeting.

The BATC constitution was updated at the BATC General Meeting on 7th August 2022

The Constitution of the British Amateur Television Club

1. General
2. Aims and objectives
3. Membership
4. Committee
5. Finance
6. General Meetings (G.M.)
7. Extraordinary General Meetings (E.G.M.)
8. Dissolution of the BATC

1. General,

(a) The Club shall be known as the British Amateur Television Club or by the initials BATC.

(b) The administrative address shall be that of the Secretary or as assigned by the Committee.

(c) The BATC shall affiliate to the Radio Society of Great Britain.

(d) The name of the BATC, its logos, badges and CQ-TV are copyright and may only be used with the written permission of the Committee, excepting that members may use the logos and badges for their personal, non commercial use without seeking permission.

(e) In this Constitution, the word "term" means the period between two consecutive General Meetings.

2. Aims and Objectives

(a) To further the interest of its members in all aspects of television and to inform, instruct, co-ordinate and represent the activities of television enthusiasts.

(b) To promote the advancement and practice of television in all its forms, together with sound, control and data systems, and any other systems for the transmission or processing of images in any form.

(c) To publish, in any form, the BATC's journal "CQ-TV" and to provide books, pamphlets, or any other medium associated with the objectives.

(d) To supply components or assemblies, or any other items, for use associated with the objectives.

(e) To organise meetings and events, competitions and awards of any kind for the mutual benefit of members and promotion of the objectives.

3. Membership

(a) Membership of the BATC is open, subject to the discretion of the Committee, to all individuals or groups interested in the aims and objectives of the BATC.

(b) Each ordinary member shall pay a membership subscription fee. The fee for membership of the BATC and the duration of the period of membership shall be as set by the Committee. The Committee shall have the power to waive or reduce individual subscriptions in special circumstances.

(c) Honorary membership may be granted to any person, who, in the opinion of the Committee has rendered outstanding service to the BATC. Such membership shall carry the rights and obligations of ordinary membership but shall be free from subscription dues and of a duration set by the Committee. A list of honorary members is to be kept by the Secretary and may be published at the discretion of the Committee.

(d) The Committee may also grant life membership and student membership on payment of the appropriate subscription. Student members must be under 25 years of age and in full-time formal education.

(e) The Committee of the BATC shall have the authority to grant complimentary membership, associate membership, patron status and other categories as required, these categories having no voting rights.

(f) A group may affiliate to the BATC by paying a subscription as one member. The affiliated group shall have one vote and be entitled to all benefits and obligations as if it were one member. The aims and objectives of any member group should support the BATC and be compatible with the aims and objectives of the BATC.

(g) Members with subscriptions in arrears have no voting rights or any privileges of membership. They shall be deemed to have resigned from the BATC after a period of grace, as set by the Committee, has elapsed.

(h) On ceasing to be a member of the BATC the individual must return, without delay, all BATC property to the Secretary

(i) The Committee shall have the authority to expel any member whose conduct, in the opinion of a majority of the Committee, renders that person unfit to be a member of the BATC. No member shall be expelled without first having been given an opportunity to put their case before the Committee.

4. Committee

(a) The affairs of the BATC shall be administered by a Committee of up to 10 members elected at a General Meeting and, additionally, a President appointed by the Committee.

(b) The Committee, in whom the BATC's property shall be vested, shall consist of :-

(i) A Chairman who shall preside at all meetings at which he/she is present. No member may hold this position for more than 3 consecutive terms. He/she may serve in a different Committee position but a period of at least one term must elapse before being eligible again for the post of Chairman. The Chairman has a single ordinary vote at all meetings. In the absence of the Chairman meetings shall be chaired by the Secretary or the Treasurer.

(ii) A Secretary and a Treasurer. The Chairman, Secretary and the Treasurer shall be the Officers of the BATC.

(iii) Up to 7 further Committee members. These may hold specific posts, as decided by the Committee, which may include:- membership secretary, editor, IT manager, BATC shop manager, contest organiser, RSGB liaison, and such other posts as required.

(iv) The duties of the Officers and Committee members of the BATC shall be those conventionally and normally performed by those Officers and Committee members.

(c) A President shall be appointed by the Committee to hold office for two terms, but may be re-appointed by the Committee to serve again up to a total of six terms. The President has an ordinary vote if taking part in a G.M., E.G.M. or Committee meeting. Retiring Presidents are to be listed as past Presidents of the BATC. This list is to be kept by the Secretary and may be published by the BATC.

(d) The Committee shall have the power to co-opt additional members of the BATC to serve as Committee members or Officers, but the total number of Committee members and the President shall not exceed 13. All such co-opted Committee members or officers shall retire at the next G.M., but shall be eligible for election at that G.M. Co-opted Committee members have full voting rights.

(e) All Committee members are elected for two terms and then should retire, but are eligible for re-election. Approximately half of the Committee members and half of the officers should retire at each G.M. In order to meet this requirement Committee members and Officers may retire one session early or late to restore the balance.

(f) The Committee should physically meet at least once a year at a date and venue to be selected by the Chairman in consultation with the other Committee members, notice of this Committee meeting and its agenda should be sent so as to reach each Committee members not less than 14 days before the date of the physical meeting. At other times Committee meetings can be conducted, by any other means of communication, and provided that all are informed of the meeting and the agenda the 14 day stipulation need not apply.

(g) A quorum for the Committee shall be 66% of the total Committee membership rounded to the lower whole number, two of the quorum shall be officers of the BATC. A simple majority of the Committee members voting shall be required for a proposal to succeed. An absent Committee member may cast a proxy vote by instructing the Chairman of the meeting to cast his/her vote(s) for the proposals as described on the agenda. The Chairman shall inform the meeting of who has cast proxy vote(s) and if they are for or against the proposal. That proxy vote counting towards the number required to be quorate. In the absence of a quorum, business may be discussed but no decisions can be taken. The minutes of the meeting may published, in full or in part at the discretion of the Committee.

(h) All Committee members shall be unpaid, but receipted travel expenses incurred by the Committee in meeting can be reimbursed at a rate up to the equivalent of the standard second class rail fare. Other expenses must be authorised in advance as described in the finance section.

(i) In the special case of a proposal for a vote of no confidence in a Committee member or Officer that may be proposed on the agenda for a Committee meeting. Notice of that meeting and the agenda for business to be considered at such a meeting, shall be sent so as to reach each member of the Committee not less than 14 days before the date of such meeting. No Officer or Committee member shall be removed without first having been given an opportunity to put their case before the Committee. The effect of a resolution of no confidence being passed is to remove from office and/or, the Committee, the person concerned.

(j) Upon resigning from the Committee or otherwise ceasing to be a Committee member, the individual must return, without delay, all BATC property to the Secretary.

(k) The Committee has the power to make grants of money, awards, books, medals, apparatus, or otherwise for the purpose of promoting activity, invention and research into television or its applications or in subjects connected with the objectives of the BATC.

5. Finance

(a) All money received by the BATC shall be promptly deposited in the BATC's bank account(s) held in the name of the BATC. The principal bank and building societies accounts shall be based in the UK. The BATC may make use of payment services (PayPal or similar payment systems) based in the UK or elsewhere. Withdrawals from any account shall be on the authorisation of the Treasurer. The Chairman or Secretary shall have reserve access to the principal bank and building society account(s) and the BATC's IT manager may have administrator and reserve access to the PayPal account or similar payment system(s).

(b) The financial year for the BATC is the calendar year January to December. The BATC's accounts shall be examined and approved by an independent non-committee member of the BATC or some other qualified person. The approved balance sheet together with income and expenditure summaries shall be presented to the Committee annually and published in CQ-TV at intervals not exceeding 3 years and prior to a General Meeting.

(c) In principle all expenditure should be approved by the Committee in advance. In practice, small amounts for day to day Committee members administrative expenses do not need prior approval up to a total value of £100 per year. Normal regular payments, CQ-TV printing, web fees, renewal notices, shop re stocking, etc., do not need individual prior approval, but any significant changes to the expenditure must be approved in advance by the Committee. If speed is of the essence the Treasurer and either the Chairman or Secretary may approve expenditure.

(d) No member of the Committee may obtain credit or, loans or, cash advances of any form, in the name of the BATC.

6. General Meetings

(a) The BATC shall hold a General Meeting normally at intervals of 2 years, but not exceeding 3 years at a time and place to be decided by the Committee.

(b) The proposed date of a G.M. shall be published at least 90 days in advance together with invitations for nominations to stand for election to the Committee. The date, time, location and agenda of the G.M. shall be confirmed and published at least 28 days in advance in CQ-TV, e-mail and other forms of communication can also be used for distribution of the G.M. details. Only business on the published agenda may be transacted. For clarity the Chairman at the start of the meeting shall chair the meeting until the end of the meeting.

(c) The quorum for a General Meeting shall be the lesser of 30 members or 5% of the current membership, such a quorum to include at least 4 Committee members.

(d) Any member wishing to include an item on the G.M. agenda must forward the item to the Secretary, so as to be received not less than 60 days prior to the meeting in good time to be circulated to the membership on the agenda. This item must be supported by the signatures of not less than 20 members or 5% of the membership whichever is the lesser.

(e) Any BATC member may stand for election to the Committee at a GM. Nominations for election to the Committee shall be proposed and seconded by two paid-up members of the BATC with the consent of the nominee. Nominations should be submitted to the Secretary at least 60 days prior to the meeting to be added to the agenda of the G.M. If insufficient nominations have previously been received by the Secretary, nominations shall also be accepted from the floor of the G.M. The meeting shall then select the successful candidates. The Chairman of the meeting shall supervise the voting.

(f) The Committee may institute a system of postal voting at a G.M. or E.G.M. Such paper votes are to be sent by post to the secretary on the form provided and signed by the member. They will be properly recorded and presented to the meeting and count as if the member was present at that meeting. For clarity other forms of proxy votes are not valid at a G.M. or E.G.M.

(g) No entrance fees shall be charged to members for admission to a G.M. or E.G.M.

(h) A typical agenda for the G.M of the BATC shall be:

- Apologies for absence
- Minutes of the previous G.M.
- Reports by:- the Chairman, the Secretary, the Treasurer and the presentation of the accounts.
- Other Committee reports, contests, editor, shop, etc.
- Other business as itemised on the agenda.
- Presentation of awards.
- Election of Committee members.
- Close of meeting.

After the G.M. is over, the new Committee shall select from its number a Chairman, Secretary and Treasurer, together with additional Committee posts as required.

7. Amendment to Constitution

Any proposed amendment(s) to the Constitution shall be listed as an agenda item for the G.M. or E.G.M. The full text of the proposed new Constitution shall be made available at the meeting and published in CQ-TV

at least 28 days prior to that meeting. Any proposal to change the Constitution requires that two thirds of the paid up members present to vote, including any valid postal votes, in favour to succeed.

