Radio Society of Great Britain
Advancing amateur radio since 1913

RadCom

Bumper review special

FoxRex ARDF Rx, bhi ParaPro DSP, Towermate tilt plate reviewed – and much more

0917

September 2017 ◆ Volume 93 ◆ Number 09 ◆ £4.95

ML&S

0345 2300 599
Web: www.HamRadio.co.uk

SAFE ONLINE SHOPPING
Shopping online with ML&S is safe and secure. E&OE
PayPal
FOLLOW US ON TWITTER AND FACEBOOK HamRadioUK

Martin Lynch & Sons Ltd. Wessex House, Drake Avenue, Staines, Middlesex TW18 2AP. E-mail: **sales@hamradio.co.uk**
Opening Hours: Mon - Fri: 8.30am to 5pm. Sat: 9am to 4.30pm. International Tel: +44 1932 567 333

ML&S - the world's favourite *original* ham store

ML&S NO.1 FOR SDR RADIO

Two new SDR products from Expert Electronics

NEW SunSDR-QRP

ML&S INTRO OFFER: ~~£799.95~~ NOW £749.95

Based on the renowned SunSDR2 Pro transceiver, Expert have now introduced a lower cost QRP version, the SunSDR QRP. *Offering 5W output on all modes from 100KHz to 55MHz (RX) and 160-6m on TX, the QRP version runs all the software of its big brother and can be run locally or via LAN using the Expert Remote System.*

Click! www.HamRadio.co.uk/SUNsdrQRP

NEW ColibriNANO

ML&S: £239.95

A highly advanced 14-bit ADC 122.88Msps Direct Sampling SDR-based receiver packaged in a small dongle type case.
Covering 100KHz-500MHz, this new design leads the way in low cost SDR technology and is compatible with every popular HAM software such as HDSDR, SDRSharp and ExpertSDR2.

Click! www.HamRadio.co.uk/SUNsdrNANO

FLEX RADIO SYSTEMS *FACTORY APPOINTED DEALER*

New Products! Announced at the Dayton Hamfest.
Flex-6400, 6400M, 6600 & 6600M.
A new line in advanced SDR available with or without front panels.

The ultimate performance direct sampling SDR technology and the best value for the serious HF/6m operator. Designed for the Ham who wants to operate the radio exclusively as a server from PC, laptop, Maestro, Mac, or iOS clients – whether local or remote.

FLEX 6400: £1999.00. PRE ORDER NOW with a £200 deposit.
FLEX 6400M: £2999.00. PRE ORDER NOW with a £200 deposit.
FLEX 6600: £200. FLEX 6600M: £200.

Come and see our new display unit for the Flex range of SDR transceivers.

Click! www.HamRadio.co.uk/FLEX

FUNcube DONGLE PRO+

The World's Number 1 Dongle for SDR Technology.

150kHz-1.9GHz. (gap between 250MHz to 410MHz).

ML&S: £149.95

Designed and built in Great Britain

Click! www.HamRadio.co.uk/funcube

NEW! ELAD DUO-ART

NEW

Linear Amp & Auto Tuner with PSU.

Launched at Dayton, the new FDM-Duo accessory features a 60Watt amp, optional Auto-ATU & PSU. Large colour screen and as to be expected from ELAD, crafted out of aluminium. A must for the FDM owner.

New! ELAD SP-1 Matching speaker
Soon to be released this fantastic matching speaker for the FDM-Duo & Art. **Price & delivery October 2017.**

Click! www.HamRadio.co.uk/ELAD

ELAD FDM-DUO

ML&S: £949.95

Click! www.HamRadio.co.uk/fdmduo

Beautifully engineered and crafted in aluminium. 10kHz-54MHz, direct conversion RX operating at 122.88MHz, employing a fast analog-digital-converter sampling received HF directly into digital signals. A downstream DSP module provides for filtering and processing. Another ARM processor handles the signals of the control unit. All Mode, in stock.

Receive only version also available at £699.95.

Click! www.HamRadio.co.uk/fdmduoR

SDRplay

RSP1: £114.95 RSP2: £154.95

Designed and built in Great Britain

- 10kHz to 2GHz
- 12-bit ADC silicon technology
- Built-in High Performance front-end filters • Up to 10 MHz bandwidth
- Low noise floor
- Simple USB interface (type B socket)
- Powers over the USB cable
- SDRuno - World class SDR software

RSP2PRO: £189.95

Click! www.HamRadio.co.uk/sdrplay

APACHE LABS ANAN-100B HF + 6M 100W ALL MODE SDR

RRP: £1849.95
ML&S PRICE: £1549.95

APACHE LABS ANAN-200D HF + 6M 100W ALL MODE SDR

The ANAN-200D is The most powerful Amateur Radio Transceiver available today, it builds on the very successful OpenHPSDR Hermes and the Apache Labs Angelia designs and offers unprecedented performance/functionality not available in any other HF/6M radio transceiver.

RRP: 3849.95
ML&S PRICE £2899.95

APACHE LABS ANAN-8000DLE HF & 6M 200W SDR

APACHE LABS SOFTWARE DEFINED RADIOS
FACTORY DIRECT DISTRIBUTOR

ML&S PRICE: £CALL
Click www.HamRadio.co.uk/8000DLE

Please click **www.HamRadio.co.uk** for the full range of SDR products

NO.1 FOR ACCESSORIES

NEW! METROVNA-180 & 250 ANTENNA ANALYSERS

Both available from stock, Large clear 16k touch-screen display, Internal Battery, BlueTooth, either 100kHz-180 or 250MHz, WIN10 or MAC or Android interface.

METROVNA-180: £249.95 250 VERSION: £299.95

Click! *www.HamRadio.co.uk/MetroVNA*

NEW! NISSEI DIGITAL POWER/SWR METERS

The RS-50 (120W 2m & 70cm) & 70 (200W 160m-6m) are compact in-line meters that present power and SWR on a digital backlit LCD display. ***Introductory price: £69.95 each.***

Click! *www.HamRadio.co.uk/nissei*

ML&S ARE THE OFFICIAL UK IMPORTER FOR HEIL SOUND

Pro-Set 7	£239.95
Pro-Set 6	£134.95
Pro-Set IC	£169.95
Pro-Set Elite 6	£169.95
Pro-Set Elite IC	£199.95
Pro-Set 3 Headphones	£99.95
PR-781 Microphone	£189.95
PR-40 Microphone	£289.95

Click! *www.HamRadio.co.uk/heil*

POWER SUPPLIES

Two-year warranty on all MyDEL PSUs

MyDEL MP-30SW1V £89.95

25Amps, 9-15V DC, super light with digital metering for Volts & Amps.

Click! *www.HamRadio.co.uk/mydelmp30*

MyDEL MP-304MKII £99.95 Heavy Duty LINEAR 30Amp

Non-switching linear power supply with huge chassis mounted transformer (old style!)

Click! *www.HamRadio.co.uk/mydelmp304*

MyDEL MP-50SW111

50 Amp DC power supply **£125.00**

50 Amp version of the MP-30SW1V.

Click! *www.HamRadio.co.uk/mydelmp50*

New! Nifty Desk-top Stand Holder for Icom ID-5100. Only £29.95

Daiwa Meters

All featuring cross needle display offering unrivalled accuracy for SWR & Power

Click! *www.HamRadio.co.uk/daiwa*

NEW Diawa meters in stock now.
CN-901, GFCN-501, CN-901.
See web for more info.

CN-101L	1.8-200MHz. 15/150/1.5kW	£97.95
CN-102L	1.8-200MHz. 20/200/2kW	£97.95
CN-103LN	140-525MHz. 20/200W. N-Type	£99.95
CN-901HP	1.8-200MHz. 20/200/2kW. PEP Reading. Large display	£129.95
CN-901HP3	1.8-200MHz. 30/300/3kW. PEP Reading. Large display	£149.95
CN-901VN	140-525MHz. 20/200W. N-Type	£119.95

Messi & Paoloni

Full range of Messi & Paoloni Low Loss Professional Coaxial Cable in stock now!

M&P ULTRAFLEX 7

Ham Radio professional coaxial cable with stranded core (19 wires) and extraordinary flexibility. The external PVC jacket is in black UV resistant PVC. This cable delivers exceptional mechanical features and electrical properties. Notwithstanding its small dimension (7,3 mm) its performances are so good to outperform RG 213 U (10,3 mm) and put into shade the competitor cables of the same diameter.

M&P ULTRAFLEX 7
7.3 LowLoss cable, 50 Ohm, double shielded.

M&P ULTRAFLEX 10
10.3mm LowLoss cable, 50 Ohm, "alternative for RG-213."

M&P BroadPro50 double jacket
12.4mm LowLoss cable, 50 Ohm, double jacket.

Any of our cables can be ordered in any multiple of 10m length. There is a 10% discount for 100m+.

Click! *www.HamRadio.co.uk/ultraflex*

MyDEL-SF-401PLUS

MyDEL

Handheld frequency counter with a difference. 100MHz-3GHz & displays your CTCSS & DCS codes.

RRP £44.95
Special Offer £39.95

Click! *www.HamRadio.co.uk/sf401plus*

DX ACCESSORIES

For more information, prices & technical information email MicroHam@HamRadio.uk

microHAM

For the complete range of Array Solutions and microHAM

Click! *www.HamRadio.co.uk/arraysolutions or / microham*

TIGERTRONICS SL-USB

ONLY £119.95 WITH FREE LEAD

ALL sound card Digital and voice modes are supported by the SignaLinkTM USB. This includes traditional modes such as RTTY, SSTV and CW (to name a few), as well as today's hottest new modes like PSK31, MT-63 and EchoLink.

Cable included - see web.

Click! *www.HamRadio.co.uk/tigertronics*

MORSE KEYS

CG-PK4 Pocket Keyer

CG Antenna introduce the new pocket Electronic Memory Keyer.

- Extremely small size
- Very low power consumption (160MicroAmps)
- Four memories with Auto Repeat function
- Selectable Keying Weight
- Built-in side tone ideal for training
- Keying speed 8-50WPM
- Advanced Paddle Mode
- Straight Keyer Mode

Only £44.95

KENT MORSE KEYS

See web for full range and specifications

Kent Morse Practice Oscillator	£31.95
Kent Twin Paddle Key	£114.95
Kent Twin Paddle Key Kit	£98.95
Kent Hand Key	£99.95
Kent Hand Key Kit	£86.95
Kent Single Paddle Key	£95.95
Kent Single Paddle Key Kit	£94.95
Kent KT-1 Professional	£109.95
Kent Vail Lever Correspondent Replica	£219.95

RADIOSPORT HEADSETS

Whether for DXing, contesting, field day, or casual everyday use we think you'll agree Radiosport headsets have the features you want. ML&S are proud to have been appointed their distributor and have stock today.

All headsets are supplied with GEL Cushions giving extra comfort and FREE cloth covers.

RADIOSPORT

RS1OSL
Listen only stereo lightweight headset for CW ops **£119.95**

RS60CF
Deluxe Dream Edition Stereo Headset with boom **£239.95**

RS20S
Deluxe Dream Edition Stereo Headset only no boom..... **£139.95**

Mini-XLR
Lead set for any radio (Yaesu/ Kenwood/Icom/Flex/Elecraft) ..... **from £59.95**

PTT-FS-RCA Foot switch with 7ft cable with phono plug **£44.95**

PPT-HS-RCA Hand PTT Switch, 7 foot cable with phono plug .. **£64.95**

How about an additional 3.5mm socket on the opposite ear cup to allow "tethering" of another headset for a logger or maybe just an additional pair of ears?

Click! *www.HamRadio.co.uk/radiosport*

TOUCH PADDLES

BASICOMM

Click! *www.HamRadio.co.uk/basicom*

MyDEL COAX SWITCHES

CO-201	COAXIAL SWITCH 2-WAY COAX SWITCH SO-239. 500W MAX	SPECIAL OFFER £19.95
CO-201N	2-WAY COAX SWITCH. N-TYPE SOCKETS. 500W MAX	SPECIAL OFFER £21.95
CO-201AM	2-WAY DELUXE HEAVY DUTY COAX SWITCH SO-239 1KW	SPECIAL OFFER £32.95
CO-201AN	2-WAY DELUXE HEAVY DUTY COAX SWITCH N-TYPE 1KW	SPECIAL OFFER £33.95
CO-301M	2-WAY DELUXE HEAVY DUTY COAX SWITCH 1KW	SPECIAL OFFER £39.95
CO-301N	2-WAY DELUXE HEAVY DUTY COAX SWITCH N-TYPE 1KW	SPECIAL OFFER £40.95

FAST DELIVERY

You can now order from ML&S for delivery on a Saturday or Sunday!

Order before 3pm as late as Friday of each week and see it delivered at the weekend.

Web purchases: Just select Saturday or Sunday at the check-out or call to place your order for Saturday or Sunday delivery on **0345 2300 599**

DPD

ML&S ARE THE OFFICIAL UK IMPORTER FOR HEIL SOUND

ML&S - the world's favourite *original* ham store

ML&S 0345 2300 599

Web: www.HamRadio.co.uk

SAFE ONLINE SHOPPING
Shopping online with ML&S is safe and secure. E&OE

FOLLOW US ON TWITTER AND FACEBOOK HamRadioUK

Martin Lynch & Sons Ltd. Wessex House, Drake Avenue, Staines, Middlesex TW18 2AP. E-mail: **sales@hamradio.co.uk**
Opening Hours: Mon - Fri: 8.30am to 5pm. Sat: 9am to 4.30pm. International Tel: +44 1932 567 333

ProSet-7 and ProSet-7 IC

A great sound at an affordable price. Available in Black, Blue, Red from stock and Pink to order. DX'ers and contesters love them for their large comfortable gel earpieces which also act to suppress outside ambient noise. The IC version for Icom radio comes with the correct microphone element and the adaptor cable. Proset-7 £239.95. Proset-7IC £259.95

PR-781G

Designed by the amateur radio division of Heil Sound using the technology and a professional dynamic cardioid element from the broadcast division. A beautifully wide frequency response and the perfect addition to just about any shack. Adaptor cables to suit any mainstream radio. £209.95

HEIL SOUND™

Our Best-selling Headphones and Microphones

click!
www.HamRadio.co.uk/heil

ProSet Elite 6 and ProSet Elite iC

Not only for amateur radio. This is the headset of choice for commercial sportscasters and podcasters and sounds just brilliant on air. With the Heil exclusive phase reversal technology to help put a stop to listener fatigue, and removable ear pads washable cotton covers to keep the headset hygenic over many years of use. iC for Icom radios. ProSet Elite 6 - £169.95, ProSet Elite iC - £189.95

PR-40

Offering the widest frequency range from any Heil PR series microphone. The 1" large, loss mass diahphram microphone element is shock mounted inside the body and sits behind NOT one but two mesh screens to stop popping noises. Available in Champagne, Black and Gold, Gold or a Chrome finish and provided with an adjustable microphone holder and padded leatherette bag with a molder foam insert to protect the microphone in transit. FROM £289.95

HTH

New from Heil sound is the Handie Talkie Headset (HTH). A simple single sided headset with boom mic for use with your favourite handheld radio. Varients available for Kenwood/ Wouxun, Yaesu and Icom. £38.95

PMD-6

Heil Sound at an affordable price for all. The PMD-6's fitted with the same HC-6 mic element found in their more expensive headsets with stereo headphones. Supplied with a foam windscreen to reduce breath noise on the microphone. Compatable with all AD-1 adaptor cables. £109.95

FOR THE FULL RANGE OF HEIL SOUND PRODUCTS SEE HamRadio.co.uk/Heil

Contents

September 2017

News and Reports

Regulars

Reviews

56

Courtesy G3TXF

48

Technical Features

Features

Cover image: The FoxRex 3500 80m amateur radio direction finding (ARDF) receiver. Image by Bob Titterington, G3ORY.

RadCom THE RADIO SOCIETY OF GREAT BRITAIN'S MEMBERS' MAGAZINE

Managing Editor: Elaine Richards, G4LFM, elaine.richards@rsgb.org.uk
Technical Editor: Giles Read, G1MFG, giles.read@rsgb.org.uk
Layout and Design: Kevin Williams, M6CYB, kevin.williams@rsgb.org.uk

All contributions and correspondence concerning *RadCom* should be posted to: *RadCom* Editor, 3 Abbey Court, Fraser Road, Priory Business Park, Bedford MK44 3WH Phone 01234 832 700, fax 01234 831 496, radcom@rsgb.org.uk

RadCom is published by the Radio Society of Great Britain as its official journal and is sent free and post paid to all Members of the Society. **The October edition of *RadCom* is expected to arrive with most Members by 23 September** although this can take up to a week longer in some cases; international deliveries can take longer still.

All material in *RadCom* is subject to editing for length, clarity, style, punctuation, grammar, legality & taste. Articles for *RadCom* are accepted on the strict understanding that they are previously unpublished and not currently on offer to any other publication. Unless otherwise indicated the RSGB has purchased all rights to published articles. No responsibility can be assumed for the return of unsolicited material. See tinyurl.com/radcompix for info on taking photos

The online *RadCom* is at www.rsgb.org/radcom/
RadCom Plus is available to RSGB Members online at www.rsgb.org/radcom-plus
Abbreviations and acronyms we use are listed at http://tinyurl.com/RC-acronyms
RadCom Basics for Members new to the hobby can be found at www.rsgb.org/radcom-basics/

The RSGB is on Twitter @theRSGB

Find us on Facebook at www.facebook.com/theRSGB

Diversity in amateur radio

What was your earliest encounter with amateur radio? There are probably almost as many stories as there are RSGB Members. Perhaps it was early contact with your local club. I remember looking mine up in the *RSGB Bulletin* (yes, I know!) and going to a meeting. Fortunately, I was already nuts about radio or that meeting might have been the end. No one spoke to me. No one even offered me a coffee. Nothing much seemed to be going on. The meeting was in a gloomy community hall that smelled of disinfectant. I didn't go back and the experience has stayed with me. I hope this doesn't ring a bell – but it might!

We all know it doesn't have to be like that and fortunately I had already met amateurs prepared to welcome me with great generosity and humour. There seemed to be another virtual 'club' – amateurs bound together by their passion for radio. They shared knowledge willingly and were prepared to lend you almost anything. They wanted to do things! How do we re-boot that spirit?

In our RSGB Strategy 2022, with strong Member support, we want to encourage far greater diversity in amateur radio. Diversity in terms of Membership – not just for ageing white males like me! Better access for all – especially young people, minority groups and those living with disabilities. We also need diversity in our activities. Amateur radio is a scientific service – just look at its history. The youthful enthusiasts of today could well be the inventors and entrepreneurs of the future – but only if amateur radio is seen as a test bed for ideas and innovation. Whatever our age, amateur radio is also an important part of personal fulfilment through life-long learning.

Where do clubs come into this? There are about 500 clubs affiliated to the RSGB. They remain an important feature of the service – even in these days of changed social habits. Some great things going on in clubs across the UK. There are specialist groups for particular enthusiasms – such as microwave operation, low power working, contesting, building things – the list goes on. Legacy Funding has recently been given to groups working on construction projects with young people. Some clubs are hardly recognisable as such. Suffolk RED and Essex Skills Night are just two examples and exist to bring together people from neighbouring clubs to share and enjoy innovation and activity. Groups meet in pubs or for breakfast – and of course there is the internet. There are also other quite traditional clubs that are simply all-round successful!

Sharing these good ideas already goes on locally but I feel we should do more. That is one reason why I have been visiting clubs to see ideas in action. Please try to help. There will be a forum at the Convention in October to offer my findings so far and then discuss openly how best to take things forward. Please come – and also contact me if you have some really innovative ideas to share (president@rsgb.org.uk). It's about the future.

Nick Henwood, G3RWF
RSGB President

Beacon News

The Orkney 5MHz beacon, GB3ORK, is back on air on 5290kHz after repairs and an upgrade by Andy, G4JNT. Its new synthesiser now transmits JT9A, in addition to the original sequence of stepped power levels.

On 50MHz, the Mid-Cornwall Beacon, GB3MCB, has been reconfigured to join the IARU Region 1 Synchronised Beacon Program. It sequentially transmits on its new frequencies of 50.005 and 50.443MHz, sending both CW and the PI4 digital mode. For the shared 50.005 frequency, its callsign is modified to GB3MCB/S to assist reception reports.

Did you hear?

The Russian satellite *Sputnik 1* was launched 60 years ago in October. Did you hear its beeping signal in Morse code at any point during its orbits of Earth? Radio amateurs played a major role in confirming reception of the satellite's QRPp signal. Tell us about your Sputnik experience and we'll pass the details on to those who are compiling information of this historic event (email radcom@rsgb.org.uk).

RSGB Contest Club

The RSGB Contest Club was a new initiative in 2016 that provides a group for RSGB Members who wish to participate in RSGB Affiliated Society contests but are not currently members of clubs that take part. The Club currently has 25 members with a varying level of entry to the contests. If you are an RSGB Member and would like to join the RSGB Contest Club please send an email with your RSGB Membership number to ContestClub@rsgbcc.org

GB2RS newsreader retires

Phillip Brooks, G4NZQ has been looking after the GB2RS news service in Norwich since 20 November 1994, which makes it almost 23 years of news reading. Together with support from the local stand-in news readers, he has provided an unbroken service over that period. Phillip has decided it is time to retire, although the others in the team, David, G7URP, Roger, G3LDI and Mike, G4DYC are going to keep the service going, probably on a rota basis.

The RSGB would like to thank Phillip for his many years of service to GB2RS and has recognised this commitment with a Certificate of Appreciation.

Microwave news

Ofcom has issued a statement confirming the technical parameters for the extension of Wi-Fi in the 5.7GHz amateur band. Following extensive inputs, the RSGB welcomes the conservative approach that Ofcom are taking and look forward to the low power and indoor restrictions being properly enforced. The new regulations were effective from 7 August. Details are at https://tinyurl.com/y8cdwoy5

Ofcom has also confirmed the final details for their forthcoming auction of 2.3 and 3.4GHz spectrum that was removed from amateur radio use as part of the 2014 Licence Review. The auction documents include an information memorandum with considerable detail of amateur and Primary User usage in these bands. See https://tinyurl.com/y9fyvnyf for full information.

International Amateur Radio Union (IARU)

We all know about the importance of the radio spectrum in modern life – or should do! The amateur radio service has to compete with many other users and potential users. The International Amateur Radio Union (IARU), of which the RSGB is a member, provides a vital strong voice in negotiations about such important worldwide issue as frequency allocation and use, band plans, spectrum pollution and the future of the amateur service. The UK is in IARU Region 1 – comprising Europe, Middle East, Africa and North Asia. Frankly, without a world voice, the amateur service would struggle to survive. In September our delegation, all volunteers, will be attending the Region 1 Conference in Germany.

At the Friedrichshafen Ham Radio Fair the Regional President, Don Beattie, G3BJ, set out the current challenges for the IARU. His speech is available in full on the RSGB website (see www.rsgb.org/iaru-speech). This is a short summary.

Amateur radio needs to work hard to maintain its privileged spectrum access in the face of strong competition from commercial, civil and military users. Decisions are taken at World Radio Conferences which are preceded by much preparatory work by the RTOs (Regional Telecommunications Organisations – CEPT for Europe). RTOs rely greatly on national spectrum regulators (Ofcom for the UK). The next World conference is in 2019 and work began in early 2016 in IARU.

The IARU and its volunteers comprise the only amateur radio organisation that has access to the ITU and all RTOs.

Spectrum retention is one core challenge for amateur radio. A second critical area is spectrum protection. There is growing awareness of the problems of electrical interference and intruders. The IARU seeks to influence international standards organisations considering emission standards for electrical and electronic devices. Current issues include solar photo-voltaic generators, wind generators, digital devices, VDSL+ and wireless power transfer. Too often levels of market surveillance are low and products arrive in the market with self-certification. Concern is growing about our ability to maintain a usable radio spectrum in suburban Europe.

Two other important areas are intruder monitoring and band planning to ensure effective use of the spectrum. With 167 member societies, the IARU is uniquely placed for such work.

These issues are vital for the future of amateur radio. Member societies and individuals are always needed to help the IARU's small volunteer band of 'very capable people'.

G6XX callsign returns to RSGB

After 90 years we are extremely pleased to be able to reuse this historic callsign on behalf of the Radio Society of Great Britain.

The callsign 6XX was first held by the RSGB in the 1920s and was used in transatlantic tests with a special permit to use an input power of 1kW. This was before the prefix 'G' was added to callsigns in England, so G-6XX was used. In the early 1930s G6XX was held briefly by George Lionel Seymour Dawson-Damer, Viscount Carlow. He was a flamboyant and gifted individual who was a close friend of T E Lawrence (Lawrence of Arabia); he was one of few friends to visit Lawrence in his last days after his infamous motorcycle accident.

In 1935, G6XX (now with the G prefix) was issued to Don Scarr of Howden in Yorkshire. Don was a DX enthusiast and he continued to hold the callsign until his death in the 1980s. He was frequently mentioned in *Shortwave Magazine*. The Goole Radio & Electronics Society has memories of Don and the homebrew tower that he had in his garden.

