



The British Amateur Television Club

# CQ-TV

No. 280 – Summer 2023

The future of 23cms – update

ARISS International Meeting

How to connect the receiver and  
transmitter to the feed?

The Raspberry Pi disk imager

Cheapskate's "Stream Deck" alternative

Amateur television comes to the farm

Dish experiments for /P operation

My Shack - Dave, G8GKQ

The BATC HDMI video source

Signal Box



Photo: G8GKQ testing  
the IC-905 into GB3SQ

... and much more inside!

# CQ-TV 280



## Contents:

- 3 From the Chairman...
- 4 The Listing - new and renewing members
- 7 News from the Treasurer
- 8 Activity and Contests
- 9 The future of 23cms – update
- 10 ARISS International Meeting April 2023
- 13 How to connect the receiver and transmitter to the feed?
- 15 The Raspberry Pi disk imager
- 16 Cheapskate's "Stream Deck" alternative
- 17 Amateur television comes to the farm
- 19 Dish experiments for /P operation
- 21 My Shack - Dave, G8GKQ
- 23 Rechargeable battery for occasional use
- 25 The BATC HDMI video source
- 26 Signal Box
- 28 Norbreck Rally 2023
- 29 Turning Back the Pages

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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:  
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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'

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## From the Chairman...

*Martin Charman G4FKK*



As the evenings get longer and the weather stays dry I've been carrying on with the construction of my new workshop in the back garden.

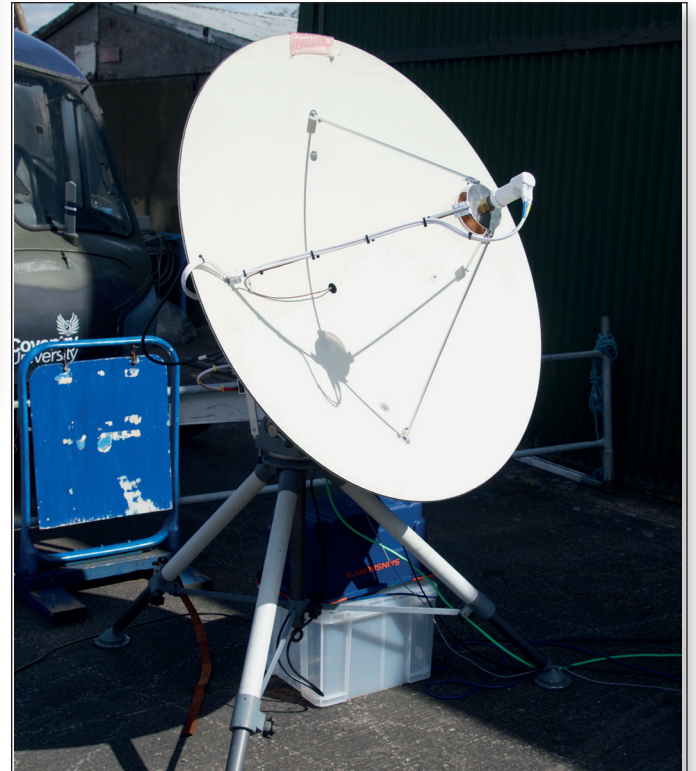
Ultimately I hope to equip it with a lathe, milling machine (CNC maybe?), and, at the very least, a pillar drill. It will also house my collection of ancient amateur radio equipment and also a TV area with proper lighting. The picture shows the roof taking shape last year.

In this edition of CQTV you'll find a guided tour of our treasurer's shack and maybe you'd like your own shack, workshop, or TV studio featured in a future CQTV.

Anyone remember "The Other Man's Shack" in Short Wave Magazine years ago? We're always interested in what other members are getting up to so please send articles, tips, tricks or other useful info to [editor@batc.tv](mailto:editor@batc.tv)

On the committee front, our marvellous Membership Secretary Rob, G8NXG, is planning on stepping down next year so if anyone would like to fill those shoes, please let me know by dropping me an email at [chair@batc.tv](mailto:chair@batc.tv)

Finally, don't forget CAT 23; back at the Midland Air Museum in Coventry on Sunday 6 August.



Jen will be setting up a QO100 demonstration station and Dave, G8GKQ, will be running a test-and-fix-it workshop. There will be the usual members' flea market and some traders too. There's also an informal dinner on Saturday evening, 5 August, at The Old Mill in Bagington. Dave, G8GKQ, will be taking bookings – probably on the BATC Forum.

Places are likely to be limited so book early to get a seat at the table.

As for entrance to CAT 23, Noel, G8GTZ, should have set up a ticketing system for members in the BATC online shop by the time this is published.

Tickets will be free to members and will also allow access to the Air Museum. I'm looking forward to seeing you all in August. 🗨️





# The Listing

## new and renewing members

Rob Burn G8NXG

Welcome to another list of members, both new and renewing, who have activated a membership subscription within the three months to 31 May.

I have nothing specific to report this time so this a short introduction. However there are a couple of very worthwhile mentions. Our membership numbers continue to hold up to around the 1450 mark and we also continue to attract members from many parts of the world.

Although known as the British Amateur Television Club that only indicates that the Club originated in Britain – it has always been open to TV amateurs overseas to join and contribute to the Club.

Once again, many thanks to all for supporting what must be one of the most unique radio clubs in the world! 📺

### Australia

Ross Pittard	VK3CE	Bendigo
Charles Andrew Cutler	VK3CAC	Berwick
Richard Carden	VK4XRL	Brisbane 4012
Michael Ampt	VK3CH	Doncaster
Andrew Wollin	VK4ZXI	Highland Park
Dennis Jurisinec	VK2ZRN	Menai Central
John Lukey	VK2ZUH	Sanctuary Point
Wayne Stringer	VK5BI	Seaton
Clinton Cann	VK6FCRC	Spencer Park

### Austria

Robert Kiendl	OE6RKE	Deutschlandsberg
Heinz Meschnark	OE8MEQ	St Stefan
Gerhard Burian	OE3GBB	Wartmannstetten

### Belgium

Alex Verhoeven	ON5NV	Deurne
Tim Schmitz	ON8TT	Herk-de-Stad
Geert Cruypelants	ON5AAS	Hombeek
Daniel Pannecoek	ON4DPM	Malderen
Patrick De Rocker	ON7ARQ	Merelbeke
Dirk Reyners	ON5GS	Oudsbergen
Luc Vlecken	ON4ALV	Sint-truiden
Thierry Wiame	ON4LTW	Temploux
Ronny Huybrechts	ON4RH	Tessenderlo
Vandewalle Yves	ON4YV	Vilvoorde
Guy Roelant	ON4BHM	Zelee

### Denmark

Ole Nykjær	OZ2OE	Horsens
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### France

Thomas Mlodzinski	F4HPX	Argenteuil
Pascal Peteil	F8AAV	Beaumont Sur Oise
Francis Picq	F6DES	Breugnon
Alain Fort	F1CJN	Carrieres Sur Seine
Jean Louis Barthel	F5AJJ	Dijon
Philippe Cavazza	F4BRC	Drancy
Teodor Gradinariu	F5VMH	Dreux
Pierre Desreumaux	F4JXP	Florange
Patrice Boyer	F1NSU	Gareoult
Robert Hauersperger	F1TZU	Hettange-Grande
Auvray Michel	F1ETU	Izy
Dominique Metayer	F1EJP	Le Grand Quevilly
Nicolas Fontaine	F4HTN	Montigny-En-Gohelle
Pierre Roussiere	F1FCO	Nîmes
Roland Etienne	F8CHK	Pabu
Pierre Marie Gayral	F5XG	Rurange Les Thionville
Jean-jacques Metay	F1HUS	Saint Herblain
Patrick Samson	F6GWE	Sainte-maxime
Jean-Marie Vallet	F6HBW	Veretz
Jean Claude Darge	F1HGJ	Veules les roses

### Germany

Josef Grimm	DJ6PI	Augsburg
Siegfried Jackstien	DG9BFC	Barenburg
Walter Plaschke	DB2BG	Bremen
Rolf Gerhardt	DG8AR	Bruchsal
Ferdinand Schmehr	DC8EC	Brunthal
Kaspritzki Hans	DG1HTS	Dessau- Roßlau
Dr. Ralf Siegmund	DF9JB	Duisburg
Norbert Wetzel	DF6IY	Gaggenau
Thomas Ehrhart	DF7PZ	Hoehr-Grenzhausen
Hans-Joachim Faber	DC7UG	Jever
Peter Nestler	DB4ZW	Langen/Hessen
Wolfgang Bürkner		Leipzig
Dietmar Austermuhl	DL1ZAX	Lohfelden
Klaus Hirschelmann	DJ7OO	Mainz
Hans-Walter Peters	DC5EO	Mönchengladbach
Andres Justus	DK2ER	Niederkassel
Gert Weinhold	DG8EB	Oelsnitz
Erich Jankow	DL6ZEW	Oschersleben



Hans-Peter Neuber	DD1IA	Pirmasens
Frank Schirpke	DL2GFS	Rottenburg am Neckar
Peter Quidde	DG2AAO	Salzgitter
Peter Quidde	DG2AAO	Salzgitter
Wolfgang Klein	DD1WKS	Schmelz
Rolf Lehmann	DJ7TH	Schwanau
Jan Engelen	DL6ZG	Selfkant
Ralph Mundt	DG4LX	Stuhr
Gottfried Sacher	DG3MU	Sulzberg
Per Malmbak	DC3ZB	Taunusstein
Guenter Bauer	DK9CL	Waldmuenchen
<b>Greece</b>		
Emmanouil Mantzatas	SV1BKE	Cholargos
Grigorios Smiaris	SV2RR	Kilkis
<b>Ireland</b>		
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Stephen Ormondroyd	EI4KM	New Ross
<b>Italy</b>		
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Bergamin Andrea	IU4GAV	Vignola
<b>Japan</b>		
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Hideyuki Aoyama		Narashino
Satoshi Yasuda	7M3TJZ	Sayama
Gregory Overkamp	JE1ICP	Shibuya-ku
<b>Kuwait</b>		
Yaser Malallah	9K2YM	N,W solybekoat
<b>Malta</b>		
Dominic Azzopardi	9H1M	Birkirkara
Stanley Grixti	9H1LO	Iz-Zurrieq
<b>Montenegro</b>		
Dragan Milosevic	4O6DM	Podgorica
<b>Netherlands</b>		
Rob Engberts	PA0RWE	Alphen A/d Rijn
Eric Post	PE1MIX	Best
Jack Hoogewerff	PA3AXO	Bosschenhoofd
Harry Paas	PA1AS	Brunssum
Jan Kok	PA3FRX	Bunnik
Martin Struijs	PE3MST	Burgum
Jeroen Bastemeijer	PE1RGE	Delft
Eric Oosterbaan	PA2EON	Den Dungen
Hans Baard	PE1NKP	Ede
OJM Baken	PE1PMD	Grou
Gerrit Nieuwpoort Jr	PD0RZJ	Hillegom
P.J. Halfweeg	PA0VAB	Hippolytushoef
Gerko van Doesburg	PE1OYF	Hoogersmilde

Harry Broersma	PA3GSI	Kootstertille
Benno Plantagie	PA3FBX	Nijeveen
Wim Meijerink	PA4EVR	Rijswijk ZH
Rob Storcken	PE1OQP	Stein
Rody Korthout	PD2RVK	The Hague
Fred Marinus	PE1EXM	Veghel
Maikel Sessink	PE1MSW	Winterswijk
<b>New Zealand</b>		
Kevin Ravenhill	ZL3KE	Christchurch
<b>Portugal</b>		
Jyrki Leppanen	CT1ALX	Perafita
Pedro Batista	CT2GVH	São Julião do Tojal
<b>Romania</b>		
Dan Robu		Brasov
Dan Bolboros	YO8RNP	Bucuresti
<b>Slovakia</b>		
Juraj Bujdosó	OM0ACE	Presov
<b>Slovenia</b>		
Bojan Majhenic	S52ME	Maribor
<b>South Africa</b>		
Ohan Smit	ZS1SCI	Durbanville
Johan Lehmann	ZS6JPL	Pretoria
<b>Spain</b>		
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Miguel Angel	EA1HXG	O Oural-Sarria
Eirabella Lopez		
<b>Sweden</b>		
Jan-Olov Gråsten	SM0VPJ	Sollentuna
<b>Switzerland</b>		
Luca Rovelli	HB9OBD	Barbengo
Pierre Andre	HB9AKP	Bremblens
Gossweiler		
Carl Conrad Maeder	HB9EFX	Hittnau
Kurt Steiger	HB9ZCF	Kloten
Pierre Binggeli	HB9IAM	Le Grand-Saconnex
Jean Perez	HB9HIT	Le Mont-sur-Lausanne
<b>UK</b>		
John Morris	G6PEP	Abingdon
Peter Wright	G8GYS	Andover
David Boocock	M0XMZ	Anstey
John MacDonald	MM0IEJ	Armadale
Norman Jacobs	2E0RKO	Arundel
Mike Berry	G1LWX	Ashton-in-Makerfield
Joe Bingham	G14TAJ	Ballyclare
Gary Whittaker	M1EGI	Barnsley
Chris Cole	G8FIG	Beaconsfield