8. Extraordinary General Meeting

At the request of the Committee, or at the written request of not less than 30 members or 5% of the membership whichever is the lessor, the Secretary shall call an Extraordinary General Meeting (E.G.M.). The date, venue and agenda of the E.G.M. shall be published at least 28 days in advance and sent to all members by the most suitable means of communication available. The date and venue of the meeting should be the earliest convenient as decided by the Committee, taking into account the requirement to inform all members of the E.G.M. The only business which may be transacted is that on the agenda and no other business may be discussed. A proposal at an E.G.M. requires that two thirds of the paid up members present to vote, including any valid postal votes, in favour to succeed. Where an E.G.M. is called for by a group of members and is not supported by the Committee the cost of that E.G.M shall be borne by those members and paid in advance. The quorum for an E.G.M. shall be the lessor of 30 members or 5% of the current membership, of which 4 shall be Committee members.

9. Dissolution of the BATC

(a) A proposal for the dissolution of the BATC can only be heard at an E.G.M. called for that purpose.

(b) Upon the dissolution of the BATC the properties of the BATC shall be sold by private treaty, or by public auction. The assets of the BATC shall be used firstly to pay the creditors of the BATC, secondly to refund to paid up members that portion of their subscription remaining, provided that the amount due for refund is more than £9.99 and that they can be contacted in a reasonable time (28 days). Any remaining funds shall be used to further the hobby of Amateur Television by distributing funds to other groups with closely similar aims and objectives, or by donation to the RSGB, or a Registered Charity, all as decided at the dissolution meeting.

(c) If a proposal for dissolution of the BATC includes a resolution to transfer the assets and operation of the BATC into a Limited Company or, a Company Limited by Guarantee which has the same or similar aims and objectives, then clause 9b shall not apply.

This Constitution of the BATC was adopted at the G.M. on 7th August 2022

A selection of images from CAT22

Photographs by Rob, G8NXG and Frank, M0AEU

IARU Region 1 2022 ATV Contest Results

Dave Crump G8GKQ - IARU Region 1 ATV Contest Manager

There were 22 UK entries in the IARU ATV contest this year, second only to Italy with 31 entries. The UK took two of the places in the top five (G8GTZ and myself) but it was also good to see so many UK stations represented at all levels in the rankings.

G8GTZ activated six sites during the contest, maximising the points on microwave bands for a number of stations.

G4FRE's contact with G4NXO on 122 GHz deserves special mention. This was a digital contact over 5.6km using 250kS QPSK video. Output was around 12uW with DB6NT HSCH-9401 diode mixers and 100mw of 40GHz local oscillator and 146.5MHz IF at both ends. The LO was a DB6NT MKU LO 8-13 PLL (Rubidium locked) followed by a CTR multiplier. Antennas were Pasolink dishes fed with VK3CV horns via a machined adaptor.

▶ *G4FRE/P on 122 GHz*

At the other end of the spectrum, IO9DATV in Sicily received PE1ASH at 1760km on 51.7MHz 125kS DATV.

The overall listings are on the following pages.
The rankings within each band can be found online at *https://wiki.batc.org.uk/images/4/46/IARU_Region_1_ATV_Contest_2022_Final_Results.pdf*

Overall rankings - excluding 50 MHz

Pos	Call	Score	Locator
1	OE8EGK/P	34649	JN76LP JN76LT
2	II5DATV	32496	JN52CR
3	G8GTZ/P	29349	IO91GN IO91BV IO81XW IO91JA IO90LX IO90LU
4	G8GKQ/P	28438	IO81FD IO80WP
5	IK3HHG	25953	JN65AW
6	OE8FNK/P	19872	JN66UO JN66VO JN76LP JN77TB JN87DJ JN87DK
7	IW6ATU	18346	JN63QN
8	IW3RMR	17488	JN66OF
9	IQ3ZB	16671	JN65AW
10	OE8KVK/P	14696	JN66UO JN66VO JN76BO
11	IQ3TR	13081	JN65HM
12	IK3UVC	12756	JN65HM
13=	IT9BDM	10080	JM78RE
13=	IT9FKD	10080	JM78RE
15	G4LDR	9984	IO91EC IO91GI
16	SWL 69-83 AN	9896	JN63QN
17	IO9DATV	9422	JM78SF
18	IQ3EC	9086	JN65VQ
19	IV3WSJ	8945	JN65VO
20	G4XAT/P	8712	IO91GI
21	IU3OVK	7976	JN65AW
22	OE8HZK/P	7681	JN76LP
23	M0DTS/P	7037	IO94DF IO94JF
24	G4FRE/P	6998	IO93OX IO94PB
25	PA0BOJ	6875	JO21ON

26	PA0T	6671	JO33JC
27	IK4ADE	6572	JN54OE
28	ON7MOR	6522	JO21GK
29	PA7HV	6074	JO21TK
30	OE1BES/P	5314	JN87DK JN87DJ
31	PA3FXB	5089	JO33KC
32	PE1MPZ	4891	JO22NB
33	OE8CKK/P	4711	JN66UO JN66VO
34	IW3HYS	4418	JN66EB
35=	DC8UG	4340	JO30UG
35=	DK7UP	4340	JO30MH JO30MJ JO30NI
37	PA3DLJ	3420	JO20VW
38	OE6RKE/P	3379	JN76LP JN76RT
39	OE6PJF/P	3325	JN76LP
40	PA3AOD	3237	JO32GW
41	PE1APH	3150	JO21XM
42	IU3NMQ	2230	JN66EA
43	PA2TG	2175	JO22FE
44	PE1ORG	2096	JO32HJ
45	PE1ASH	2084	JO22KF
46	I1SXT	2068	JN44QH
47	PA3CGG	2067	JO22ID
48	F9ZG	2042	JM25GJ
49	PE1ITR	1884	JO21QK
50	OE8JDK/8	1820	JN76CP
51	PA0JCA	1819	JO22JG
52	PA3BYV	1536	JO32NX
53	PE1CVJ	1464	JO22KG
54	G4KLB	1406	IO80WP
55	G0UHY	1230	IO80EK
56	I3NGL	1132	JN65DR
57	I3FIW	1013	JN65CO
58	IW6CHN	994	JN62SW
59	PA1AS	962	JO20XW
60	HB9IAM	926	JN36BF
61	G0MJW	916	IO91IO
62	G3VKV	610	IO81XV
63	EA7GLU	838	IM86SU
64	G4EEV	794	IO94EB
65	M0YDH/P	702	IO82RJ
66	IU3KKY	696	JN65BR
67	HB9TV	690	JN36DK
68	IU3KMM	672	JN65DP
69	IZ3NVT	664	JN66EA
70	G3GJA/P	652	IO93PV
71	G3IUZ	622	IO81QF
72	PA0RWE	488	JO22HC
73	G4BVK	462	IO81RK
74	IW1QEF	382	JN44PH
75	G4YTV	296	IO93UU
76	G4HIZ	290	JO01HH
77	IW2HXW	281	JN44GK
78	ON7ARQ	222	JO10VX
79	G8KOE	198	JO10VX
80	OE8III/P	190	JN66UO
81	PA1EBM	145	JO20XW
82	G0AZQ	142	IO94TA
83	IU3OUT	140	JN65CP
84=	IK6ZDE	132	JN63PP
84=	IQ6SE	132	JN63PP
86	G8TA/P	130	IO82RJ
87	SA0BDC	126	JO89TF
88	SM0OFV	100	JO89XI
89	IK1WVQ	98	JN44CB
90	EA7KA	80	IM86SU
91	IW6DCN	70	JN63QO
92	SA0BDK	66	JO89XF
93	SA0CCA	60	JO89XG
94	PA3GNZ	50	JO22NB
95	EA7CU	30	IM86SU
96	PE2V	28	JO32JH
97=	GI7UGV	10	IO74DO
97=	GI4DOH/P	10	IO74CO

Overall rankings – 50 MHz section

Pos	Call	Score	Locator
1	PE1ASH	1812	JO22KF
2	IO9DATV	1761	JM78SF
3	PA0RWE	36	JO22HC
4	PE1CVJ	16	JO22KG

Band winners:

Band	Entries	Winner	Score
6m	4	PE1ASH	1812
70 cm	57	II5DATV	2380
23 cm	76	IQ3ZB	6006
13 cm	53	II5DATV	20170
9 cm	22	OE8EGK/P	11005
6 cm	28	G8GTZ	6225

3 cm	35	II5DATV	5260
1.2 cm	12	G8GTZ	6810
0.6 cm	3	G4FRE	590
0.4 cm	2	G4LDR & G8GTZ	230
0.2 cm	1	G4FRE	60

Country winners:

Nation	Entries	Winner	Score
Austria	10	OE8EGK/P	34649
Belgium	2	ON7MOR	6522
France	1	F9ZG	2042
Germany	2	DK7UP, DC8UG	4340
Italy	31	II5DATV	32496
Netherlands	21	PA0BOJ	6875
Spain	3	EA7GLU	838
Sweden	4	SA0BDC	126
Switzerland	2	HB9IAM	926
UK	22	G8GTZ	29349

Best DX:

Band	Best DX		Dist km
	From	To	
6m	PE1ASH	IO9DATV	1760
70 cm	II5DATV	IO9DATV	673
23 cm	IW6ATU	IW3RMR	297
13 cm	II5DATV	IO9DATV	673
9 cm	G8GTZ/P	G8GKQ/P	136
6 cm	IK3HHG	S58RU	150
3 cm	II5DATV	IT9FKD	672
1.2 cm	IK3HHG	IV3WSJ	141
0.6 cm	G4FRE/P	G4NXO/P	37
0.4 cm	G8GTZ/P	G4LDR/P	23
0.2 cm	G4FRE/P	G4NXO/P	6

Possible IARU Region 1 ATV contest rule changes

Dave Crump G8GKQ - IARU Region 1 ATV Contest Manager

Introduction

I have participated in the IARU Region 1 ATV Contest for many years, and compiled the final scores for the past five years.

I see the objectives of the contest to be:

- To promote ATV activity, especially across international borders
- To promote technical innovation within the ATV field
- To encourage newcomers to participate in ATV activity

The rules and scoring system need to support these objectives. I think that the current rules need to be amended to continue to meet these objectives. Here are some proposals for discussion that have been sent to all current participant nations.

Technical advances

When the existing rules were last amended, building ATV equipment for 23cm and above was difficult and was rewarded by band multipliers to encourage technical innovation. With the current availability of surplus mobile telephone base stations, microwave link equipment and satellite TV equipment, it is much easier to build an ATV station for the 23cm, 13cm, 9cm, 6cm and 3cm bands. Additionally, commercially produced ATV equipment (the Icom IC-905) is soon to be available for these bands.

Building equipment for the 1.2cm band is still reasonably difficult. The bands above this (0.6cm, 0.4cm and 0.2cm) are ripe for amateur technical innovation and band multipliers remain appropriate.

My first proposal is that all bands 3cm and below should use the simple band multiplier of two points per km for two-way and one point per km for one-way. 1.2cm should use four points per km and bands above that should use 10 points per km (both halved for one-way).

Too many bands at once?

With the recent addition of 50 MHz as an IARU Region 1 band, and the use of 0.2cm, the IARU Region 1 ATV Contest covers 11 Bands. The level of complexity required to operate on more than two or three bands is well out of reach of beginners, and the transportation and set-up requirements for portable operation are unreasonable.

Splitting the contest into a low-band and a high -band contest is one possible solution, with the possible dates being the second weekend in June and the second weekend in September. The low band contest could be in June, with the high band contest in September.