Fig. 1. A general view of the interior of British amateur radio transmitting station G-6XX. A. E. Treham, the chief operator, is at the key. This station is located at Shenherd's Bush, London, and was erected in a room loaned by the Dubilier Condenser Co., Ltd. A special permit has been granted to use an input power of one kilowatt.

Now that G6XX has eventually returned to its original holders we aim to use this historic callsign to raise the profile of contesting within the RSGB and to represent the RSGB in international contesting. It is a now held as a club callsign by the RSGB Contest Club, which is an RSGB Affiliated Society within the RSGB, officiated by the Chairs of the three RSGB Contest committees.

We welcome proposals from RSGB Members for use of the callsign, particularly in multi-operator contest stations or in the context of training newcomers to amateur radio contesting. Please keep a lookout for G6XX on the bands and give us a call.

RSGB AGM 2018

The 91st RSGB AGM will be on 21 April 2018 in Birmingham. Details, including the Calling Notice, will appear in the April 2018 edition of *RadCom*.

EMC errata

An item in August 2017 EMC stated that the Rampion offshore wind farm in the English Channel will use high voltage DC (HVDC) transmission with AC-DC converter stations. This particular wind farm will actually use high voltage AC transmission all the way, with conventional AC substations, so there are no potential EMC issues with the onshore substation. Nevertheless, other onshore HVDC converter stations for offshore wind farms are under construction and it is planned to include further details in a future *RadCom* EMC Column.

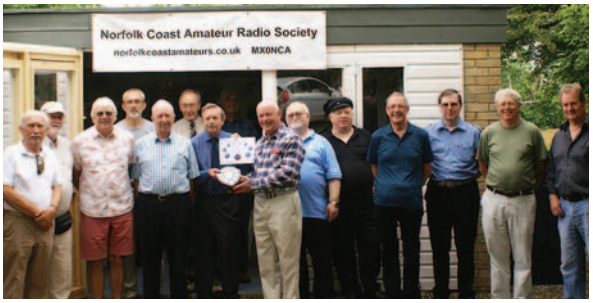
Club of the Year

National Club Of The Year
Principal Sponsors
WATERS & STANTON

Region 12 Manager Keith, G3WRO presented Loughton & Epping Forest ARS with the Regional Club of the Year Award. Keith was joined by Jeff Stanton, G6XYU from Walters & Stanton and District 123 DRM Peter, G0DZB.

Stockport Radio Society has recently received the Region 3 Large Club of the Year award from Dave Wilson, M0OBW DRM33. Receiving the award were Tony, M0SAV and Heather, M6HNS.

RM13, Jim Stevenson, G0EJQ presented the R13 Club of the Year award to Worksop ARS. The two Regional representatives for YOTA were in attendance, Kane, M6JQC and Courtney, M6JPV.



RM12 Keith, G3WRO presented the Club of the Year Trophy (small club) to Norfolk Coast ARS. He presented the trophy to Phil, G4PQP.

International amateur radio

RSGB volunteers contribute to the development of international amateur radio within Region 1 of the International Amateur Radio Union (IARU). Some volunteers also work directly with the IARU. This vital work goes on largely unseen but is essential in ensuring the amateur radio voice is heard, especially in Regional telecommunication organisations, the International Telecommunications Union and international standards organisations.

The RSGB wishes to ensure that it can continue to support the important work in this area, and is looking for additional people with the appropriate capabilities. Essentially, if you have some prior knowledge and experience of spectrum management or EMC issues and also have well-developed political and diplomacy skills, you could be the ideal person. We also welcome expressions of interest from people who feel they could develop these skills and are interested in this important area of RSGB and IARU work. For more information see www.rsgb.org/iaru-volunteer

If you feel you could make a contribution to this work and would like to explore what it might mean, please contact RSGB General Manager Steve Thomas, M1ACB via email to gm.dept@rsgb.org.uk

G4DCV appointed as TEC Chair

Paul Whatton, G4DCV has been appointed as Chair of the RSGB's Technical and Educational Committee (TEC). Paul previously held the post of Vice Chair within TEC and is the Project Leader for the Train the Trainers scheme, which recently trained its 200th tutor.

First licensed in 1972 as G8FUR, Paul is a member of Windmill Contest Group and enjoys activating a number of special event stations. Although mainly a 2m SSB, CW and digital modes operator, he can also be found on HF and has a keen interest in home construction.

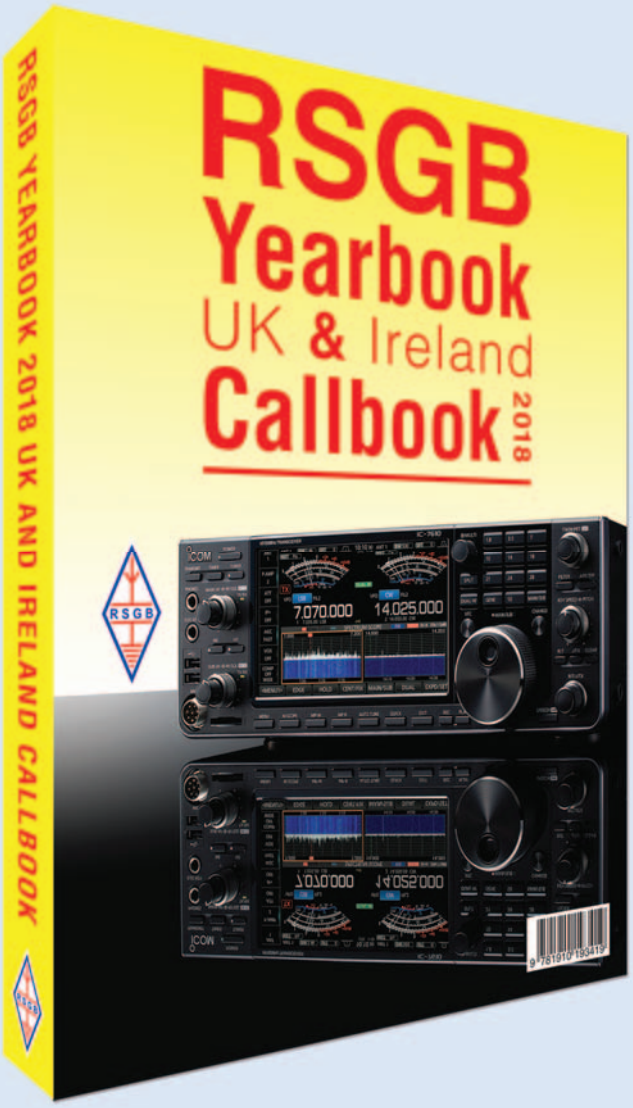
By profession Paul is a Senior Lecturer in Film Production for the University for the Creative Arts in Farnham and has used his professional skills to good effect by assisting the Society with a number of its amateur radio videos and vlogs.

Club Contests Autumn Series

We now have the rules for the Autumn Series of introductory Club Contests published on the RSGB HF contests website. These can be found from the RSGB HF Calendar page at www.rsgbcc.org/hf/. Many of the ideas for these contests were suggested by contesters and then the specific rules were chosen in a Survey held earlier in the year. These include many features that are designed to encourage newcomers so please discuss in your radio clubs how you might use this series of contests for mentoring new contesters. Although the rules are similar to the 80m Club Championships, there are some subtle differences, so you should check out the new rules before entering.

The dates are September 11 – SSB, 20 – CW, 28 – Data. October 9 – CW, 18 – Data, 26 – SSB. November 13 – Data, 22 – SSB, 30 – CW.

If you have any questions about this series please e-mail hf.query@rsgbcc.org.



NEW TITLE

NEW LOWER PRICE!

At the NH National Hamfest
Fri 29 Sept & Sat 30 Sept

FREE* IMPROVED RSGB Document Bag

RSGB Yearbook 2018

Edited by Mike Browne, G3DIH

More calls than ever before and a new lower price too!

There are more UK and Ireland callsigns on issue than ever and they are all included in the *RSGB Yearbook 2018.* With thousands of changes and updates included, this book contains the very latest details available of over 87,500 UK and Irish Republic callsigns in its massive 544 pages.

Not only does the *RSGB Yearbook 2018* remain the latest callsign information available for the UK but it is also the most comprehensive guide to amateur radio in the UK and worldwide. You will find over 170 pages of invaluable reference material for just about everything you are ever likely to want to know about amateur radio. There is all the latest information on every aspect of the RSGB from how the Society is organised, the services it offers, committees, who to contact for assistance, etc. Regional information provides details of the RSGB Regional Manager Teams, local clubs, contest, repeater and much more. There is a huge range of information sections included from Repeaters, Beacons, Band Plans, RSGB Awards, RSGB Contests and HF Propagation Predictions for 2017. There are also listings of special contest callsigns, permanent special event callsigns and much, much more.

The *RSGB Yearbook 2018,* is as always, much more than a simple list of callsigns and, if you haven't purchased a copy in a while, the updated information is an essential for every well-equipped shack.

Better value than ever – why not treat yourself to a RSGB Yearbook 2018

210x297mm, 544 pages, ISBN: 9781 9101 9341 9
Non Members' Price £17.99
RSGB Members' Price £15.29

Only available at National Hamfest for the first 100 customers each day who purchase a copy at the show. Or with orders over £20** ***(While Stocks Last)

E&OE *(All prices shown plus p&p)*

RSGB SHOP

Radio Society of Great Britain www.rsgbshop.org
3 Abbey Court, Priory Business Park, Bedford, MK44 3WH.
Tel: 01234 832 700 Fax: 01234 831 496

FROM **FREE P&P**
on orders over £30. See Page 82

Examination Group changes

Alan Betts, G0HIQ has recently chosen to step down from his long-standing and much-valued role as Chair of the Examination Group. He will continue as part of the Group and to contribute to the examination system in numerous ways, not least being the lead tutor at his local amateur radio group.

Alan first became involved with the amateur radio Exams Committee at its inception in 2001 when he was working for the Radiocommunications Agency (Ofcom's forerunner), responsible for amateur, marine and aeronautical licensing. On retirement from full-time work in 2006, Alan's voluntary roles with the RSGB expanded and he became the Chief Examiner for the RCF and Chair of the RSGB Examinations Committee, a position he has held since.

Although the Exams Committee was initially formed to develop the Foundation exam and licence, as RSGB and Ofcom re-shaped the licensing structure and City and Guilds withdrew from amateur radio, the Exams Group developed the syllabus and exam for the new Intermediate and Advanced levels.

The RSGB thanks Alan for his 15 years as Chairman and the incalculable help he has provided in shaping the Foundation, Intermediate and Advanced exams. He has made amateur radio an accessible hobby for thousands of people and we look forward to benefitting further from his experience in the future.

60m news

The Philippines Telecom Regulator has permitted access to the new WRC-15 Amateur Secondary 60m allocation of 5351.5 – 5366.5kHz under ITU footnote 5.133B, with a maximum power limit of 15W EIRP.

The new Belize Amateur Radio Club (BARC) website carries information that the new WRC-15 Amateur Secondary 60m allocation of 5351.5 – 5366.5kHz has become available with a maximum power limit of 25W EIRP.

The Cyprus telecom regulator issued a Gazette notice on 30 June updating the national frequency table to include the new WRC-15 Amateur Secondary 60m allocation of 5351.5 – 5366.5kHz with a maximum power limit of 15W EIRP and also the Amateur Secondary MF allocation of 472 -479kHz with a maximum power limit of 1W EIRP.

146-147MHz Digital TV progress

Slides and video are now available on the Ofcom website from the latest RSGB/BATC Presentation at Ofcom's Business Radio Interest Group (BRIG) held on 30 June. Ongoing advances in Reduced Bandwidth TV by radio amateurs at 146-147MHz were presented by VHF Manager John Regnault, G4SWX. The video clip shows robust reception of colour digital video transmissions over 15km on 146.5MHz with a reduced bandwidth of 470kHz.
See https://tinyurl.com/yczf4248 for more information.

RSGB Convention Satellites lecture online

The latest 2016 RSGB Convention lecture to be added to the RSGB Members' area is *The new world of amateur satellites* by Graham Shirville, G3VZV. You'll find this, other convention lectures and a host of other exciting videos in the RSGB video portal at www.rsgb.org/video
The 2016 Convention lectures are a Members' benefit, but the other videos are available for anyone to view.

Want to help review the latest gear for *RadCom*?

We are looking to augment our existing group of authors to test new amateur radio equipment and write *RadCom* reviews. These articles cover anything from dipole antennas onwards and vary from a one-page impression of a handheld to a five or six page in-depth look at a larger piece of equipment. You may need to have access to suitable test equipment to check the performance of some equipment, ranging from power output to sensitivity, phase noise and IP3 measurements, for example.

All reviews will be on a commissioned basis, with equipment normally coming straight from the manufacturer or distributor. The scope and length of the article will normally be agreed at the outset, as will the deadline and fee we'll pay. You'll need to have a good 'feel' for radios and the ability to write reasonably well, but we will give you as much editorial support as needed.

If this is something you might be interested in, please email radcom@rsgb.org.uk with your basic details and phone number so that we can discuss how best to proceed.

DRM132 volunteer vacancy

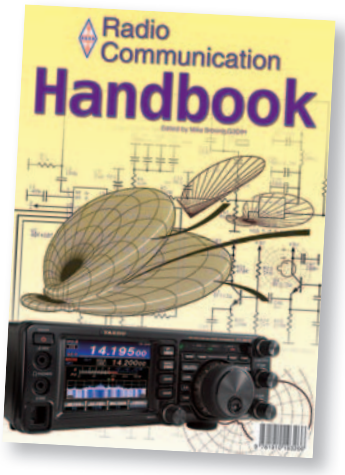
A vacancy has arisen or a Deputy Regional Manager in District 132, the South Nottinghamshire South Derbyshire area of Region 13. If you are an RSGB Member who resides in or around that area and are interested in finding out more about this role, please contact the Regional Manager, Jim, G0EJQ by email to rm13@rsgb.org.uk

G5RP trophy

The G5RP Trophy is an annual award to encourage newcomers to HF DXing. The award is not limited to youngsters or the newly-licensed; it is open to anyone who has recently discovered and made significant progress in HF DXing. If you are an established HF DXer and want to recommend someone to be awarded the G5RP Trophy for 2017, now is the time to send in your nomination. Your nominee should be an up-and-coming HF DXer who has made rapid progress in the last year and has some real achievements to show, for example, a good total of new countries worked or some serious HF DXpedition activity. This prestigious award will be presented this year at the RSGB Convention in October.

Please send your nominations to Ian Greenshields, G4FSU, QTHR, or by e-mail to ian.greenshields@gmail.com to arrive no later than 15 September.

Authors & Editors Wanted



Could you write a book? Or edit several articles into a book? If you think you could, then the RSGB would like to hear from you as we are currently looking for new book authors and editors. We are particularly looking for those who have something to offer in the Raspberry Pi, Arduino and other new technologies. However we also need help with VHF/UHF projects and would also like to hear from those with experience in HF, construction and antennas. We are also looking for those who have experience of Apps and much more so whatever your skills we would like to hear from you. Whilst we are looking to hear your concept for a new RSGB publication we also have a number of our own ideas for new titles and are keen to appoint amateurs to write or edit these for us. If you would just like to find out more about becoming a published author or editor with the RSGB please send an email to authors@rsgb.org.uk and we will send you further information about writing for us.

QSL Matters

This month, sub managers M0A, Des Heard MBE, G6YEK and M0C, Rod Ashman, G4JVJ are retiring. Also stepping down due to group consolidations is G4Y-Z manager, Tony Roberts, G4ZIB. Tony has been an extremely active volunteer for 11+ years. We thank them all for their long-term support of the society and for their consistent and excellent service to the Membership.

Roy, M0RRV, sub manager for M1, M3 & M6 tells us that this year he has sent 134 emails asking Members to collect their cards, or send him envelopes. Only 36 responded and amongst them he has envelopes with no callsigns, no delivery addresses, no return address on the outer envelope and some with no stamps! We would urge all Members to keep all their calls, email addresses and contact details up to date on the RSGB database (you can phone or do it online) to allow our team of volunteers to support the Membership.

Finally, are you holidaying in another UK prefix area this summer? Please remember to visit the QSL sub-managers listings on the website and deposit at least one collection envelope in the area you're visiting. It will avoid the need to give out 'via' information on the air and it will make our volunteers' jobs much more rewarding.

Ofcom guidance notes

Ofcom have updated their guidance notes relating to the UK Amateur Radio Licence. The new edition dated July-2017, replaces the previous April-2016 version and includes changes associated with the introduction of the new Ofcom online licensing system last summer. The document should be read in conjunction with the licence, and is intended to help licensees understand and comply with the licence terms and conditions.
It can be downloaded from the Ofcom website (26-page/240KB PDF) https://tinyurl.com/y7eeshkr.
Links to the Ofcom guidance and additional resources are also available from the RSGB website at https://tinyurl.com/y9ohlbrz

Congratulations

To the following Members whom our records show as having reached 50, 60 and 70 years' continuous Membership of the RSGB.

70 years

Mr P W Bowles	G3ECM
Mr B W Legrys	G3GOT

60 years

Mr C H Evans	G3LUO
Mr F Griffiths	G3MED
Mr K Ashcroft	G3MSW
Mr M E Slater	G3NML
Mr DJ Penny	G3PEN
Mr J Juleff	G4MXU

50 years

Mr J K Harding	G3XFL
Hereford ARS	G3YDD
Mr D Whalley	G4EIX
Mr W D Green	M5AGW
Mr D Pratt	G8KPY

The RSGB would like to welcome to the RSGB family the following new Members who have joined their voice to ours and are helping to keep the RSGB strong.

Mr L Stamper, 2E0DNW
Mr C Panaitescu, 2E0IPL
Ms J Atkinson, 2E0SVN
Mr T Prince, 2E0TPR
Mr U Munir, 2E0UMR
Mr K Davies, 2E0VKB
Mr D Blackburn, 2E0VMO
Mr K Mitchell, 2I0KFM
Mr A Ulyatt, 2W0ULY
Mr D Aldis, AA6HO
Mr F Fina, AC2IK
Mr D Fifield, AD6A
Mr D Kozel, AG6PO
Mr T Groves, AG7ES
Mr P Sadowski, AH6LS
Mr L Parente, CT2ERT
Mr A Tibus, DK2WT
Mr H Bartz, DL7UKT
Mr S Rees, G0GPN
Mr M Cooper, G0SVZ
Mr H Lemmon, G3HRL
Mr J Mcmahon, G4KVD
Mr J Coupe, G4NRO
Mr C Thomas, G4ZCT
Mr G Trudgill, G7MVX
Mr J Ledbury, G7VYL
Mr D Evans, G8POI
Mr J Kreft, G8PVB
Mr J Smith, GU7DAI
Mr C Morrison, HB9HFB
Mr R Meneghini, IK3TCH
Mr J May, K6MAY
Mr D Fannin, KK6DF
Mr J I Recabeitia, LU8ARI
Mr H Lennertz, M0IHT
Mr M Salt, M0UMS
Mr T Weston, M0WTJ
Master J Fitzpatrick, M3IQM
Mr G Mears, M3PIA
Mr P Marshall, M6EHR
Mr A Hateley, M6DYR
Mr L Guy, M6HHV
Mr L Boylan, M6ISQ
Mr J Hansford, M6JHX
Mr P Reeves, M6JPQ
Mr J de Vantier, M6JRK
Mr P Smythe, M6JVY
Mr K Hodgkins, M6KHR
Miss S Dagger, M6LHY
Master F Petheu, M6LXF
Mr P Cooke, M6NLX
Master O Petheu, M6OPU
Mr R Hankinson, M6PZT
Mr G Buxton, M6VOV
Mr M Smith, M6WMS
Mr B Kuttikkate, M6WWI
Mr R Curtis, M6YRC
Mr H E Taylor, M6YTX
Mr J Davidson, MI0IKF
Mr S Cummings, MM6JVQ
Mr T Weir, MM6XTW
Mr L Nunnelley, N6QKP
Mr A F Hansen, OZ3AAA
Mr T Gallagher, RS313389
Mr R Cichocki, RS313404
Mr C Grech, RS313473
Mr M Stevenson, RS313483
Mr P Rea, RS313487
Mr D Jones, RS313496
Mr M Pott, RS313522
Mr L Cooper, RS313526
Mr P Haywood, RS313579
Mr J McEwan, RS313668
Mr A Heyes, RS313694
Mr R Morgan, RS313710
Mr T Carroll, RS313714
Mr C Butcher, RS313753
Mr P Brucher, RS313763
Mr B Murphy, RS313782
Mr D Szymanski, SQ6EMM
Mr B Barksdale, W0CBB

The RSGB would like to welcome back the following Members who have rejoined the Society.

Mr D Jacobs, 2E0DFJ
Mr D Humphrey, 2E0DGH
Mr J Lugsden, 2E0JFL
Ms A Bate, 2E0LMD
Mr J Grint, 2E0PPO
Mr R Tuffin, 2E0TES
Mr J M Stubbs, 2W0SCT
Mr A Green, EI3HG
Mr D Baker, G0GWL
Mr C Witson, G0KIJ
Mr L J Jenkins, G0LTG
Mr T Chapman, G0OOD
Mr L Baker, G0TEO
Mr G Mann, G0VHH
Mr R S Coleman, G0WYD
Mr P Walker, G1OVA
Mr B Lundean, G3ZHT
Professor D M Jackson, G4DKR
Mr D A Johnson, G4DPZ
Mr J F Fitzwater, G4HVO
Mr M W Pitt, G4KPM
Mr G A Hooker, G4OEM
Mr B Millican, G4OFA
Mr C N Wilson, G4VVZ
Mr A Chidwick , G4XDW
Mr M G Nixon, G6ADP
Mr P Booth, G6FZU
Mr R J Ashberry, G6RTM
Mr R Webb, G6TXH
Mr J S Smith, G7MUN
Mr P Thackeray, G8YZL
Mr J H Stronach, GI3LQY
Mr L Robinson, GI4NSS
Mr S Brennan, GW3ZXI
Mr R Merritt, KC2ORX
Mr B Parsons, M0COG
Mr F Brunt, M0FCB
Mr M Hotchin, M0HOM
Mr M G Hopewell, M0XMH
Mrs R Sanders, M1AYG
Mr S Mathew, M6VWN
W J Niessen, PA2PIM

New 23cm Tropo record

Terry, M0VRL (IO70PO) reports that on 14 July he completed a QSO of 2662km with Pedro, EA8AVI (IL28FC) in the Canary Islands that breaks the UK and IARU Region 1 23cm tropo records. Terry runs an Icom IC-910X, a Gemini 23 power amp and a 67 element Wimo Yagi. Pedro runs an IC-910X to a 23 element Tonna Yagi. Reports of 51 both ways were exchanged on SSB. The QSO was completed at 2021UTC with an exchange of reports and locators. The photo shows Terry's 23cm antennas.

RAOTA AGM

The Radio Amateur Old Timers' Association (RAOTA) is holding its AGM on 6 September at the Brunswick Inn, 1 Railway Terrace, Derby DE1 2RU, almost opposite the railway station car park. Commencing with an informal get-together at noon, the AGM is at 1.30pm. For more information contact Ian Brothwell, G4EAN on 0115 926 2360 or by email to GenSec@RAOTA.org Membership of RAOTA is open to anyone with an active interest in amateur radio.