Russel Tait	G5ART	Beausale
Paul Breck	G7EWS	Beckenham
Graham Bailey	G1ZTJ	Bideford
Andrew Jackson	M1AAS	Birkenhead
Ian Gordon	G8IFT	Birmingham
Phillip Weaver	GW4ROV	Blackwood
Elliot Riddle	M0JBY	Braintree
Martin Newell	G8KOE	Bridgwater
David Atkinson	G8DRE	Brightlingsea
David Stone	G8FNR	Bristol
Gareth Evans	G4XAT	Bromley
Graham Jefferies	M1ASR	Broomfleet, Brough
Simon Edwards	GM0SCA	Broughton
Art Smyth	G3XNE	Bude
Steve Haseldine	G8EBM	Burton on Trent
John Marsden	G8PEF	Bury
Peter Mc Farland	GW7BZY	Caernarfon
Brian Shaw	G6HFS	Cambridge
Terence Cross	GW4LFW	Cardiff
Martin Charman	G4FKK	Carshalton
Peter Day	G3PHO	Chesterfield
Peter Braidwood	M1TCP	Cirencester
Philip Richardson	G8MLA	Coldham
Martin Butler	G8KTX	Coventry
Alan Ash	G3PZB	Cowes
Brian Dinsdale	G4CJS	Cramlington
Konstantin Dimitrov		Dartford
Rob Southerington	G0IOZ	Derby
Mike Stevens	G8CUL	Didcot
Robert Harris	G4APV	Dronfield
Mick Worsfold	G4PRJ	Eastbourne
Anthony Parker	G4AXN	Great Yarmouth
Tony Wilson	G6ZAC	Guildford
Leslie Dodd	G7VTC	Hallaze
Mark David	G4MEM	Harrogate
David Warwick	G4EEV	Harrogate
Peter Ransom	M0SFZ	Harrow
Paul Bunnage	G8SVE	Havant
Wyn Griffiths	MW0AQZ	Holyhead
Roger Tuffin	M0TJK	Hove
Mike Bues	G8AAI	Ipswich
George Brutnall	G4PAV	Irchester
David Hensman	M7CSF	Kenilworth
Carolyn Williamson	G6WRW	Kidderminster
Dr Bill Ward	GM0ICF	Kilwinning
David Richards	2E0KSF	Kings Lynn

Peter Elms	G0IJU	Kings Lynn
Graham Denton	G8VAT	Knottingley
Jeremy Harmer	M6IGP	Leeds
Matt Melling	2E0YML	Leighton Buzzard
Ian Hutchinson	M0LIH	Lincoln
Bernie Wright	G4HJW	Little Wilbraham
Dafydd Walters	M0WDV	London
Chris Wilson	2E0ILY	Lower Heath
Daniel Mc Dowell	EI8ICB	Luton
Richard Ellis		Macclesfield
Adrian Hope	G0ACZ	Matlock
Anthony Pearce	G0AZQ	Nafferton
Nigel Reeve	2E0EHH	Nottingham
Ed Magnuszewski	G6UAP	Nottingham
Tony Tyrwhitt-Drake	M0TDK	nr Beccles
Stephen Catlin	G8HLM	Oakham
Iain Coates	GM1MSS	Peebles
Martin Rigby	G4FUI	Penrith
Marcus Bowman	GM4LVW	Prestwick
Barry Knight	G7MSC	Ripple, Nr Deal
Laurence Cook	M0LDZ	Rochdale
Ray Hill	G6TSL	Ross On Wye
Ian Tickle	G4ZJH	Saxmundham
Nigel Smith	G4EQD	Scunthorpe
Matthew Dronfield	G6BNT	Sheffield
B Barker	G4VRT	Sheffield
Richard Harris	M0TUW	Shepton Mallet
Sam Whitehead	M0SJW	Sidcup
Henry Neale	G3REH	Spalding
Keith Le Boutillier	GU6EFB	St Andrews
John Newman	G0VDU	St Austell
Stephen Thompson	G8TNA	St Austell
Andrew Ellis	M1DNS	St Stephen St Austell
Warren Dibden	G6OXW	Stockport
Nigel Evans	M0NDE	Stoke on Trent
Drew Belcher	G7DMO	Stourbridge
Chris McCarthy	G3XVL	Stowmarket
George Quarterman	G3NHX	Sutton
Tim Clark	MW0RUD	Swansea
David Hazell		Swindon
Ray Gathergood	G4LUA	Tadley
David Wright	G3XOU	Tavistock
Peter Wallace	G1OAR	Telford
Martyn Vincent	G3UKV	Telford
Chris Pegrum	M0NAY	Tunbridge Wells
Mark Scott	G7IRN	Wadhurst



Warrington ARC	G0WRS	Warrington
David Edwards	G8BFV	Wells.
Chris Foote	G8IPN	Weybridge
Paul Coddington	M1BKL	Whitchurch
Sean Finch	2E0SAF	Wigan
Keith Brooks	G0SPH	Winsford
William Davies	G4YWD	Wirral
Stephen Head	M7SCH	Woking
Peter Hampton	G4ADJ	Worcester
Andrew Hearn	G3UEQ	Worthing
<b>US</b>		
Kurt Geisel	N3JTW	Bellevue
David Frackman	KD2ZDZ	Brooklyn
James Andrews	KH6HTV	Broomfield

Mike Bagstad	KB0OZN	Columbia Heights
Thomas Taft	KA8ZNY	Columbus
Greg Beat	W9GB	Elmhurst
August Merker	K3TAZ	Finksburg
Mike Irving	N6BYH	Fresno
Allen Vinegar	W8KHP	Hebron
James Edelen	KA3KIU	Jamison
Bryan Herbert	KE6ZGP	Las Vegas
Ron Wright	KA5LUG	Natchitoches
Ed Mellnik	WB2QHS	Portland
Andrew Spencer	KA5BBC	Tulsa
Laurence Howell	KL7L	Wasilla
John Greusel	KC9OJV	Winfield

## From the Treasurer

I'd like to thank Tony G3UIS for being first to volunteer to examine the 2023 accounts. Also to the two other volunteers - it's good to know that there are a few people available for the task.



### BATC shop sales at rallies

For many years, sales at rallies have been limited to cash transactions. Following initial trials of our card reader machine, we will now be able to take payment by credit card at future rallies.

To reduce the burden on our volunteers, we will not be accepting cash as long as the card machine works as planned. 📱

*Dave, G8GKQ  
BATC Treasurer*

## In the next edition of CQ-TV...

Dave, G8GKQ will be putting the Icom IC-905 through its paces from an ATV perspective and giving us the complete lowdown on Icom's latest rig.

**Do you have an article to contribute to the next edition? Copy to the Editor before the 14th September please.**



# Activity and Contests

Clive Reynolds G3GJA



## Contests

### IARU International ATV Contest

I have received four logs so far. Please remember to send your log files to [contests@batc.tv](mailto:contests@batc.tv) as soon as possible. The best DX reported was between Rob, M0DTS/P, in IO94LI to PE1CVJ in JO22KG, a distance of 455km; Rob completed with Lex both ways on 70 and 23cms; MERs were 13 and 14 respectively.

It was especially pleasing to see the callsign G7AVU appear in the logs again. Bob was taken ill almost two years ago and is recovering well. We all wish him well in endeavours to get back on the air with ATV

## Ladders

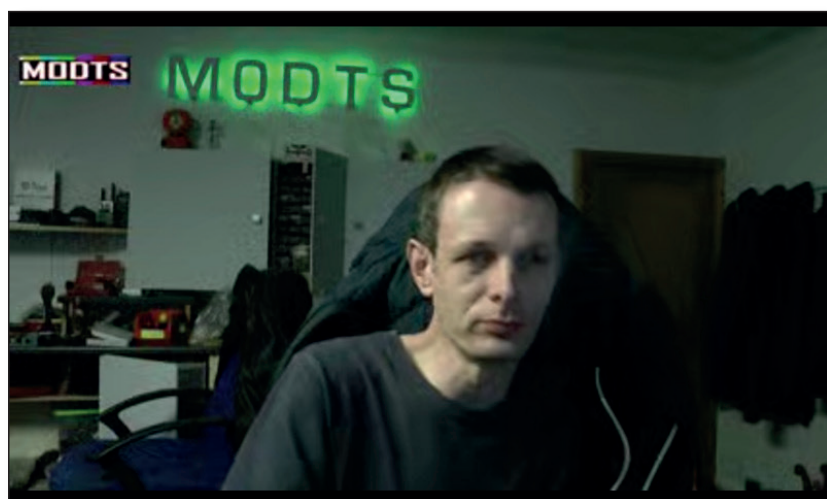
The 6cm and 70cm Ladders are running again this year. Please support these activity initiatives.

See <https://batc.org.uk/contests>

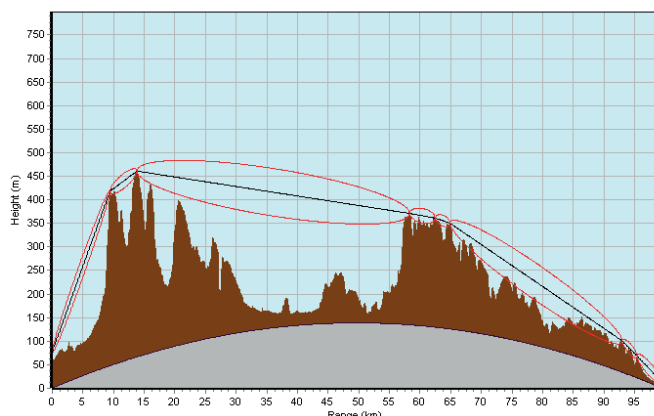
## Activity reports

Tropo enhanced paths around the extended high pressure during the week leading up to the IARU contest produced some good DX. For me, the lift appeared to be best along the North Sea Coast. GB3EY was accessed three nights in a row by Rob using just 20W in IO94IL over a very obstructed path. Ok, he was using his 3m dish but still an achievement of note.

For the first time I was able to work Rob M0DTS on 23cm from his home QTH. I was running 50W and a 48el loop yagi and Rob was still on 20W and the dish. Symbol rate was dropped to 125k/s and the FEC was 1/4.



► As received at G3GJA on 23cm. QRB 100.6km



► Path profile IO94IL to IO93TR

With the North York Moors reaching 1300 feet about six miles from Rob, it's surprising the duct was accessible. Alan, G0KOO also managed to get some FM ATV into Hull for my first analogue contact for many years.

Jaap, PA0T reports "Rob's DX record on 144 MHz is four times broken last week by the other Rob PE1ITR. The record is now 695 km two-way between Rob HB9/PE1ITR in JN47CF and PI4GN in JO33HJ. DVB-S, 125, 1/2. So, we did make some history. No tropo at all, only Aircraft scatter".

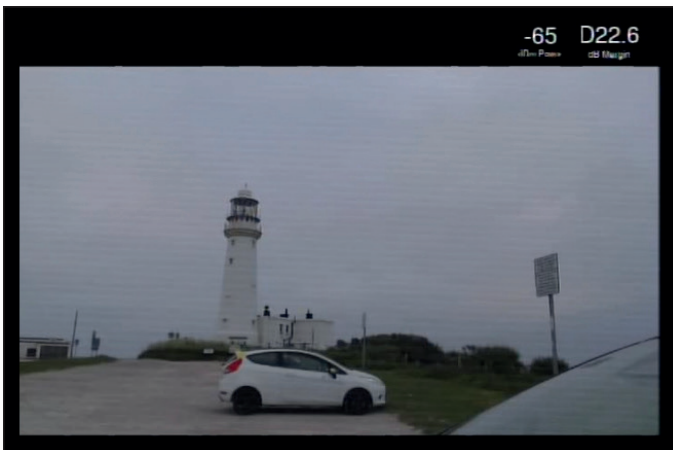
Jaap also reported some attempted ATV EME operation using the Dwingeloo 25m dish. Signals were seen 5dB above the noise but were too distorted to decode.

The May Activity Weekend saw some good portable operation. Rob M0DTS was out on the Moors again and bagged G0KOO, G3GJA, G4YTV and G1LPS on 23cm. G4EEV/P was on the Pennines near Pately Bridge.

On 23cm, Dave made a 23cm contact over 94km, scaling the Yorkshire Wolds into Hull with just 4W.

Dave also made a trip to Flamborough Head, north-east of Bridlington later in May. From there he accessed GB3EY with a good signal. The grey background as seen in the photo below was typical of the weather along the North Sea coast during the time that the high pressure was to the west of the UK.





► G4EEVIP (Flamborough Head) via GB3EY

Whilst the rest of the UK was basking in the sun and getting a bit of tropo, the easterly breeze was dragging in low cloud off the North Sea making it cold and miserable. Definitely not conducive to enhanced propagation or portable operation. 🌧️

### Activity Weekends reminder

- Jul 15th/16th Activity Weekend - 6m & 4m + 23cm (Es Special)
- Aug 19th/20th Activity Weekend - 6m, 2m, 70cm & 23cm (coincides with Veron event)
- Sep 16th/17th Activity Weekend - 13cm & Up + 23cm
- Oct 14th/Oct 15th Activity Weekend - 2m & Down + 23cm
- Nov 11th/12th Activity Weekend - 70cm & 23cm
- Dec 9th/10th Activity Weekend - 13cm & Up + 23cm (coincides with Veron event)

## The future of 23cms – update

Noel Matthews - G8GTZ



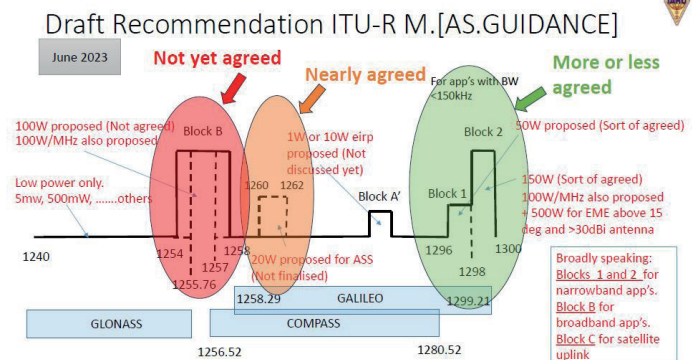
As hopefully everyone is aware major changes to amateur access to the 23cms band are set to be agreed at WRC23 in October.