The band split could be 6m, 70cm and 23cm for low, and 13cm and above for high, or 13cm could be included in the "low bands".

My second proposal is that the contest be split into two weekends, a low band weekend in June, and a high band weekend in September, with the split between bands to be decided based on the feedback that I receive.

Roving stations

In the current rules, roving (moving) to a new location allows you to contact new stations and also stations that you have previously contacted and claim points for them (again). While in a two-day contest it seems reasonable to use a different location on each day, some stations have been gaining an advantage by "roving" to up to six locations during the contest. This disadvantages fixed stations and beginners.

There is a case to be made for allowing multiple roving locations on the higher microwave bands where it is difficult to establish line-of-sight paths with multiple other stations from a single location.

My third proposal is that entrants should be limited to two roving locations during the contest, except for the bands 1.2cm and higher, where multiple roving locations would be acceptable.

Video codes for contacts with roving stations

The current rules require that a station contacting a roving station for the second (or subsequent) time changes their transmitted video four-digit code. This has proved difficult to achieve and even more difficult to check during scoring. Given the low risk of (and low reward for) cheating, I do not think that this rule is sensible.

My fourth proposal is that the requirement to change transmitted video code for second and subsequent contacts with roving stations be dropped.

Shared equipment

The current rules do not include any statements about the use of shared equipment by different stations (callsigns/entries) at the same site. Taken to the limit, this could allow a queue of operators using the same equipment to give multiple contacts (points) to a single remote station.

My fifth proposal is that each station operating at one site must use a unique set of equipment and that equipment must not be shared with any other station operating from the same site.

I would welcome comments on these proposed changes; nothing is decided yet, but I do feel that some changes would benefit the hobby.

Please provide comment to Clive G3JGA at *contests@batc.tv* or to me at *atv@iaru-r1.org* before 30 October.

Dave, G8GKQ. IARU Region 1 ATV contest co-ordinator.

Networked remote DATV receiver - Longmynd Client

Tom Van den Bon ZR6TG

This Minitiouner has been a favourite of datv reception, especially on Oscar 100. I've been using mine with the Minitioune software ever since I got my DATV station up-and-running. I have always felt constrained to the shack though when I wanted to view some of the DATV nets running on the Oscar 100 satellite. I did some looking around and got an idea when I found Phil Crump's modified Longmynd software. For those that don't know, Longmynd is a piece of software written by Heather Lomond for DATV reception using the Minitiouner hardware. Phil Crump did a fork on Github and was doing some experiments for adding a web interface to longmynd. The communication between Longmynd and the web interface happened via websockets which was ideal for my idea around creating a remote networked DATV receiver. I had the following goals:

- Control the longmynd client over the network, ie. send frequency changes and symbol rates
- Receive the UDP stream from Longmynd and display in the client
- Allow to redirect the UDP stream to various clients on network
- Android client for phone/tablet

Network control

With the websocket control it was fairly easy to send commands to the Longmynd client. Websockets are usually designed for easy sockets for web interfaces, but it also works very well for connections from applications. Phil's changes allow for commands to be sent, and also receive status messages in JSON format. This is what a status message typically looks like coming from the Longmynd client:

```
{'type': 'status', 'timestamp':
1654151458.621, 'packet': {'rx':
{'rfport': 0, 'demod_state': 1,
'frequency': 742717, 'lnb_voltage_
enabled': False, 'lnb_voltage_
polarisation_h': False, 'symbolrate':
498504, 'vber': 137, 'ber': 0, 'errors_
bch_uncorrected': False, 'errors_bch_
count': 12, 'errors_ldpc_count': 491,
'mer': 0, 'modcod': 0, 'short_frame':
False, 'pilot_symbols': False, 'ts_use_
ip': True, 'ts_fifo_path': 'longmynd_
main_ts', 'ts_ip_addr': '192.168.0.105',
'ts_ip_port': 4003, 'constellation':
[[54, 203], [0, 127], [241, 8], [237,
63], [72, 4], [243, 201], [90, 253],
```

```
[231, 228], [199, 184], [205, 249],
[233, 212], [39, 240], [14, 237], [62,
31], [25, 183], [44, 203]]}, 'ts':
{'service_name': '', 'service_provider_
name': '', 'null_ratio': 100, 'PIDs':
[]}}}
```

That gives the client all the information that it needs to know from the Longmynd client.

To send commands are just as simple, for example to set the frequency and the symbol rate all I need to do is send the following command which changes the frequency to 741521 and the symbol rate to 1500:

```
C741521,1500
```

All of the above means that I can change parameters on the fly without having to restart Longmynd.

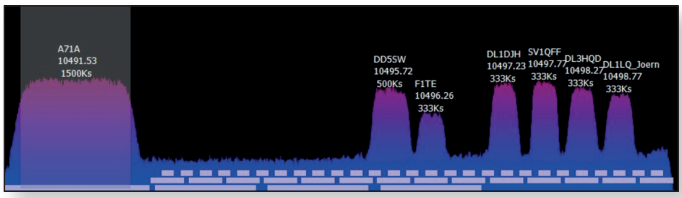
UDP TS stream

Longmynd doesn't actually decode any video or sound from the data it receives, but rather shares it as a transport stream. Usually this gets redirected to a video player type application which will then do the actual decoding of the stream into video and sound. The popular way to do this is to use something like VLC which is a great video player. VLC also provides a set of core libraries that you can integrate into your own application. Normally you configure the ports and IP addresses of where it needs to stream this data via the parameters you set on Longmynd when starting it up. With the changes that Phil has done I can now via the websocket control send commands to change the IP and port on-the-fly which becomes important when running multiple clients.

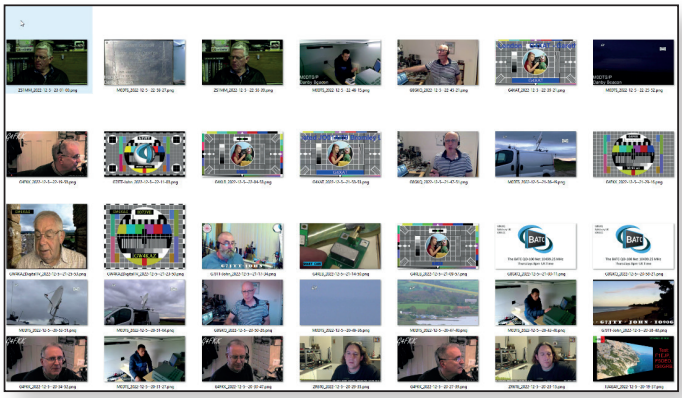
The UDP stream can be either broadcasted in unicast or multicast mode. In multicast mode all the client can receive and decode the video stream. Multicast has however had issues on various networks, the alternative is to use unicast mode which will send the stream to a specific IP and port, but can only be viewed by one client at one time. This isn't really a problem though and the client was programmed to redirect the stream to the client that sends the tuning commands.

The Longmynd client

The client was programmed using C# and I make use of a websocket and VLC core library. I started with the Windows app purely as a test to understand how it's all put together so that I can more easily develop the Android client. More and more people started using the client though so I had to clean it up and refine it a bit. At the basic core it can control the various parameters on Longmynd, this includes setting the frequency, symbol rate, which port to use, etc. It also gets various feedback such as whether it has locked onto a signal and the various properties of that signal (mode, PID's, MER, etc). Some more improved functions have been added based on conversations with users using the software:



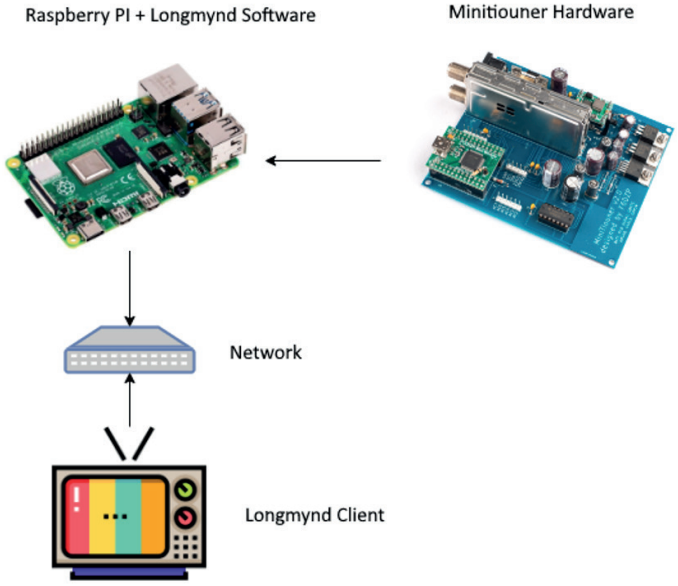
- Similar functionality of the Quicktune application designed by Rob Swinbank. Basically get the spectrum from the BATC wideband monitor and display it in the app, with the added functionality of having an automated Quicktune setting and showing callsigns on the spectrum. This is only for Oscar 100 use, so I have added functionality to disable it as needed.



- Snapshots. You can make a snapshot by clicking on a button, or alternatively set it to auto snapshot which works well with auto tune as it will make a snapshot of each transmission it tunes into.

- Simple satellite calibration tool. This feature simply shows the MER and gives audio feedback so that you don't need to look at the screen while adjusting the dish.

The complete system



From a hardware point of view all we need for the "server" side is a Raspberry Pi and some BATC Minitiouner hardware.

You are not limited to a specific Raspberry PI and various users have tested it all the way down to a Pi1 and even a PI Zero. Since it doesn't decode the video and audio on the PI it doesn't need to do a lot of processing. You also aren't limited to a Raspberry Pi, this works on almost any PC (Linux-Based) and it has also been tested on other SBCs such as the Jetson Nano.

The basic setup for the software on the Raspberry Pi side is as follows:

1. Flash your Raspberry Pi sd card with the Raspberry Pi OS (legacy) – Buster – released 2022-04-04
2. Boot raspberry pi, connect to network and enable ssh using raspi-config

```
sudo raspi-config
```

3. Install dependencies

```
sudo apt-get install cmake git make
gcc libusb-1.0-0-dev libasound2-dev
```

4. Clone repository

```
git clone https://github.com/
philcrump/longmynd.git
```

5. Compile modified Longmynd

```
cd longmynd && make
```

6. Install udev rules

```
sudo cp minitiouner.rules /etc/udev/
rules.d/
```

7. Run Longmynd specifying the following parameters (adapt to your network)

```
./longmynd -W 8080 -i 192.168.0.105
4003 -I 192.168.0.105 4002 741538
1500
```

Where:

- 8080 is the configured web/websocket port.
- 192.168.0.105 is my windows pc running the client
- 4003 is the UDP TS port
- 4002 is the UDP Status port
- 714538 is the initial frequency
- 1500 is the initial symbol rate

The important settings here is the websocket port as all the other settings can also be adjusted from the client side.