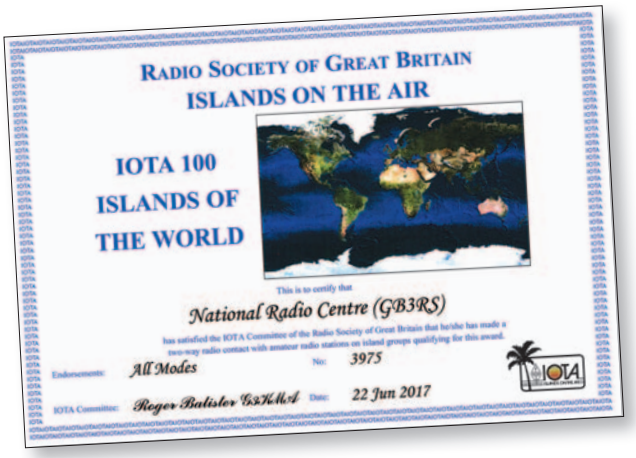
Telford HamFest

The Telford HamFest takes place on 3 September at 'Enginuity' in Coalbrookdale, Telford, Shropshire TF8 7DX. The venue has a new Museum of Iron as well as the hands-on Enginuity technology centre. Numerous traders and exhibitors will be present and Dave Pick, G3YXM, who writes the LF column, is presenting an update to activities on the lower frequency bands. The G QRP Club's mini Convention and Buildathon takes place the previous evening at the Holiday Inn, Ironbridge, Telford TF3 4EH. Steve Hartley, G0FUW is running the Bath-style 'Buildathon' of a pocket sized digital power meter, based around the ubiquitous Arduino Nano, with a resolution of 10mW. Further information at www.telfordhamfest.org.uk

Special event stations

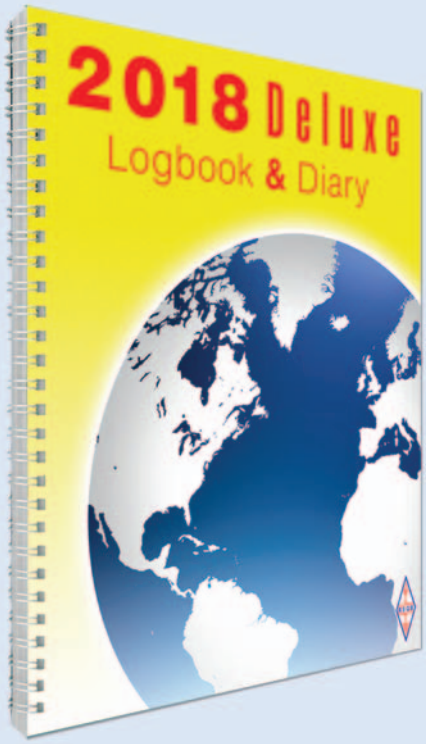
Riviera ARC in Torquay will be running two special event stations in September. GB1BOB will be on 15 & 16 September, celebrating the hard work and sacrifices of all those who fought in or served during the Battle of Britain. GB4BCR will be run as part of Railways on the Air on 23 September from Babbacombe Cliff Railway, a funicular railway that takes people up and down the cliffs to Oddicombe at the bottom of the Babbacome Downs. e-QSLs will be available for these events.

Torbay ARS will run a special event station from Stover Canal (TQ12 3QJ) on 23 September from 9am to 4pm. The canal was built by James Templer of Stover House between 1790 and 1792 to serve the ball clay industry in the area. It runs for nearly 2 miles from Ventiford Basin near Teigngrace to Jetty Marsh on the outskirts of Newton Abbot. Having been allowed to fall derelict, the canal is now in the process of being restored.



IOTA award

Volunteers at the National Radio Centre, using the GB3RS station, have worked the required qualifying contacts to obtain the Islands On The Air IOTA 100 award. Congratulations to all those involved in island chasing. Read more about the award at www.rsgbiota.org/info/directory/rules-en.pdf



At the **NH** National Hamfest **Fri 29 Sept & Sat 30 Sept**

FREE IMPROVED RSGB Document Bag

IF YOU SPEND OVER £20 (*While Stocks Last*)*

RSGB Deluxe Logbook & Diary 2018

Looking back over old log books can bring back memories of old friends, satisfying and challenging QSOs. For many there is nothing like it and even today nothing sits better on the bench of an amateur radio shack than a well maintained log book. If you are looking for an attractive way to record your log year by year, the *RSGB Deluxe Log Book & Diary 2018* provides an ideal solution. This logbook isn't just somewhere to note your QSLs but much more.

This hugely popular annual logbook contains a wealth of extra material just where you want it, when you want it, right at your fingertips in your shack. The *RSGB Deluxe Log Book & Diary 2018* contains the latest UK Band Plans, RSGB Contest Calendar, DXCC prefix list and RSGB QSL Bureau information. The information doesn't stop there either, a locator map (and an explanation of how locators work), repeater information, diary section, notes pages, handy lists of operating abbreviations & codes - pretty much everything you want to know when operating is included. The logbook section isn't forgotten either and there is a generous log section with plenty of space for you to record a whole year activity. If you want to keep your log for years to come and make it easy to look over then the *RSGB Deluxe Log Book & Diary 2018* provides an attractive logbook that will grace any shelf for years to come.

The *RSGB Deluxe Log Book & Diary 2018* includes:
- Current UK band plans
- European locator map
- Prefix guide
- Repeater listings
- QSL bureau information
- RSGB Contest Calendar
- Generous Log section
- 2018 Diary
- Handy lists of abbreviations & codes

***DON'T FORGET** - more than a standard logbook - yet at the same price!*

Size 210x255mm, ISBN: 9781 9101 9344 0
Non Members' Price: £4.24
Members' Price: £4.99

Callseeker Plus 2018

NOW with a Raspberry Pi interface

Raspberry Pi

As many will know, the *Callseeker Plus 2018* is the electronic version of the *RSGB Yearbook 2018* and much, much more. Now not only can you run this software direct from either a CD or Memory stick on your PC you can also run it with a Raspberry Pi.

As always *Callseeker Plus 2018* provides the latest UK and Republic of Ireland callsign data but as a bonus you also get call information from 9A, DL, EA, ES, F, HA, HB9, I, LX, LY, OE, OH, ON, OZ, SM, SP, SV and Z3 as well. All this takes up no computer hard disk space as it runs straight from the CD or memory stick, it is really easy to use and. You can search by callsign, name or location and navigating through the search results is quick and easy. You can print the results in a variety of formats including straight to an address label. *Callseeker Plus 2018* is the ideal way to search for European QSLs

Callseeker Plus 2018 also boasts a host of "extras" from across Europe, including the *RSGB Yearbook 2018* reference information pages in an easily searchable PDF format providing the very latest amateur radio reference information from the UK and around the World.

Two formats – one price
The *Callseeker Plus 2018* is available as either a traditional CD ROM or an USB Memory Stick version. The CD is in the full jewel case whilst the memory stick is encased an Eco bamboo shell. Both are highly portable and easy to use and provide a great alternative to the traditional *RSGB Yearbook*.

***Callseeker Plus 2018* cheaper than a *RSGB Yearbook 2018* and with more callsigns – what a bargain!**

Non Members' Price: £16.99,
RSGB Members' Price: £14.44

* See p9 for T&Cs

E&OE (*All prices shown plus p&p*)

Amateur radio at the BBC

In July Kenwood UK Sales Director, Mark Haynes, donated a Kenwood TS-590 HF transceiver to the recently formed London BBC Radio Group, G8BBC. Group Chairman, and Radio 4 announcer/newsreader, Jim Lee, G4AEH received the donation in the new club shack at the top of BBC Broadcasting House where test transmissions are now in progress ahead of the official opening. The station, which has been dormant for four years since leaving BBC Television Centre in 2013, is now making test transmissions to check for any EMC issues with BBC Engineering. G8BBC is active on HF and VHF, and now has 25 members of BBC staff, some with amateur licences, and some short wave listeners.

Full Licence course in SE9

Cray Valley RS, a member of the South East Tutors group of clubs is running a fully taught and mentored Full licence training course this autumn. Details are at http://goo.gl/AEV5GN

The course includes evening maths primer sessions on 2 & 9 October, an Intermediate revision day on 14 October. The main intensive course commences on 4 November for three consecutive Saturdays followed by the exam on 25 November. For further details of the course, which will run in Eltham, London SE9, please contact Kevin, M0KSJ via email to courses@cvrs.org

LAMFST 2017 success

LAMFST enjoyed another successful year, the 5th so far. Over £800 was raised for Yorkshire Air Ambulance including from the raffle with prizes from Icom, Kenwood, Yaesu, bhi, Cross Country Wireless and LAMCO. Well done to all involved.

CHOTA on 9 September

Churches & Chapels On The Air (CHOTA) takes place on 9 September between 10am and 4pm. It all began in 2006 when John, G3XYF thought it would be a good idea to establish an amateur radio station in his church on that day for the benefit of visitors as part of the York Historic Churches Trust open day. CHOTA has developed substantially during the intervening years, and year thirty to forty churches across the UK permit their local radio amateurs to set up stations in aid of this good cause. For details of churches and chapels taking part see www.wacral.org/CHOTA.htm Those claiming the available award must contact eight or more stations operated by WACRAL members. See the website www.wacral.org for details.

EME on Goonhilly 32m dish

Thanks to the generosity and support of Matt Cosby and Ian Jones of Goonhilly Earth Station, a group of UK amateurs are planning to operate EME on 3.4GHz and 5.7GHz using the 32m antenna GHY6 at Goonhilly Down on 25 and 26 August. The moon rise at Goonhilly is at about 1000UTC on the 25th and 1100UTC on the 26th and they hope to be on the air until about 1830UTC using GB6GHY. They will be present on the HB9Q logger and are looking forward to as many QSOs as possible. Anyone interested can contact Brian, G4NNS or Noel, G8GTZ by email to chair@batc.tv See www.goonhilly.org/antennas/antenna-list for details of the site and antennas.

Air Ambulance Week

This year's International Air Ambulance event will take place between 9 & 17 September, with the focus on supporting and generating donations for flying medical services around the world. Registration will be mandatory and all stations taking part will be issued a registration number. Awards will be available for those who support the event see the website for details, www.radio-amateur-events.org

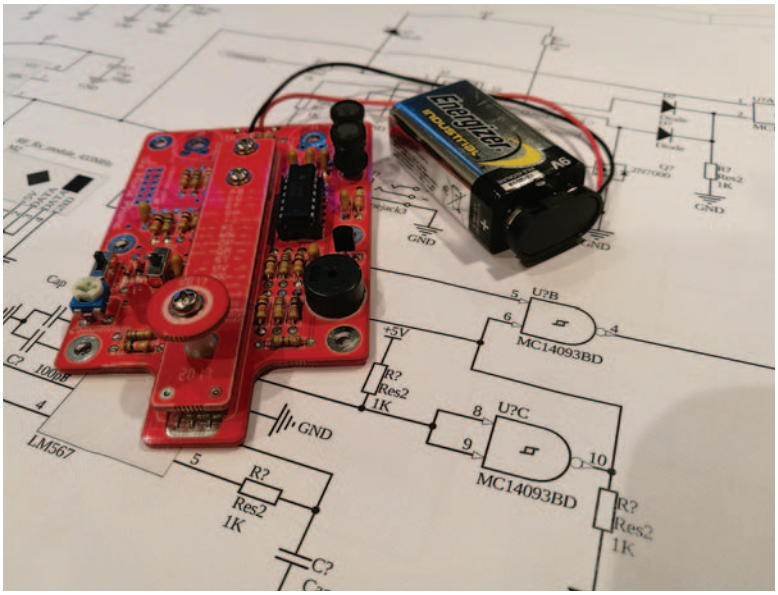
DX-Hotel prize won

The 2018 World Radiosport Team Championship is being held in Germany in July 2018. To raise funds for this event, the DARC arranged a daily tombola at the recent Ham Radio event in Friedrichshafen. Philip, GW4HAT won second prize on the Sunday's draw, which was a voucher for 2 people for 2 days half-board accommodation at DM9EE's DX-Hotel with use of his (rather special/big) DX station located in Holzminden, Lower Saxony. He runs a hotel complex called DX-Hotel Hellers Krug, part of which is dated from circa 1756 (www.dm9ee.de/hotel.html). The DX-Hotel is good for chasing DX, but also offers sightseeing, cycling along the river Weser and nice villages such as Hamlin and Bodenwerder.

New Products

22-25A Switch Mode PSU covers 0.5 to 17V

The Avair AV-2025D is a digital display switch mode power supply that has been designed to match both the performance of modern digital transceivers. The LCD back-lit display gives large clear voltage and current readings with an amber back-light for dark environments. The output is 0.5 to 17V variable at 22A continuous, 25A peak. It will retail at £89.95 and will be available from Waters & Stanton. See www.hamradiostore.co.uk



The Morse Phone

The Servicekring JOTA-JOTI is a non-profit organisation, run by volunteers, supporting the international Scouting event JOTA-JOTI (Jamboree On The Air/Internet). They provide nametags and badges to support the JOTA-JOTI in the Netherlands and every year develop a new electronics kit at cost. For JOTA 2017 it is the Morse Phone. The kit can be build during JOTA, providing a fun and educational activity during the event. The Morse Phone can be used as a stand-alone Morse-sounder (practice oscillator), but it can be coupled to other Morse Phones as well, making a two way communication link. It is inspired by the Fullerphone (used in the Army around the WWI and WWII), and shares the same working principle. The price of the kit is 4.85 Euro plus delivery and it can be ordered from www.kitbuilding.org. Orders are shipped, in principle, once a week.

ML&S now West Mountain stockists

ML&S Ltd has announced that they are now distributors for the superb West Mountain Radio range of accessories. With a varied selection of products available from the world renowned 'RigBlaster' interface, 'RigRunner' DC panels to the handy 'Anderson Powerpole' connector packs. ML&S is now stocking the entire range and specialist items can be ordered on demand.
Check out the range at www.hamradio.co.uk/wmr

Guying collars

If you use one of the many popular telescopic poles to support temporary antennas on DXpeditions or portable, you will likely have needed some way to guy it. SOTABEAMS has introduced two heavy duty guying collars designed for this application. They are made of a rugged plastic material with eight holes for flexible guying options. Although they are suitable for use in heavy duty applications, the use of modern high-performance plastics means that they are lightweight. Two sizes are available, 22mm and 34mm inner diameter, sitting at different heights on telescopic poles. The smaller collar has a vertical section suitable for attaching a small beam antenna (such as a TV antenna). Priced at £2.99 and £3.50 respectively, see www.sotabeams.co.uk for full details.

bhi audio equalisation

DSP noise cancellation specialist, bhi, has launched the new ParaPro EQ20 range of audio DSP products (see the review of the ParaPro EQ20-DSP on page 22). The ParaPro EQ20 range features a 20W modular audio power amplifier with a parametric equaliser plus the option of having bhi's latest dual channel DSP noise cancelling technology and Bluetooth technology. The parametric equaliser allows any specific part of the frequency range to be selected and adjusted in strength. The user is able to precisely select a frequency to boost or cut to suit your own hearing and environment. The EQ20 range can be used with your own passive speaker/speakers and is supplied with a user manual and full accessory kit to suit most types of connection. There are four options ranging in price from £159.95 to £299.95. For more information go to www.bhi-ltd.com

Acom ATU

The new ATU-04AT 1.2kW Auto ATU from Acom is designed to work seamlessly through a single coax connection, from any of the new Acom solid state amplifiers. Remote control is achieved by using a 60kHz bi-directional FSK modem in both tuner and amplifier fed through the coaxial cable. The tuner has a built in 4-way switch, with SO239 output sockets that allow selection of four different antennas at the tuner. A bypass switch is also included, for those broadband antennas that do not require tuning, to be connected to one of the sockets. The unit is fully weatherproof and supplied complete with brackets for desk, wall, or tower mounting. It is expected to retail for around £1099. Nevada is a UK dealer for Acom and further details can be found at www.nevadaradio.co.uk

60m portable antenna

With the decline in solar activity, 40m is getting to be hard work for more local HF contacts. The 5MHz band (60m) is now available in many countries so SOTABEAMS has introduced a version of their popular Band Hopper antennas to include 60m. The Midi Hopper is a full-size, full-performance antenna that covers 20m, 40m and 60m. It is ready tuned, includes a balun, feeder and guying for a 7m telescopic pole. Selling for £63.50, you can see full details at www.sotabeams.co.uk

Acom 1.2kW amplifier

The new Acom A1200S is a solid state 1.2kW amplifier, covering 1.8 to 54MHz. The output stage uses BLF188 field effect (MOSFET) devices that can withstand high SWR and mismatch. They can be driven to full output with just 50W of RF drive power and were originally intended for aerospace and broadcast applications. The amplifier has a large high resolution colour display making it easy to use and to see all operating functions at a glance. The A1200S is compatible with all radios currently on the market as it does not need any special control signals other than a simple 'ground on transmit' PTT. It senses RF and immediately tunes to the band in use. It has a selling price of £2795, with first deliveries expected in early August. Full details at www.nevadaradio.co.uk

Ham Radio at Friedrichshafen 2017

Ham Radio again proved to be a great draw for amateur radio enthusiasts from around the world with around 17,110 visitors in July. The 196 exhibitors and associations at the show came from 33 countries, including the RSGB. From antennas to transmitters and accessories to books, the international amateur radio exhibition offered just about everything an amateur could possibly need. The flea market area again proved to be a real treasure trove as well as place to meet and talk shop. The RSGB took the opportunity to present an RSGB Special Award to Lisa Leenders, PA2LS, IARU Region 1 Youth Working Group Chair, for her tireless work in putting on Youngsters On The Air via the IARU YOTA programme. The RSGB President also received the YOTA flag ready for YOTA 2017 taking place in the UK during August.

Ham Radio will again be taking place in Friedrichshafen next year from 1 to 3 June 2018.

Homebrew

This month we look at receive automatic gain control for the 160m transceiver.

For the experienced constructor, designing a circuit is usually a fairly simple affair. When you need a particular building block for your project, you:

- make a list of specifications for the circuit
- check to see if there is a readily available device that will provide an ideal solution
- design and build your circuit. Component manufacturers' data sheets and application notes will often provide useful guidance.

More often than not, your circuit will work as expected. With a bit of luck, it will meet or exceed the requirements from your list of specifications.

There are a few notoriously difficult areas for the circuit designer. Anything that involves extremes can be a bit tricky. Very high gain can lead to instability (unwanted oscillation). Extremely wide or narrow bandwidth can also present stability problems. Automatic gain control (AGC) is one area of receiver design that is often regarded as something of a 'black art'. There are a few extremes involved in the design of a typical SSB or CW receiver, these include:

- gain, typically well over 100dB
- gain control range (60-100dB).
- time – large difference between application (attack) and removal (decay) times for automatic gain control.

In many cases, some compromises in performance may be acceptable. Spurious free dynamic range of 100dB or more has become standard for many receivers. As a casual user of the 160m band, a mere 80dB would probably be adequate for my needs. I could also live with relatively poor selectivity because the 160m band is usually sparsely populated and relatively quiet here, even during the hours of darkness. If my receiver was much weaker in terms of dynamic range or selectivity, there is a good chance that I wouldn't even notice the subtle effects caused by these problems. On the other hand, I would have little or no tolerance for poor AGC performance. The effects of a poorly designed AGC system will be very obvious to the listener. Clicking or popping on the AGC attack, hideous distortion on the first syllable of speech or the first Morse character is impossible to ignore. My pet hate is slow 'pumping' of the receiver gain by background noise. Many receivers, both homebrew and commercially made, have in my opinion been spoiled by poor AGC performance.

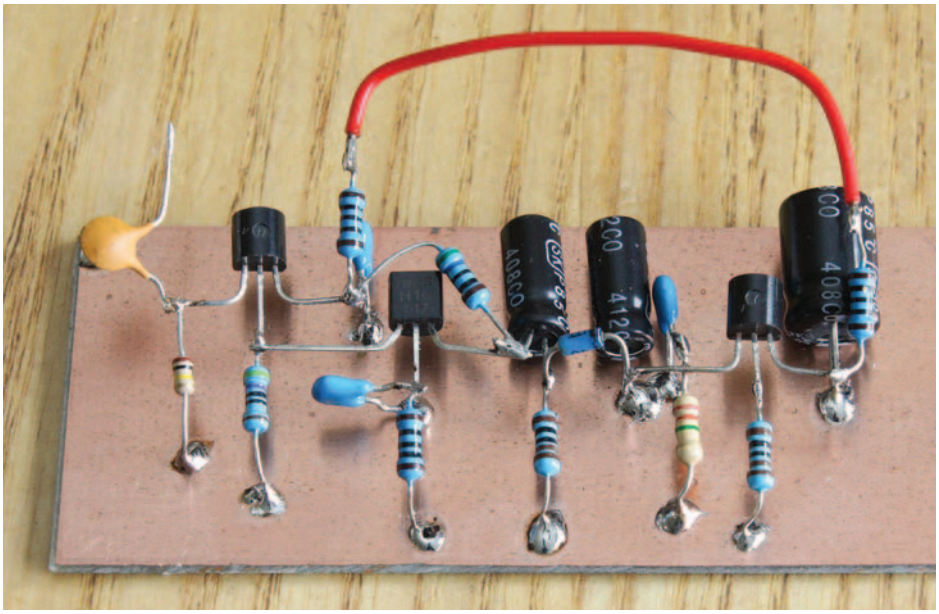


PHOTO 1: Prototype AGC circuit.

The ideal AGC system will keep receiver gain under control without producing any unexpected noises. Attack should be fast enough that there is no audible distortion on very strong signals. Attack time should be no more than a few milliseconds. Decay time is mostly a matter of personal preference. Typical decay time for speech is several seconds. Shorter decay times tend to result in audible variations in background noise between words or during short pauses.

In a typical SSB/CW receiver, the received signal strength is sampled at the IF or AF stages. Some more complex AGC systems measure both IF and AF. In such systems, the gain feedback loop is controlled by the IF sample, the hang-time is determined by the audio sample. This allows a relatively long decay time, combined with a rapid return to full gain in the absence of demodulated signals.

Both IF and AF derived AGC is widely used in SSB and CW receivers. Either approach can give excellent results. As a general rule, IF derived systems give better dynamic performance. Audio derived systems are inherently slower to respond, particularly when a simple half-wave rectifier is used as the AGC detector.

Over the years, I have built many AGC systems. The best examples were excellent, while some of the others were really awful. The key components are the detector and the attack and decay time constants. I have found the simple circuit shown in **Figure 1** has consistently given superior performance

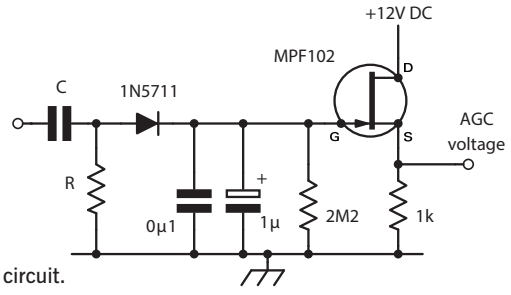


FIGURE 1: FET-based AGC circuit.

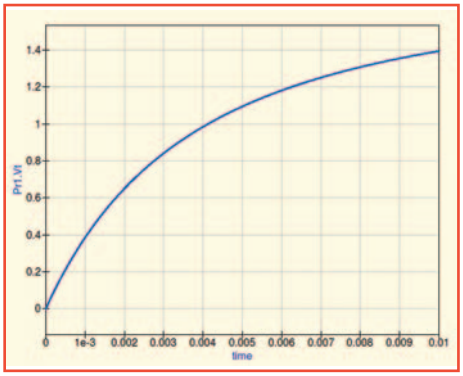


FIGURE 2: *QUCS* simulation of the AGC's strong-signal attack characteristics.

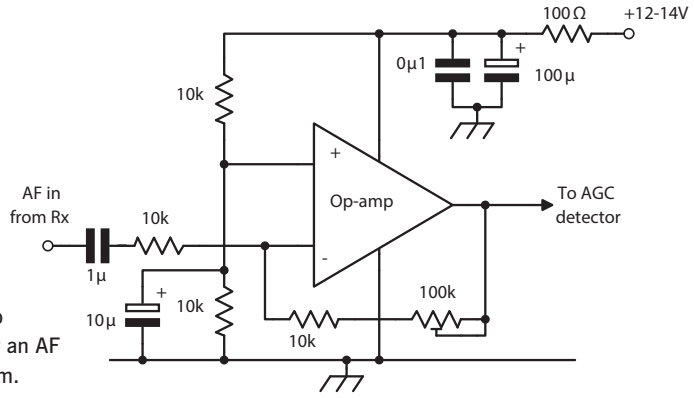


FIGURE 3: Opamp based amplifier for an AF derived AGC system.

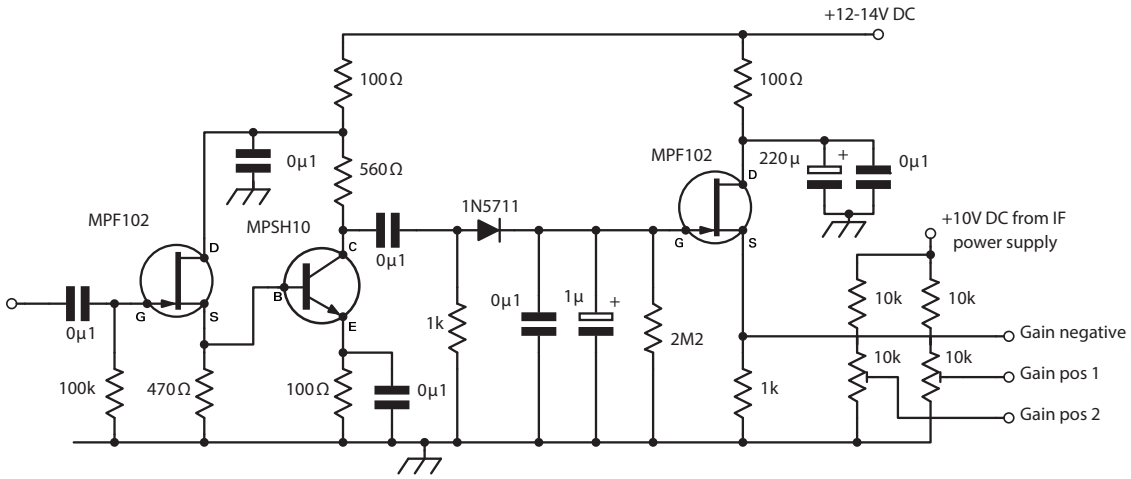


FIGURE 4: IF derived AGC system.

to any other type. The detector is a simple half-wave rectifier based on a Schottky diode. This design can be used for either IF or AF derived AGC. The input capacitor (C) is chosen to have a low reactance at IF or AF as appropriate. 10µF works well for AF, 100nF is suitable for IF derived systems. The input resistor (R) is 1kΩ. The attack time of around 1ms is determined by the 1µF electrolytic capacitor and the relatively low impedance of the driving circuit. The decay has a much longer time constant of just over 2 seconds, as the capacitor discharges through the 2M2 resistor.