Barry G4SJH is leading the IARU negotiation team and gave an update at the RAL microwave roundtable on Sunday June 18th.

For the full background to the changes watch the video of Barry's presentation at the Martlesham microwave roundtable <https://www.youtube.com/watch?v=0DnXrmj0Hk>

The changes are significant and there will be a stringent power limit (less than 1 watt) to the majority of the band apart from 4 segments seen below. Negotiations are still ongoing and nothing will be decided until after the WRC – it is hoped there will be a segment centered around 1256MHz to accommodate digital repeater inputs and simplex operation.

It is important that everyone prepares for these changes so they do not come as a surprise when Ofcom update your license - we will try post the latest updates on the BATC forum here: <https://forum.batc.org.uk/viewtopic.php?f=91&t=8436&p=33718#p33718>



**Whatever agreement is made, FM ATV operation will no longer be possible below 1300MHz and it is likely the IARU and BATC contest rules will be amended before the end of 2023 to exclude FM entries on 23cms.**

# ARISS International Meeting April 2023

*Graham Shirville G3VZV*



For many years delegates from the international ARISS community have held annual face to face meetings in various locations around the world. These meetings have enabled the various technical and programme teams to discuss and agree future plans for both hardware being carried in the ISS and the actual schools contacts.

Presently there are more than 60 school contacts being undertaken worldwide every year. A total of 68 different countries have had at least one ARISS school contact over the years and more than 1500 schools have had successful contacts.

Covid did, of course, put a stop to these F2F meetings and for the past three years they have been held online (or “ear to ear” as they have been described).

Last autumn it was decided to restart the hybrid F2F meetings and the first one has just been held. The venue was to return visit to the “Escape” facility at ESA-ESTEC in the Netherlands and some 18 delegates from Europe, America and Europe attended with others on-line from elsewhere in Europe, America, Canada and Australia.

The ARISS - Europe team is led by Oliver Amend DG6BCE together with Ciaran Morgan M0XTD, Emaunuele D’Andria IOELE and Bertus Husken PE1KEH.

This year’s meeting was hosted by Oliver and led by Frank Bauer KA3HDO who is chair of the US and International organisations.

The UK was “represented” by Ciaran M0XTD, Graham Shirville G3VZV and Phil Crump M0DNY.

The agenda for the three-day meeting included discussions on:

- ▶ Liaison with, and training of, all the future astronauts, including those flying with commercial organisations such as Axiom who have already completed one mission to the ISS;
- ▶ Planning future schools contacts post Covid. These discussions included debate about how to enhance the experience for schools before, during and after the actual QSO and the use of telebridge stations and even multi-point telebridge networks;
- ▶ Planning for a possible 40th Anniversary Conference potentially to be held near the NASA Kennedy Space Center early in 2024. This will celebrate 40 years of Amateur Radio on human spaceflight vehicles.

Frank described some of the new projects presently under way. These include SPARKI, the Space Pioneers Amateur Radio Kit Initiative which consists of various components to teach basic radio science principles.

Also \*STAR\* - Space Telerobotics using Amateur Radio and also “Student On Orbit Sensor System” (SOOSS) is a proposed enhancement to the ISS ARISS Station and comprises of a Raspberry Pi based solution with a number of additional sensors.

He also stressed how important it will be to recruit some new, and younger members to the international ARISS team. He reminded everyone of the possibilities that exist for the programme in future. A recruitment poster, with

an image of the installation of the ARISS antennas onto the Columbus module, is shown here.

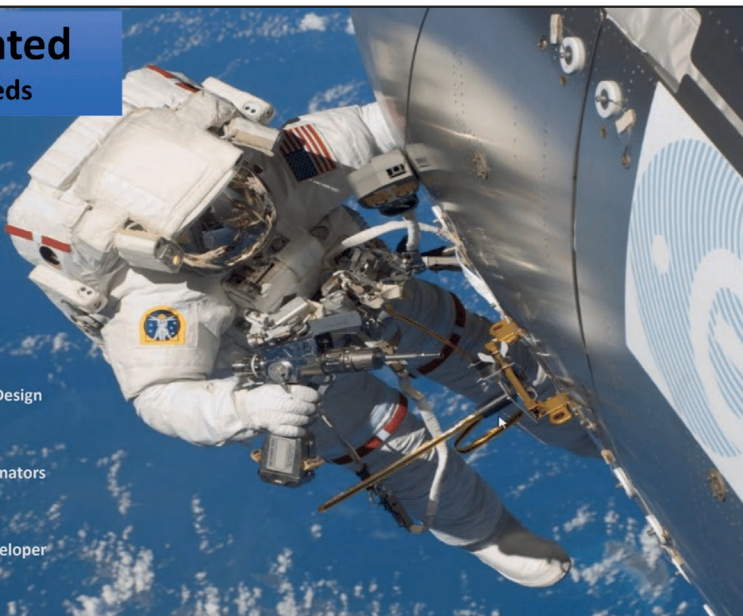
In terms of hardware on the ISS, there are now interoperable stations established in both the Russian segment and in the Columbus module with the multi-voltage power supply systems providing power for each.

The SSTV system has been inactive for some time due to equipment difficulties and investigations are under way to develop a new system possibly based on a digital system for enhanced performance.

## Help Wanted

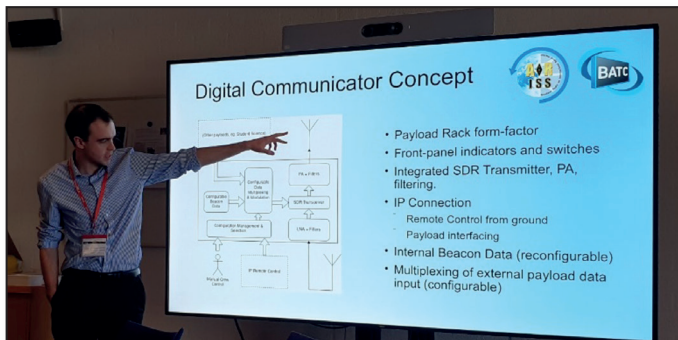
### Immediate Needs

Social media  
Video Production  
Operations Support  
Electrical & Mechanical Design  
Ham TV Ground stations  
School Group Mentors  
Education Project Coordinators  
Education committee  
STEM Education Support  
Fundraiser/Business Developer  
Administrative support





The HamTV system that was first used by Tim Peake during his Principia mission in 2016 and subsequently by other astronauts failed in flight in 2019 and was brought back to earth for repair. It is now, at last, after comprehensive testing, ready to be sent back to space and is manifested to fly on the Antares NG19 mission. This is presently scheduled to launch in July this year and will hopefully be reinstalled and re-commissioned not long after.



Phil, M0DNY presented a paper showing the BATC plans for a new transport stream merger system. This provides for the reception of the S Band DVB-S signal to be received by multiple ground stations and for the "best" one to be selected for display at the school and on the internet.

This ensures a much more reliable system that would be possible with individual stations and will probably require servers in three locations worldwide to ensure the best possible experience.

He was also able to announce that Goonhilly Earth Station have reached an agreement with BATC and AMSAT-UK to make available their 3.8 metre dish GHY99 for ARISS HamTV contacts.

This is great news and Phil was able to demonstrate the new rack mounted receiver that has been built for the operation. This is expected to be installed on-site for testing within the next few weeks.



► The new DVB-S receiver from HamTV reception at Goonhilly  
Image@MOXTD

ARISS-2 is the heading covering the opportunities that we have for the future including "Beyond ISS". In the future. There should be possibilities of having equipment in lunar orbit on the Lunar Gateway missions, or even on the lunar surface and, potentially, on commercial space stations.

As the link budget for transmission to and from lunar distances is much different than from the ISS, a team from BATC and AMSAT-UK have worked on some ideas for a Digital Communicator. The SDR based "Digital Communicator" is a Proof of Concept design intended to demonstrate what is possible with a SDR and small computing platform such as the Raspberry Pi.

Phil demonstrated the capability of the Digital Communicator to simultaneously transmit data, voice and video in low or high data rates.

At the end of the meeting, the delegates were able to inspect the full-size Columbus mock-up in the Erasmus Centre which is a building a few hundred metre away from where we were meeting.



► The delegates visiting the Columbus mock-up in the Erasmus Centre  
Image:KA3HDO

Additionally, we were also able to visit the ESA Education VHF and UHF ground station which is in the same building. This was installed as part of the GENSO ground Station Network back in 2006/2007 and is now in use with the SatNOGS system. Originally specified by, among others, G3WGM, G3VZV and PA9N, it is still working well 17 years later.



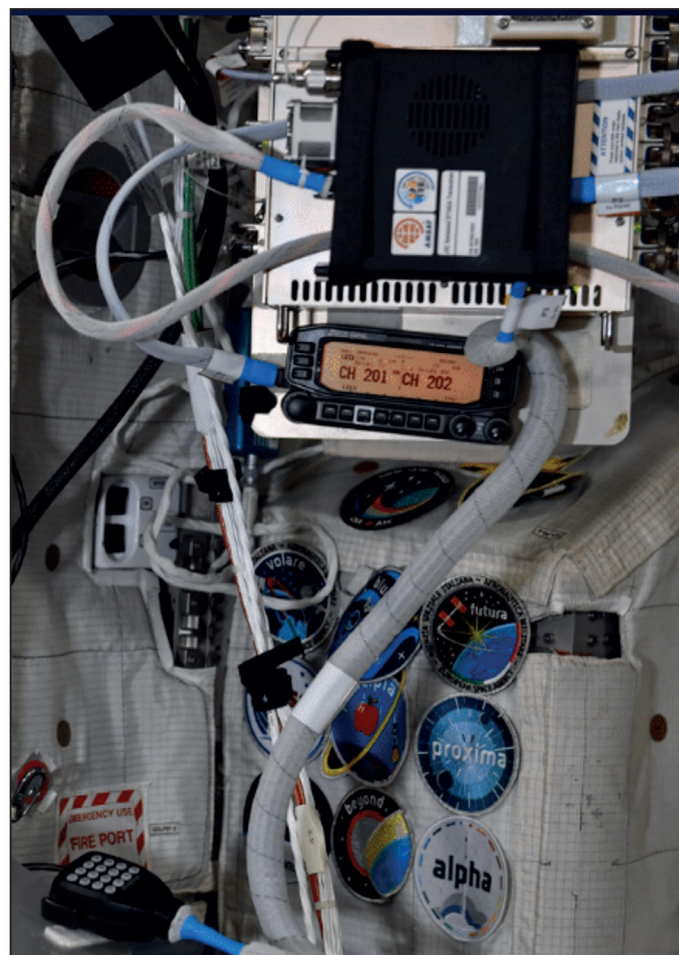
► The ESA Education Ground Station in the Erasmus Centre.  
Image: KA3HDO



Full information about current ARISS activities can be found here <https://www.ariss.org/> and when HamTV becomes active again then look here for more info <https://live.ariss.org/hamtv/> 📡



## Amateur Radio on the International Space Station



► The Erasmus Centre with the VHF and UHF antennas just visible on the roof! Image:ESA

► The current VHF & UHF equipment in the Columbus module. Image:NASA







# How to connect the receiver and transmitter to the feed?

Chris van den Berg PA3CRX

For my first steps in the 24 GHz band I bought a surplus Eyal-Gal module.

It only needs a local oscillator of half the frequency and the IF is in the 13 cm band and all with SMA connectors.

However, the output and input connections for 24 GHz are waveguide openings in the module.

To start with no big deal, I made two small horn antennas (see CQ-TV 271) and made the first contact with this station.



► 6 cm dish (with ATV station) on top of the 24 GHz ATV station



► Two horn antennas directly mounted on the Eyal-Gal module

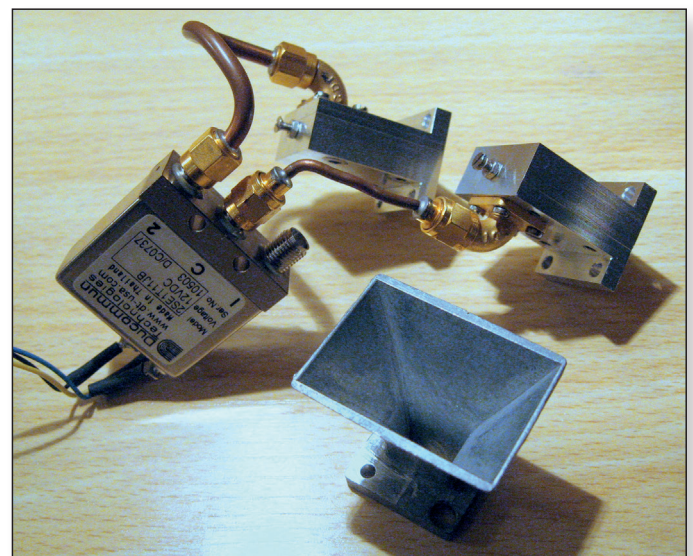
While portable, having my 6 cm station with me, I gave it a try to lay the dish (including the 6 cm station) on top of the 24 GHz station. The 24 GHz horns then are positioned on both sides of the 6 cm feed. This way, the dish acts as an offset dish.

After finding the correct elevation, it proved it gave a lot of gain. However, the pointing direction was (of course) not the same as without the dish. And after every switch over from transmit to receive the antenna had to be realigned again. Logically, both horns are not in the focus point of the dish; one left of it and one right of it. The radiation direction is therefore different for transmit and receive.