Optional, but if you want Longmynd to autostart on boot on the pi,

- Create service file

```
sudo nano /etc/systemd/system/
longmynd.service
```

- Enter this into the text file:

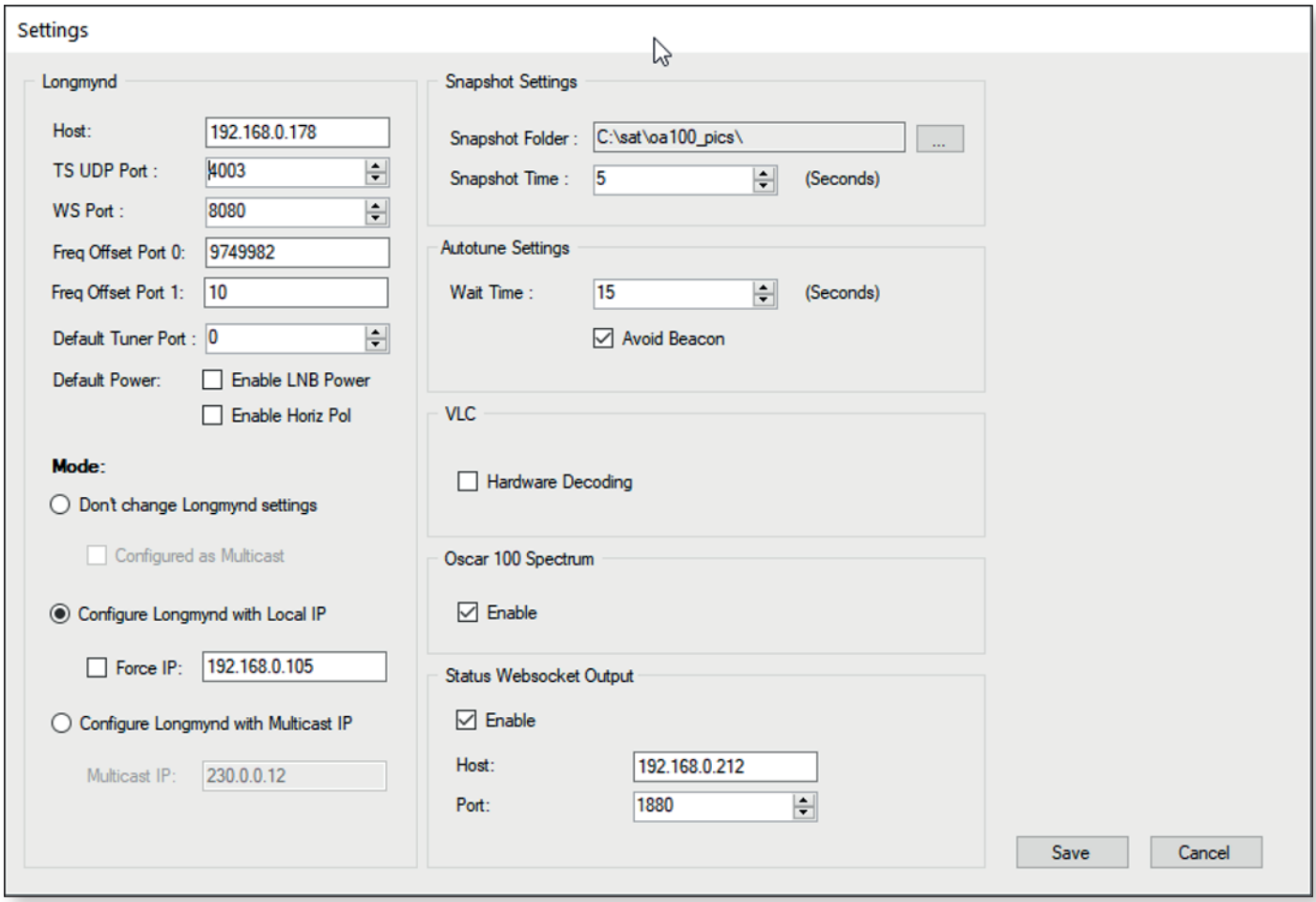
```
[Unit]
Description=Longmynd Client
After=multi-user.target
Requires=network.target

[Service]
Type=idle
User=pi
ExecStart=/home/pi/longmynd/longmynd
-W 8080 -i 230.0.0.12 4003 -I
230.0.0.12 4002 741538 250
Restart=always

[Install]
WantedBy=multi-user.target
```

then do

```
sudo systemctl daemon-reload
sudo systemctl enable longmynd.
service
```

it should then start on reboot, you can also use these commands manually

```
sudo systemctl stop longmynd.service
sudo systemctl start longmynd.
service
sudo systemctl status longmynd.service
```



Client Settings

The following settings are available on the client side:

Most of it is fairly explanatory, but take note of the modes:

Don't change Longmynd settings

The client will assume that Longmynd command line parameters have been configured with the correct TS port and IP and won't change it. You need to check the "configured as multicast" if you are using multicast addresses.

Configure Longmynd with local IP

With this setting the client will tell Longmynd where to send the TS stream to. It will autodetect the local IP and use that, unless you force it with your own configured IP (useful if your machine has multiple network interfaces)

Configure Longmynd with multicast IP

The client will still tell Longmynd where to send the data to, but it will configure a specified multicast IP.

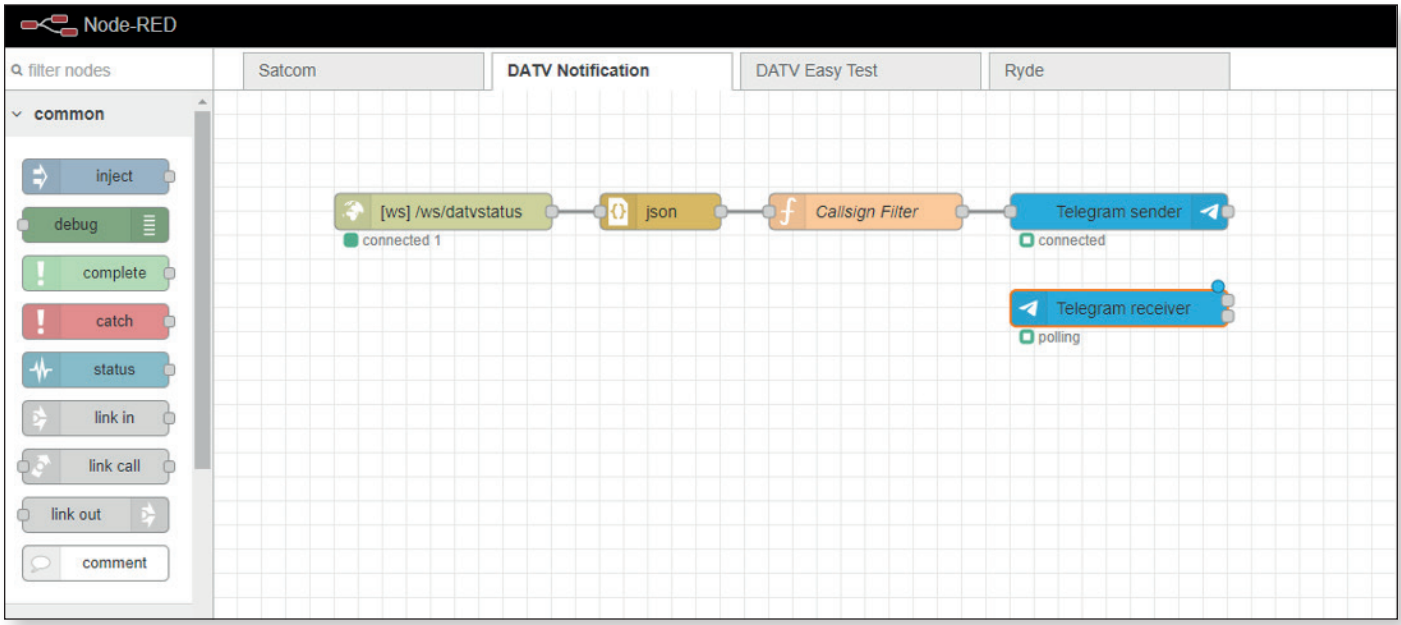
These modes determine how the VLC core will be initialised in the client, so if it looks like everything is working, except that you don't get video/audio then it's most likely these settings you want to fiddle with.

Android Client

Based on all the above, I had started working on the Android client. It's still very experimental and buggy, but it has allowed me to view the various Oscar 100 nets from the comfort of my bed ;)

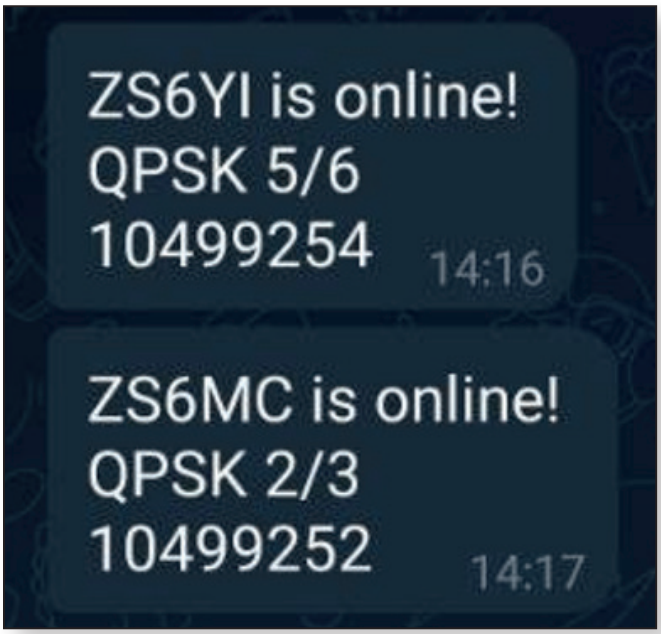
The concept of the mobile app is pretty much the same as the Windows client, although I had to get a bit more creative with space limitations, for example, instead of showing the spectrum it will try to detect the signals and show buttons instead with which you can select to tune to that signal.

The Android is still a work in progress and I suggest checking in on my site for updates and releases.



Node-Red fun

One last setting to mention on the client is the ability to output a small packet to a websocket service when the client manages to decode a call sign. I added this to play a bit with notifications for when people are transmitting. As an example I have configured a simple Node-Red flow that will listen for these packets and then send me a Telegram message when that call sign is decoded.



With the power of Node-Red you can make it do other things, such as display it on a separate display, or turn on a light when there is a signal, or maybe even control a repeater from it. Lots of possibilities.

Future developments

I'm still fairly new to the DATV scene thanks to the Oscar 100 (it's not something that is done in South Africa) so for now I'm experimenting and trying things. It's not always practical, but it's always fun! I think this system can be very fun to use with a Winterhill (Advanced DATV Receiver), as such I have recently put together the kit and I am in the process to develop some software for it as well. I'm still adding and testing lots of features on the Android client and I would also like to branch it out to target Android TV devices.

Stay updated on this and similar projects on my website at *https://www.zr6tg.co.za/longmynd-client/*

Many thanks to the BATC for all the fun hardware kits as well as lots of thanks to Phil Crump for his Longmynd modifications, Rob Swinbank for the information and code regarding the wideband spectrum monitor and everyone who has been using the software and providing feedback.

▶ *Satellite aerials at ZR6TG*

Options for a Digital ATV Repeater Transmitter

Dave Crump G8GKQ

The full HD (1080p) signals on QO-100 have demonstrated that excellent picture quality is possible in really low bandwidths using symbol rates of 333 kS and below.