The FET is configured as a source-follower (common-drain) amplifier. This configuration offers a few advantages. The extremely high input resistance of the FET gate circuit ensures that the decay time is almost entirely determined by the external R/C values. The FET buffer gives a useful DC voltage offset of a few volts between the input (gate) and output (source). This is ideal for driving the gain-control input of a typical IC based IF amplifier. Most devices are not designed to work with input voltage close to the negative supply rail. With an MPF102 FET, the DC voltage across the 1k source resistor was measured at 2.49V. Testing several MPF102 FETs from the same batch resulted in no more than a couple of mV variation in output voltage.

Figure 2 shows a *QUCS* **[1]** simulation of the strong-signal attack characteristics of the AGC circuit. The detector starts to respond within microseconds. This is where IF derived systems score a big advantage over relatively slow AF derived AGC. For a single AD603 amplifier with gain reduction of 25mV/dB, gain is reduced by 16dB in 1ms and 40dB by 4ms. This rapid response is critical for smooth AGC operation.

In most cases, the AGC detector will be preceded by an amplifier. This should have a high input impedance and low output impedance. The circuit in **Figure 3** is an opamp based amplifier for an AF derived AGC system. AF gain is adjustable from 0dB to more than 20dB. This gives a lot of flexibility when choosing the 'tapping point' for receiver audio. When fitting AF derived AGC to an existing receiver, the 'hot' end of the AF gain control pot is a convenient point to take the receive audio from. AF voltage will be relatively high, proportional to received signal strength (for SSB/CW) and independent of the main AF gain control adjustment.

IF derived AGC

Figure 4 shows the IF derived AGC system that has been installed in the new 160m transceiver project. The input buffer and amplifier is designed to place minimal loading on the output of the IF amplifier. The IF signal is taken from the output of the second IF amp, at the connection to the product detector. See the July Homebrew for a detailed description of the IF stages. The source follower buffer is followed by a direct-coupled, common-emitter amplifier. The circuit is suitable for use at most common IFs from 455kHz to at least 22MHz. Voltage gain for the pair of amplifiers was measured at 17 (24dB) for frequencies around

Eamon Skelton, EI9GQ
hbradio@eircom.net

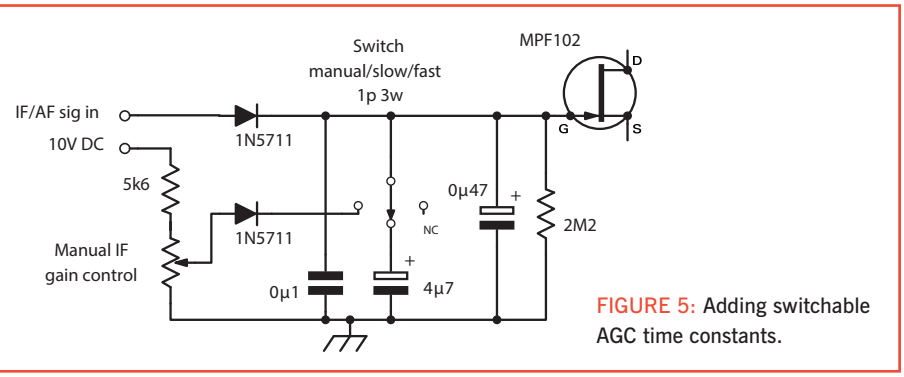


FIGURE 5: Adding switchable AGC time constants.

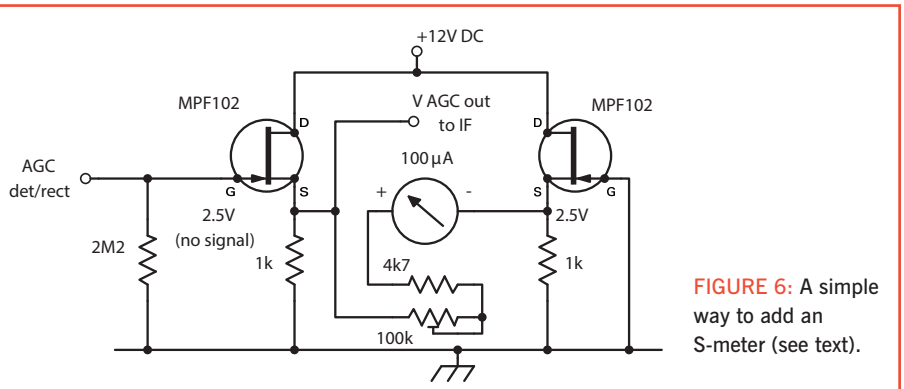


FIGURE 6: A simple way to add an S-meter (see text).

10MHz. The detector was described earlier. The values shown give very good performance for SSB speech and CW.

The AD603 IF amplifiers have very flexible arrangements for applying AGC. Gain control can be applied to one stage only, to both stages at the same time, or sequentially, so that no gain reduction is applied to one stage until another has reached the limits of its control range.

For optimum signal-to-noise performance, AGC can be applied to the second amplifier first. The first amplifier will have no gain control applied unless the second amplifier reaches the end of its 40dB+ control range. If maximum accuracy (minimum ripple across the control range) is a priority, AGC can be applied equally to both devices at the same time. This avoids the potential 'glitch in the middle' at the crossover where gain control shifts from amp 2 to amp 1. As signal to noise ratio (SNR) is the priority for my application, I have decided to use sequential gain control.

Construction

The circuit was built on a strip of PCB laminate. To keep signal leakage to/from the LO, IF and carrier oscillator to a minimum, you should follow good HF/VHF construction practice. Keep leads and ground connections short and direct. The combined gain of the IF amps and AGC buffer is more than 80dB. This places great demands on IF filter stopband attenuation and product detector carrier balance, in order to keep the strong LO and carrier signals out of the broadband IF and AGC sections. I used a standard 1μF aluminium electrolytic from a Velleman kit (Maplin) in the R/C circuit. I tested a few of these devices for leakage using a digital multimeter. All showed infinite resistance on the 20MΩ range, which suggests there is no need for a more exotic low-leakage tantalum capacitor. The assembled prototype is shown in **Photo 1**. The rectifier/detector diode is a 1N5711 Schottky type. A silicon switching diode like the 1N4148 can also be used in this circuit. Because of the higher forward voltage of the 1N4148, AGC will not be applied until a slightly stronger signal is received. I actually prefer this AGC 'hold-off' at low levels. I don't like to hear any AGC action on very weak signals.

Testing

The AGC unit was wired to the existing modules as described in July. Happily, the list of missing blocks is getting smaller. A local oscillator signal was provided by my bench DDS signal generator. As mentioned earlier, the DC voltage at the detector output is just under 2.5V. With background band noise, noise from the amplifiers and any carrier leakage, the detector sits at around 2.7-2.8V on a quiet frequency. Even fairly weak signals will result in a measurable voltage increase.

Gain_negative from the AGC output line is fed to both ICs in parallel. The Gain_pos inputs are set at two separate levels. This allows for sequential operation. Gain_pos_2 is carefully set for an output of 3.80V using a digital multimeter. Gain_pos_1 is set one volt higher at 4.80V. Using separate pots to set Gain_pos allows great flexibility when experimenting with AGC options. Once the optional values are established, I may replace the pots with a fixed resistor network.

Adding AGC has greatly enhanced the performance of the receiver. I can now listen to evening nets on 160m without having to reach for the manual gain control. Even very strong signals are easily and silently controlled by the AGC.

Typical variation between strong and weaker stations was about 0.5V on the control line (about 20dB). I was interested to observe that even very strong signals rarely pushed the AGC line much beyond +1V (giving 40dB of attenuation). It would seem that for most practical purposes, applying AGC to just one stage would probably be sufficient. I won't know for sure until my near neighbour joins the net.

Switchable AGC options

It is very easy to adjust the AGC decay time to suit your own preferences. Time delay is proportional to the value of the electrolytic capacitor. **Figure 5** shows a method of adding more AGC options. This configuration requires a single pole, three way switch. One of the plastic 1, 2, 3 or 4 pole rotary types will probably be easier to find. This configuration allows fast, slow or manual AGC options.

S-meter

Figure 6 shows a simple method of adding an S-meter. The moving coil meter is driven from the AGC output voltage. The predictable gain control characteristics of the AD603 should result in a reasonably accurate (or at least *consistent*) meter. If you subscribe to the 6dB per S-unit standard, then you should see 150mV per S-unit below S9 and 250mV for each 10dB increment above S9. You will need to find a 50μV source for the initial calibration. Accuracy at the lower end of the scale will be limited due the behaviour of the detector diode at low signal levels. The sole purpose of the second MPF102 FET on the right of the schematic is to provide automatic 'zeroing' of the S-meter.

Next time we'll look at the local oscillator section and the overdue Rx/Tx switching arrangements.

Websearch

[1] Quite universal circuit simulator, http://qucs.sourceforge.net/

The radio... YAESU

HF Excitement
Seeking the Best Performance in All areas of Transceiver Design

Photo shows the FTDX9000D

HF/50 MHz Transceiver
FT DX 9000MP
400 W / Class-A 100 W

HF/50 MHz Transceiver
FT DX 9000D
200 W / Class-A 75 W

The Best of the Best

- Built-in three μ-Tuning modules*1
  (Excellent suppression of out-of-band interference)
- Enhanced Operation (DMU : Data Management Unit included)
- Built-in Automatic Antenna Tuner

*1 FTDX9000MP: Optional

HF/50 MHz Transceiver
FT DX 5000MP Limited
200 W / Class-A 75 W

Best Performance for the Serious DX'er

- 9 MHz Down Conversion receiver construction
- Equipped with Extra Sharp Crystal Roofing Filters
  (300 Hz, 600 Hz and 3 kHz)
- Built-in Automatic Antenna Tuner

HF/50 MHz Transceiver
FT DX 3000D
100 W

Pursuing the Highest Ideal of HF Transceivers

- 9 MHz Down Conversion receiver construction
- Equipped with Extra Sharp Crystal Roofing Filters
  (600 Hz and 3 kHz)
- Built-in Automatic Antenna Tuner

HF/50 MHz Transceiver
FT DX 1200
100 W

Best in Class Performance and Supreme Operability

- 3 kHz, 6 kHz and 15 kHz Roofing Filters included
  (Effective interference attenuation)
- Built-in Automatic Antenna Tuner

HF/50 MHz Transceiver
FT-450D
100 W

The Ultimate Compact HF Base Station

- Proven performance with unique Yaesu IF DSP
- Built-in Automatic Antenna Tuner

HF/50 MHz Transceiver
FT-891
100 W

Exciting Yaesu HF Field Gear

- Ultra Compact (W/H/D: 155 x 52 x 218 mm)
- SSB/CW/AM/FM Modes Available

YAESU
The radio

YAESU UK Ltd
Unit 12 Sun Valley Business Park, Winnall Close
Winchester, Hampshire SO23 0LB

For the latest Yaesu News , visit us on the internet at www.yaesu.co.uk

bhi ParaPro EQ20-DSP

The new bhi ParaPro EQ029-DSP provides versatile parametric filtering along with a 2-channel, 10 watts per channel, Class D power amplifier.

The unit has options that include bhi's digital signal processing (DSP) noise reduction filter along with Bluetooth connectivity, making the ParaPro EQ20 a sophisticated audio processing solution for all types of radio listening.

It is housed in a compact ABS case measuring 145mm (w) x 75mm (h) x 100mm (d) (including controls) and has plenty of connection options so it should be easy to integrate into just about any shack. Power requirement is the usual 12V DC power at up to 1.2A and this can come from the shack supply or the included 12V plug-top unit. Audio inputs are made using the three 3.5mm jacks on the rear panel. These provide channel 1 and 2 mono inputs or a combined stereo jack. All three inputs have been designed to cope with line or headphone level signals. The outputs comprise a set of banana sockets for the left and right speakers plus a pair of RCA phono jacks, also carrying the speaker output. One important point to note here is that the Class D bridge output has a direct DC connection to the amplifier circuitry (ie no isolating capacitors) so you must not parallel the speaker outputs or ground any of the connections. For headphone listeners, there is a 3.5mm stereo jack on the front panel. The Bluetooth version, reviewed here, adds Bluetooth connectivity into the mix with the ability to take input from a Bluetooth source and thus use the ParaPro EQ20 as a Bluetooth speaker.

Ways to adjust the audio

Let's start by explaining the difference between these three common methods of adjusting the frequency response of an audio system – Tone Control, Graphic Equaliser and Parametric Equaliser. The humble tone control is the simplest system and is usually configured to lift or cut bass or treble frequencies. The only adjustment provided is the amount of lift or cut but the frequencies acted upon are fixed.

A graphic equaliser, on the other hand, usually splits the spectrum into several fixed bands and provides lift and cut adjustment for each frequency band. However, the controls usually interact so if you lift one band you will often find that the adjacent bands are also lifted

PHOTO 1: The ParaPro EQ20 Audio DSP unit.

but to a lesser degree, **Figure 1**.

Parametric equalisers also split the audio range into bands but in this case, both the centre frequency of the band and the amount of lift and cut is adjustable. In a full parametric equaliser, the bandwidth of each band is also adjustable. Parametric equalisers exhibit far less interaction between adjacent bands and therefore make for more precise control.

The parametric filtering in the ParaPro EQ20 uses a slightly different approach as the filters act like two shelving filters, **Figures 2 & 3**. In those graphs, you can see that the boost or cut extends beyond the selected frequency giving the shelf-like curve.

Testing the ParaPro

Before using the ParaPro on-air, I carried out a few frequency response tests so I could better understand how the controls were operating. For these tests, I used the *HOLMImpuse*, freeware audio measurement tool. This is a very useful, general purpose, measurement tool that turns your PC into an audio sweep generator and spectrum analyser. The software can be downloaded from http://holmacoustics.com An important feature of the software is its built-in self-calibration that allows the characteristics of your soundcard to be subtracted from the measured result. That lets you clearly see the performance of the device under test (DUT). To handle the digital to analogue (and vice-versa) conversion I used a Mackie Onyx-Blackjack external USB soundcard. This unit is built like the proverbial brick outhouse, uses the excellent Cirrus Logic chipset, has 2 inputs and 2 outputs plus rotary level controls for input, output and headphone levels, **Photo 2**.

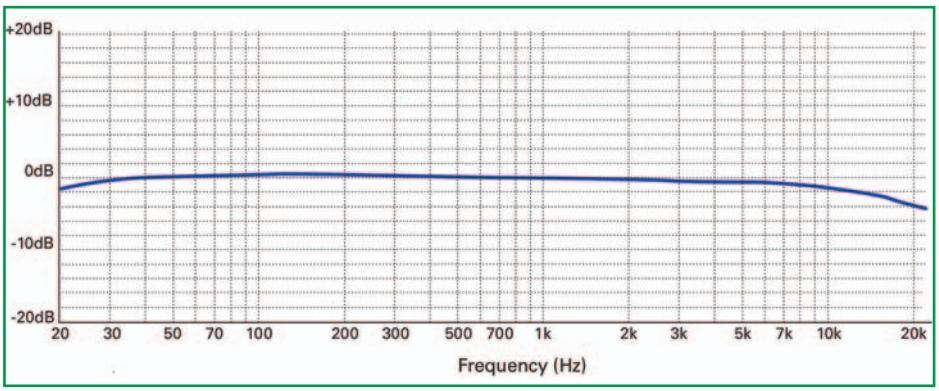


FIGURE 1: ParaPro EQ20 frequency response with the controls set for a flat response.

PHOTO 2: The sturdy Mackie Onyx-Blackjack external USB soundcard.

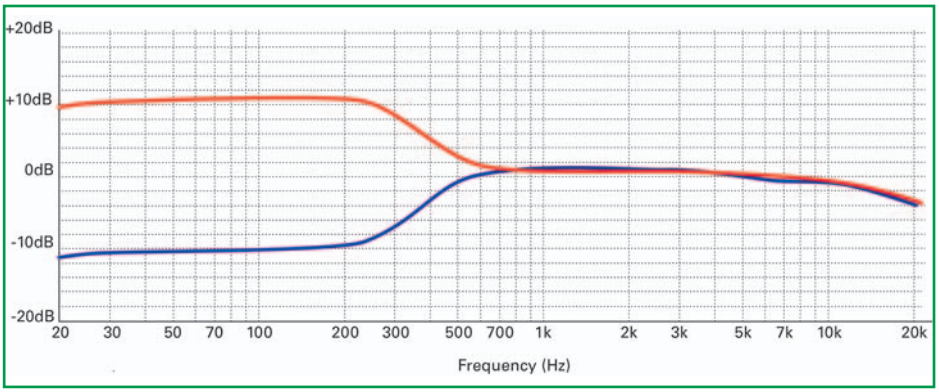


FIGURE 2: ParaPro EQ20 frequency response with the LF filter set to 300Hz +10dB (red) and -10dB (blue).

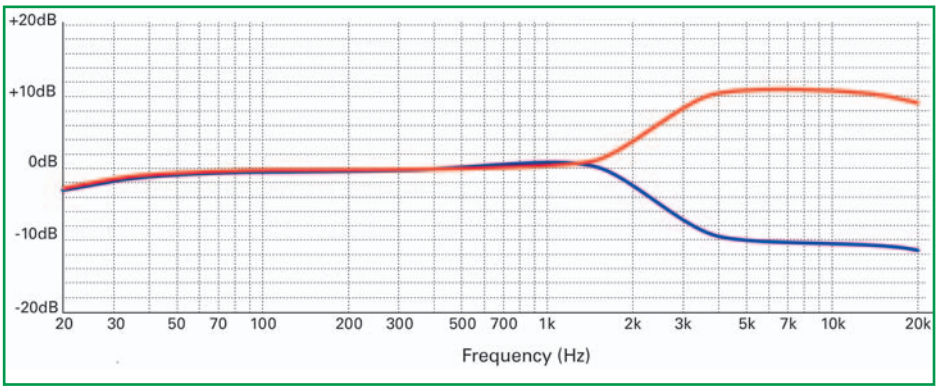


FIGURE 3: ParaPro EQ20 frequency response with the HF filter set to 3000Hz +10dB (red) and -10dB (blue).

As you can see from the photos, the ParaPro EQ20 has two parametric channels labelled Bass and Treble with the Bass centre frequency being adjustable from 100Hz to 1kHz, whilst the Treble covers 1kHz to 10kHz. Used together, these controls provide two bands of ±10dB adjustment from 100Hz through to 10kHz. In Figure 1, I've shown the frequency response of the ParaPro EQ20 with the equalisers set for a flat response and the noise reduction off. As you can see, other than a slight roll-off at the bottom end, the response is flat to within 1dB from 30Hz to 18kHz. The next test was to look at the available boost and cut with the Bass control set to 300Hz. I've shown the results in Figure 2. Here you can see a very well defined 10dB lift and cut without impacting on the response of the Treble range. In Figure 4, I set the Treble control to 3kHz and plotted the response with gain set to its ±10dB limits. This shows a similar well controlled response with good differentiation between the Bass and Treble controls. The panel controls for the Parametric equaliser were marked with a min and max value supplemented by ticks indicating increments of 100Hz for the Bass control and 1kHz for the Treble control, see **Photo 3**. I decided to take a few measurements to see how well these tracked. I was pleasantly surprised to find the markings remarkably accurate. In each case, the selected frequency exhibited a lift or cut that was half the selected lift or cut, ie if I set the Treble to 5kHz and the lift to 10dB, 5kHz would be lifted by 5dB.

When the DSP noise filter is switched in, the response changes significantly because the noise filter is a primarily a speech-band device, so allowing frequencies up to 20kHz would only add to the noise. The DSP Noise Filter in the ParaPro EQ20 is continuously variable from off to full noise reduction. To show the impact on the frequency response, I measured the response with the noise reduction control set to the mid-point. The result is shown in **Figure 4**, where you can clearly see the passband shaping. The parametric equalisation still works with the DSP noise filter active but its only effective over the narrower frequency range of the DSP Noise Filter.

On the Air

For the on-air tests, I used the ParaPro EQ20 with several computer based software defined radio (SDR) receivers plus a Yaesu FT-897 transceiver. For the audio source, I used either the headphone output socket or the line out from the computer. The input selection on the ParaPro EQ20 is managed via a small button on the front panel that cycles the input selection through the available options. On the review model, these were CH1, CH2, Stereo or Bluetooth with the selection indicated by a light emitting diode (LED). This LED served a secondary role as a clipping indicator where the LED would flash if the input signal was too high. The facility to select single channel or stereo mode is useful for SDR operators as you could use multiple virtual receivers with their outputs routed to different channels. For example, if you were running an SDR with 3 virtual receivers, you could send one to CH1, a second to CH2 and place the third on both channels. That way, if the sound comes from the left its receiver 1, the right and its receiver 2 and the centre for receiver 3.

The first challenge for the ParaPro EQ20 was some mid-morning listening on 14MHz

Mike Richards, G4WNC
mike@photobyte.org

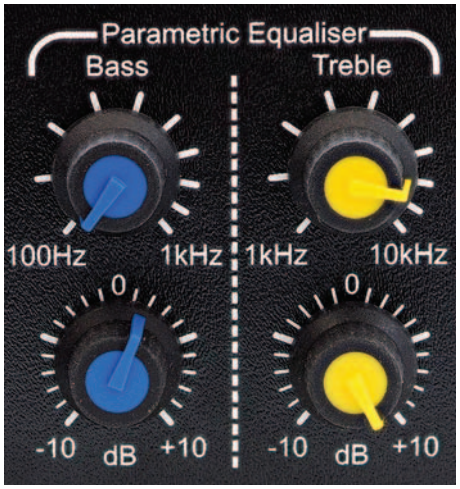


PHOTO 3: Close-up view of the filter control panel.

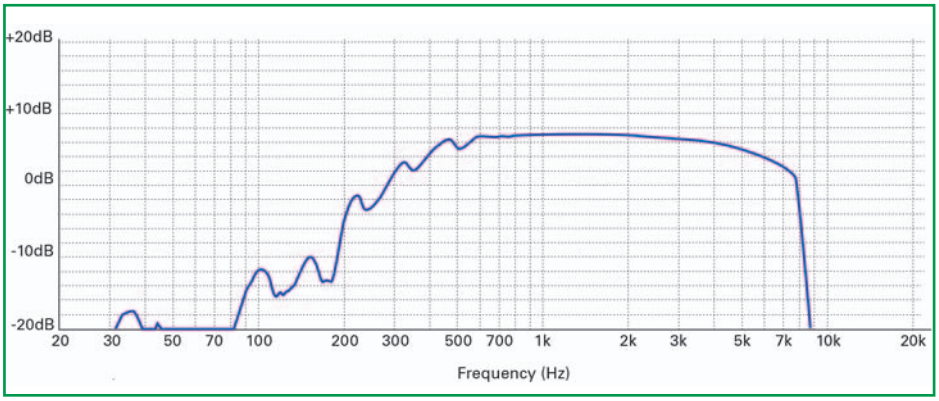


FIGURE 4: ParaPro EQ20 frequency response with the DSP noise filter set to mid-point.

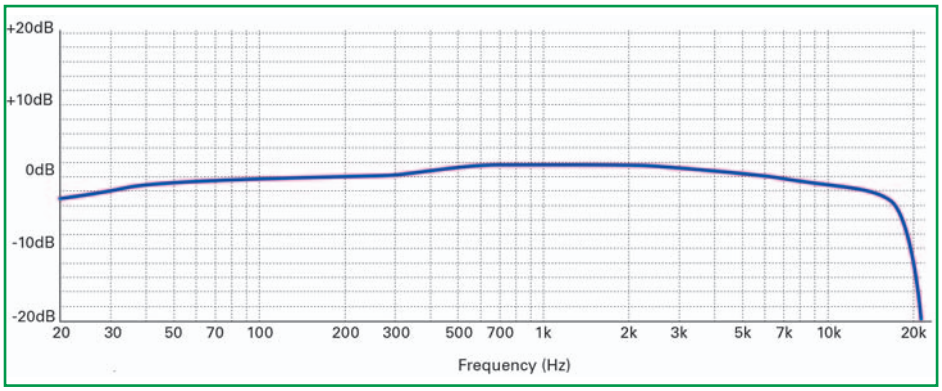


FIGURE 5: ParaPro EQ20 frequency response via the Bluetooth link.

when conditions were flat and everything was noisy. I started by setting the Bass equaliser at -10dB and then adjusting the Bass frequency upwards from 100Hz to reduce the low frequency roar. Once that was done, I turned to the Treble control, set it to -10dB and tuned it down from 10kHz until the speech started to deteriorate then backed off a bit. That produced a significant improvement over the unfiltered audio so I tried using some Treble boost to see if that would help. I soon found that setting the boost to +10dB and tuning up from 1kHz helped the intelligibility more than just using the filter to cut the higher frequencies. The boost setting gave some very useful mid-range punch that helped readability. Once I'd used the level settings at their extreme I refined the filtering using the frequency and lift/cut controls.