Then I found on a rally a small camping offset dish that I bought. The intention was to use it with the 24 GHz station but how to feed it?

First thinking about a circulator instead switching the signal. Everything to be connected to the circulator. The expected isolation between the ports of a circulator is about 20 dB if everything is terminated correctly. However, this will be much less if not terminated correctly. Then the total power of the transmitter could be forwarded to the receiver, so a bad idea.

My friend also have the same module, he choose to go for waveguide to SMA adaptors, a coax relays and a horn feed, all connected with pieces of semi rigid coax.





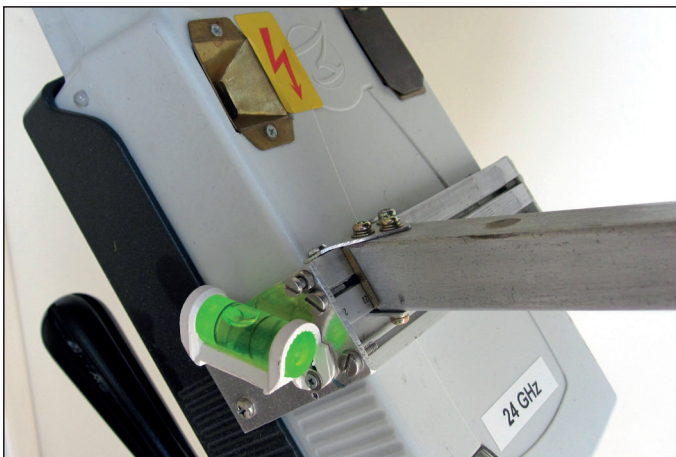
I was more in for a mechanical solution to get the wanted horn in the focus point.

Thinking about a kind of revolver system that I had seen in the EME world (with the feed for individual bands rotatable at the dish focus) it would be a heavy construction. And my dish was much lighter than the whole station.

So I decided to have the station with horn antennas as a stable factor and made it possible to adjust the dish in front of the wanted horn.

The result was a piece of rails of a 19" rack, that has a sliding strip in it. I positioned it with plates and screws in a way that the focus point of the dish was exactly in the correct place of the horn. At both ends of the rails I added screws as 'end stops' to limit the total sliding range of the dish.

The sliding range is set to exact the distance of the centres of the two waveguide openings.



At the first test it was a bit searching for finding the other station because first the correct elevation must be found. When the correct elevation was found, I fastened a level for easy setup next time.



What I also did; a small openable metal plate on the receiving horn. I am not sure how much transmitting signal would go to the receiver without it, just as precaution. However, it needs an additional operation while switching from transmitting to receiving; slide the dish, operate the horn cover, switch the electronics.

However, received signals could be so strong that I once received the other station with the horn still covered with the plate so does it really protect the receiver the way it's intended?

### Conclusion.

Using adaptors with a coax relays will give some attenuation but makes operation easy, just switch from receive to transmit.

Sliding the dish by hand is an easy and cheap way to get the feed in the focus point. For the few times during portable experiments this is doable, despite the additional proceedings. If the dish is the stable factor, the station could be made slidable.

When a contact failed, it had often to do with forgetting something, like sliding the dish. 🗣️

► Eyal-Gal module info:

<http://www.rfdesign.co.uk/microwave/Content/Eyal%20Gal%2023GHz2.pdf>

## Jamboree on the Air 2023

Are you helping a local Scout group get on air for this annual Scout event? Or would you like to demonstrate TV at a local event to you?

JOTA attracts over half a million participants worldwide and takes place over the third full weekend in October (21/22 in 2023). If your local group is involved, please contact the Editor with details in time for the next CQ-TV so we can publish a list of active groups.

The UK Scout Association headquarters will be hosting 3 stations at Gilwell Park (Epping Forest), Youlbury (Oxford) and Broadstone Warren (Sussex)..



# The Raspberry Pi disk imager

Dave Crump G8GKQ

The Raspberry Pi foundation have recently released a simple disk imager for preparing SD Cards for use in the Raspberry Pi.

As use of Win32DiskImager has recently become problematic on Windows 11, and some of the more recent BATC builds require an additional file to enable ssh, the new tool makes things much easier.

You can download the tool from this page  
<https://www.raspberrypi.com/software/>.

Once installed, open the tool and make sure that you have an SD card in a card reader connected to your computer.



Start by selecting "choose storage" and select your SD card. Then select "choose OS".

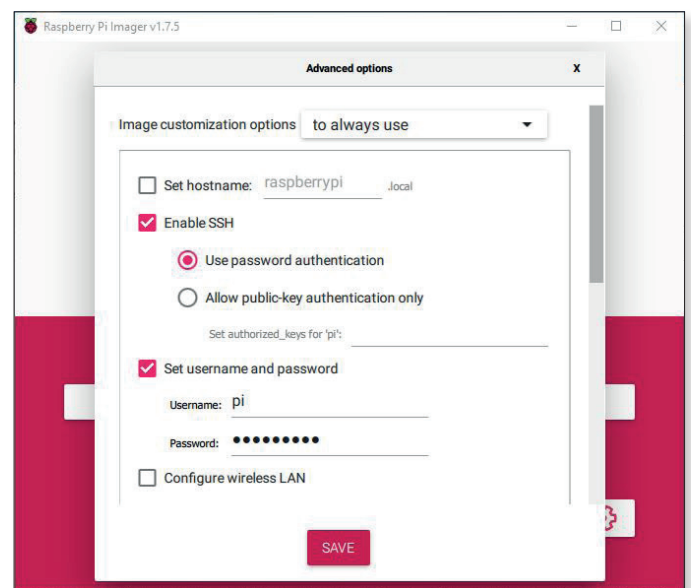
For all current BATC projects, you will initially need to select "Raspberry Pi OS (other)"

On the next menu, for Portsdown 4, Portsdown 2020, Ryde and the composite video source you should select "Raspberry Pi OS Lite (Legacy)"

For WinterHill, select "Raspberry Pi OS (Legacy)".

For the BATC repeater controller and the HDMI video source, select "Raspberry Pi OS Lite (32-bit)".

Before you click "WRITE", click on the cogwheel and set the tool to "Enable SSH" using password authentication, and to use the username pi with the password raspberry. Then press SAVE.



You can then click "WRITE".

At the end of the write, you can simply unplug the SD card to put it into your Raspberry Pi. After it has booted, expanded the file system and rebooted, you can log in by ssh and paste in the three lines from the install instructions for your project. 🗨️

► Sunrise, M0DTS style  
 (It's midnight, on the longest  
 day as I finish this edition  
 of CQ-TV - ED)







# Cheapskate's "Stream Deck" alternative

David Shaw M5TXJ

## OBS control for under a tenner.

Like I suspect many others using OBS I didn't find using the mouse and keyboard the easiest when it comes to swapping sources etc so I kept an unsuccessful eye on eBay for a Stream Deck at a reasonable price.

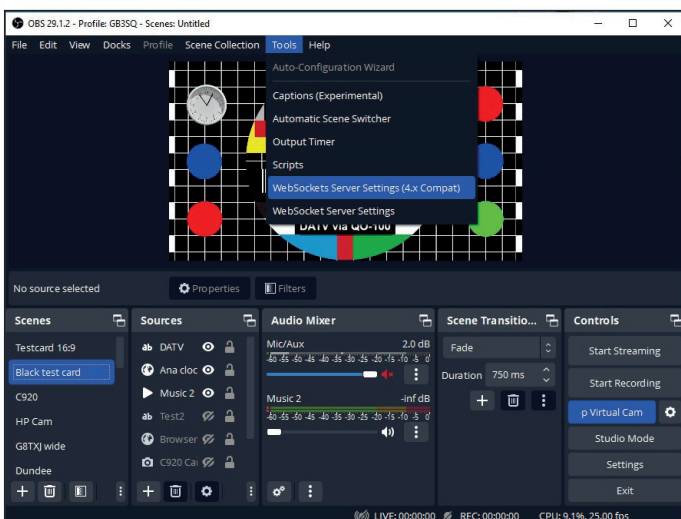
One day I accidentally typed Stream Deck into Youtube search instead of Google and lots of videos about alternatives were listed. Many of the results interested me, however using an Arduino and a touchscreen or building a custom keypad and the resulting sourcing suitable case etc made finding a second hand Stream Deck more appealing.

I then found "Nutty" a rather eccentric Youtube video producer and a video entitled "Turn ANY Keyboard Into A Stream Deck" (1), of course I had to watch and this led to another of his videos "How I fixed the Stream Deck" (2).

Eccentric he certainly is, but I was intrigued, was this something I could use, a USB key-pad was ordered from eBay for the vast sum of £3.50 and I downloaded the software in anticipation of its arrival.

The first software you need is "NOOBS Commander" (3) which you download and unzip to a folder of your choice. All this is clearly explained in the videos mentioned above.

Here is the only stumbling block that I found, you need to activate the OBS websocket in the Tools menu.



If you are using OBS v28 or newer you have to download legacy websocket v4.9 (4) as the native OBS websocket only recognises IPv6 not IPv4 as used by NOOBS Commander.

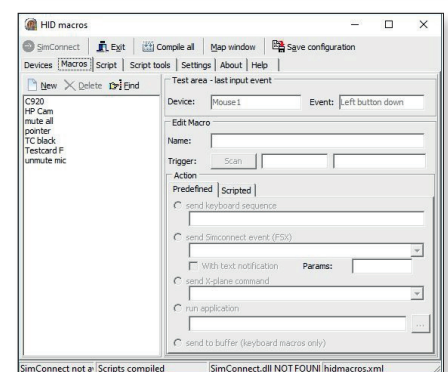
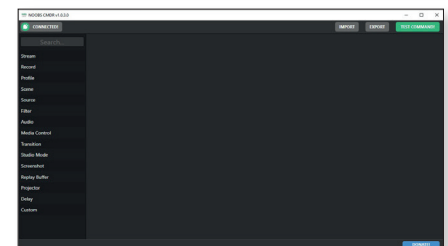
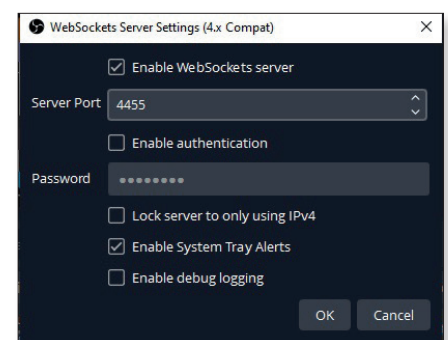
Once installed enable the legacy websocket and make a note of the port settings as you may have to edit the NOOBS Commander config file to suit, I'd recommend checking that the native websocket is not enabled to avoid conflicts.

The first time you run NOOBS Commander, run it as admin, this is explained in the "How I fixed the Stream Deck" video, you should be greeted with the screen below. If you do not get the "connected" sign then check the port settings for the websocket.

I'll not go into creating the macros as that is explained well in the video, but having got this far it's time to download and unzip HIDMacros v2.3 (5) which again should be run as administrator the first time.

You're now ready to go with all you need, you may want to watch the videos a couple of times just to make sure you're doing things right but there's really nothing difficult.

Have fun - that's what this hobby is all about.



## Links

1. [https://www.youtube.com/watch?v=jdl\\_LePIK3o](https://www.youtube.com/watch?v=jdl_LePIK3o)
2. <https://www.youtube.com/watch?v=lx3QqZHR6IY>
3. <https://obsproject.com/forum/resources/nuttys-official-obs-commander-noobs-cmdr.1178/>
4. <https://github.com/obsproject/obs-websocket/releases>
5. <http://www.hidmacros.eu/HidMacros.zip>



## Amateur television comes to the farm (eventually) *Colin Watts, G4KLB & John McCarthy, G7JTT*



A wise old army sage once said never volunteer for anything, keep your head down, and get home safe.

Maybe not what you'd expect to hear in amateur TV circles but what started as a simple demonstration at a spring fayre turned into an epic production and technical challenge for Colin and John.

Previously, Colin had been asked by John, M1BAI to bring his ex-BBC ATV car to High Mead Community Farm in Dorset to show the public - this was before Covid struck.

The fundraising event had been cancelled twice because of the pandemic - but the Bournemouth-based ATV influencer said he would be "delighted to honour the commitment".

Originally the plan was just to have "a contact or two" through GB3SQ but M1BAI was keen to see some activity through QO-100.

Friend and former colleague John, G7JTT, said he really wanted to help out:

"The farm is no ordinary farm it's a place that caters for the very special needs of young and old people with both physical and mental disabilities.

"This is very close to my own heart after over a year of battling my own health with both prostate and bowel

cancer which led to a very complicated surgery and lengthy stay in hospital.

"So for me it was an opportunity not only to get out and play portable but also help raise some funds for a very worthy cause," John added.

For Colin the cancelled dates "were a blessing in disguise as that gave more time to build a system to show off our hobby.

"The QO100 system comprises of a Triax TDS110 dish with a Potty and Bullseye LNB feeding a Global splitter; one feed to each WinterHill tuner and one for the Airspy. A small network connected the WinterHill, Raspberry Pi with the Airspy [for the offline QO-100 spectrum viewer] and the RX laptop.

"The TX chain was a Pluto and DATVEasy into an Amsat driver; then into a Stealth Microwave PA, Ecoflex 10 into a Potty.

"For 23cm and 70cm terrestrial the built in Portsdown 2020 was used. Video was provided by a C920 inside the van, a camcorder on the roof, and a C930 at the top of the mast.

"Despite the extended period for preparation, I was still building things right up to the day before.





"The path to QO100 was between two trees, so we moved the vehicle to the mid-point before everyone else turned up, that allowed us to set up the [EMC] exclusion zone fencing.