Any doubters about the quality achievable in 333kS should be encouraged to watch the BATC QO-100 Net which is streamed live on the BATC streamer every Thursday evening at 8pm; the net runs at 333kS with participants using a variety of encoders and transmitters.

UK repeater transmission standard

A number of the existing UK ATV repeaters are still using 2MS or even 4MS to transmit PAL-derived (576i) pictures. For these repeaters, there is significant scope for picture quality improvement, bandwidth reduction and increased coverage area by using more efficient video encoding with lower symbol rates.

Although 333kS has proven adequate for most amateur transmissions on QO-100, there is a reluctance to adopt this standard for repeater outputs as it precludes the use of commercial satellite receivers (which only work down to 1MS) for reception.

For this reason the BATC recommended standard for ATV repeater outputs (see CQ-TV 266 pp 9 – 10) is 1MS FEC 2/3 DVB-S2 H264 encoding.

As well as being much more spectrally efficient, the use of DVB-S2 coding means there are very significant gains to be made over a 16MHz analogue or even a 4MHz DVB-S transmission.

It can be reliably shown that the difference between a P3 analogue signal and loss of lock on the DVB-S2 QPSK 2/3 FEC 1 MS signal was more than 13dB. The difference between a P5 signal and a weak but locked D5 signal was more than 20dB.

Equipment choices

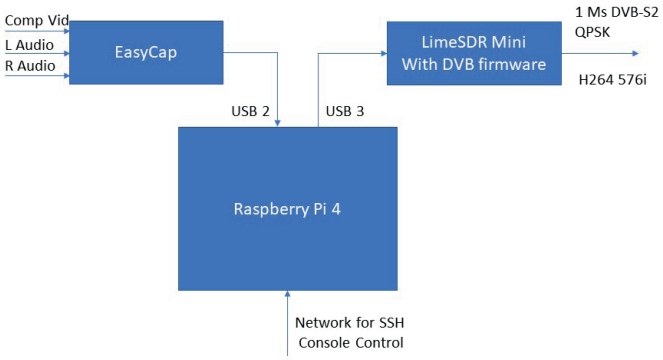
A major issue for repeater builders is finding an encoder and exciter that can replace the existing SR Systems or DTX-1 to take in video and audio, and output modulated RF at the desired frequency.

The DTX-1 is limited to MPEG-2 encoding; more recent SR Systems equipment is capable of H264 encoding, but struggles to transmit at less than 1.5MS symbol rate.

1MS H264 can easily be generated in a conventional station using a capable PC with an SDR (Lime, Pluto or DATV Express). However, the power requirements, physical size and lack of suitability for unattended operation make this approach impractical for repeater transmitters.

1MS H264 from analogue video

To address this, the CQ-TV 266 article described a Portsdown-based transmitter with a LimeSDR Mini as a suitable repeater encoder and exciter. The simple design is illustrated below.



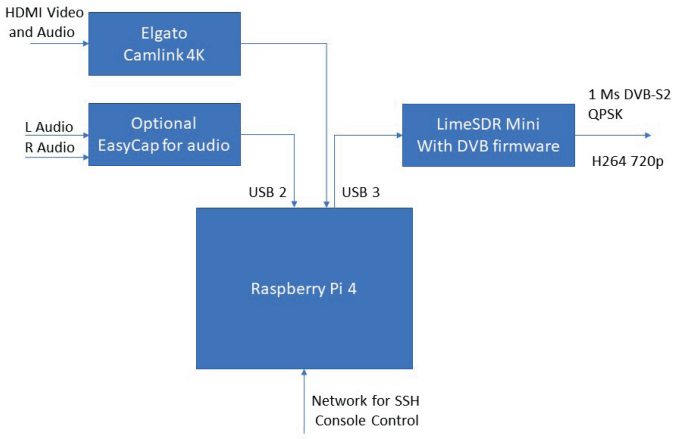
▶ *Basic composite video input ATV repeater TX*

This design only transmits 576i video which was adequate when only analogue sources were available at a repeater site.

However, the Ryde receiver with HDMI output is now in use at a number of repeater sites and a transmitter capable of HDMI input (preferably at 720p) is required.

1MS H264 from HDMI (720p)

The Elgato Camlink 4K device can capture HDMI and is now compatible with the latest Portsdown release. This means that the design above can be upgraded to HDMI input.



▶ *HDMI 720p repeater TX*

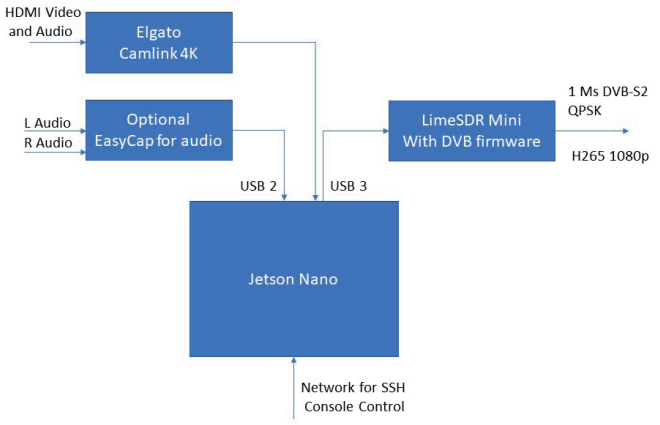
The transmitter can either use audio input from the HDMI channel, or the audio input from an EasyCap can be used to relay analogue audio. Note that a Raspberry Pi 4 is essential for this design as USB3 is required to handle the high data rates from the HDMI capture dongle.
This arrangement is ideal for use with the BATC ATV repeater controller as described in CQ-TV 275 pp 11-14.

All the software for the configurations described above is ready for use now. Simply e-mail me and I can provide a "Portsdown" SD Card pre-configured for use.

Note that the HDMI capture dongle MUST be an Elgato Camlink 4K. No other dongles are supported.

1MS H265 from HDMI (1080p)

I am working on the third iteration of the design; this will use a Jetson Nano instead of the Raspberry Pi 4 and be capable of 1080p H265 encoding within the 1MS FEC 2/3 signal. H265 encoding is the next step and allows stunning rendition of 1080p images.



▶ *Future 1080p H265 repeater TX using a Jetson Nano*

This design is under development, I just need to finalise the unattended operation aspects. All the video encoding and modulation is functioning.

Evolution

The aim has been to provide an evolutionary migration path from today's composite video-based analogue repeaters to an all-digital (in video at least) 1080p HDMI-based solution. Step one is mature and ready to drop in to your current repeater.

The transition from composite video to HDMI (step 2) then simply requires the addition of an HDMI capture dongle. Step three, the transition to 1080p H265 will require the Raspberry Pi 4 to be replaced with a Jetson Nano. The Jetson is slightly larger than the Raspberry Pi 4, but is a reasonably easy replacement.

Please do not hesitate to contact me for advice on the implementation of repeater transmitters; I aim to provide an enhanced level of support for these community projects.

Out and about at the McMichael rally…

▶ *Above - Ashley, G8DPH manning the stand with some interested rally attendees.*

▶ *Below - The inside of Tony, G1HBD's blue ATV van…*

The wonderful world of surplus

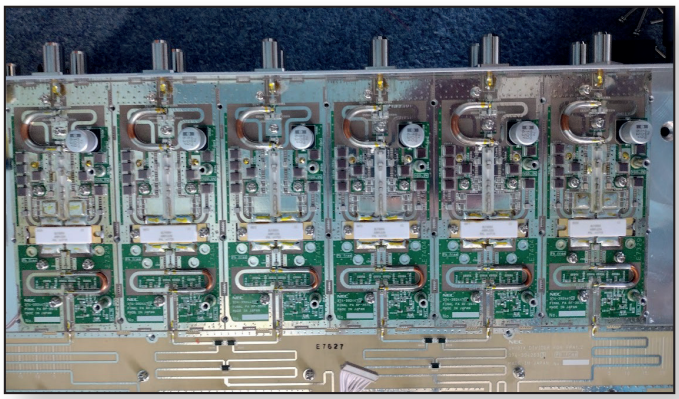
Gareth, G4XAT

I used to think that I'd missed the boat on the 'surplus wonderland' that was Lisle Street post WW2, stories of military gear being sold for a few shillings. But not so.

In recent time us amateurs have been lucky to lay our hands on some real quality kit, rendered surplus by the onwards march of mostly mobile phone and data-link technologies. Think of the excellent Nokia Dolphin amps, ex Eddie Stobart's empire, various microwave technologies on 3.4GHz (Ionica, Stealth and others) and of course the profusion of ex-UMTS base station amplifier pallets, some of which convert to give up to 500W CW and have put probably 1,000s of us on QO-100 – myself included.

More recently I happened across a Parker Patterson auction that included a number of NEC digital TV amplifiers, by all appearances 'as-new' in boxes. Hedging my bets I had a quick look on eBay and found a seller offering the same units at a similar price.

The auction was chaos and after adding in buyer's premium and VAT my notional reserve was soon surpassed. No problem, I made a low offer on the eBay seller's amps and bought one. Following preliminary inspection, I bought the remaining three, two on behalf of Mike, G0MJW. And another for me.



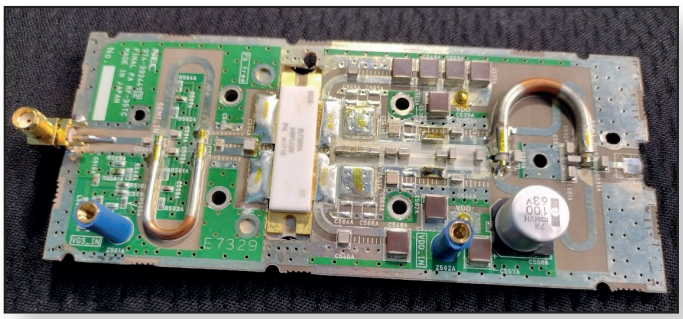
Why so keen? Read on.

The amplifiers comprised a two-U rack unit, with built in three-phase SMPSU and 12 separate pallets, each designated as capable of 115W of DVB-T. So clearly very linear and under-run. .The NEC data sheet and a few pictures informed my decision to buy.

The actual unit is beautifully built and with a build date of 2017 represents bang up to date technology. Each pallet features a current product Ampleon dual FET rated up to 1GHz, and at 600W.

That will do nicely.

So I separated the complex drive arrangements (12 outputs to feed 12 inputs) down to one pallet and added a simple bias circuit. Cautious addition of bias voltage saw Ids rise as expected and was set at 1.3A as per the data sheet.



Adding some RF (initially mW) exceeded my wildest dreams – 200+ watts of DVBS2 at acceptable shoulders. A cavernous appetite for 50 VDC (at up to 15 amps) gets the job done at quite reasonable efficiency.

It does need a big heat sink, originally taken care of by another work of art, aluminium cast around a copper manifold and then extensively machined on every surface. Goodness knows what the purchase price was, the quality is very definitely up to CCS.

To develop it into a usable amp, I removed a single pallet and fitted it to a huge heat-sink that I bought over 25 years ago – you know, 'it will come in useful one day'.

Bias was provided via a buck down-converter set to 12 volts for the fans, then a LM317 eBay PCB off the 12V for bias (around 3.4V). This was found necessary as the low impedance bias circuit drew about 10mA, far more than should be reasonably supplied by just a simple potentiometer.