The next test was to use the same signal to evaluate the DSP noise reduction. I soon found that the best setting seemed to be mid-point on the rotary control as it produced very effective noise reduction without introducing the robotic and watery sounds that characterise many DSP noise reduction systems. With the noise reduction set, I then experimented with the Treble and Bass controls. As mentioned earlier, the effective control range is much narrower due to the frequency shaping of the DSP noise reduction. I used the same techniques as before and they worked very well to provide a significant improvement over the original, unprocessed signal. By combining the filtering and noise reduction I could convert an unpleasantly noisy signal into comfortable listening. As audio quality is so subjective, I've made some recordings of one of the test signals so you can hear the results for yourself. These can be found at http://photobyte.org/bhi-parapro-eq20-dsp-sound-file/

When I used the filter for some 80m local QSOs with relatively strong signals I found the same adjustment techniques worked but best results came with less severe use of the cut/lift controls. Just to complete the picture, I used the ParaPro EQ20 for some broadcast band listening and the Treble/Bass controls worked well to make the most of the prevailing conditions. When signals were good I employed a bit of boost at both ends of the spectrum to deliver a more natural sound.

One slightly unusual use of the DSP noise filter was as an audio squelch. This was particularly useful on VHF and overcame the problem of missing weak signals that are below the traditional squelch threshold. This worked well for keeping an eye on VHF calling channels and air band signals.

Bluetooth

Including Bluetooth connectivity is a very useful option and opens up a host of additional uses for the ParaPro. Those with PC based SDR receivers need only add a simple Bluetooth dongle (£2 - £10 from Amazon) to enable a wireless connection between their computer and the ParaPro. Setting-up the Bluetooth link was very straightforward as you just set the ParaPro EQ20 source selection to Bluetooth, go the Bluetooth panel on your PC, locate the ParaPro EQ20 and hit connect. Once you've made the initial connection, the PC remembers the device and will automatically connect when it's within range. You can also use the ParaPro EQ20 as a Bluetooth speaker with other Bluetooth enabled devices such as mobile phones, tablets and laptop PCs. With this wider use in mind, I was interested to see how the frequency response held-up when measured through the Bluetooth connection. To do this, I used HOLMImpuse software I mentioned earlier but with the input to the ParaPro EQ20 routed via the Bluetooth link. This worked very well and gave a response that was within 3dB between 20Hz and about 18kHz, **Figure 5**.

Summary

The ParaPro EQ20 builds on bhi's comprehensive range of audio processing solutions and provides some powerful, yet easy to use audio processing. The parametric equaliser works particularly well and the tuning and lift/cut range is about right. I was very impressed with the DSP noise filter as it manages to achieve good levels of noise reduction without adding the unpleasant artefacts so often associated with DSP noise reduction. The addition of Bluetooth capabilities is very welcome and expands the range of applications for the ParaPro EQ20.

The ParaPro EQ20 Audio DSP unit is available direct from bhi (www.bhi-ltd.com) and can be found at other popular radio suppliers. It ranges in price from £159.99 to £299.95 depending on the optional extras. My thanks to bhi for the loan of the review model.

MOONRAKER

Radio Communications Manufacturer and Reseller

Moonraker UK Limited
Cranfield Road
Woburn Sands
Bucks MK17 8UR
Open Mon-Fri 9-5:30pm

Sales line 01908 281705
E-mail sales@moonraker.eu Web www.moonraker.eu

Postage (UK Mainland Only):
Small items just £2.99
Medium items just £4.99
Maximum charge just £7.99

PayPal VISA MasterCard

Full range of ICOM, KENWOOD & YAESU radios and accessories in stock – check out our "Real-Time" Stock Website at www.moonraker.eu Check out our "Real-Time"

"NEW" Moonraker HT-500D DMR Dual Band Transceiver

Dual Band DMR has arrived with twice the fun with the MOONRAKER HT-500D Dual Band DMR Digital & Analogue hand held Radio!
The HT-500D takes the experience of DMR to a new level with features designed for the amateur radio user.
The MOONRAKER HT-500D Operates in analogue and digital modes 400-480MHz frequencies on UHF and 136-174MHz VHF at up to 5 watts of power. It uses Time-Division Multiple-Access (TDMA) digital technology to double the number of users on a single 12.5kHz channel.
The Audio on DMR is excellent in both transmit and receive ensuring dependable communications.
The HT-500D boasts 3000 channels, 10000 contacts, built-in CTCSS/DCS (analogue mode only), single call, group call and all call, remote kill/stun/activate, transmit interrupt, VOX, and lone worker function. It is compatible with MOTOTRBO™ Tier I and II.
Amazing value £199.99!

Moonraker MT-270M Dual Band Mobile Transceiver ... £79.95
A lovely small compact Dual Band Transceiver but still with a 25W punch at a remarkable price – see our reviews on our website from some of the 1 thousand sold !!!

LEXION

VV-898S Dual Band Mobile Transceiver
New VV-898 "S" version now with 25W as standard – comes complete with keypad microphone, radio bracket all in a compact size with an a amazing compact price of just **£69.95!**

"NEW" Leixen VV-898SP Portable Dual Band Transceiver
Introducing the Leixen VV-898SP, the mobile backpack transceiver you can take virtually anywhere you need it! Leixen combined their micro-compact, 25 watt Dual Band UHF/VHF Mobile Radio with a powerful 12A Li-ion rechargeable battery and put it all in a sturdy chassis you can fit in your pack or emergency bag for use anytime, anywhere!
All for an amazing £149.95!

BAOFENG 寶鋒

Authorised dealer

Handheld

GT-3 136-174/400-480MHz transceiver **£44.95**
GT-5 (right) 136-174/400-520MHz transceiver **£39.95**
UV-5RC 136-174/400-480MHz transceiver **£29.95**
BF-888S 400-470MHz transceiver **£14.95**

Accessories

Speaker microphone **£9.95**
Software cable **£9.95**

bhi

Noise cancelling products

Bhi NES10-2 Noise eliminating speaker **£99.95**
Bhi DSPKR Amplified DSP noise cancelling speaker **£129.95**
Bhi Desktop speaker **£179.95**
Bhi Dual in-line noise cancelling unit **£179.95**
Bhi NEIM1031 MKII noise eliminating inline module **£149.95**
Bhi Radiomate compact keyboard for FT-817/857/897 ..... **£89.95**

RM

Amplifiers

The BLA 600 is a wideband compact linear amplifier for the HF bands and 6m, from 1.8 to 54 MHz Using Freescale MRFE6VP5600, Output 500W. Dual MCU Control, Fast PIN Diode RX-TX TX-RX switching enables QSK operation, 2x16 LCD Display for Amplifier Status, Separate LED displays for power and antenna VSWR, Input drive from 1W to maximum of 40W, 3 user configurable Antenna Output connectors, Dual large diameter MCU controlled, multispeed cooling fans for efficient cooling **£1999.95**

BLA350 1.5-30MHz 300w mains powered solid state amplifier **£659.95**
HLA305V 1.8-30MHz 250W professional amplifier with LCD.. **£599.95**
HLA300V+ 1.8-30MHz 300W all mode amplifier with fans **£429.95**
HLA150V+ 1.8-30MHz 150W all mode amplifier with fans **£349.95**
LA250V 140-150MHz 200W professional amplifier with LCD **£499.95**
ULA100 420-440MHz 100W compact linear for 70cms **£399.95**

LDG ELECTRONICS

Tuners

LDG Z-817 1.8-54MHz ideal for the Yaesu FT-817 ..... **£129.95**
LDG Z-100 Plus 1.8-54MHz the most popular LDG tuner **£169.95**
LDG IT-100 1.8-54MHz ideal for IC-7000 ..... **£179.95**
LDG Z-11 Pro 1.8-54MHz great portable tuner **£179.95**
LDG KT-100 1.8-54MHz ideal for most Kenwood radios **£209.95**
LDG AT-100 Pro II 1.8-54MHz **£244.95**
LDG AT-200 Pro II 1.8-54MHz **£259.95**
LDG AT-1000 Pro II 1.8-54MHz continuously **£519.95**
LDG AT-600 Pro II 1.8-54MHz with up to 600W SSB **£394.95**
LDG YT-1200 1.8-54MHz 100W for FT-450D, FT-DX1200 & FT-DX3000 ..... **£244.95**
LDG YT-100 ideal for your Yaesu FT-857D **£199.95**
LDG AL-100 1.8-54MHz 100w designed for the Alinco range of transceiver ... **£139.95**

MFJ

Antenna Tuners

See our website for full details.
Automatic Tuners
MFJ-925 Super compact 1.8-30MHz 200W **£199.95**
MFJ-926B remote Mobile ATU 1.6-30MHz 200W **£319.95**
MFJ-927 Compact with Power Injector 1.8-30MHz 200W **£309.95**
MFJ-928 Compact with Power Injector 1.8-30MHz 200W.. **£249.95** **MFJ-929** Compact with Random Wire Option 1.8-30MHz 200W **£259.95**
MFJ-991B 1.8-30MHz 150W SSB/100W CW ATU **£279.95**
MFJ-993B 1.8-30MHz 300W SSB/150W CW ATU **£309.95**
MFJ-994B 1.8-30MHz 600W SSB/300W CW ATU **£409.95**
MFJ-998 1.8-30MHz 1.5kW **£729.95**

Manual Tuners

MFJ-16010 1.8-30MHz 20W random wire tuner **£79.95**
MFJ-902B 3.5-30MHz 150W mini travel tuner **£134.95**
MFJ-902H 3.5-30MHz 150W mini travel tuner with 4:1 balun **£149.95**
MFJ-904 3.5-30MHz 150W mini travel tuner with SWR/PWR **£149.95**
MFJ-904H 3.5-30MHz 150W mini travel tuner with SWR/PWR 4:1 balun **£184.95**
MFJ-901B 1.8-30MHz 200W Versa tuner **£119.95**
MFJ-971 1.8-30MHz 300W portable tuner **£139.95**
MFJ-945E 1.8-54MHz 300W tuner with meter **£149.95**
MFJ-941E 1.8-30MHz 300W Versa tuner 2 ..... **£164.95**
MFJ-948 1.8-30MHz 300W deluxe Versa tuner **£174.95**
MFJ-949E 1.8-30MHz 300W deluxe Versa tuner with DL **£199.95**
MFJ-934 1.8-30MHz 300W tuner complete with artificial GND **£229.95**
MFJ-974B 3.6-54MHz 300W tuner with X-needle SWR/WATT **£229.95**
MFJ-969 1.8-54MHz 300W all band tuner **£249.95**
MFJ-962D 1.8-30MHz 1500W high power tuner **£339.95**
MFJ-986 1.8-30MHz 300W high power differential tuner **£399.95** **MFJ-989D** 1.8-30MHz 1500W high power roller tuner **£439.95**
MFJ-976 1.8-30MHz 1500W balanced line tuner with X-Needle SWR/WATT **£589.95**

Analysers

MFJ-259C 530 KHz to 230MHz **£299.95**
World's most popular SWR analyser is super easy-to-use. It gives you a complete picture of your antenna's performance. You can read your antenna's SWR and Complex Impedance 530 KHz to 230 MHz continuously with no gaps.

Power Supplies

PS30SWIII 30A peak switching power supply provides 13.8 VDC at 20 Amps continuous, 30 Amps surge. The output voltage is adjustable from 9 to 15 VDC. Red and black terminals on are the rear panel (30A)
SPECIAL OFFER ~~£79.95~~ **£69.95**

PS30SWIV switching power supply provides 13.8 VDC at 20 Amps continuous, 30 Amps surge. The LCD digital panel meter simultaneously displays voltage and current. There is a Noise Off-Set control that can be adjusted to eliminate pulse noise from the power supply.
SPECIAL OFFER ~~£79.95~~ **£69.95**

PS30SWII 25A continuous switch mode PSU with variable output voltage and cigar socket also includes noise offset function
SPECIAL OFFER ~~£99.95~~ **£89.95**

QJ1830SB 30 AMP Linear PSU, no noise issues with the great old school power supply unit, nice digital display and heavy as you like, so you feel like you bought something and on offer this month.
SPECIAL OFFER ~~£129.95~~ **£119.95**

QJE QJPS30II 30 AMP Switch Mode Power Supply Unit
Includes noise offset control to eliminate the pulse noise of the switching circuit. This patent pending function is specially designed for communication equipment use. Its effectiveness may vary depending on the frequency and mode.
SPECIAL OFFER ~~£79.95~~ **£69.95**

QJE QJPS50II 50 AMP Switch Mode Power Supply Unit
Same as above but in a 50amp version
SPECIAL OFFER ~~£129.95~~ **£119.95**

Want a new radio and get some money back for your old one?

〈Turn this into this〉

Don't want the hassle of selling, queuing at the post office or paying online fees?

Part Exchange the easy way with 5 simple steps at Moonraker

1 Choose your desired rig, scanner or even accessory
2 Call or email what you would like to part exchange
3 We will be give you the best deal and agree the balance owed
4 Pack your equipment securely and wait for the door bell
5 Swap your old gear for shiny new with the delivery driver and enjoy! ..... it's that simple

Cable

RG58 Standard, 5mm, 50 ohm, per metre **£0.35**
RG58-DRUM-50 Standard, 5mm, 50 ohm, 50m reel **£14.95**
RG58-DRUM-100 Standard, 5mm, 50 ohm, 100m reel **£24.95**
RG58M Mil spec, 5mm, 50 ohm, per metre (best seller)..... **£0.60**
RG58M-DRUM-50 new 50m reel of mil spec RG58 in a great handy size only . **£24.95**
RG58M-DRUM-100 Mil spec, 5mm, 50 ohm, 100m reel **£44.95**
RGMINI8 Mil spec, 7mm, 50 ohm, per metre, (amateur favourite)..... **£0.75**
RGMINI8-DRUM-50 mil spec, 7mm, 50 ohm, 50m reel **£34.95**
RGMINI8-DRUM-100 Mil spec, 7mm, 50 ohm, 100m reel **£64.95**
RG213 Mil spec, 9mm, 50 ohm, per metre..... **£1.30**
RG213-DRUM-50 Mil spec, 9mm, 50 ohm, 50m reel..... **£59.95**
RG213-DRUM-100 Mil spec, 9mm, 50 ohm, 100m reel **£109.95**
300-20M Ladder Ribbon, best USA quality, 300 ohm, 20m pack..... **£17.95**
300-DRUM Ladder Ribbon, best USA quality, 300 ohm, 100m reel ... **£69.95**
450-20M Ladder Ribbon, best USA quality, 450 ohm, 20m pack..... **£19.95**
450-DRUM Ladder Ribbon, best USA quality, 450 ohm, 100m reel..... **£79.95**

Antenna Wire

Perfect for making your own antennas, traps, long wire aerials etc.
SEW-50 Multi stranded PVC covered wire, 1.2mm **£19.95**
SCW-50 Enamelled copper wire, 1.5mm **£24.95**
HCW-50 Hard Drawn bare copper wire, 1.5mm..... **£29.95**
CCS-50 Genuine Copperweld copper clad steel, 1.6mm **£29.95**
FW-50 Original Flexweave bare copper wire, 2mm **£34.95**
FWPVC-50 Original clear PVC covered copper wire, 4mm **£44.95**
FW-100 Original high quality flexweave antenna wire, 100m reel ... **£59.95**
FWPVC-100 Original PVC coated flexweave antenna wire, 4mm, 100m reel ... **£79.95**

Rigging Accessories

Get rigged up, for full list of all options visit our website!
PULLEY-2 Adjustable pulley for wire antennas, suits all types of rope..... **£24.95**
GUYKIT-HD10 Complete HD adjustable guying kit for up to 40ft masts. **£54.95**
GUYKIT-P10 Complete LD/portable guying kit to suit up to 40ft masts . **£39.95**
SPIDER-3 Fixed 3 point mast collar for guy ropes..... **£5.95**
SPIDER-4 Fixed 4 point mast collar for guy ropes..... **£6.95**
PTP-20 Pole to pole clamp to clamp up to 2" to 2"..... **£5.95**
DPC-W Wire dipole centre to suit either 300 or 450ohm ladder line.. **£5.95**
DPC-S Wire dipole centre with SO239 to suit cable feed connections.. **£6.95**
DPC-A Dipole centre to suit ½ inch aluminium tube with terminal connections **£7.95**
DPC-38 Dipole centre with SO-239, 3/8th sockets to make mobile dipole ..**£6.95**
DOGBONE-S Small ribbed wire insulator..... **£1.00**
DOGBONE-L Large ribbed wire insulator **£1.50**
DOGBONE-C Small ceramic wire insulator **£1.20**
EARTHROD-C 4ft copper earth rod and clamp **£24.95**
EARTHROD-CP 4ft copper plated earth rod and clamp **£16.95**
G5RV-ES In-line SO239 replacement socket for 300 or 450 ohm ladder line.. **£6.95**
AMA-10 Self amalgamating tape for connection joints, 10m length.... **£7.50**

Portable Telescopic Masts

LMA-S Length 17.6ft open 4ft closed 2-1" diameter **£79.95**
LMA-M Length 26ft open 5.5ft closed 2-1" diameter **£89.95**
LMA-L Length 33ft open 7.2ft closed 2-1" diameter **£99.95**
CARPLATE-HDT brilliant drive on plate with tilt – ideal to be used in conjunction with the portable telescopic masts and only **£44.95**
CARPLATE-HD without tilt **£24.95**

20ft Swaged Mast Sets

(5ft Sections)

These heavy duty masts sets have lovely push fit swaged sections to give a strong mast set. Ideal for portable or permanent installations also available singly
MSP-125 4 section 1.25inch OD mast set..... **£39.95**
MSP-150 4 section 1.50inch OD mast set..... **£44.95**
MSPX-150 heavy duty 2.65mm 1.50 inch OD mast set..... **£59.95**
MSP-175 4 section 1.75inch OD mast set..... **£49.95**
MSP-200 4 section 2.00inch OD mast set..... **£59.95**
MSPX-200 heavy duty 2.65mm 2.00 inch OD mast set..... **£79.95**

Telescopic Masts

TMF-1 Fibreglass mast ★ 4 sections 160cm each ★ 50mm to 30mm ★ Approx 20ft erect 6ft collapsed..... **£179.95**
TMF-1.5 Fibreglass mast ★ 5 sections 200cm each ★ 60mm to 30mm ★ Approx 30ft erect 8ft collapsed..... **£249.95**
TMF-2 Fibreglass mast ★ 5 sections 240cm each ★ 60mm to 30mm ★ Approx 40ft erect 9ft collapsed..... **£299.95**
TMF-3 Fiberglass mast * 6 sections 240cm each * 65-23mm * Approx 50ft erect 8ft collapsed..... **£349.95**

Patch Leads

PL58-0.5 ½m Standard RG58 PL259 to PL259 lead **£3.50**
PL58-10 10m Standard RG58 PL259 to PL259 lead **£8.95**
PL58-30 30m Standard RG58 PL259 to PL259 lead **£16.95**
PL58M-0.5 ½m Mil Spec RG58 PL259 to PL259 lead **£4.50**
PL58M-10 10m Mil Spec RG58 PL259 to PL259 lead..... **£12.95**
PL58M-30 30m Mil Spec RG58 PL259 to PL259 lead **£27.95**
PL213-10 10m Mil Spec RG213 PL259 to PL259 lead **£18.95**
PL213-30 30m Mil Spec RG213 PL259 to PL259 lead **£39.95**
PL103-10 10m Mil Spec Westflex 103 PL259 to PL259 lead **£29.95**
PL103-30 30m Mil Spec Westflex 103 PL259 to PL259 lead **£69.95**
(All other leads and lengths available, ie. BNC to N-type, etc. Please phone for details)

PAM Kit A great portable freestanding tripod which can be extended to 4m. Perfect for field days at a perfect price.
Just £59.95 complete

Mounting Hardware & Clamps

We have all the mounting brackets you could possibly want - for all options see our website
TRIPOD-HDA Free standing, heavy duty, fold away tripod, which adjusts from 50-65mm..... **£149.95**
TRIPOD-25L Free standing heavy duty tripod to suit masts 65mm or less **£79.95**
TRIPOD-20L Free standing heavy duty tripod to suit masts 2 inch or less. **£74.95**
TRIPOD-15L Free standing heavy duty tripod to suit masts 1.5 inch or less **£69.95**
TK-24 Heavy duty galvanised pair of T & K brackets, 24 inches total length **£29.95**
TK-18 Heavy duty galvanised pair of T & K brackets, 18 inches total length. **£24.95**
TK-12 Heavy duty galvanised pair of T & K brackets, 12 inches total length. **£19.95**
SO-9 Heavy duty galvanised single stand off bracket, 9 inches total length.... **£9.95**
SO-6 Heavy duty galvanised single stand off bracket, 9 inches total length..... **£6.95**
CHIM-D Heavy duty galvanised chimney lashing kit with all fixings, suitable for upto 2 inch..... **£24.95**
CAR-PLATE Drive on bracket with vertical up stand to suit 1.5 or 2" mounting pole **£24.95**
CROSS-2 Heavy duty cross over plate to suit 1.5 to 2" vertical to horizontal pole **£14.95**
JOIN-200 Heavy duty 8 nut joining sleeve to connect 2 X 2" poles together **£19.95**
PTM-S Pole mounting bracket with SO239 for mobile whips, suits upto 2" pole **£19.95**

Connectors

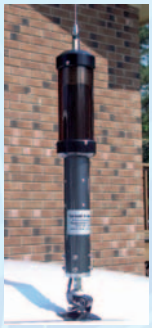
PL259-6mm Standard plug for RG58..... **£0.99p**
PL259-9mm Standard plug for RG213..... **£0.99p**
PL259-7mm Standard plug for Mini8 ..... **£0.99p**
PL259-6C Compression type for RG58 ..... **£2.50**
PL259-9C Compression type for RG213..... **£2.50**
PL259-103C Compression type for Westflex 103 ..... **£5.50**
NTYPE-6 Compression type plug for RG58..... **£3.95**
NTYPE-9 Compression type plug for RG213..... **£3.95**
NTYPE-103 Compression type plug for westflex 103 ..... **£6.00**
BNC-6 Compression type for RG58 ..... **£1.50**
BNC-9 Compression type for RG213 ..... **£3.50**
SO239-N Adapter to convert PL259 to N-Type male..... **£3.95**
NTYPE-PL Adapter to convert N-Type to PL259..... **£3.95**
BNC-PL Adapter to convert BNC to PL259..... **£2.00**
BNC-N Adapter to convert BNC to N-Type male..... **£3.95**
BNC-SMA Adapter to convert modern SMA radio to suit BNC..... **£3.95**
SO239-SMA Adapter to convert modern SMA radio to suit SO239 ... **£3.95**
PL259-38 Adapter to convert SO239 fitting to 38th thread **£3.95**

Direct from the USA Direct to you from stock

Alpha Antenna

Alpha Antenna 10-80M Loop Tripod & Bag **£399.95**
Alpha Antenna 10-40M Loop Tripod & Bag..... **£299.95**
Alpha Antenna 6-80M Multiband Tuner Free HF Antenna **£399.95**
Alpha Antenna 10-80M Promaster Base Antenna..... **£329.95**
Alpha Antenna 10-80M Military 2.0 Tuner Free Antenna **£369.95**

Tarheel Antennas



BABY TARHEEL When properly installed on your vehicle this antenna will provide continuous coverage from 7.0 to 54 MHz with the supplied whip. The Baby Tarheel antenna like all of our motorized antenna models are built to meet the highest standards but in a smaller size **£399.95**
LITTLE TARHEEL II The Little Tarheel II antenna like all Tarheel motorized antenna models are built to meet the highest standards but in a more user friendly size. This antenna comes with the sensors already pre-installed so if you decide to add one of the auto controllers (SDC-100 Simple Controller, SDC-102 Programmable Controller, Turbo Tuner, Antenna BOSS and BOSS II) now or later everything is ready **£449.95**

Chameleon Antenna

Loops
CHA P-LOOP This antenna was designed with portability, ease of use, simplicity, ruggedness and high performance in mind. 40-10M.... **£349.95**
CHA F-LOOP This antenna was designed with weight, durability, portability, versatility and cost in mind. The antenna is built to last. The unit covers everything between 10M to 60M (or 29,700MHz to 5,300MHz) continuously **£499.95**
CHA F-LOOP PLUS as above but with heavy duty aluminium loop **£649.95**

Base Antenna

CHA ECOMM II This antenna has been specially designed for backup emergency HF system or permanent installation 6-160M 500W SSB 60ft..... **£139.95**
CHA SKYLOOP This antenna is a 250' (14 gauge) full wave loop antenna cut for 80M. With the help of an antenna tuner the antenna will cover all the bands between 80M and 6M included and capable of 1000W **£149.95**

Portable Antenna

CHA TD The CHA TD (Tactical Dipole) is a HF broadband antenna specially designed for portable HF communication where rapid deployment and simplicity of operation is essential. 10-80M 300W **£399.95**
CHA HYBRID MICRO This antenna is a lightweight highly portable broadband antenna system designed to offer maximum portability and performance. The antenna weights approx. 1lb. 6-160M 100W.... **£229.99**
CHA HYBRID The CHA HYBRID Base is designed to enhance the capabilities of the common HF radio application by allowing faster tuning operation across the HF bands including MARS/CAP frequencies. 6-160M 800W **£199.95**

CHA TD LITE This antenna is a HF broadband antenna specially designed for portable HF communication where rapid deployment and simplicity of operation is essential but compactness is primordial. 6-160M 500W **£159.95**

Mobile Antenna

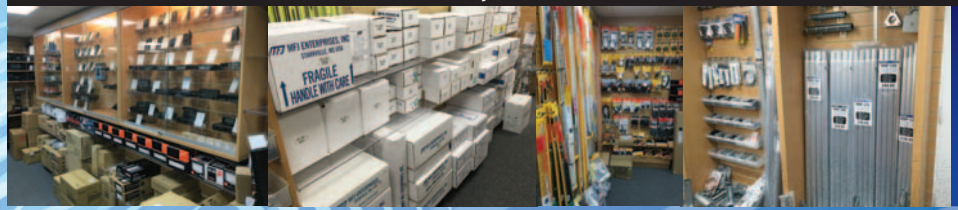
CHA V2L The CHA V2L is a rugged multiband HF antenna designed for smaller vehicle. The antenna must be used in conjunction with either the CHA HYBRID or the CHA CAUM to perform adequately. 10-80M with CHA HYBRID or CHA CAUM (6/2/70cm stand alone)..... **£169.95**
CHA MIL This whip is a broadband monopole antenna designed for portable or manpack radios requiring compact but rugged antenna systems. 6M-160M with CHA HYBRID, 6M-10M stand-alone 1500W **£129.95**

Accessories

CAP-HAT This capacity hats increase the bandwidth of your antenna making it more efficient..... **£89.95**
RFI Choke 1-300MHz..... **£34.95**
JAW mount great versatile mount to make dipole out of two mobiles **£44.95**
SPRING Heavy duty stainless steel 3/8th spring..... **£29.95**

COME AND VISIT US FOR A BROWSE, FRIENDLY IMPARTIAL ADVICE AND EXTRA INSTORE DISCOUNTS

OPEN NOW



The largest stockist of Amateur, Scanner, CB and Hobby Radio products for 60 miles around. Plenty of parking and easy access from the M1 – come for a visit soon.