"I used my portable bandviewer on the roof to set up the dish. I must say that made the job much easier than previous methods.

"Fantastic results. The signal in and out of the satellite was almost as good as at home, the new "Mast Cam" really looked great as did "Roof Cam" and "Internal Cam".

"Everything continued to work perfectly for the rest of the day.

"I didn't do quite as much operating as intended as there were many people to talk to, but that really was the main objective anyway.

"Many thanks to those who sent recordings of our transmissions, that was very useful to see what could be done better next time.

"Considering this was a public event, the amount of interest was encouraging, we were interviewed by community radio station Forest FM.

"One person had been wanting to gain his amateur licence for a while and seemed determined to do that now, just needed to be pointed in the right direction."

On the day John had arrived early at the farm to meet the owner: "High Mead is more a small holding with some crops mainly in green houses and some pigs, chickens, ducks and alpacas," John said.

"Colin arrived not long after me and we were able to get a spot in the field that gave us a clear view of the sky towards QO100. We then set about setting up for both QO100 and GB3SQ, one thing's for sure this isn't a five minute process.

"I think it took around a couple of hours not only setting up the dish and antennas but also a perimeter fence to keep the public at a safe distance from the RF.

"I won't repeat the many achievements of the day as Colin has already listed them, but just to say it felt like we could achieve anything.

"For me personally I needed this day out as it was my first portable outing in over a year and although I was left very tired at the end of it I'd like to thank Colin, John and the team at High Mead Community Farm for letting me tag along and enjoy the very successful day."







## Dish experiments for /P operation

Gareth G4XAT

Pretty much since QO-100 became operational I have wanted to have a /P capability to operate via it. In the early days I did try a large dish (1.2x1.35 which only just went into my camper in dismantled form) and by a combination of wooden props, tent pegs and rubber bungees I was able to find the NB section and tune around a bit.

Fast forward a few years, and two things moved this project onwards. First, Rob M0DTS became a regular /P participant on the Thursday evening BATC QO-100 net and Tom ZR6TG published a satellite dish tracking programme for a CCTV camera head. And then fortune smiled on me as I spotted a nice heavy duty CCTV head at CAT22. Inevitably, I bought that. A quick look inside revealed 12VDC drive motors and 10-turn feedback potentiometers. Perfect.

It took until spring 2023 for me to finalise the build of Tom's design, slightly modified by me to allow full manual control of tracking the azimuth and elevation.

By virtue of 1N4148 diode OR gates, either an internal Raspberry Pi running a NodeRed dashboard (or satellite tracking software) could control the H-Bridge driver or I could, via centre-off biased toggle switches. The addition of a PWM speed-control finished off the control box nicely.



► Not a lot on the front panel, but there's a RPi3 lurking inside via wifi or RJ45 that will one day host the tracking software and GPS

And so to testing. Standing in high energy microwave fields is ill-advised, so unless the /P operation was literally going to be in a private field something had to be done to eliminate the possibility of harm to myself and/or others.

Simple, put the whole assembly on top of my car. My previous /P has been conducted satisfactorily from my

Mazda 3 Hatch with an adapted roof-rack. When that moved on to my son Reuben I replaced it with a much handier Mazda 6 estate.

An added bonus was that the flat-pack radio bench I designed for Mr Whippy (the camper) was easily adapted to work in the back of my Mazda.



Strong plywood costs money, so I looked around. Not far as it turned out, a suitable pallet was next to a skip a near neighbour had for building works. That was salvaged and sized up, fitting

nicely across the roof-rails kindly provided by Mazda. Securing it for use and motorway speeds involves 4 J bolts and some L-brackets from Lidl.

For actual high-speed I will add a ratchet-strap for peace of mind. By offsetting it slightly, the overhang on the LHS is enough to rest a lightweight pair of alloy step for 'platform access' while safely clearing the bodywork.



The CCTV head unit was easily adapted to the top of a very solid ex-NATO tripod I bought at CAT 21 (thanks Jen G4HIZ) by virtue of turning a shoulder on the alloy mounting flange and drilling six holes using the top bracket off the tripod as a template.

It looks like it was designed!

Next step was to get the assembly onto the pallet and drill suitable holes for the tapered anti-slip foot-pegs on the underside of the tripod feet.



► Pallet, Tripod and dish all on the car roof. Side access via alloy ladder

A cone drill was used to begin with but wasn't quite large enough, so a step-drill was substituted and the tripod sat in nicely. 6mm holes were then drilled through the tripod foot sides and through the pallet to allow additional security supplied by 6mm bolts and wing nuts. My smallest /P dish, a handy mesh unit of 78x86cm was fitted with a bullseye LNB and hooked up to a PD4. The control unit was then used to steer the dish around towards QO-100 and after a quick check with a compass it was soon found and peaked up, managing nearly MER8 on the beacon.

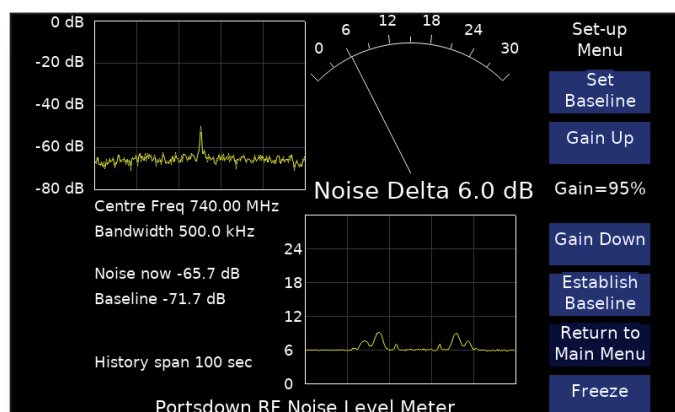
I next tried the huge 1.2x1.35 dish, but having got it on the roof of the car, I decided that it was just a bit much for common sense. Instead, I used a TRIAX dish (1.0x1.1m) that I had acquired along the way but taken out of usage as the LNB arm was prone to movement.

With a piece of card wedged into the arm securing arrangement I quickly found QO-100 and was rewarded with a MER of 9.5. Not bad for a smallish dish.

Happy with that and since the sun was shining, I decided to try and measure sun noise using the latest addition to the PD4 test equipment armoury, the noise meter. What a fascinating experiment that was.

The sun was easy to find and aim at, so experiments followed with scanning the dish back and forth across the noise source. Doing so revealed the dish side-lobes and a believable sun-noise. Having test gear (even uncalibrated, as ultimately I was looking for 'more is better') that can do this sort of thing is one of the wonders of the 21st Century.

Just how much more versatile can a Portsdown 4 get?



The results are shown in the picture, along with my dish-tracker-on-my-car pictures. With the height of the tripod on top of the car roof height, the dish (and its lobes of RF when transmitting) should be well above the level of any nearby heads.

I will of course tick the box on the RF exposure spreadsheet and maybe add an orange strobe beacon for when TX is under way. I'm hoping to contribute to Jamboree on the Air from the Scouts activity centre at Broadstone Warren in Ashdown Forest, Sussex.

*Is anyone else helping with a JOTA station? Please let me know for the next edition - thank you! Editor.*

### Fogstar LiFePO4 Battery update.

I'm up to three charge/discharge cycles on my nice battery and so far no problems. Equally the boost converters have both been worked out on 28V (QO-100 amp) and 50V (70cms activity day). I did manage to blow the 60A fuses (3x20A) when a faulty SMA lead made me unwisely turn up the drive, and of course then the lead connected.

Labels have since been added to the amp so I don't do this again. Peak amps as recorded by the in-line power monitor were 95A. That everything survived this abuse (other than the fuses) was a great relief. 🗨️





## My Shack

*Dave Crump G8GKQ*

I recently had to tidy up my shack in support of the TX Factor team who were visiting to make a video about the new IC-905. It was an ideal opportunity to take a photo in support of CQ-TV and to describe my working area.

My QTH is surrounded by hills on all sides, so before moving in I had made the decision that I would not be putting up aerials for terrestrial operation. As my main interests are home construction and portable operation, this works for me.

I do have a 1.2m dish for QO-100 in the garden so am able to operate ATV from home. The room is about the size of a double bedroom and one end is allocated to storage, with the other end (shown in the photo) used for construction, writing and operating.

The furniture is from Ikea, with the (out-of-shot) storage being a wall of "Kallax". The wall behind the test bench has a piece of chipboard laminate on it with about 36 13 amp sockets (never enough) and the network and 13.8 volt power distribution boxes mounted on it.

13.8 volt distribution is on PowerPoles, with a few (switched) flying leads terminated in 5.5/2.1 mm barrel connectors.

There is very little new equipment in the shack; except for the ATEM Mini HDMI switcher and the digital oscilloscope, everything is either homebuilt or more than five years old.

### RF test equipment

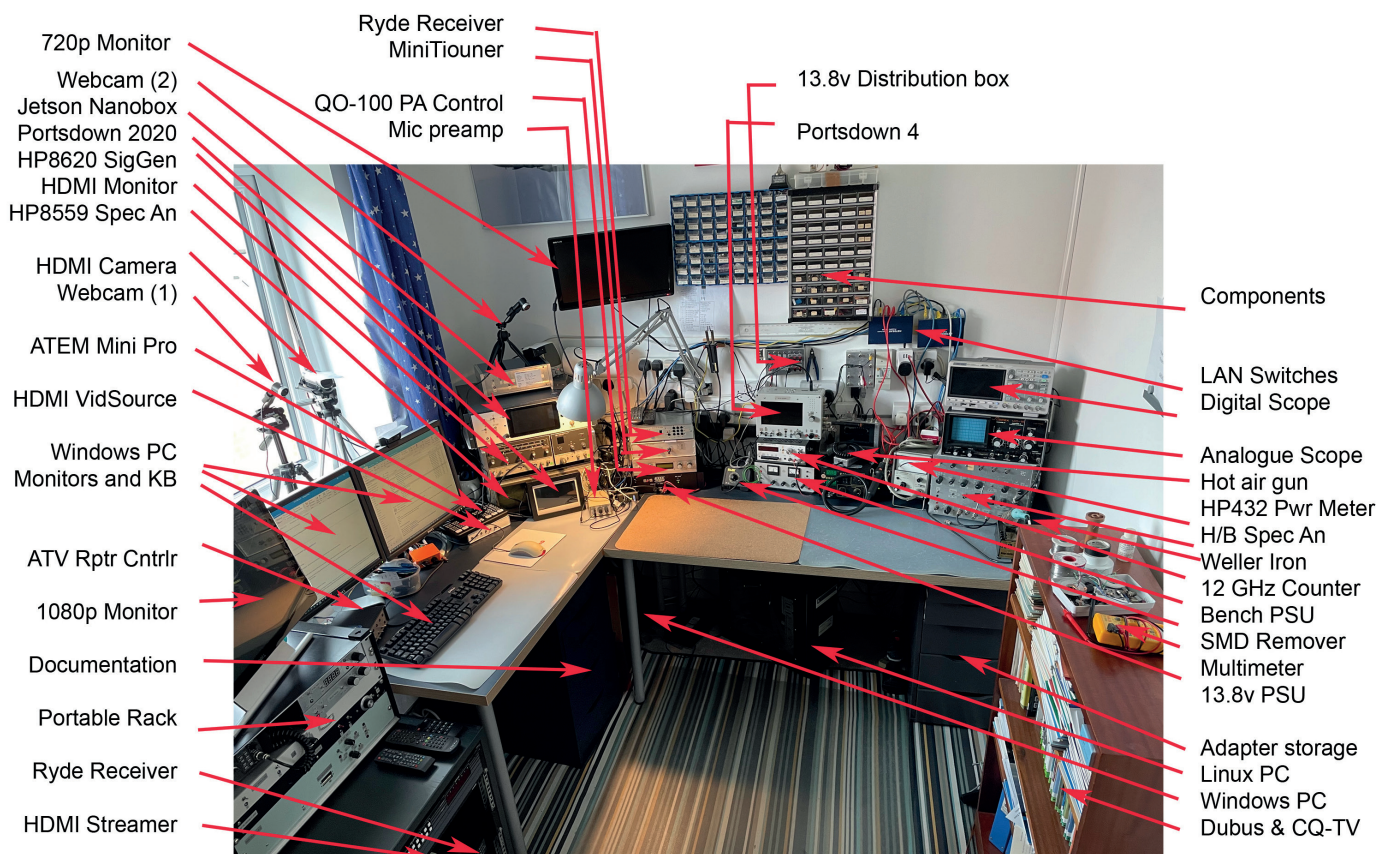
Pride of place goes to my homebrew spectrum analyser which I started building over 40 years ago based on a Varicap TV Tuner. It now covers up to 2.6 GHz and includes a tracking generator (up to 1.6 GHz).

Its display is on an analogue scope of similar vintage. It still gets used more often than the HP8559A analyser (up to 21 GHz) because it does not sound like a diesel train when it is turned on.

The frequency counter is also home constructed from about 40 years ago, but now sports a 12 GHz prescaler. The HP432 power meter is invaluable, and I have a power attenuator allowing it to measure up to 150 watts at up to 10 GHz.

### Other test equipment

I use a cheap (£5) DMM for most measurements, as convenience is more important than accuracy; I also have a very old AVO 8. I can measure noise figure up to





18 GHz thanks to a lucky purchase of three noise heads 30 years ago and the Portsdown NF Meter.

Increasingly I use the Portsdown as a bench signal generator although the sweep function of the HP8620C that I have on loan is useful for filter alignment.

## Portsdowns

The Portsdown 4 in the picture is the test and development master. The Portsdown 2020 development master sits on a storage shelf and is brought on to the bench whenever I need to make changes. Four other Portsdowns are available for portable use.