With its main planned use being DATV, I configured it as bias either remote or manually switched and put together a small driver and filter chain, using the RX input strip removed from a Nokia Dolphin.

This provides about +10dB of gain and a 30MHz wide band-pass filter. This drives a small brick amp, originally designed for a 70 cms hand-held and suitable for 12 volt operation.

That signal passes through a 433MHz low pass filter from eBay (check, one I was sent cut off at 380MHz – refund granted) into the main PA pallet. If you stick to 115W DVB-T or DVBS2, the device can be cooled by bolting it to the heat-sink. If you wish to pursue higher power for CW, SSB or data then it's well worth sourcing a copper heat spreader and machining/mounting the device as appropriate to the intended dissipation.

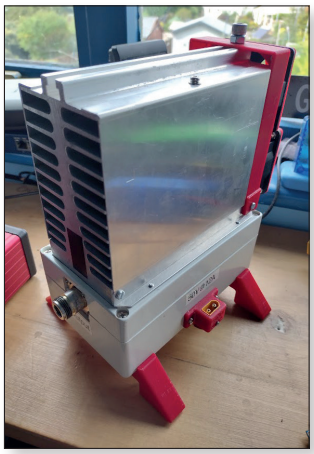
The Pluto SDR (or Lime Mini) is capable of fully driving the chain and the PA to saturation. Tests at the Martlesham microwave round table showed 300W of CW before any gain compression was seen.

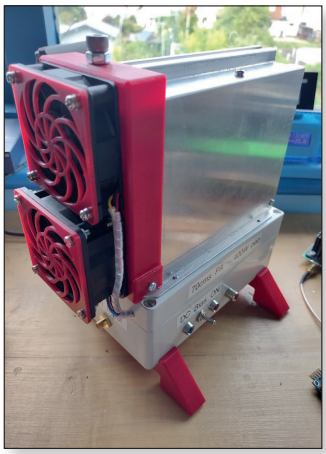
There are numerous parts that can be re-used, a huge number of M3 screws and a variety of pre-driver chains to re-purpose. As I have a good supply of these (sorry I have sold all my spares) my plan is to build a 'quad' amp out of four of the pallets, mounted on a re-configured piece of the original water-cooled heat-sink.

Well, I like to build stuff, and that would facilitate 70 cms moon-bounce with a dipole.

If you see one of these pallets or complete amplifiers, (NEC UH101X PA 1250W) buy it, you won't be disappointed.

The attendant Ampleon data sheets have a wealth of information, including links to a great document about thermal management of devices like this and sample circuits. There is also a good chance that the device will have significant gain at 23cms and perhaps two-metres, but power there is easy with a MRF300 or similar.





▶ *Photos (above and previous page) show one side of six pallets, a single pallet close-up, the pre-driver with filter and driver brick and the finished amplifier.*

It doesn't stop there either, the well-known eBay seller Bison Electronics (the main supplier of UMTS pallets for conversion to QO-100) often has other interesting stuff too and it was here that I spotted some surplus parts from ODU (outdoor units as seen fitted behind dishes up towers).

▶ *24GHz transverter block*

In particular one ex-Cambridge Broadband Networks (now in receivership) listed as a one-Watt @10GHz unit, another (really cheap) rated at three-Watts on 11GHz (bought on the off-chance it would go on 10GHz) and finally a 24GHz unit with a whopping two-watt output (serious QRO at this frequency).

Extensive research on the www led me to a Polish microwave group (*http://mikrofale.cafe/*) where people had also seen these modules and worked out what made them work.

All three units are basically a mast-head transverter, with RX and TX IFs down the bottom of the microwave spectrum (2.3GHz area). Essentially the units needed various power supplies (all derived from 12V) and a suitably stable LO.

For the LOs I used TXCOs driving ADF4351 boards and for the RX & TX IFs, I use the Pluto, driven by either Portsdown or Langstone software.

As most of the RF hard work has been done, it was not a big job to plumb in some very short SMA cables and a suitable relay, along with building a SMA to WG launcher for the two dishes I'd selected. One from the local dump about 26 years ago was fitted with a modified G3PHO pipe-fittings unit and a nice little 24 GHz unit from Noel G8GTZ sorted that band.

My first outing with them was a test day with Dave G8GKQ and Noel G8GTZ. Much to my delight both systems worked 'straight off the bat' – other than the base frequencies being a few 10s of kHz adrift (easily tweaked).

That led to successful NB QSO's and followed DATV exchanges.

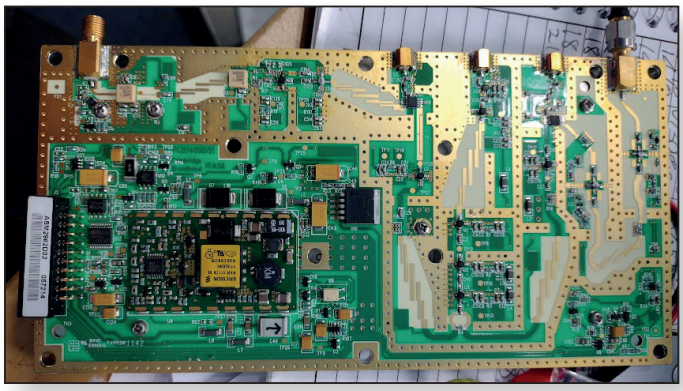
Since then I have done a proper job of boxing up both units and used the 24GHz system in the June contest. A wiring error I made in 'improving' the 10GHz system took it out of the contest, but that too has been rectified and improved with the addition of a Down East Microwave pre-amp that reduced the system noise figure to 2.5dB.

With nearly one-Watt out to a 65cm dish it's a great starter system. Compared to how hard this would have been even 10 years ago, this is simple. I just hope more of these units come to light.

As mentioned I just had to buy some of the two-Watt Wavelab 24GHz ex-ODU modules too – even if just the PA strip could be used it was a bargain price.

Information on the *http://mikrofale.cafe/showthread.php?tid=197* reflector and someone there offering at-cost PSU/interface broads made its operation fairly simple by virtue of not having to worry about matching RX & TX IF frequencies to amateur bands – just dial up my Langstone/Portsdown4 as required.

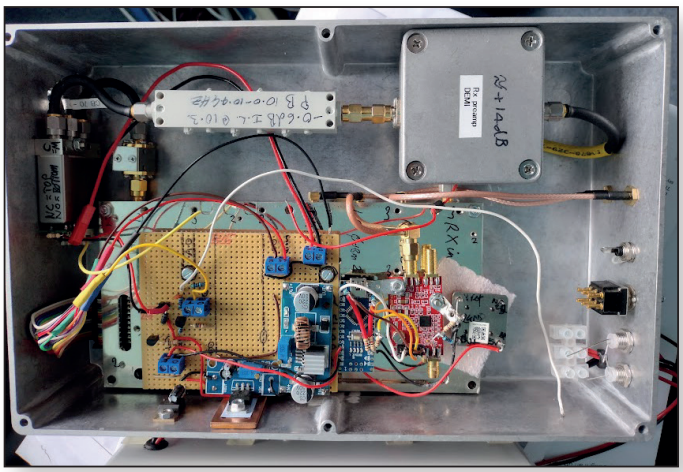
As for 10GHz, other parts were collected as required, mainly an ADF4351 eBay board for the LO (modified with extra capacitors for reduced phase noise, running at 1808MHz and multiplied by 12 inside the Wavelab module), an Arduino Nano with Robin's (G1YFG)



▶ *Inside the 10GHz unit*

'sleep after instructions issued' code and a super-stable 20MHz reference oscillator bought at the recent Martlesham MWRT.

It does not seem to be a temperature controlled unit as it draws a tiny current but is super-stable – worth every penny of the £10. A suitable SMA relay and the shortest possible rigid SMA leads were added, along with PTT derived relay switching. The assembly was placed in a heavily modified plastic box, internally sprayed with Nickel conductive paint and incorporating a heatsink.



▶ *Boxed unit showing PSUs, LO/TXCO and preamp*

A manual PTT was provided along with my standard phono control option and also DC out to supply other equipment such as a Langstone/PD4. An adjustment hole is provided to tweak the TXCO. Stability is adequate for SSB (+/- 100Hz) and I have worked both NB and DATV over 80km paths, aided and abetted by my 'Orange Tripod Azimuth and Elevation Solution' (OTAES or TOM for short – 'Tilt-O-Matic' – see previous CQ-TV).

As might be expected for commercial gear, the 24GHz system has been probably the most reliable piece of kit I have built and used recently. It just works.

To further my experiments on this frequency, I bought a NOS Andrews dish (60cms diameter, 1.5 degrees beam width and 42dBi gain = 20kW ERP). I have had some adaption to do to the feed arrangements, but by the time you read this it should have been tested.

What of the 11GHz unit?

Recently found information on the power supply and control circuitry has shown that it will produce around two-Watts on 10.3GHz, again by using a suitable LO and IF. The receive side is not suitable for 10GHz but then another LO, some 'Franco' amps and a mixer with suitable pipe-cap filtering should solve that.

Watch this space.

Turning Back the Pages

A dip into the archives of CQ-TV, looking at the issue of 48 years ago

Peter Delaney - G8KZG

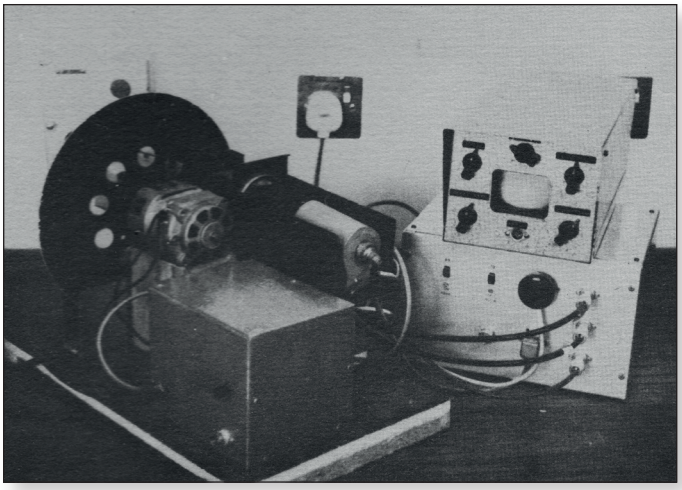
CQ-TV 88

CQTV 88 appeared in November 1974, so included a report on the BATC Convention which had taken place in the September. Held at Rugby, it was only the second time the event had taken place outside London (the previous occasion being CAT 70 at Cambridge). Around 100 people attended (which was thought to be a disappointing number), and there was a good selection of equipment on show by the membership. Joe Rose had managed to get his OB truck to take part, with cameras in and around the exhibition hall - although only after extracting it from the mud in which it had got stuck.

Other exhibits included microwave equipment shown by a group from Coventry Technical College, and Cyril Chivers, who was demonstrating his fibre optic television equipment (decades before most people had heard of 'fibre optics' - BATC members in the lead - again).