Antennas

I received several responses to the recent overview of the off-centre fed dipole (OCFD) in the column, which form the basis of this month's column.

160m & 630m on a 40-10m OCFD

A reconfiguration of the OCFD has allowed operation on 160m and, surprisingly, on 630m. Therefore, details of the antenna's reconfiguration are provided. The following summary applies to the OCFD intended for use on the 40m to 10m bands. However, the analysis also could be applied to an antenna using different wire span and vertical section lengths.

Configuration

The OCFD was configured as an asymmetric Marconi T antenna by strapping the feeder cable conductors together at the bottom, thus forming the MF antenna's vertical section. The horizontal wire span then acts as a top-loading capacitor with the ground beneath it. However, the wire span tends not to radiate due to the effect of RF currents circulating in the ground. The concept of the antenna's configuration is shown in **Figure 1**.

On 160m, the antenna was matched using a Transmatch type ATU **[1]** and worked against the ground. The ground system was a 1m long copper rod driven into the ground with the connection to the ATU's earth point using a short length of 6mm diameter stranded copper wire. Using 25W SSB, the antenna enabled several contacts across the UK and near continent to be made. The antenna's performance was not as good as an antenna with a much longer wire span, however this configuration did make operation on 160m possible.

On 630m, an ATU was constructed to match the 'homebrewed' 50W CW transmitter **[2]** to the antenna. This ATU used two coils 'telescoped' together, with the outer coil acting as an autotransformer that interacted with an inner loading coil, forming a variometer **[3]** to tune the antenna. The concept of this technique is shown as **Figure 2**. The two coils were wound onto PVC tubes of 70mm and 50mm outside diameter. The 70mm diameter autotransformer coil comprised 193 turns of 1.5mm insulated stranded copper wire, while the inner 50mm diameter coil consisted of 260 turns of 0.7mm insulated stranded copper wire. The outer autotransformer coil was tapped 57 turns from its earthed end, where a good match to the transmitter's output impedance was obtained. This arrangement enabled the OCFD be resonated for operation on the 630m band while configured as a Marconi T antenna. The inner coil's optimum position was found by monitoring for maximum antenna current, using an RF ammeter **[4]**, as the inner coil was moved inside the outer coil. Once the optimised, the transmitter delivered about 1A RMS of current into the antenna and the coil was held in position using an insulated wedge. The ATU was earthed using the same arrangement as used on 160m.

Photo 1 shows the assembled ATU that has enabled several contacts to be made on 630m with a number of stations including Chris, G3XIZ and Ian, G4GIR.

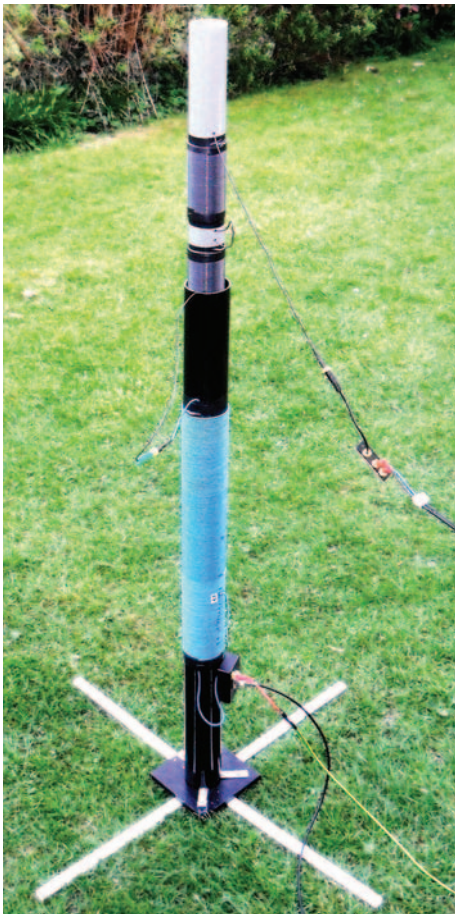


PHOTO 1: The auto-transformer/variometer antenna matching system used for operation on 630m.

Antenna performance calculations

The antenna's performance can be estimated **[5]** from its 21m wire span and its 8m vertical section where the wire diameter was 2mm.

Calculating the antenna's capacitance allows the effective radiator height (Heff) to then be found. The antenna's capacitance comprises the vertical section (CV) and the horizontal span (CH) capacitances, given approximately by:

$$C_V\,(pF) = \frac{24H}{Log_{10}\left\{\frac{1.15H}{d}\right\}}$$

$$C_H\,(pF) = \frac{24L}{Log_{10}\left\{\frac{4H}{d}\right\}}$$

Therefore:

$$C_V\,(pF) = \frac{24\times 8}{Log_{10}\left\{\frac{1.15\times 8}{0.002}\right\}} = \mathbf{52pF}$$

$$C_H\,(pF) = \frac{24\times 21}{Log_{10}\left\{\frac{4\times 8}{0.002}\right\}} = \mathbf{120pF}$$

The effective height (Heff) can then be calculated using:

$$H_{eff}\,(m) = H\times\left(\frac{\left(\frac{2C_H}{C_V}\right)+1}{\left(\frac{2C_H}{C_V}\right)+2}\right)$$

Therefore:

$$H_{eff}\,(m) = 8\times\left(\frac{\left(\frac{2\times 120pF}{52pF}\right)+1}{\left(\frac{2\times 120pF}{52pF}\right)+2}\right) = \mathbf{6.8m}$$

As expected, an Heff of 6.8m is slightly shorter than the vertical section's actual 8m length. Using the Heff of the antenna, an indication of the antenna's radiation resistance (Rrad) can be calculated using:

$$R_{rad} = 160\times\pi^2\times\frac{(H_{eff})^2}{\lambda^2}$$

Taking 474kHz (633m) as the frequency of operation:

$$R_{rad} = 0.00394 \times (H_{eff})^2$$
$$= 0.00394 \times (6.8)^2$$
$$= \mathbf{0.18\Omega}$$

(Note: calculating Rrad at 1.9MHz gave 2.93Ω).

A short vertical MF antenna has a gain of around 2.62dB (ie 1.83 times) [5], therefore the effective radiated power (ERP) is

$$ERP = 1.83 \times (I_{ant})^2 \times R_{rad}$$
$$= 1.83 \times (1amp)^2 \times 0.18\Omega$$
$$= \mathbf{0.33W}$$

(Note: on 1.9MHz, Iant was 0.6A RMS, giving an ERP of 1.05W).

The UK has a permitted 630m band effective isotropic radiated power (EIRP) of 5 watts. EIRP calculations have a 2.15dB increase over an ERP (ie 1.64 times). Therefore:

$$EIRP = 1.64 \times 0.33W$$
$$= \mathbf{0.53W}$$

This indicates that the OCFD Marconi T radiates as a MF vertical antenna within the licence power limitation on 630m.

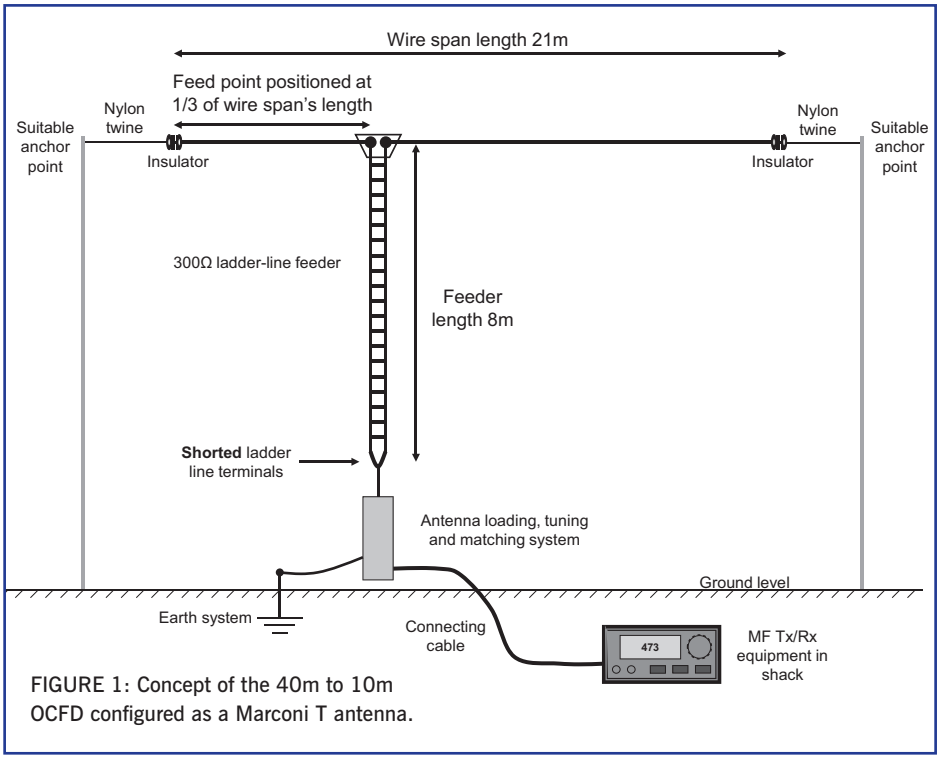


FIGURE 1: Concept of the 40m to 10m OCFD configured as a Marconi T antenna.

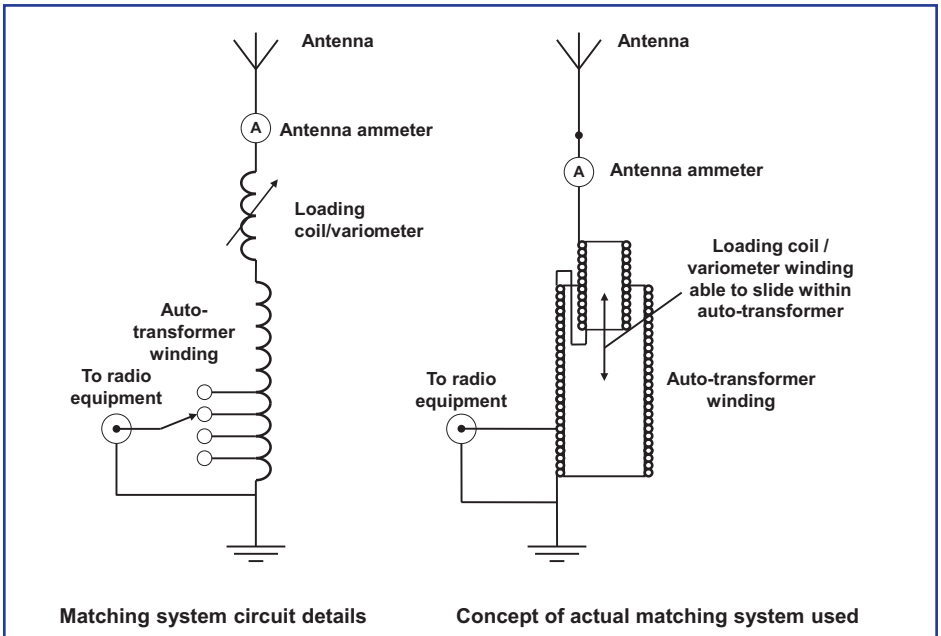


FIGURE 2: Concept of the auto-transformer/variometer antenna matching arrangements used for operation on 630m.

Predicted performance

The antenna's performance was modelled using the *MMANA-GAL* application [6] with the horizontal 21m wire span at 9m AGL and the 8m feeder cable run straight downwards. The predicted antenna gains were 1.61dBi for 160m and 0.18dBi for 630m. The predicted horizontal and vertical radiation patterns are shown in **Figure 3** for both bands. The horizontal radiation pattern was omnidirectional, however the performance on 160m slightly improved. The antenna's vertical radiation pattern had a pronounced null directly above the vertical section, as could be expected for a short MF vertical antenna. The vertical radiation pattern on 160m showed an improvement over that for 633m as illustrated.

Readers' feedback

The Antennas column describing the OCFD had a quite a response and thanks are passed to everyone for their comments. Extracts of the correspondence may be helpful to others considering using an OCFD – my responses are in *italics*.

Feeder length. Geoff Day, G4DED asked how the feeder's 8m length was determined. *The balanced feeder can be any length to suit the particular installation. This is because the feed point's impedance tends not to change when the antenna is used on its resonant bands, usually giving a low SWR. However, using the OCFD on the non-resonant bands tends to give higher SWRs, necessitating the use of an ATU to maximise the antenna's performance.*

Use of other balanced feeders. Raul Mehmood, M0ZZM asked if 450Ω balanced ladder-line could be used. *450Ω ladder-line could be used to feed the antenna,*

Mike Parkin, G0JMI
email2mikeparkin@gmail.com

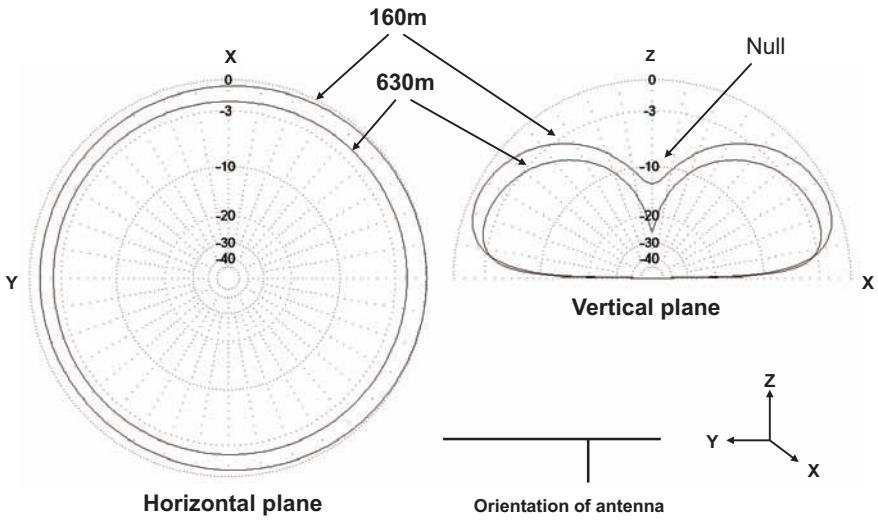


FIGURE 3: *MMANA-GAL* predicted OCFD configured Marconi T antenna 160m and 630m performance. Note: *MMANA-GAL* prediction of OCFD antenna radiation patterns in the horizontal and vertical planes

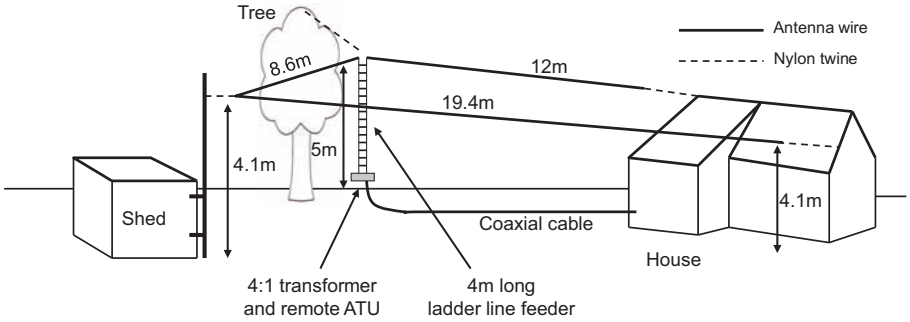


FIGURE 4: Bob, MM0RKT's 'U' configured OCFD covering 80m to 10m.

provided a 4:1 transformer is connected at the bottom of the feeder when 50Ω coaxial cable is run to the transceiver/ATU. However, the SWR on the resonant bands is likely to be slightly higher compared to using 300Ω balanced feeder, necessitating the use of an ATU to maximise the antenna's performance on these bands (and also on the non-resonant bands).

Using an OCFD in a 'U' shaped configuration. Bob Towers, MM0RKT has provided details of the 'U' configuration 80m to 10m OCFD installed to fit within the space available at this QTH. Bob also asked if locating the 4:1 transformer at the bottom of the balanced twin-line feeder was the usual practice.

Usually, an OCFD's wire span is installed as a straight run. However, good results can often be obtained when an antenna is installed contrary to the usual practice. Bob's OCFD gives a low SWR on its resonant bands apart from 20m. However, using a remotely controlled ATU enabled operation on 20m, 15m and the WARC bands. This remote ATU is solar powered; a practical approach to providing power to the ATU.

Bob's antenna was run from one side of the house to a tree, then to a shed and back to the other side of the house. The feed point's connection used 4m of 300Ω ladder-line and was located where the tree supported the antenna, as shown conceptually in ***Figure 4****. Bob's OCFD was 40m in length and is slightly shorter than the usual length of 42m to cover 80m to 10m. However, this may be associated with the antenna's 'U' configuration.*

The take-off from Bob's QTH is not clear southwards because of higher ground. However, the antenna has enabled contacts into North America, Asia, Australia and New Zealand; unfortunately, South American and African stations are more difficult to work.

Locating the 4:1 transformer at bottom of the balanced feeder is not the usual approach. This configuration was suggested by the late Peter Dodd, G3LDO enabling the antenna's operation to be likened to a doublet ***[7]****.*

Length. Neil Hutton, MONJH asked why an OCFD is longer than a comparable dipole.

While researching the OCFD's technical details, an explanation as to why the OCFD's wire span is slightly longer was found as follows ***[8]****:*

It seems the ground below the antenna causes the 2nd, 4th, 8th harmonics (etc) of the operating frequency not to fully align at the 60° and 120° points along the wire span. This results in the impedance presented at the feed point not being the same at the 2nd, 4th and 8th harmonics (etc) as it should be, ie about 200Ω. DK2KY, as have others, found that making the wire span slightly longer seemed to stabilise the impedance presented at the harmonic frequencies improving the SWR and so the antenna's performance. It is understood that the wire span's extra length allows for any differences between the individual harmonic velocity factors.

Historical perspective. Ger Akse, G0UVR/PA0AXE, provided a detailed insight into the OCFD/Windom's history **[9]**. The OFCD is attributed to William Litell Everitt who asked two students to study the antenna. Their results were published in the IRE magazine in 1929. However, two months earlier, Loren Windom had published an OCFD article in *QST* and this led to the mistake that he had invented the antenna. Hence, the antenna was named after him.

References

[1] to [5] are from the RSGB *Radio Communication Handbook,* 13th edition edited by Mike Browne, G3DIH:

[1] Pages 15.13 to 15.24.

[2] GW3UEP transmitter, pages 10.12 to 10.14.

[3] Pages 10.26 to 10.28.

[4] Pages 10.35 to 10.36.

[5] Pages 10.21 to 10.23.

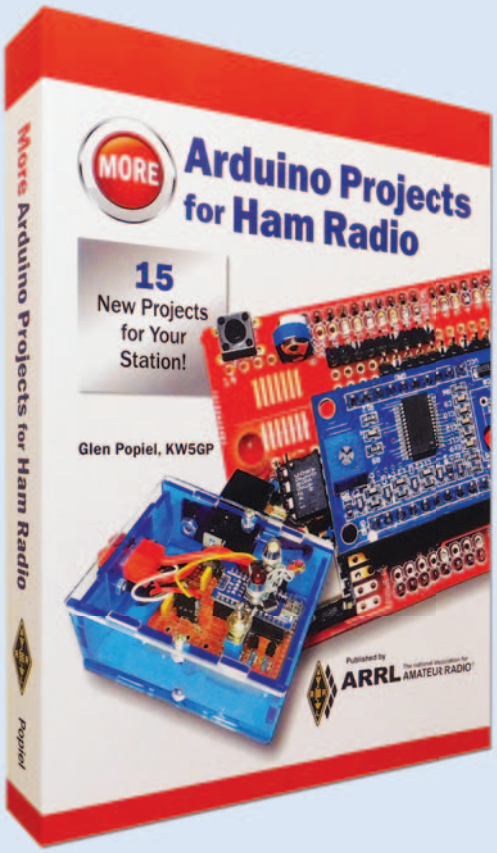
[6] *MMANA-GAL Basic* V3.0.0.31, antenna application. Original code by Makoto Mori JE3HHT. *MMANA-GAL Basic* and *MMANA-GAL Pro* by Alex Schewelew DL1PBD and Igor Gontcharenko DL2KQ, 1999 onwards

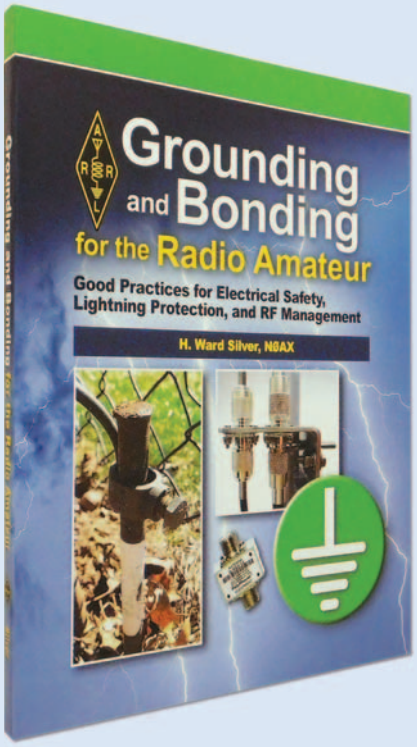
[7] *RadCom* June 2006, Antennas. Also, *Antennas Mastered,* Peter Dodd, G3LDO, page 65.

[8] *HF Antennas for Everyone,* edited by Giles Read, G1MFG, Chapter 1, pages 77 - 80.

[9] ARRL *Antenna Handbook for Radio Communications,* 19th edition, page 7.5.

NEW TITLE





More Arduino Projects for Ham Radio

by Glen Popiel, KW5GP

Building on the success of the original ARRL book *Arduino for Ham Radio*, this book *More Arduino Projects for Ham Radio* includes 15 completely new practical and functional Arduino projects for ham radio. This book branches out to use some of the newer Arduino variants and devices. Each project is complete and functional but room has been left for you to add personal touches and enhancements. That's part of the fun of the Arduino and Open Source communities building on the work of others, and then sharing your designs and innovations for others to learn, modify and improve.