## QO-100

The Portsdown 2020 in the 3U rack shown in the picture is used to control the Jetson Nano for H265 encoding for QO-100. The Jetson gets a USB video feed from the ATEM Mini Pro which has an HDMI Camera and the BATC HDMI Video source connected. There are two webcams connected to the HDMI video source.

A LimeSDR Mini connected to the Jetson Nano feeds into the QO-100 PA Controller where the RF is amplified before going through 20m of satellite coax out to the PA which is next to the dish. A single wire keys the PA and carries serial data signalling for PA current and temperature.

On receive the incoming 745 MHz from the LNB is split seven-ways to Rydes, MiniTiouners, a Knucker and an Airspy.

## Computing

I do most of my computing using an old Windows I3 desktop with two monitors (essential). I do have a Linux desktop, but it is only used very rarely. I do all the Portsdown development using SSH and WinSCP to remotely log in to Raspberry Pis. These are supported by 16 available network ports around the shack.

## Construction

The Weller TCP-1 soldering iron has been my favourite for many years. I supplement it with a cheap Chinese hot air gun, and a pair of heated tweezers for SMD rework. A small bench vice and a Parkside cordless drill get a lot of use.

## Portable Operation

The portable rack sits in the shack and is moved to the car when required. It is placed at the rear of the boot in my estate car and operated from outside the rear of the car.

The photo shows it with the “Portsdown Double” on top of the rack (bandviewer or transmit on the left screen, receive or transmit monitor on the right screen). Beneath that on the left is the FT-290R for 144 MHz talkback, and on the right a transmit RF distribution switch (a boxed 8-way switch with a battery voltmeter on the front panel) with a multi-input MiniTiouner (and Knucker) in the unit below it.

The white 1U unit is the 23cm TX driver and receive filter unit, the black 1U unit is the 70 cm driver and receive filter unit. The bottom ex-Pye 2U rack unit houses the 146 MHz PA and filtering, a 100 watt 144 MHz PA for talkback, and switching and filtering for 144/146 MHz operation.

I'll describe the complete portable set-up in a future article. 🗨️





# Rechargeable battery for occasional use

Dave Crump G8GKQ

I have a large number of semi-portable “gadgets” ranging from microphone amplifiers to fully-built Portsdown transceivers that run from a “12 volt” supply.

On the bench, these are powered from a 20 amp fixed power supply, but occasionally I need to use them elsewhere in the house or garden and I was looking for a convenient battery source.

Many of the gadgets use buck converters or linear regulators to generate the 5 volts that actually run the active components, so the actual supply voltage is not too critical.

While grocery shopping at Lidl (honest) I happened to find their “X12V” range of Lithium Ion batteries.

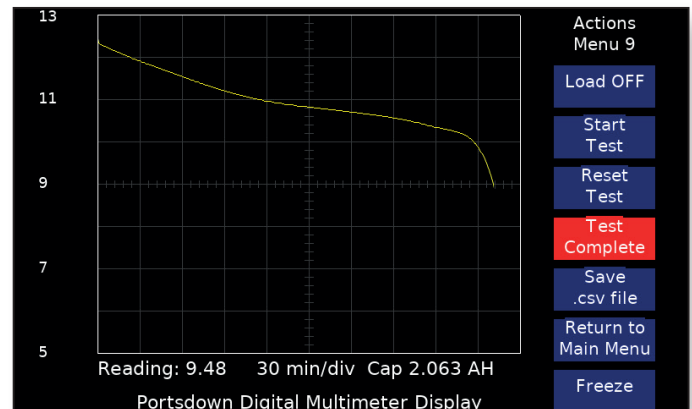
The 12v 2Ah battery and mains charger were available for £19.99 with replacement batteries (2Ah and 4Ah) also available. As I had found their 20v batteries to be reliable and long-lasting on my cordless drill, I purchased a battery and charger.



## Testing

After charging the battery, I tested it at 500 mA discharge rate using the Portsdown DMM logger. The plot shows that the initial voltage is about 12.3v and it falls to 10.2v fairly linearly as it discharges. The capacity down to 9v (3v/cell cut-off) is just over 2 Ah, but for long battery life I would not recommend discharging the battery below 10.2v.

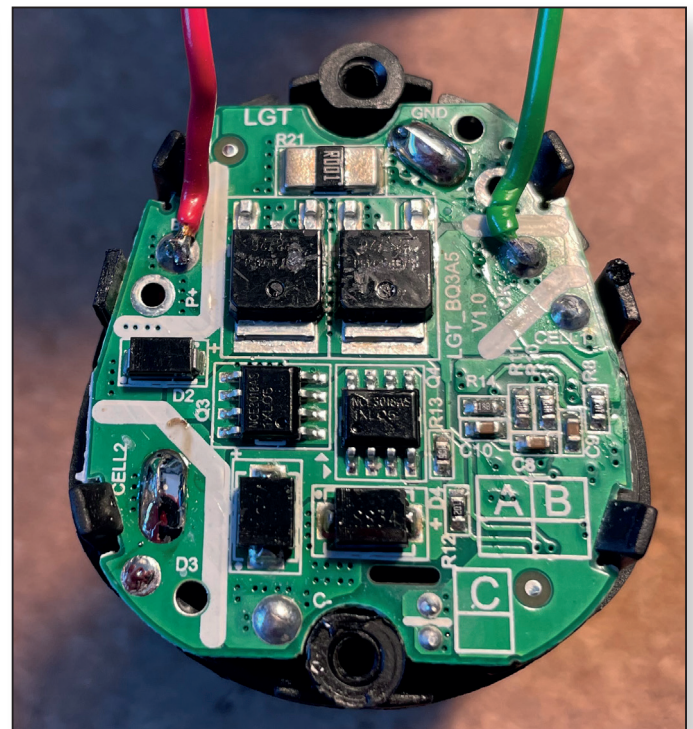
So, a good performance as long as the 12v to 10v voltage drop is acceptable for the intended application.



## Modification for use

To make the battery more convenient for hobby use, I took the large end cap off by removing the two self-tapping screws. This revealed the discharge-balancing circuitry and two points where I could solder supply output wires.

The locations can be seen in this image marked P+ and P-.



Take great care when soldering not to cause any disastrous short-circuits. I do not know what protection there is, but did not want to test it.

If the wires are routed “north” about 2 mm, and then bent upwards, they can be routed through the top two ventilation holes in the end cap.



I drilled these holes out to 2.5mm.

The end cap can then be replaced, leaving the body of the battery free to plug in to the supplied charger.



## Safety

You must use an in-line fuse (I suggest 2A) to protect the battery from short-circuit. Additionally, do not use barrel connectors for the power output as these are very easy to short-circuit. I fitted a PowerPole connector for safety.

You have been warned.

The mains charger does have transformer isolation, but I have not tested using the battery output during charging and would not recommend it.

## Conclusion

The battery is ideal for running Portsdown or other similar units for short demonstrations and testing. The supplied charger is very convenient and the brand has a good track record for longevity.

Yet another Lidl bargain. 🗨️

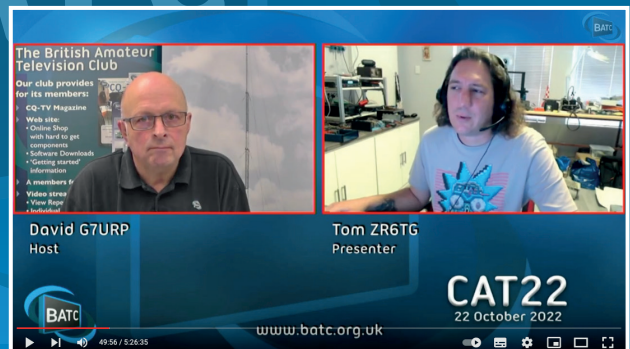
## CAT 23 Part 1 Sunday August 6th

- ▶ **ATV Equipment Demonstrations**
- ▶ **Fix it, test and measurement area**
- ▶ **Members' flea market and traders**
- ▶ **Free access to Air Museum**
- ▶ **Midland Air Museum Coventry  
Just off M69/M6**



## CAT 23 Part 2 Saturday October 21st

- ▶ **Online Lectures**
- ▶ **The latest in ATV**
- ▶ **Something for everyone – from  
beginners to advanced.**



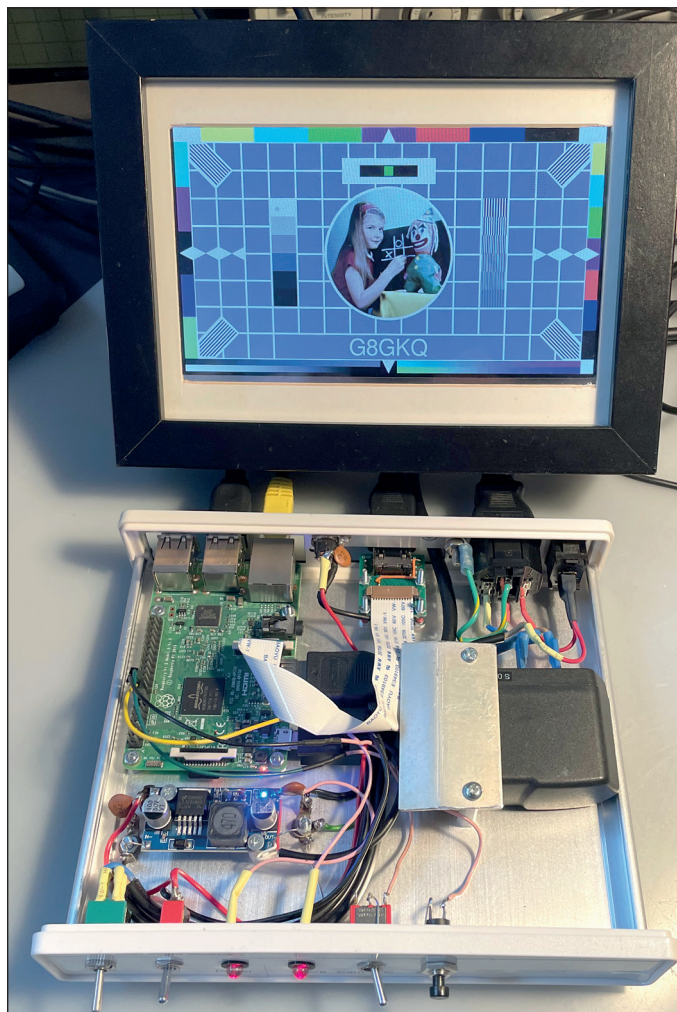


# The BATC HDMI video source

*Dave Crump G8GKQ*

The BATC HDMI video source is designed to allow selected WebCams and Raspberry Pi Cameras to be used with HDMI-input video mixers. It also provides a source of HDMI Test cards and some HDMI diagnostic information.

It is based on a Raspberry Pi 3B, but should work on the Raspberry Pi 2 and 1. It has not been tested on the Raspberry Pi Zero or Raspberry Pi 4.



## Construction

The wiring for the HDMI source is very simple; it only requires a switch connected between GPIO pin 16 and ground, and a button connected between GPIO pin 18 and ground. These are the same connections as are used on the BATC PAL video source.

An additional “active” LED can be wired, with a series resistor, between pin 13 and ground. A 5.2 volt power supply completes the build. Make sure that you retain

access to the HDMI output socket, the LAN port, all four USB ports and an extender for the Raspberry Pi Camera ribbon cable if required.

## Software build

The software build is based on the latest Bullseye Lite operating system (not the Buster version used for Portsdown and Ryde). The build process is very similar to that used for the Portsdown and is described here <https://github.com/BritishAmateurTelevisionClub/hdmisource>. During the build you will be asked for your callsign and locator.

There is no upgrade process. A new build is required to load any (infrequent) new features.

## Operation

On first power-up, make sure that the switch is open (the test card position) and that you have the Pi camera connected if you plan to use it. Hot-plugging of the Pi camera is not supported. Also connect the display or mixer to the HDMI output so that it can negotiate the correct resolution and frame rate.

Once the Raspberry Pi boots, the first test card should be displayed with a callsign overlay. Each time the button is pressed, the test card should change.

If the switch is closed, the first camera will be selected. The camera order is:

1. Original (H264-capable) Logitech C920
2. Polycom EagleEye USB Webcam
3. 2nd Polycom EagleEye webcam (if fitted)
4. EasyCap video composite video
5. Raspberry Pi Camera

Each time the button is pressed, the next camera will be selected. Hot plugging of webcams (but not the Pi Cam) is supported

A long press (two seconds) of the button will cause the Raspberry Pi to safely shutdown. A caption is displayed, and the “active” LED (if fitted) will extinguish.



## Camera sources

ONLY the following camera sources are supported. Users will need to modify the file `hdmisource/camera.sh` if they want to add support for other cameras.

- ▶ The early (H264-capable) C920 webcam. The subsequent two versions of the C920 are NOT supported.
- ▶ The Polycom EagleEye webcam. Two of these can be connected, and individually selected.
- ▶ An EasyCap for composite video capture. Both the Portsdown-compatible USBTV-007 version and the non-compatible MS210x versions (sold by the BATC Shop) are supported.
- ▶ Raspberry Pi Cameras version 1, 2 and HQ.

## Audio

Although planned, there is no audio functionality yet. Webcam and EasyCap audio is not relayed.

## Configuration

An SSH Console Menu is available. This allows selection of specific cameras and changing the GPIOs used for the button, switch and LED.

## HDMI utilities

The SSH console menu includes the option to list the compatible modes of any connected HDMI monitor. It also includes the option to check the actual output configuration of the Raspberry Pi HDMI output.