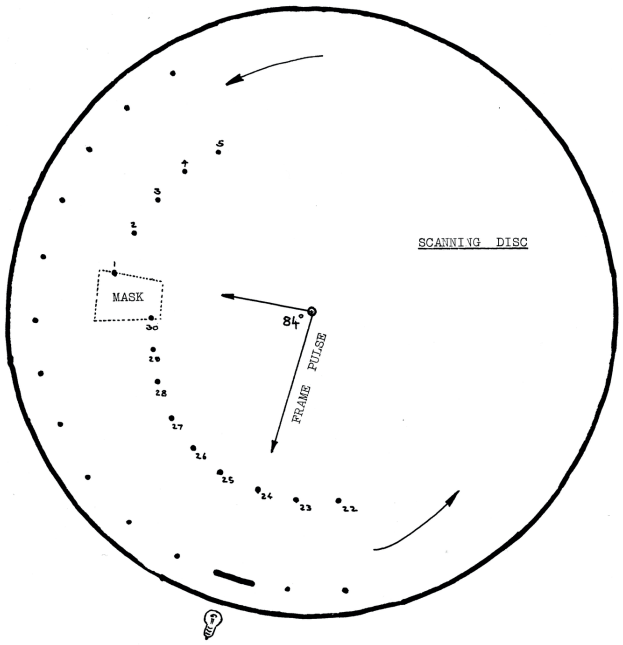
A new Chairman - Don Reid - was appointed, to take over from Malcolm Sparrow, who was awarded honorary life membership in recognition of his work for the Club. Amongst the new committee members were Arthur Critchley and Brian Summers (who must be the longest serving committee member in the Club's history!).

The technical articles in this issue covered two rather different processes for picture transmission. The clue to the first was the picture on the front cover.



This was for a low definition system, one way to produce a reduced bandwidth television signal – but 'rather different' to the current RB-TV! A group in the Midlands decided that a demonstration of mechanical scanning would be of interest, so their "memories were stretched, old books 'dug out' and read until a working knowledge of the principles involved were acquired". A system using a 30 line picture, vertically scanned was adopted. One particular problem was how to synchronise the transmitting disc to the receiver. If the latter was also a mechanical disc, then synchronous motors at each end would be locked to the mains power supply. However, as most amateurs were familiar with crt monitors, a method was devised to use one of those as the picture display.

The scanning disc had a diameter of 10½". Starting at 4¾" from the centre, the inner spiral (only some are shown on the diagram) consisted of 30 $^{1}/_{32}$" diameter holes, each set at the same angle from the one before (12°), but $^{1}/_{32}$" in from it. These would therefore pass, in turn, behind the mask, to scan an area about 1" wide, the light passing through being detected by a photomuliplier tube. The second series of 30 holes were kept at a constant distance of 5" from the centre, to generate a series of sync pulses, one per line, with a longer pulse (near the bottom of the diagram) to create a frame pulse. The light from a small bulb was arranged to shine through these holes and be detected by a photo diode to produce the sync signal.

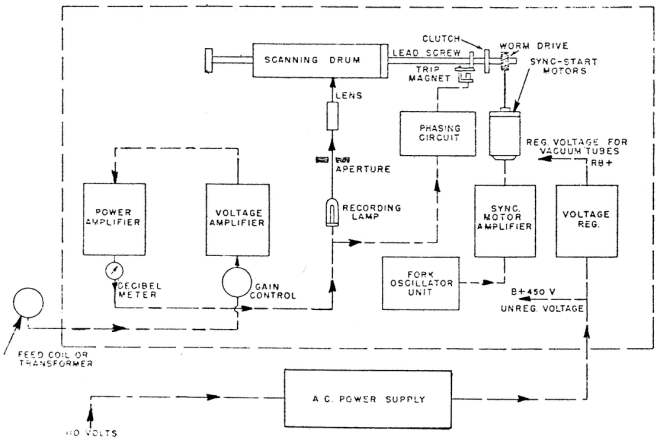


The disc was then rotated at 3,000 rpm, to give 50 pictures per second. The amplifier for the photomultiplier signal and adding the sync pulses to it was done in the same way as for a flying spot scanner (which was a familiar piece of equipment at the time).

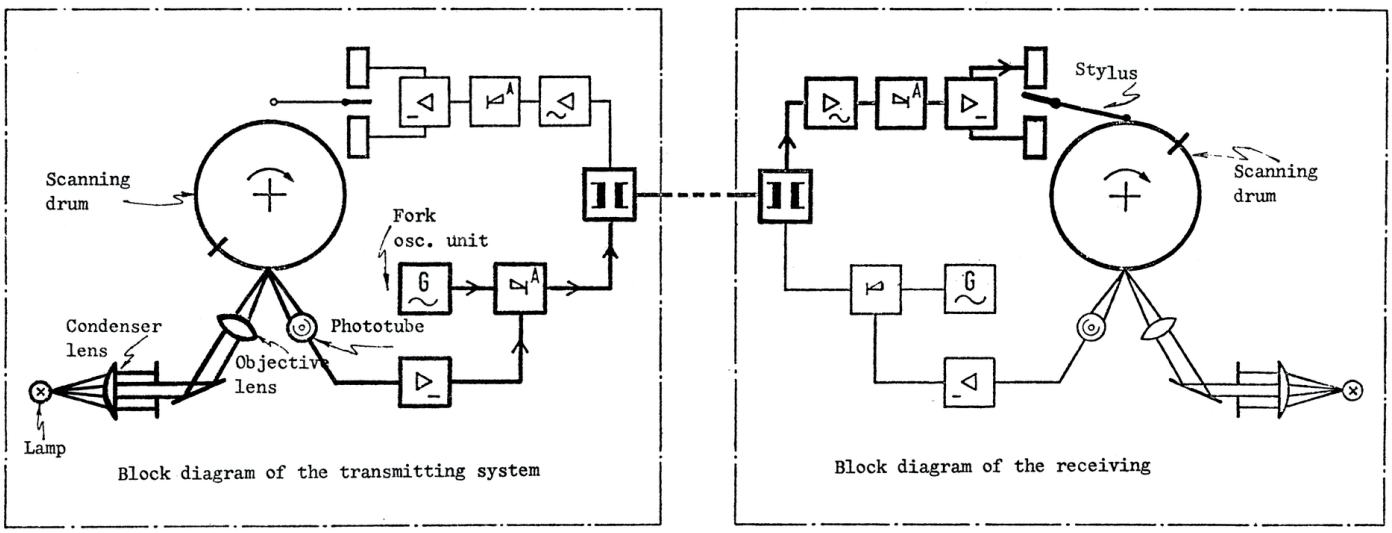
The article concluded that "the definition of the system is of course rather poor! The reasons for the use of a 50 pictures per second is of course to save many modifications to monitors etc, but a complete mechanical system would make a very interesting project. Higher definition is quite practical though I doubt if the system will catch on".

The second means of picture transmission was described by Professor Franco Fanti, an Italian amateur. He suggested that alongside radioteletype (RTTY) and slow scan television (SSTV), amateurs could experiment with using Facsimile (ie FAX) as a transmission mode. In this process, the (still) image was scanned, transmitted, received, and then displayed by a similar device at the receiving end, where the received image was put onto photographic paper or film, which was better at reproducing pictures or half tones (a process called photofacsimile, which was better at reproducing pictures than the purely mechanical facsimile machines).

The receiver was very similar, with the drum motor locked to a stable source in the same way, but instead of the photocell, a lamp was focussed by the lens onto the drum, where the light sensitive paper was fixed.



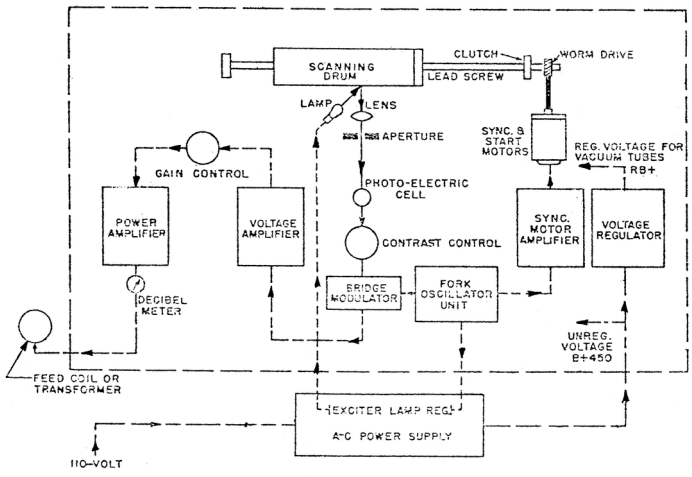
▶ *The receiver*



As with the low definition television, the image was scanned by a mechanical process - in this case a rotating drum. The block diagram showed the principles of the system.

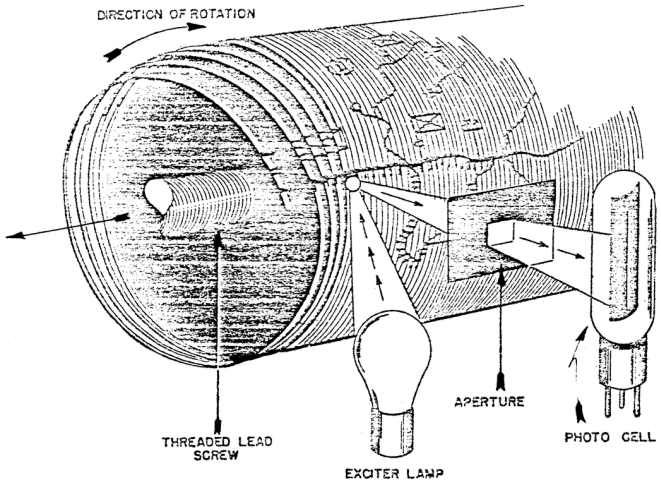
The transmitter comprised a light source that was focused onto the image to be scanned, with the reflected light being detected by a photocell or photomultiplier. The image to be transmitted was fixed onto a drum, which was scanned by rotating the it at 60 rpm (or a multiple of that).

At the same time the drum was moved laterally past the lamp and photocell, to create a similar series of lines to a television system. There were no sync pulses, however, just a 'start' signal, and the motor driving the drum was locked to a very stable fork oscillator unit.