More Arduino Projects for Ham Radio builds a solid foundation through descriptions of the many new Arduino boards and add-on components, followed by a collection of practical ham radio projects. Readers will find a wide variety of applications with projects including Wireless Remote Coax Switch, Yaesu Rotator Controller, Antenna SWR Analyser, two 40 Meter QRP Transceivers and much more.

There is something in *More Arduino Projects for Ham Radio* for everyone interested in Arduino. This is thoroughly recommended reading for beginners or a seasoned programmer alike.

Size: 208 x 276mm, 500 pages
ISBN: 9781 6259 5070 3
Non Members' Price: £39.99
RSGB Members' Price: £33.99

ARRL Grounding and Bonding for the Radio Amateur

By Ward Silver, N0AX

Proper Station Grounding is important and this ARRL book sets out to explain how to do it safely. This book is specifically aimed at US radio amateurs and provides an intriguing insight into a different electrical system even if it absolutely shouldn't be used as a guide to UK regulations and methods.

ARRL Grounding and Bonding for the Radio Amateur provides information on AC safety in the US and their National Electrical Code but there is much more. Many parts are useful regardless of supply differences and you will find fascinating information on for example lightning protection. The chapter on 'RF Management' is describes preventing unwanted RF currents and voltages from disrupting the normal functions of equipment whilst the 'Good Practice Guidelines' chapter contains a wealth of information that is applicable both here and internationally.

If you are interested in different electrical standards and how they affect station management across the globe *ARRL Grounding and Bonding for the Radio Amateur* provides a hugely interesting read.

Caution: This book is not intended as a guide to setting up a station in the UK or Europe and some solutions are not compliant with UK/European electrical regulations and thereby may be illegal or deemed dangerous in these areas.

Size: 184 x 229mm, 176 pages
ISBN: 9781 6259 5065 9
Non Members' Price: £22.99
RSGB Members' Price: £19.54

E&OE *(All prices shown plus p&p)*

Forgotten antenna lore – and some common myths

I have often heard it said that there is no point trying to put out a signal on Top Band (160m) unless your garden is X feet long – X being some quite large number, often around 130 or 270 (40 or 82⅓m). Now, as many holders of G3xxx callsigns (and those licensed even longer) will know, this simply isn't the case.

Editor's note: all dimensions in this article were originally given in feet and inches and are just for guidance. They are reproduced as per the original, along with a metric approximations *in brackets.*

When those G3xxx callsigns were issued – strictly in alphabetical order! – most of us used 160m as a 'starter' band and there was usually activity of some sort throughout the day. But gardens were often just as small and all but a lucky few had to 'make do'. Most did so reasonably successfully and those who made a special effort often succeeded spectacularly. I knew one North London G3 who managed to come up with a usable system on the windowsill of a first floor flat. He operated on 160 and 2 metres and had plenty of contacts on both bands.

What was apparent at the time – and seems to have been largely forgotten now – is this: if you can put up a pole 25 feet (7⅔m) high and manage a 40 foot (12m) span of wire (**Figure 1**) then all you need to radiate a perfectly usable signal is a couple of earth rods and some buried earth wires. Two or three 30ft (9.1m) ones would usually be better than one 70ft (21⅓m) wire). If you can manage a 30 foot (9.1m) pole and a 60+ foot (18⅓m) span (**Figure 2**) then this, with a little more effort on the earth connection, will mean you should be able to compete quite well with most of the signals on the band and some quite serious DX should be within your grasp. In fact this is precisely the arrangement I used when first licensed and my 6 or so watts from a Codar AT5 made contacts all over Europe (at least where the band was available) and down to ZB2 and ZC4 stations. I once managed a RS57 report from ZC4 using just 4 watts of AM. Admittedly I never did manage a trans-Atlantic contact then, but my excuse is that, as a teenager, I wasn't any good whatsoever at early mornings.

The 66 foot wire

An end fed wire of 66 feet (20.1m) was always considered to be very useful, and with good reason. Indeed, Figure 1 is based on this length (in an inverted L configuration). On 80m it is a quarter wavelength long, so has a low impedance and should be easy to feed. On 40m it is a half wave, high impedance but non-reactive, so not too difficult. It's the same story for 20 and 10m, while on 15m it falls somewhere between so might be more tricky, but with an ATU that has a good range of inductance and capacitance this shouldn't be a problem. The same is also true for Top Band; it is just about long enough to radiate with reasonable efficiency. It is worth remembering, also, that it doesn't necessarily need to be erected in a straight line.

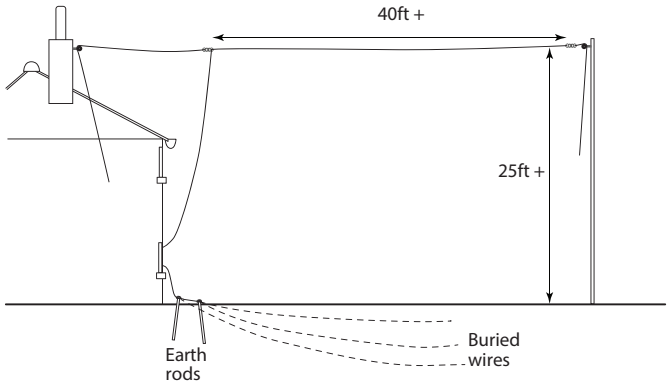


FIGURE 1: Basic long wire antenna arrangement.

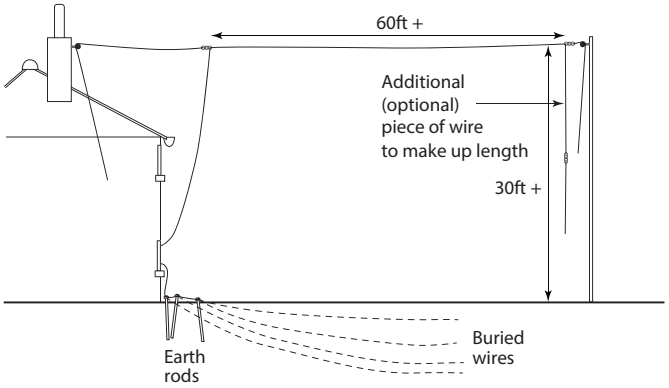


FIGURE 2: A longer and higher wire, with an optional drop-down extension, also performs well.

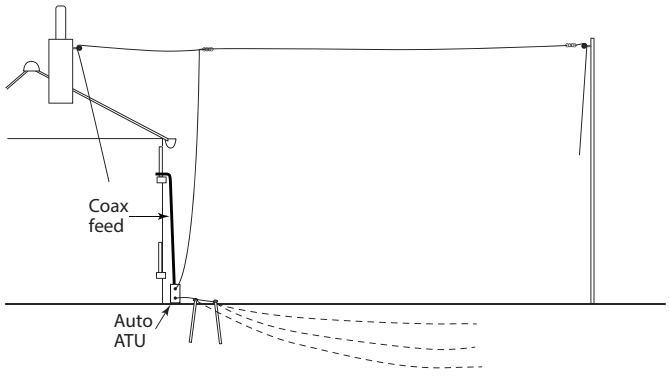


FIGURE 3: Using an (automatic) ATU at ground level against a good earth makes an upstairs shack very viable.

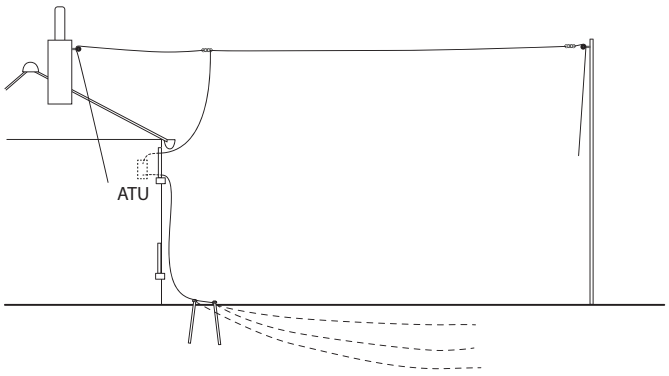


FIGURE 4: If you have an upstairs shack and an indoor ATU the long earth connection can cause problems.

The 100 foot wire

Actually we should be talking about a 99 foot wire (30.2m), generally as shown in Figure 2 in an inverted L configuration. This is, if anything, even more useful than the first example. It is long enough to work well on Top Band (well enough, in fact, to make it worthwhile to provide a really good earth). It is ⅜ of a wavelength on 80m, so the principle same applies, while on 40m it is ¾ of a wavelength, so it's easy to feed and should perform well.

Again, the earth connection will be crucial: you will need a very good, low impedance RF earth to feed against. As a (very general) rule of thumb it's worth having at least as much metal *under* the ground as you put above it – and preferably rather more.

On 20 and 10m the 100ft wire feed impedance will be high, but if your ATU can cope it should compete with anything except a beam. On 15m, at nine quarter waves, it should be low impedance, but the odd foot or so of length (a few tens of cm) could be crucial.

Siting your shack

You will make things easier for yourself if your shack can be on the ground floor with a convenient window through which to bring in the antenna and earth connections. Ideally, the antenna would use some kind of feed-through connector in a pane of glass, but a hole in the window frame will suffice if it can be drilled safely (wood is more amenable to this than some uPVC frames, see later). I remember using a red hot poker to make such a hole in a wooden window frame many years ago – not recommended!

If you intend to use high power then good insulation is vital. Particularly if the antenna impedance is high, the voltage could easily be enough to cause arcing and hence be a fire hazard. Although wood is often thought of as an insulator it is no match for kilovolts of RF! uPVC window frames often have aluminium sub-frames that high voltages may find attractive and it may also be difficult or impossible to avoid inducing voltage into the aluminium by capacitive coupling.

The earth lead should be as thick as is convenient. I now use 15mm copper pipe for my Top Band system. One very important factor is the length of the earth lead. This becomes even more important as the frequency is increased. More on this later.

[A number of proprietary solutions are available to bring amateur radio cables through windows, often consisting of a panel with double-ended sockets or other ingenious cable-based solutions, and most work well. Unless you're only using very low power it is wise avoid the through-the-window-gap 'flat coax' links sold for use with satellite, DAB and TV cables because unless explicitly stated otherwise they're generally not suitable for transmitting through – Ed].

Multi band operation

MYTH: An antenna needs to be resonant to work well. This is not true – any piece of wire will radiate if RF can be persuaded to flow in it. This is all down to matching; a versatile ATU should make this possible.

So, let's assume you have a ground floor shack with a window that looks out on a garden where you have erected a wire, as high and as long as you can manage. You have also provided a good earth connection and both of these come indoors via suitable holes in the window frame. All you need now to be able to use all bands from 160 to 10 metres is an ATU with a good range of inductance and capacitance. An old fashioned manual type is to be preferred, as auto types are often very limited in what they can match – particularly those that are built into radios. The ATU should be sited as close as is convenient to where the antenna and earth enter. The earth lead must be kept as short as possible – and the higher the frequency, the more important this becomes. Anything longer than, say, an eighth of a wavelength (as little as 4ft (1.2m) on 10m, as much as 33ft (10m) on 80m) might result in everything in the shack 'floating' at RF, with the potential for feedback problems.

If you can't have your shack on the ground floor and are forced to use an upstairs room then compromises will be necessary. The antenna / earth connection can be via coax. This must be short as it will often be operating with a fairly high SWR, which will result in losses. The centre of the cable goes to the antenna, the braid to earth (at the feed point) and the other end to the output of the ATU. The cable from the ATU to the transceiver or transmitter (via your SWR meter) will be pretty well matched, so is not critical. See **Figure 3**.

An alternative to this arrangement would be to bring the antenna and earth in upstairs (**Figure 4**) and have the ATU close to the entry point. The earth connection will be long but this might still be worth a try, particularly if you only want to operate on the LF bands. But enforced operation any great distance from the feedpoint is a situation where an auto ATU (outside) starts to look distinctly useful and is an alternative that might well be considered.

MYTH: An end fed antenna will result in RF feedback problems. Well, it might, but this doesn't have to be the case. In 48 years of using end-feds, I have only had one serious case of this. I was trying out a linear amplifier that I had rebuilt, and when I 'wound it up' to 400 watts I was getting some quite bad instability. Some might say I was asking for it. The transceiver was an all valve vintage type, the mic a dynamic running into a home made preamp (mainly to match the high impedance of the rig) built into a small metal box. When I tuned up into a dummy load all was as it should be; the problems started when I switched to the antenna, a 66 foot (20.1m) end fed. I noticed that when I moved the microphone the character of the feedback changed, so RF pickup prior to the preamp was most likely.

I plugged in a soldering iron and, while it was warming up, removed the top of the preamp case. A visit to the junkbox produced a small RF choke that I quickly installed between the mic socket and the preamp circuit board, with a 100pF capacitor to ground. This resulted in a 100% cure. So, problem diagnosed and solved within about 15 minutes. But, of course, prevention is better than cure. Effective grounding (at RF) is all-important and this is largely down to the electrical length of the earth connection.

MYTH: The G5RV is a poor antenna and is best avoided. Well, it is little more than a doublet of a particular size – and doublets work! It can, however, be tricky to match, especially on 30, 17 and 12m (the WARC bands): this is where many people are most likely

Bruce Edwards, G3WCE
g3wce@grimblepoos.co.uk

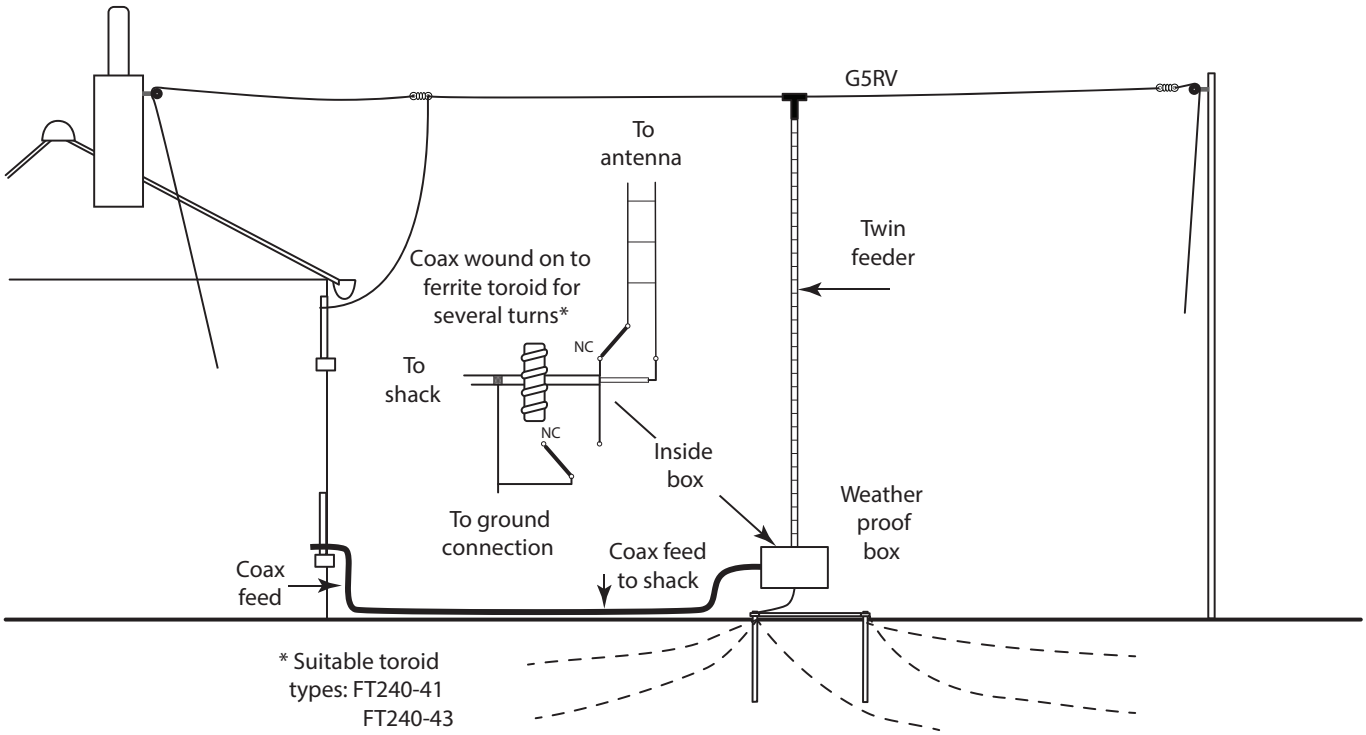


FIGURE 5: Using a relay to strap together the feed to a G5RV (or other doublet) for Top Band. A good RF earth below the feed point is essential.

to come unstuck. A lot of modern ATUs, particularly automatic ones, don't have the ability to match a particularly wide range of impedances. However, a good old-fashioned 'Z' Match should do this. By the way, building a manual ATU is MUCH cheaper than buying one, and you can often adapt it to your own particular circumstances so it will work better than any general-purpose ATU that you could purchase.

Much has been written about why the G5RV has the particular dimensions it does **[1]**. My opinion is this: the designer wanted a system that was well suited to 20m (which, at 3 half waves long and centre fed, it is), that would work on the other bands of the day (which it does) and that made best use of the space he had available. I can't comment on this, but 100 feet or so is not an excessively unusual length for a suburban garden, even if some more modern 'dwelling units' have little more than a window-box with delusions of grandeur. Incidentally, the length of twin feeder is a half wavelength at 20m, so the impedance of the antenna at the centre is reproduced at the other end of this (on this band only). In this we have a simple explanation that seems to cover all the facts.

The down side is that feeding it with coax connected directly to the section of twin feeder can give some unpredictable results, as the coax will transform the impedance to some new value that will depend on the length of coax and the frequency. Also, coax can be very lossy when poorly matched (which it often is in this application) and that loss increases with frequency.

In spite of this, a few years ago I spent some time using nothing more than a home built QRP transceiver (<5W) and, with a G5RV, managed to 'work the world'.

However, if you have the space for this antenna (or more) there is an option you might like to consider: keep the 100+ foot top section and simply feed it with 300Ω or 450Ω twin feeder all the way back to the shack. This will work on 80-10 metres, the feed will be far less lossy than coax and it will probably be easier to tune (use a Z-match again).

MYTH: The G5RV won't work on Top Band. Well, yes and no. If you use coax feed that runs along the top of a fence to the vertical section half way down the garden, and simply strap the conductors at the shack end, then you can expect poor results. I wouldn't even bother trying this. However, I have had good results from the arrangement shown in shown in **Figure 5**. Obviously, you will need an extra conductor for the relay switching. This can be a single (insulated) wire strapped to the coax, the DC return being via the coax outer sheath. The relay I use in situations such as this is the octal based type often described in catalogues as a 'power relay' – it doesn't need to be an RF-rated type. In this instance, it must be placed in a waterproof box. A few (well, as many as is practical) radials underneath the antenna should work well.

If the feeder goes straight up to the antenna from the shack window, strapping the two conductors together at the shack end should enable it to work on 160m as a top loaded vertical, assuming you have a good earth connection and an unbalanced ATU (or a balanced ATU with an external balun). It might also produce some interesting results on 80 and 40m, as it will be vertically polarised instead of the usual horizontal polarisation for a G5RV on those bands.

Noise

Electrical noise is the curse of the modern electronic age. Most of us are affected by it to some extent, and a complete cure is unlikely, but it can often be drastically reduced. As it only affects us on receive, it makes sense to use the best transmitting antenna we can manage, and tailor the receiving system accordingly.

What we need is an antenna that picks up less noise, but still gets enough of the wanted signal to still be useful. If that signal is drastically reduced in strength it doesn't matter because some amplification will put this right; what *is* important is the signal to noise ratio. Of course, when separate receive and transmit antennas are used, an

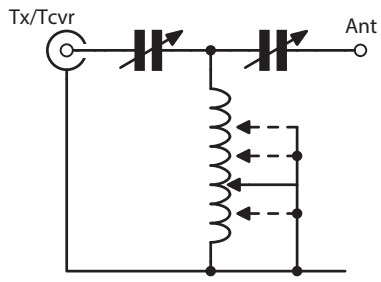


FIGURE 6: T Match ATU.

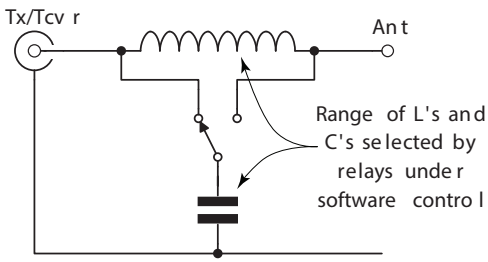


FIGURE 7: L Match ATU.

effective means of switching between them will be needed. If there is amplification on the receive side, this might need to be protected from excessive signal strength when transmitting.

Two antennas that might be worth looking at here are the screened tuned loop, and the active receiving antenna. And, of course, if the one chosen is small enough, it can often be sited away from sources of noise, possibly at the end of the garden. But this is a complex area that needs careful consideration and is beyond the scope of this article.

Types of ATU

Unless they specifically say they use a different circuit configuration, commercially available manual types are generally of the 'T' Match configuration, as seen in **Figure 6**. Automatic ATUs often use the (simpler) L Match shown in **Figure 7**. In practice, in auto ATUs these consist of lots of separate fixed capacitors and inductors and a bank of relays to switch them individually in and out of the circuit, all under software control. A SWR meter built into the auto ATU is read by the internal microprocessor and this is used to select the 'best' configuration for lowest VSWR.

A type that I favour is the 'Ultimate Transmatch' **[2]**, see **Figure 8**. It's possibly not the most efficient of ATUs under all conditions, but there is not much that it can't cope with. One point worth remembering when using a multi band ATU of this type is that when it is used on a frequency other than the minimum it is intended for, part of the inductance will normally be out of circuit. This can result in it behaving like an auto transformer. If the open section is large, then sufficiently high voltages to produce damaging flashovers can result. I haven't experienced this at modest power levels, but once while running a linear, I destroyed a roller inductor when its plastic end plate caught fire. The solution to this is to arrange for the unused section to be shorted out, most conveniently by the band switch where one is used. But this is not without unwanted effects. If the shorted section is small, then (very) high currents can flow, particularly if stray capacitances cause the shorted turns to resonate. Overall, the result will be a reduction in the Q of the inductor and a slight increase in losses. Nothing's perfect, is it?

The 'Z' Match **[3]** of **Figure 9** was produced commercially by KW Electronics in the 1960s and sold as the E-Zee Match in basic form. The KW105, KW107 and KW109 added switched antenna outputs, metering and internal dummy load, depending on model. These regularly turn up on the second hand market, and are well worth considering.

However attractive a shiny new ATU may be, many (if not most) old timers constructed their own and, as mentioned earlier, particularly if you have a large junk box or are good at spotting bargains at a rally, this can be a far cheaper way of taming your antenna. Also, don't forget that for receive-only, or very low power transmitters, you can get away with small variable capacitors such as those employed as tuning capacitors in medium wave radios: this might mean, for example, you could build a simple, short, inefficient aerial and match it to a low power WSPR transmitter that you can operate independently of your main station antenna.

Finally, which antenna would I use?

I really don't need to think too hard about this. The one antenna that will do everything that I want, effectively, including performing well on 160m, is a 100 foot end fed, ideally 35 – 40 feet high, with the best earth system that I can manage.

References

[1] The G5RV Aerial – Some Notes on Theory and Operation, Louis Varney, AMIEE, AIL, G5RV, *RSGB Bulletin*, November 1966 p70 et seq

[2] Transmatch, *ARRL Handbook 1988,* p34-15; Ultimate Transmatch, p34-16, Figure 33

[3] Z-Match, *RSGB Handbook,* any edition, HF Antennas section

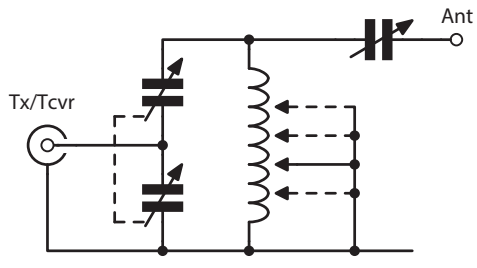


FIGURE 8: Ultimate Transmatch ATU.

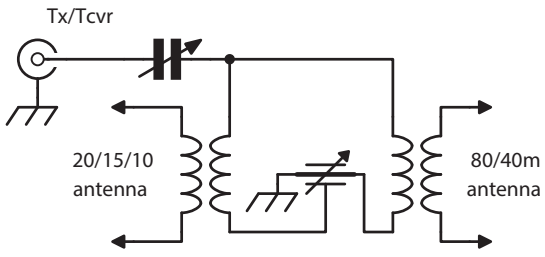


FIGURE 9: Z Match ATU.

Sport Radio

Everything is new or different with HF contests this month, including something to encourage Foundation and Intermediate licensees.

PHOTO 1: The antennas of G8P, used for the 2m Trophy Contest. Note the English Channel in the background.