### Experimental HDMI capabilities

It is possible to use the SSH console menu to request the Raspberry Pi to reboot into a specific HDMI output mode. Not all of the selections currently work and these can result in a failure to boot, requiring the card to be rebuilt. More testing and guidance to follow.

## Future development

I hope to add some audio features and possibly a moving test pattern in future. Unfortunately, the “bouncing balls” pattern is not longer supported in the latest Raspberry Pi operating system. 🗨️

# Signal Box

Microwave DATV provides plenty of room for broad signals but brings with it the question of frequency accuracy, especially if you want to test path integrity with narrow-band voice first – so easy with the Langstone in the same box. I first noticed frequency inaccuracy (NOT what is says on the label) when receiving 3.4GHz DATV – I was getting a good lock, but the video would not decode. It turned out the LNB LO was 230kHz low – not exactly a quality item despite being a branded ‘Titanium’ unit. So having an accurate source of know frequencies is clearly something worth adding to our radio/TV armoury.

My first 10 and 24GHz narrow-band and subsequent DATV QSO's required patience from the two stations I was trying to contact (Thanks Dave G8GKQ and Noel G8GTZ). I found them both by extensive spinning of the tuning dial – around 200kHz high. Since then I have been able to calibrate my RX/TX accurately against a GPS locked signal source – thanks to Dave G8GKQ. So time to build one for myself.



*Gareth G4XAT*

An article in a recent Scatterpoint newsletter described a similar solution using an Arduino Nano and a generic ADF4351 board. What was missing in this was GPS locking. The Leo Bodnar GPS locked sources are well-respected but come at a price. So I looked at other solutions, starting with a UBLOX Neo7 unit sourced from eBay for under £10. There is excellent free software on the UBLOX website and it quickly connected to the NEO7 via micro-USB.

Referring to YouTube for a ‘how to’ video soon had it configured to produce a reference frequency of 10MHz. It sounded horrible on my HF receiver; a lot of jitter and definitely NOT ‘T9’! So it was unlikely to provide a decent reference to drive a ADF4351 as the jitter would be multiplied up (not tested). Another issue was the NEO7 did not remember the settings when powered down.

A pause of many months ensued, until I noticed a new product on the excellent QRP-Labs website – the PROGROCK2, another clever piece of hardware and

software dreamed up by Hans Summers.

( <https://qrp-labs.com/progrock2.html> ) It's basically a 'programmable frequency source' and what caught my eye was the option of GPS disciplining. Reading about it ( [https://qrp-labs.com/images/progrock2/ProgRock2\\_I\\_00b.pdf](https://qrp-labs.com/images/progrock2/ProgRock2_I_00b.pdf) ) suggested that the ultimate adjustment steps may well be so small as not to matter; certainly not for a spot frequency generator. So I bought one – at \$19 plus shipping it's a bit of a bargain as it can produce up to 8 bands of 3 frequencies up to around 225MHz. It will also do clever stuff like IQ phase-shifted outputs.

The Progrock2 has its own control software, easily accessed via a Putty serial link on a USB lead. So I programmed the Progrock to produce 10MHz, accept a GPS 1PPS input and use the smallest possible adjustment steps. I used this 10MHz clock to drive an ADF4351 board which was controlled by an Arduino Nano running the 8-band code shared by Robin ( <https://github.com/rszemeti?tab=repositories> ). An added bonus was an AM modulation option on all the frequencies, selected by a hexadecimal thumbwheel found at the recent Dunstable Downs rally.

First results were very odd to say the least – a huge comb of frequencies centred around each spot frequency. After initially blaming the £0.80p SMPSU board I found it was cross-talk/inter-mod from the on-board 100MHz TXCO, presumably mixing with the desired 10MHz! The ADF4351 uses CMOS technology so will pick up almost any signal. Cutting the power rail to the 100MHz TXCO solved the problem, leaving just the correction steps from the software.

Progressing to boxing the unit required some thought as I really wanted to be able to use the Portsdown Signal Generator software with the same ADF4351, so a 9 pin D socket was fitted to the box. To select the drive source I initially considered diode OR gates but to simplify things further and not mess with the drive levels I used a 3 pole toggle switch. Then I remembered that Dave had recently added control software for the AD9850 DDS so I dug one from stock (I have spares if anyone would like one, I bought them when

they were cheap) and used the last spare wire in the 9-pin to select which signal source to use. I now had 8+8 spot frequencies, GPS locking capability and a DC to daylight (almost, if you count the higher harmonics of 4.4GHz!) signal generators.

The GPS locking process is pretty much inaudible at fundamental frequencies to 4.4GHz – the musically inclined may notice it more than I do. At the 7th Harmonic (24GHz) there is a definite warble which whilst rendering it unsuitable for a precision signal source like a beacon does makes it ideal for spotting a known frequency as it's very distinctive. After a few minutes the warble is a few 10's of Hz (at 24GHz) and in fact the provided Progrock2 TXCO is stable and accurate enough to sit on frequency all day if you remove the GPS input.

Even from a cold start, it only drifts a couple of kHz at 24GHz and Hans tells me the TXCO has an analogue control so no steps from that as it trims itself. Definitely a cheap and cheerful (but accurate) solution for a fraction of the price of a Leo Bodnar unit. Although I could have used a NEO-7 GPS, I treated the project to include one of the QRP-Labs own GPS units ( <https://qrp-labs.com/qlg2.html> ) as it covers all the available GPS systems. As I had spare LCD screens one was fitted to see how well the unit works and of course 'what the time really is'.

There isn't much room left in the box, although I could just about squeeze in a pair of lithium ion cells salvaged from discarded vape-pens (what a waste!).

But then I'd need an on/off switch ...

I think that will do for now. 🗨️





# Norbreck Rally 2023

The Blackpool Rally held at the Norbreck Castle Hotel had a tinge of sadness this year,

Elaine Elliott 2EIBVS wife of John Elliott G3WFK informed me that John had sadly passed away the previous week.

For those that knew John G3WFK (*on the right, in the photo below*), will remember a very jovial chap who manned the stand at the Blackpool rally. I joined him in 2018 when he showed me the ropes and the stalls display equipment. John had over the years arranged the display so that it was transportable, in true amateur style the system worked.



With the absence of the rally over the Covid isolation of 2020 & 2021 it was good to get back in 2022. Not many stalls were present that year and with 2023 would the crowds return?



Bill G4YWD

Peter G6PYL helped out on the stand setup on the Saturday in readiness for the Sunday start, two tables were available which we soon filled with the display.

Sunday arrived with the expected bustle, doors opened and in came the early birds.



## The main display, digital TV systems.

Brian G4EWJ developed the Digi Light along with the Digi Thin and the Digi Twist.

### ► The Digi Thin

In CQ-TV 247, Brian G4EWJ explains the Project aims and status:

*The main aim is to produce an RB-DATV (reduced bandwidth DATV) modulator with digital filtering, in a form that is easy to homebrew and has no adjustments.*

Copies of CQ-TV 247 available from

<https://batc.org.uk/cq-tv/cq-tv-archive/>

### ► The Digi Twist

At CAT 17 Brian G4EWJ presented the Digi Twist, with two Technomate TM-2600M3 joined with a 38mm block of aluminium. This gives us both azimuth and elevation for less than the Yaesu Azimuth/Elevation Rotator G-5500.

With the Digi Twist on display it raised many questions some of which Vincent M0LCR answered while he was helping out on the stand.

*Many thanks to all who called in on the stand, hope to meet up again next year 73. Bill G4YWD. 📡*

# 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 91

In the last "Turning Back the Pages", mention was made of the use of low definition television and FAX for image transmission, and both featured in CQ-TV 91. Doug Pitt announced the formation of a new association for those interested in low definition television (LDTV). Doug had been interested in the mode for many years, believed that the wide availability of domestic tape recorders, which were able to record signals of the bandwidth used by LDTV, and the new 'two-channel' (stereo) equipment would enable synchronous sound to be added to the pictures. The availability of semiconductors, and in particular opto-electronic devices, and flexible light guides would also, he suggested, make revival of LDTV a practical proposition. A Convention had been held in Nottingham in April 1975, when there had been "an exhibition of LDTV apparatus, ancient and modern". A steering committee had been formed, which included H J Peachey, "one of the Royal Television Society's oldest members provides a strong link with the past" the report said.



In the 'Postbag' column, Professor Franco Fanti, of Bologna, Italy, had sent in the results of the World Slow Scan Television contest that he had organised, and he 'mentioned that he is continuing his interest in FAX'. A photograph of Prof Fanti with his FAX equipment adorned the front cover. Also in the Postbag column was a note that "Arthur Critchley has at last moved to Canada, and is living and working in Ontario. He writes about his new home in glowing colours (except, he says, NTSC is AWFUL)".

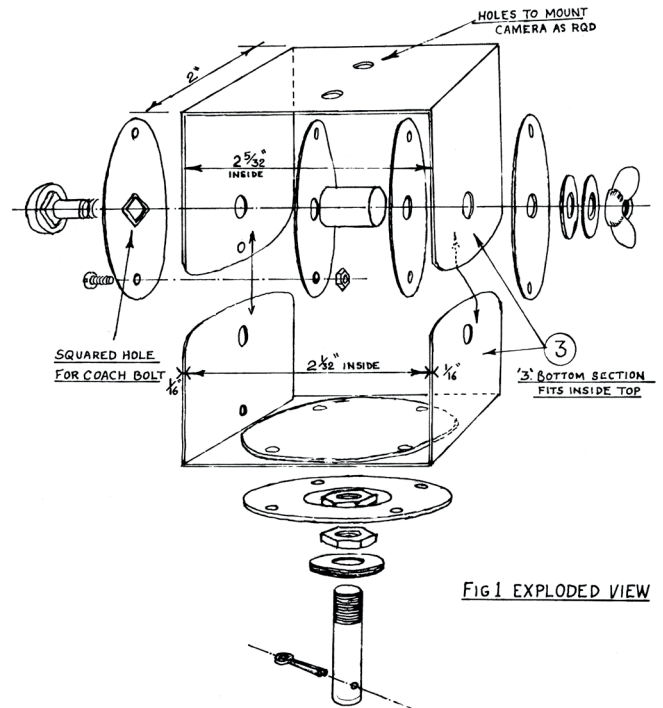
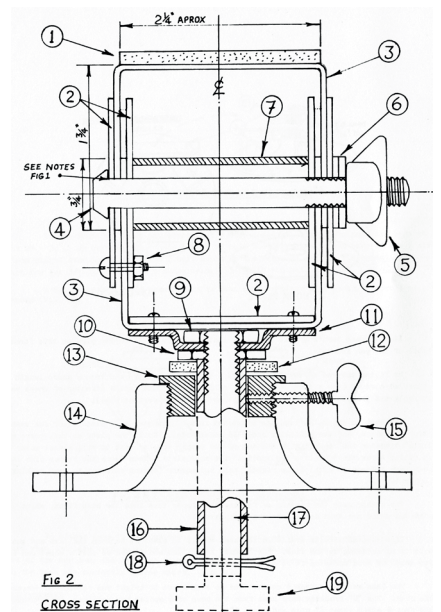
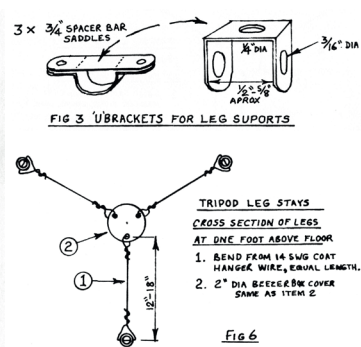
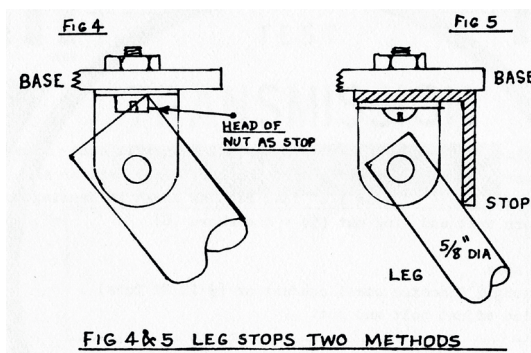
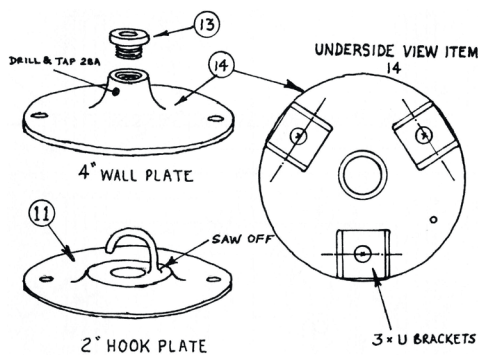


FIG 1 EXPLODED VIEW

The main constructional article in this edition involved neither valves nor semiconductors! M R Perry wrote that "after purchasing a tv camera and going through the usual process of propping it up with books, boxes, etc, it was decided that some form of tripod was required." He had found that the weight of the camera (a Pye Lynx) put too much strain on the bearings and joints of a commercially available photographic tripod, and so he set about designing one that could be made using 'available materials' (some from a local scrapyards) and hand tools. Many of the other parts were electrical conduit tube and fittings (with a warning that some new fittings were metric, whereas older items would be of imperial measure!). The author said that it was not a "fully detailed construction to be copied by the letter, but an idea of what can be done

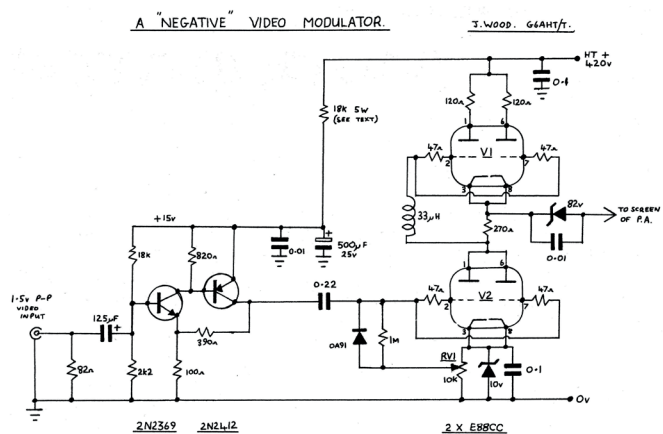




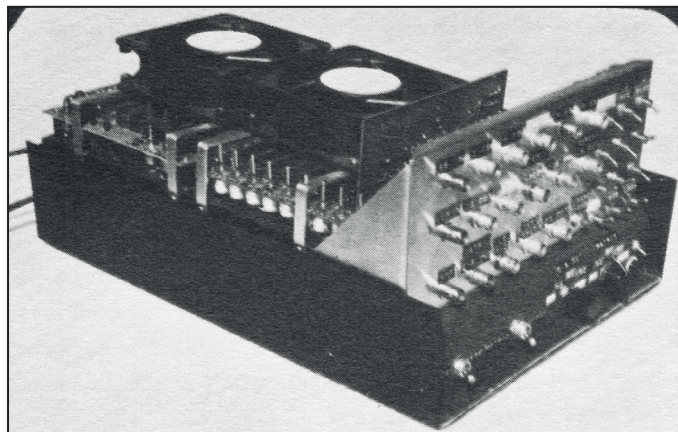


with a bit of ingenuity" - but did give details of the way in which various sections were made, suggestions on how parts could be assembled without specialist tools, and some of the pitfalls he had found along the way!