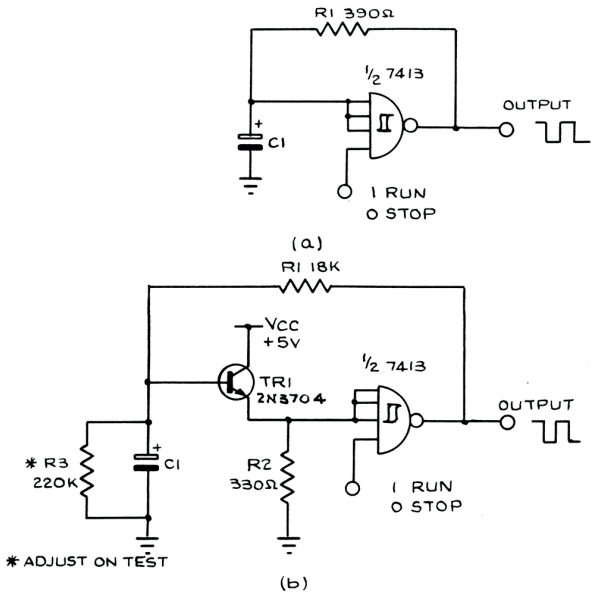
▶ *The transmitter*

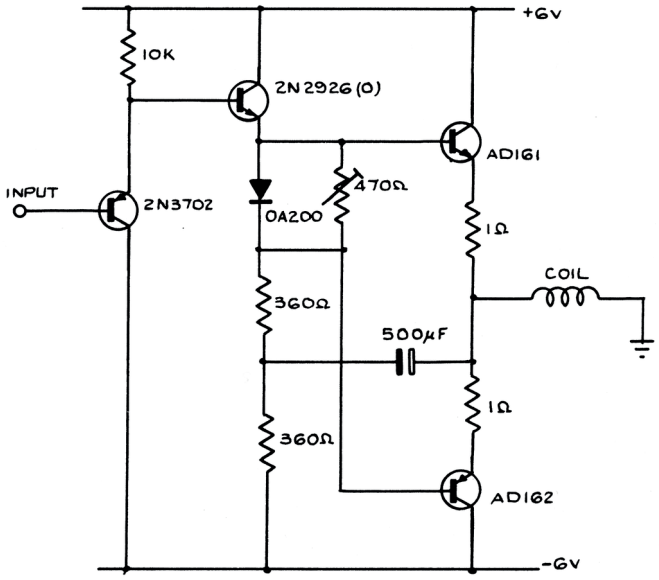
A closer view of the transmitting drum (the receiving apparatus being similar as mentioned above) shows the way in which the scan was built up, the lateral movement of the drum being produced by a treaded lead screw (in the same way as on a lathe). The drum was 152 mm in diameter, and (at least) 550 mm long. For testing, 'very strong signals could be received all over Europe' on the short wave bands from stations in Rome and Bracknell.



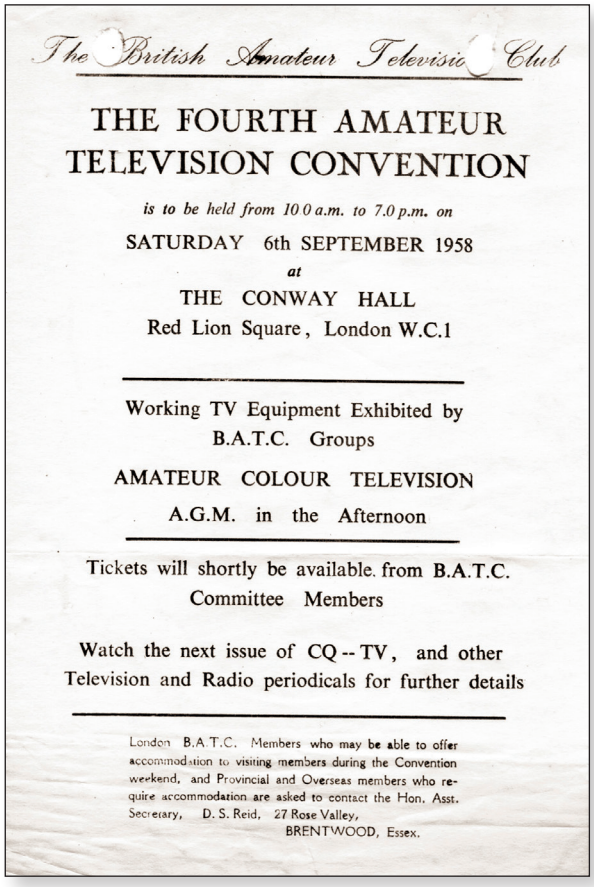
In the Circuit Notebook column, John Lawrence looked at using the 7413 Schmitt trigger integrated circuit as an oscillator. Several articles had made use of the device in this way, as in diagram (a), where the output can be turned on or off by a logic signal as shown.

However, for low frequencies, the timing capacitor was large (over 1000 µF for a frequency of 1 Hz), In diagram (b), the capacitor is buffered by the emitter follower stage Tr1, which reduced the size of capacitor needed for a 1Hz oscillator to about 10 µF. Altering the value of R3 would vary the mark / space ratio.





John had shown, in recent issues, several circuits for driving scan coils, and was able to add another, intended for slow scan working. It was designed to be driven by a sawtooth waveform from a unijunction transistor, offering a high impedance input so as not to load the oscillator (which could have led to a non-linear waveform), and then drive scan coils that had a resistance around 5 Ω.



The British Amateur Television Club

THE FOURTH AMATEUR TELEVISION CONVENTION

is to be held from 10.0 a.m. to 7.0 p.m. on

SATURDAY 6th SEPTEMBER 1958

at

THE CONWAY HALL
Red Lion Square, London W.C.1

Working TV Equipment Exhibited by B.A.T.C. Groups

AMATEUR COLOUR TELEVISION

A.G.M. in the Afternoon

Tickets will shortly be available from B.A.T.C. Committee Members

Watch the next issue of CQ-TV, and other Television and Radio periodicals for further details

London B.A.T.C. Members who may be able to offer accommodation to visiting members during the Convention weekend, and Provincial and Overseas members who require accommodation are asked to contact the Hon. Asst. Secretary, D. S. Reid, 27 Rose Valley, BRENTWOOD, Essex.

▶ *The invitation to the 4th Amateur Television Convention - 1958*

Hungarian DX-TV Reception

Dear CQ-TV editor

I'm a 73 years old Hungarian TV-DX and satellite amateur. My name is Navratil Ernő and I'm from Szigetújfalu.

From February 2022 I have received the es'Hail satellite from 25.8° East and have seen the television broadcasts from many British amateurs.

I'd like get to get an e-QSL Card from the BATC via eMail.

My interest began in summer 1972 and now it's 2022 so I have celebrated 50 years of reception.

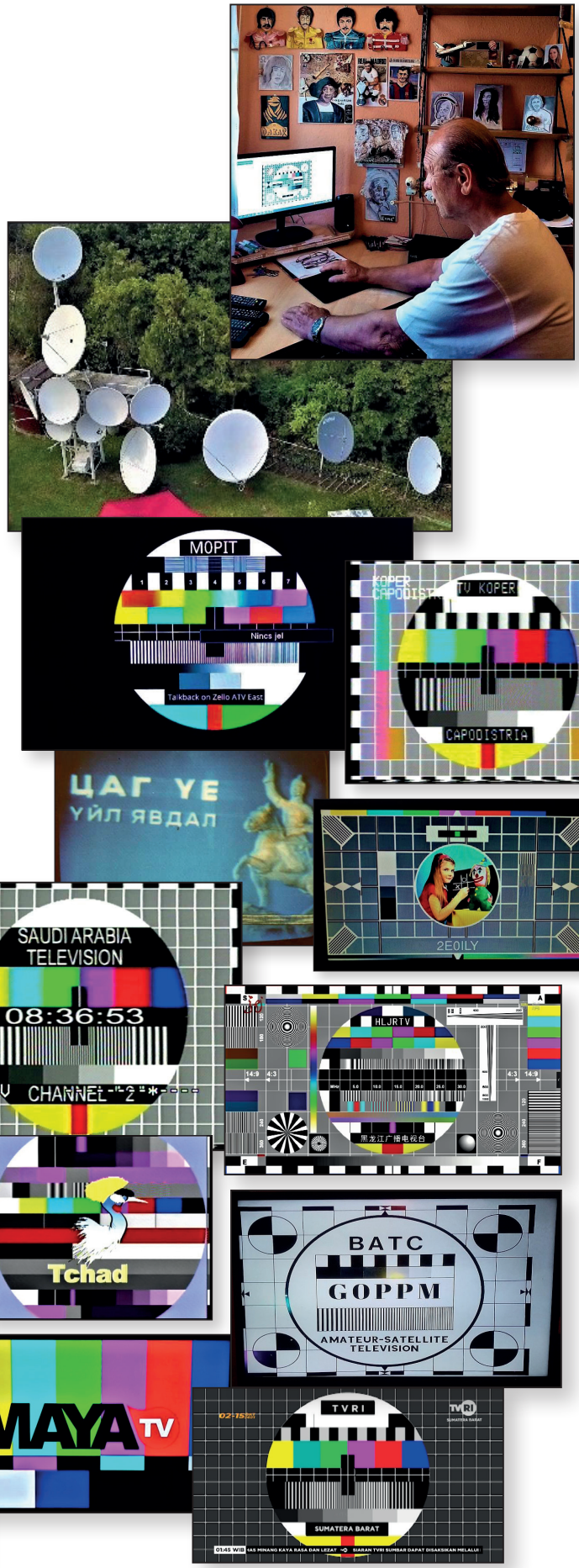
Signals seen include from Suisse La Dole city Monoscope FuBK, on test. +PTT SSR1 and my best successful receptions: Mongol Television (analogue reception in the Band One), but I have also received Jordan TV (JTV Amman), Syria TV (STC, Ortas Damas) and on the satellite Kamcsatka (Russia), 50 African nations, all Europe, Asia, south and central America, the NATO TV, the MIR Space Station, and ISS and the American Space Shuttle Missions (Hubble Space Telescope repairs). I can see every day the KU-Band, C-Band and X-Band broadcasts.

My equipment: 2 Parabola dishes and the receivers: Edision, Amiko, Optibox Anaconda, GT-Media. The down converters: Inverto Black Pro,and Inverto Black ultra, Inverto Red Pro. For C-Band: Inverto 17 K. Now I can use four antennas for X-Band (140cm, 150cm Fuba, 180cm Kathrein and 190cm Prodelin)

I send for you some photos of my QTH, aerials and my signals.

I wish you all the best and good work for broadcast and receptions.

Navratil Erno
TV-DX Amateur, Hungary



The British Amateur Television Club

Out and About

Rallies and events with a BATC stand: (subject to change)

8/9 October AMSAT Colloquium and RSGB Convention Milton Keynes – BATC Stand
(Ed:- Note date correction from previous issue)

14/15 October Newark Hamfest – BATC Stand

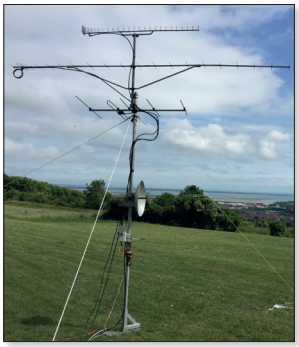
22 October BATC CAT 22 Part 2 Online

3 December Midland Microwave Round Table – BATC Stand and Test/Fixit

The most up to date status can be found on this RSGB web page: *https://rsgb.org/main/news/rallies/*

If you are able to help on the BATC Rally stands, please contact the BATC secretary.

Activity Weekends & Contests



2022 Activity Days:

8th and 9th October 2022 – 23cms and up

12th and 13th November 2022 – 70cms and 23cms

10th and 11th December 2022 – 2m and down and 23cms

Don't forget the 70cm and 6cm Activity Ladders running till 31st December 2022

The Christmas Repeater and Activity Challenges will commence on 24 December 2022 and run till 2 Jan 2023.

BATC Online

Website:	http://www.batc.org.uk
BATC Wiki:	https://wiki.batc.org.uk/
Forum:	https://forum.batc.org.uk/
Stream:	https://batc.org.uk/live/
Dxspot:	https://dxspot.batc.org.uk/
YouTube:	https://tinyurl.com/BATCYouTube