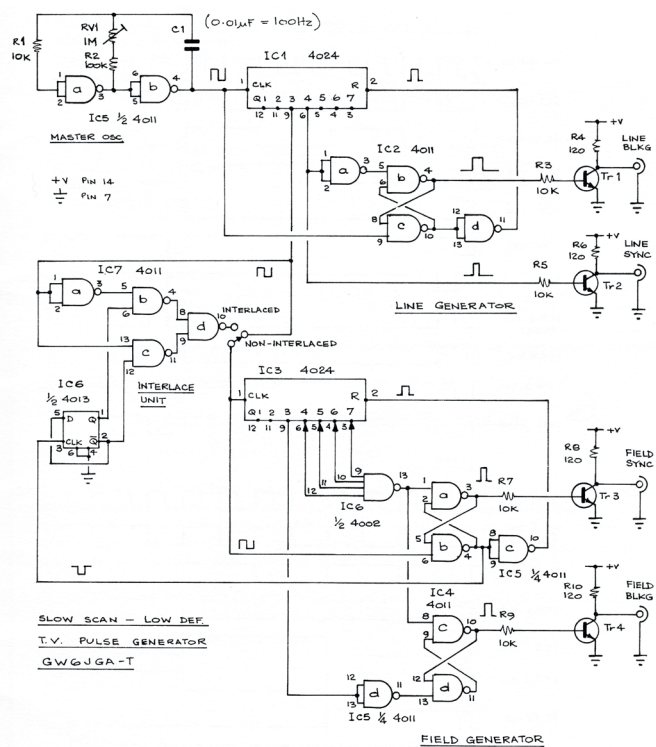
The RF side of amateur television was featured in an article by John Wood (later to become the editor of CQ-TV), who described a design for a transmitter modulator that produced negative video modulation, as used by the 625 line system - most earlier designs having used positive modulation as used with the 405 line standard



There were four articles concerning slow scan television - the operating experiences of Richard Thurlow, G3WW, a look at 'where SSTV is going', by Lewis Elmer, and the third was a description of the latest state-of-the art device that had been demonstrated at the 3 day Dayton Convention in Ohio earlier in the year. Designed by Don Miller, this was a digital scan converter for sstv. The colour signals

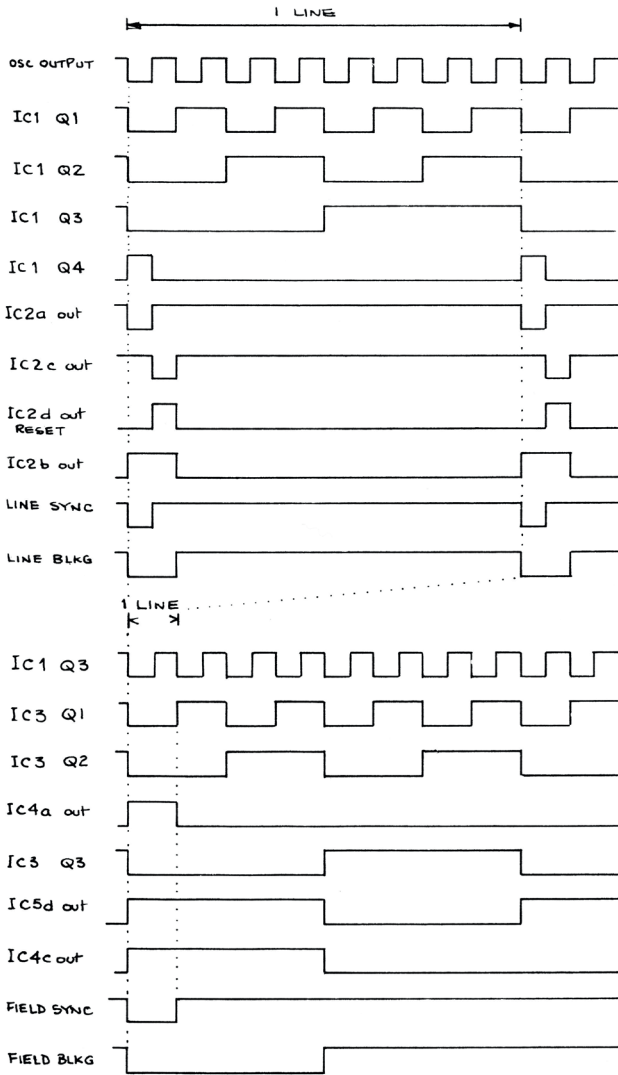


were produced in turn from a single camera with a colour wheel in front of the lens, and each was then loaded into corresponding dynamic shift registers. The signals were transmitted simultaneously using a quadrature modulated subcarrier, with the normal slow scan signal carrying the luminance signal.



The fourth was John Lawrence's Circuit Notebook, which used the new CMOS technology to create a slow scan pulse generator, in which the various signals were produced by digital counters driven by a master oscillator (IC5 gates a and b) that ran at 8 times the line frequency. Either interlaced or non-interlaced pulse streams were available. By selecting the appropriate outputs of the 4024 line divider counter, IC3, to be combined in the 4 input NAND gate, IC6, the number of lines per frame could be set.

A set of the waveforms to be found for the line timings (top) and frame timings (below) was provided.  
(On the next page... Ed)



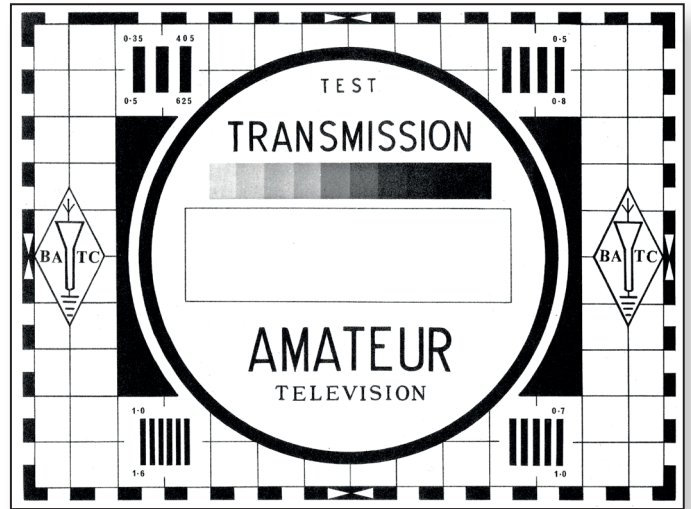
P Hayes continued his description of his image orthicon camera with details of the scanning and focus coils,

beginning by saying “this is not an operation to be undertaken lightly!” - adding that professionally made coils cost several hundred pounds.

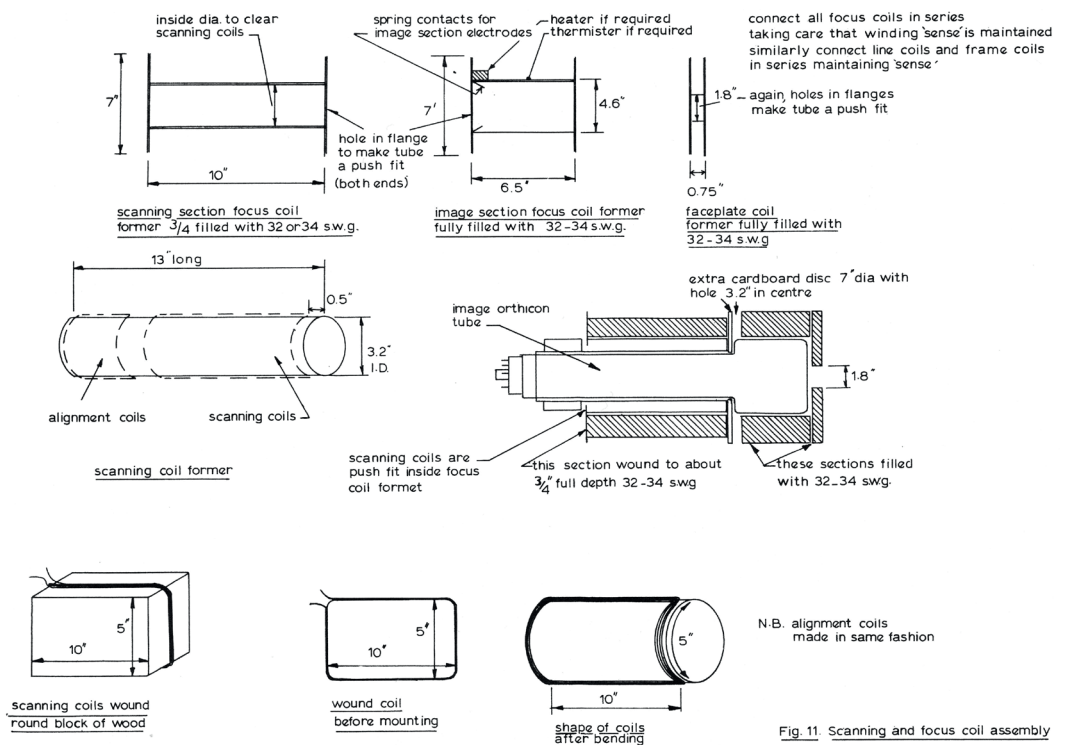
The tubes that formed the foundation of the structure were made of stiff card hardened with lacquer. The scanning and alignment coils were wound on a former, and then bent to fit around the coil former.

The line coils had to be fitted exactly opposite each other, and similarly the field coils, which also had to be set exactly at

right angles to the line set. Outside the scan coils were the sets of focus coils. There was a lot of copper wire to be supported, so it was important that the various formers and supports were strong.



Lastly, the magazine included information about a new addition to the range offered by Club Sales. A standard test card was too detailed to use over medium or long distance transmission paths, and so the BATC test card was designed to allow receiving stations to give a meaningful assessment of the signal under such conditions. A grey scale was included, the scanning linearity could be checked by observing the circle and the 4 sets of blocks corresponded to different bandwidths (one set of figures was for the 405 line system, and the other corresponded to 625 lines, whilst there was a space provided in the centre for the station callsign. Full size copies on stiff card were available from the Club for 55p. 📄



**Fig. 11. Scanning and focus coil assembly**



# The British Amateur Television Club

The BATC logo is a blue square with rounded corners, featuring the letters 'BATC' in white, bold, sans-serif font. It is set against a background of blue curved lines that suggest motion or a signal path.

## Out and About

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

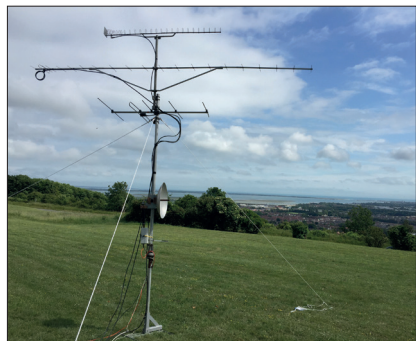
25 June	Newbury Radio Rally	14/15 October	RSGB Convention Milton Keynes
16 July	McMichael Rally (Reading)	15 October	Hornsea ARC Rally (No BATC Shop)
6 August	BATC CAT 23 Part 1 (Midland Air Museum)	21 October	BATC CAT 23 Part 2 (online)
13 August	Flight Refuelling Rally (Wimborne)	2 December	Midland Microwave Round Table (Shropshire)
3 Sept	Telford HamFest (No BATC Shop)		

Unless otherwise stated, the BATC Shop will be available at all these rallies and will be offering cheaper prices than online, and accepting card payments.

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



### 2023 Activity Days:

Jul 8/9 activity weekend - 6m & 4m + 23cm (Es special)

Aug 5/6 activity weekend - 70cm & 23cm

Sep 2/3 activity weekend - 13cm & up + 23cm

Sep 30/Oct 1 activity weekend - 2m & down + 23cm

Oct 28/29 activity weekend - 70cm & 23cm

Nov 25/26 activity weekend - 13cm & up + 23cm

## 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>