There are changes to the format of SSB Field Day this year. It takes place for 24 hours over the weekend of 2nd-3rd, but because of the outcome of the 2015 Presidential Review on Contesting (that said that the rules for CW NFD and SSB FD should be more alike) it now has a power limit of 100 watts. With HF conditions as they now are, this is going to present a *real* challenge to those accustomed to generating pile-ups and running them for long periods. This year there's also the possibility of a station inspection. Now, the new 3-month long 3.5MHz Autumn Series. I wrote an introduction about this last month. The first session – SSB – takes place on Monday 11th and on Wednesday 20th we have the CW session. Note that on CW there is a separate section for those who send *all* their CW at 15WPM or less, plus a 5kHz

Continued on page 67

Steve White, G3ZVW
steve.g3zvw@gmail.com

RSGB HF Events

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Sat-Sun 2-3 Sep	SSB Field Day	1300-1300	SSB	3.5-28	RS + SN
Mon 11 Sep	80m Autumn Series	1900-2130	SSB	3.5	RS + SN
Wed 20 Sep	80m Autumn Series	1900-2130	CW	3.5	RST + SN
Thu 28 Sep	80m Autumn Series	1900-2130	Data	3.5	RST + SN

RSGB VHF Events

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange (info)
Sat-Sun 2-3 Sep	144MHz Trophy +	1400-1400	All	144	RS(T) + SN + Locator
Sun 3 Sep	5th 144MHz Backpacker	1100-1500	All	144	RS(T) + SN + Locator
Tue 5 Sep	144MHz FMAC	1800-1900	FM	144	RS + SN + Locator
Tue 5 Sep	144MHz UKAC	1900-2130	All	144	RS(T) + SN + Locator
Tue 12 Sep	432MHz FMAC	1800-1900	FM	432	RS + SN + Locator
Tue 12 Sep	432MHz UKAC	1900-2130	All	432	RS(T) + SN + Locator
Thu 14 Sep	50MHz UKAC	1900-2130	All	50	RS(T) + SN + Locator
Sun 17 Sep	Second 70MHz	0900-1200	All	70	RS(T) + SN + Locator
Tue 19 Sep	1.3GHz UKAC	1900-2130	All	1.3G	RS(T) + SN + Locator
Thu 21 Sep	70MHz FMAC	1800-1900	FM	70	RS + SN + Locator
Thu 21 Sep	70MHz UKAC	1900-2130	All	70	RS(T) + SN + Locator
Tue 26 Sep	SHF UKAC	1900-2130 ~	All	2.3-10G	RS(T) + SN + Locator

Best of the Rest Events

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange/info
Sat 2 Sep	CWops CW Open	0000-2359	CW	1.8-28	SN + name (three 4-hour sessions)
Sat-Sun 2-3 Sep	All Asian DX	0000-2359	SSB	1.8-28	RS + age (YLs send 00)
Sat-Sun 2-3 Sep	IARU 144MHz	1400-1400	All	144	RS(T) + SN + Locator
Sun 3 Sep	WAB 2m QRO Phone	1000-1400	SSB/FM	144	RS + SN + WAB square
Wed 6 Sep	UKEICC 80m	2000-2100	SSB	3.5	4-character Locator (Grid) square
Sat-Sun 9-10 Sep	WAE DX SSB	0000-2359	SSB	3.5-28	RST + SN (EU works non-EU only)
Sun 17 Sep	UKuG	0900-1700	All	24-76G	RS(T) + SN + Locator
Sun 17 Sep	BARTG Sprint 75	1700-2100	RTTY	3.5-28	SN
Sat-Sun 23-24 Sep	CQWW RTTY DX	0000-2359	RTTY	3.5-28	RST + Zone (UK=14)
Sun 24 Sep	UKuG	0600-1800	All	5.7, 10G	RS(T) + SN + Locator
Sun 24 Sep	PW 70MHz	1200-1600	All	70	RS(T) + SN + Locator
Wed 27 Sep	UKEICC 80m	2000-2100	CW	3.5	4-character Locator (Grid) square
Sat 30 Sep - Sun 1 Oct	UKEICC DX	1200-1200	SSB	3.5-28	RS + SN + District Code

In the case of differences between this calendar and the Contest Committee website, the website takes precedence.
+ VHF Championship event ~ Different bands at different times

WATERS & STANTON
EUROPE'S HAM STORE

'SDR takes another step forward with the introduction of 4 new products from Flex and the launch of SmartSDR V2.0 and SMARTlink which provides the simplest method of remote operation yet with single-click setup. If you want to find out more about how you can benefit from the very latest in Flex Radio developments, call me today and ask. I use my Flex 6000 series radios daily!'

Justin G0KSC

ELECRAFT® Brought to you by W&S!

Microphone and key not included

KX2

Go wherever your imagination takes you thanks to its compact construction, it's only 5.8 x 2.8 x 1.5" making it the smallest full-featured HF radio on the planet. Yet it puts out up to 10 Watts, covers 9 bands and shares many features with the KX3.

To maximize your freedom outfit your KX2 with an internal 2.6 amp hour Li-ion battery (KXBT2) yielding up to 8 hours of typical operation on a single battery charge. There's also an internal automatic antenna tuner module (KXAT2), which can tune a random wire, dipole or whip on multiple bands.

The KX2 can even be used as a hand-held. It includes a built-in mic for HT-style operation.

KX2 £859.95

KX2 ACCESSORIES

CS40	Small compact carry case for KX2, and small accessories	**£38.95**
CS60	Large compact carry case for KX2 & MH3 mic plus more accessories	**£54.95**
KXAT2	Internal ATU to tune even non-resonant 'random' wire antenna	**£219.95**
KXBT2	Internal battery gives up to 8 hours operation from a single charge	**£69.95**

KX3

HF & 6m ultra compact portable transceiver with advanced DSP.

- 160-6 metre ham bands; general coverage receive from 1.5-32.0MHz (also covers 0.31-1.5MHz with reduced sensitivity)
- All modes: SSB, CW, Data (four sub-modes), AM, FM
- Quadrature down-sampling mixer compatible with PC-based SDR
- 8-band receive audio equalizer
- Built in digital voice recorder (DVR) with two message buffers

KX3-F	Ready-built	**£1,079.95**
KX3-K	Kit	**£999.95**

Microphone and key not included

KX3 ACCESSORIES

KXPD3	Precision Iambic Keyer Paddle	**£159.95**
MH3	Hand Microphone with Up/Down Buttons	**£79.95**
KXFL3	Dual Passband Roofing Filter	**£184.95**
KXPA100-F	100W power amplifier for KX3 fully assembled and tested	**£949.95**
KXAT100	Internal auto ATU used for the KXPA100	**£449.95**
KXAT3	Internal 20W Automatic Antenna Tuner	**£249.95**

ELECRAFT® ACCESSORIES • UK's Official Dealer

K3S

- New synth board for lower Tx/Rx phase noise
- IF interface board • 12m-6m low noise pre-amp
- USB interface that carries data and audio
- New 10W driver board • 100W PA upgrade

K3S/100-F £2999.95 K3S/100-K £2849.95
K3S/10-F £2449.95 K3S/10-K £2299.95

KPA500

160-6m 500 + Watts Solid State Auto Band Switching Linear Amplifier in a compact package the size of the K3.

Kit: £2449.95
Ready Built: £2649.95

KPA1500

- 1500W
- Very compact design
- Fast, silent PIN diode T/R switching
- Built-in Antenna Tuner with dual antenna jacks
- Compatible with nearly any transceiver 160-6 metres

Price: TBA

IHS™
INTERNATIONAL HAM STORES GROUP

The sign that means a GREAT DEAL!

Three of the UKs leading Ham Radio Retailers (Waters and Stanton, Nevada and Innovantennas) have combined and operate from a combined distribution centre and showroom in Farlington, Portsmouth. The new facility forms the largest ham radio warehouse and distribution centre in the country housing a wider selection of products than any other UK based company.

IHSG are hiring!
If you believe you have value you can add to our expanding team, mail us! **justin@ihsg.co.uk**

call: **01702 204965** email: **sales@wsplc.com**

Waters & Stanton Ltd • Unit 1 • Fitzherbert Spur • Farlington • Portsmouth • PO6 1TT

@wsplc blog.hamradiostore.co.uk facebook.com/WatersandStanton YouTube Waters and Stanton

StepIR SOLE UK IMPORTER European Distributor and Service Centre. Call for best prices

NEW from ICOM!

Icom ID-4100

Dual band D Star digital transceiver. Now with terminal mode & access point mode. Wireless operation (optional Headset)

- Integrated GPS Receiver
- Wideband Receiver

£479.95

Icom ID51 PLUS2

Dual Band D-STAR Digital Transceiver. Available in several patterns and colours.

- Covers 2 metres and 440MHz
- Receives two bands simultaneously (V/V, U/U & V/U)
- Output: 5, 2.5, 1.0, 0.5 or 0.1 Watts
- 1304 channel memories
- IPX7 waterproof
- Built-in GPS

£449.95

BEKO

IHSG APPOINTED SOLE UK DISTRIBUTORS

HLV-1000

A compact solid state, high efficiency 1kW amplifier providing exceptional performance on 144-148MHz with single input and single output.

£2495.00

HLV-350
A 350W 23cms amplifier, frequency range of 1270-1300MHz..... **£2595.00**

HLV-950
Dual band performance both on 50MHz (1kW) and 70MHz (700W).....**£2549.00**

FLEX RADIO

Next-Gen SDR from Flex Radio!

6400/6600

6400M/6600M

Flex 6400..... Now with preselectors..... **£1999.95**
Flex 6400M..Including front panel **£2999.95**
Flex 6600..... Now with 2 x SCU's..... **£3999.95**
Flex 6600M..Including front panel **£4999.95**
All 6400/6600 versions can have optional GPS Disciplined Oscillator (GSPDO).....**£724.95**

Flex 6700
8 slice Receiver flagship.....**£6899.95**
Flex 6500
4 slice Receiver **£3799.95**
Flex 6300
2 slice Receiver..... **£1849.95**

Flex 6300 ATU

Entry point SDR transceiver, but no slouch!

- All modes including digital
- Covers: 160m-6m
- 100W output

£1999.95

AOR

ONE MONTH ONLY!

AR-8600MkII Mobile Base Station

- All mode: WFM, NFM, SFM, WAM, AM, NAM, USB, LSB, CW
- Frequency range: 100kHz-3000MHz

£619.95

AR-6000..... **£4699.95**
AR-5001D..... **£2669.95**
DV-1..... One month only..... **£1274.95**
AR-8200D..... **£664.95**
AR-8200MkIII..... **£459.95**

LA-400

10kHz to 500MHz Desktop Magnetic Loop Receiving Aerial

£419.95

TOWERS and TRAILER TOWERS from stock

INTRODUCTORY OFFER
TRAILER TOWER
~~£4495~~ £3495
save £1000!

Fixed masts *FROM* **£1695.00**

CABLE

50 Ohms coax with an outer diameter of 4.95mm
RG-58.....(Per Metre).....£0.70
DRG-58-50.....(50m Drum)..... £23.95
DRG-58.....(100m Drum)..... £45.95

50 Ohms coax with an overall diameter of 6.1mm
Mini-RG8..... (Per Metre).....£1.00
DR-Mini-RG8-50.. (50m Drum)..... £39.95
DR-Mini-RG8.....(100m Drum)..... £79.95

50 Ohms low loss coax and a diameter of 6.1mm
RG-213.....(Per Metre).....£1.50
DRG-213-50.....(50m Drum)..... £69.95
DRG-213..(100m Drum) SAVE £5 THIS MONTH ONLY £134.95

50 Ohm low loss coaxial cable - ideal for UHF/VHF or HF
W-103.....(Per Metre).....£1.50
DR-W103..(100m Drum)SAVE £5 THIS MONTH ONLY £134.95

300 Ohms Slotted Ribbon cable
300-S..... (per Metre)....£1.00
DR-300S.....100m Drum).....£85.95

450 Ohms low loss ladder line
450-S..... (Per Metre)....£1.20
DR-450S.....(100m Drum)..... £89.95

DIAMOND WD330 COMPACT DIPOLE

80M - 10M 25M LONG

This is a dipole that covers all bands from 80m to 10m. It also comes with 30m of coax feeder terminated in PL-259 plugs. The antenna will handle up to 150W and typically has a VSWR or 2:1 or better. This is easily matched with internal ATUs. Can be erected as an inverted V, sloper or horizontal.

£199.95

DON'T SEE WHAT YOU NEED? Call us for available stock and BEST PRICES

call: **01702 204965** email: **sales@wsplc.com**

Waters & Stanton Ltd • Unit 1 • Fitzherbert Spur • Farlington • Portsmouth • PO6 1TT

@wsplc blog.hamradiostore.co.uk facebook.com/WatersandStanton YouTube Waters and Stanton

KENWOOD DEALS

OFFICIAL RE-SELLER

TH-D74

New!

New 144-430MHz handheld featuring Kenwood's APRS, Automatic Packet Reporting System, and the popular D-Star. Kenwood has made it possible to use this handheld in a wide range of radio applications with wideband reception function allowing the user to receive HF SSB and CW.

£599

KENWOOD ACCESSORIES

MC-60A
Popular desktop mic with PTT **£127.95**

MC-43S
Dynamic hand mic with up/down control **£20.95**

MC-90
Desk mic for DSP transceivers.... **£204.95**

SP-990M
Speaker with high/low filters & two inputs **£219.95**

HS-5W
High quality deluxe headphones.. **£56.95**

NEW LICENCE DEAL CALL FOR DETAILS

TS-590SG

Be witness to the evolution of Kenwood's pride and joy - the TS-590SG HF transceiver - pushing performance and technology to its utmost limit, with the receiver configured to capitalise on roofing filter performance and IF AGC controlled through advanced DSP technology.

Call for best prices

FREE SPEAKER

LAST FEW AT W&S SPECIAL PRICE

TS-990S

HF + 6m 200W transceiver with dual TFT display with a dynamic power supply that means no external unit is required.

£4999.95

ICOM DEALS

OFFICIAL RE-SELLER

IC-7300

HF-6m-4m transceiver with integrated SDR and built-in wide frequency automatic antenna tuner, ideal for field operation. Operate with 100 Watts on HF/50MHz and 50W on 70MHz.

£1199.95

SP-38

Matching speaker designed specifically for the IC-7300 improving sound quality and experience. **£129.95**

COMING SOON!

IC-7610

Retail price will be **£3598.00**
Orders taken for first batch now, limited numbers still available!!

Call to Pre-Order yours now

Here at Waters and Stanton we are getting ready for the new and exciting ICOM IC-7610. The IC-7610 is the successor to the IC-7600 and will be a dual-watch capable HF+50MHz 100W base station with built-in antenna tuner. The LCD will be touch screen and you will be able to connect an external display. The radio will be based on SDR technology, so well deployed in the very popular IC-7300. Another nice feature is the ability to output the display to a large external screen.

FULL RANGE OF RT SYSTEMS SOFTWARE AND CABLES FOR ALL KENWOOD, ICOM AND YAESU

We provide finance on all Ham equipment

Buy now pay later or regular finance deals can be arranged in store or over the phone, call for details

YAESU DEALS

OFFICIAL RE-SELLER

New!

FT-991A

Successor to the FT-991 this all band HF - UHF transceiver which includes Yaesu's System Fusion as well as traditional modes. The FT-991A packs the same features as the FT-991 plus an added real time spectrum display and multi-colour waterfall display.

Call for best price

New!

FTM-3200DE

Rugged yet compact System Fusion/FM 65W mobile transceiver. Loud and Crystal Clear Front Panel Speaker with 3W of Audio Output. Instantly recognises digital or analogue transmission and adjusts automatically for flawless coexistence of both digital and analogue users.

Call for best price

FT-891

New!

100W HF + 6m mobile transceiver with AM, USB, LSB and CW modes featuring triple conversion, noise blanker and attenuator. **Call for best price**

FT-2DE

2m/70cm dual band handheld transceiver designed with ease of use in mind such as its 1.7 inch full back-lit touch panel display. Includes FM and System Fusion modes.

Call for best price

FT-857

World's smallest HF/VHF/UHF 100W mobile transceiver including DSP.

Call for best price

FT-450D

Compact yet superb HF/50MHz radio with state-of-the-art IF DSP technology configured to provide worldclass performance in an easy to operate package.

Call for best price

FT-DX1200

HF + 6m transceiver provides up to 100 Watts on SSB, CW, FM and AM (25 Watts carrier) and a rugged state of the art highly balanced receiver circuit configuration for top performance on today's crowded bands.

Call for best price

FT-817 BHI-DSP

FROM STOCK

BHI DSP Filtering This micro size board fits inside the FT-817ND.
A mini press button & LED are installed beneath the top cover for switching. The unit cycles through 4 levels of filtering and then reverts back to 'out of circuit' mode.

£769.95

YAESU ACCESSORIES

MD-100A8X Desk mic with PTT....**£119.95**
MLS-100
High performance external speaker.... **£28.80**
FC-30
External ATU for FT-897 and FT-857.. **£259.95**

In Stock!

FT-65E
2m/70cm Handheld Transceiver
Variable 5W output
£129.95

FT-25E
2m Monoband Handheld Transceiver with Variable 5W output
£89.90

www.hamradiostore.co.uk

Pay us a visit and check out our amazing demo facility

Sign up to our WEEKLY DEALS at **hamradiostore.co.uk** for exclusive deals and latest news

WATERS & STANTON
EUROPE'S HAM STORE

WATSON

BASE STATION VERTICALS

Colinear (fibreglass) with 2" mast fittings

W-30
45 Amp variable voltage switched mode power supply with 'noise shift' feature. **£54.95**

W-50
2m/70cm, 4.5/7.2dB gain and 1.8 meters long..... **£64.95**

W-300
2m/70cm, 6.5/9dB gain and 3.1 meters long.
..... **£104.95**

W-2000
6m/2m/70cm, 2.15/6.2/8.4dB gain and 3.1meters long.
..... **£104.95**

WATSON PSU

Power-Mite
20 Amp micro PSU variable voltage switchmode power supply, excellent value. **£84.95**

Power-Max-45
45 Amp variable voltage switched mode power supply with 'noise shift' feature.
..... **£119.95**

Power-Max-65
65 amp variable voltage heavy duty switched mode power supply with 'noise shift' feature.
..... **£259.95**

WATSON SWITCHES

CX-SW2PL / CX-SW2N
2-way Coaxial Switch N-type or SO239 connectors.
..... **PL259 £34.95**
..... **N-type £41.95**

CX-SW3PL / CX-SW3N
3-way Coaxial Switch N-type or SO239 connectors.
..... **PL259 £54.95**
..... **N-type £59.95**

CX-SW4PL / CX-SW4N
4-way Coaxial Switch N-type or SO239 connectors.
..... **PL259 £69.95**
..... **N-type £79.95**

BUY NOW PAY LATER - FINANCE AVAILABLE! CONTACT US FOR MORE DETAILS

DON'T SEE WHAT YOU NEED?

Call or visit our website, we have over 7000 products available?

HANDHELD ANTENNAS

Flexible handheld air band receiving/scanning antenna.
W-901 BNC connector.....**£19.95**
WSMA-901 SMA Male..... **£21.95**

2m/70cm flexible handheld antenna.
WHXX-270 BNC connector...**£21.95**
WHSM-270 SMA Male..... **£21.95**

ATX-MkII
Portable 80m-6m antenna with 3/8, PL259 and BNC connectors for scanners etc.....**£104.95**

W-2000
6m/2m/70cm, 2.15/6.2/8.4dB gain and 3.1meters long.
..... **£54.95**

ATX-WBN
Portable 80-6m antenna with BNC connector only for scanners etc. Max. length 32cms.
..... **£46.95**

ATX-WPL
Portable loaded whip 80m-6m with multiple tap points BNC fi tting suit FT 817 & scanners.
..... **£46.95**

WHF- Range
Mobile antennas with 3/8 stud mount, available for 20m to 2m.
..... **From £19.95 to 59.95**

W-627
6m/2m/70cms Triband mobile whip PL 259 base, 2.15/4.8/7.2dB and 1.62 meters long.
..... **£44.95**

Want a second hand trade in? W&S can give you the best prices

WATSON BALUNS

400 Watts weighing 200 grams with SO-239 base connector and hook loops for mounting.
WB-1 1:1 Balun rating..... **£29.95**
WB-4 4:1 Balun rating..... **£29.95**
WB-6 6:1 Balun rating..... **£29.95**

G5RV ANTENNAS

Full Sized
31m long (102ft) 80m-10m with 300 Ohm ribbon feeder, super budget HF multi-bander!
..... **£35.95**

Half Sized
16m long (51ft) 40m-10m with 300 Ohm ribbon feeder, small garden HF multi-bander.
..... **£24.95**

DUMMY LOAD

DM-15WN
20 Watt Dummy Load (4 seconds 50 Watts) to 800MHz with N-type male.
..... **£21.95**

DM-200N
100 Watt Dummy Load (5 seconds 200 Watts) to 3GHz with N-type.
..... **£64.95**

DM-150
100 Watt Dummy Load (10 seconds 150 Watts) to 1GHz with PL PL259.
..... **£44.95**

WATSON MULTI-RANGER

Multi-Ranger-9
HF-UHF Mobile antenna fitted with PL259 1.9m long rated to 120 Watts.
..... **£59.95**

Multi-Ranger-200
HF-VHF Mobile antenna fitted with PL259 1.6m long up to 200 Watts input!
..... **£79.95**

MULTI-PROG

No need for dozens of separate cables for all your radios with this one programming cable and interchangeable adapters works with most manufactures.
..... **£19.95**

POPULAR WEATHER STATIONS

W-8681-ProII
Professional grade wireless weather station with in and out door sensors, colour display.
..... **£219.95**

W-8682-MkII
Budget weather station with in and out door sensors, mono display at a bargain price.
..... **£64.95**

W-8684
Compact inside / outside thermometer combines temperature information, with a bedside clock.
..... **£14.95**

W-8685
Wireless linked Indoor / Outdoor Thermometer, plus alarm clock & rolling date.
..... **£9.95**

W-8683
A complete weather forecaster and weather station in one very compact and portable package.
..... **£29.95**

W-8681-Solar
This product will power all the sensors connected to it and transmit the data to the main unit.
..... **£104.95**

STATION ACCESSORIES

SP-350V
Static Discharge connect to ground and install within your coax line for protection SO-239.
..... **£21.95**

SP-350VNS
Static Discharge connect ground connector as above with N-type connectors each end.
..... **£25.95**

WM-S
Gooseneck Mobile Microphone clips to sun visor for easy install. PTT box supplied.
..... **£59.95**

call: **01702 204965** email: **sales@wsplc.com**
Waters & Stanton Ltd • Unit 1 • Fitzherbert Spur • Farlington • Portsmouth • PO6 1TT
@wsplc blog.hamradiostore.co.uk facebook.com/WatersandStanton YouTube Waters and Stanton

HEIL THE UK'S OFFICIAL DISTRIBUTOR

HM-12
Designed specifically for ham radio use its high output range works with low impedance radios
£79.95

PR-30
Large Diaphragm Dynamic Studio and Broadcast Microphone in Champagne for Ham Radio and Studio Recording **£299.95**

ICOM IC-7300 PMD-IC
Headset with boom mic ready wired and matched for the IC-7300, This headset plugs directly into the mic socket.

£129.95

HMM
Clam Shell Mic
Microphone element within a clamshell design giving superior sound.

£94.95

PRO-7
Professional Boom Mic Headset
Bringing new technology the Pro-7 provides extreme comfort and amazing sound. **£259.95**

Icom model including lead **£79.95**

All HEIL Parts and Accessories are available through us.
Call us for details

CABLES
Required for most products
To find which cable/adaptor you will need please give us a call on
01702 206835

DIAMOND

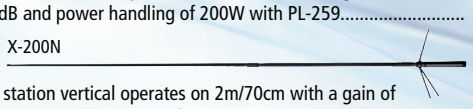
V-2000
Triband base antenna operating on frequency bands 6m/2m/70cm utilises a linear phase shift design **£99.95**

CR-8900 4 band mobile whip antenna that was designed with the FT-8900 quad band mobile in mind but works with over radios..... **£89.95**

X-30 Fixed station vertical operates on 2m/70cm with a gain of 3/5.5dB and power handling of 150W with PL-259..... **£48.95**

X-50 Fixed station vertical operates on 2m/70cm with a gain of 4/7.2dB and power handling of 200W with PL-259..... **£59.95**

X-200N



X-200N Fixed station vertical operates on 2m/70cm with a gain of 6/8dB and power handling of 200W with N-Type..... **£84.95**

X-300 Fixed station vertical operates on 2m/70cm with a gain of 6.5/9dB and power handling of 200W with PL-259..... **£89.95**

SRH-701 SMA 2m/70cm Dualband Telescopic Whip with power handling of 10W and 19cm long..... **£14.95**

SRH-771 SMA 2m/70cm flexible Whip antenna with power handling of 10W and 40cm long..... **£14.95**

SRH-815

SRH-815 High gain 15cm antenna for 2m/70cm/23cm power handling of 6W with SMA plug..... **£27.95**

SRH-999 6m/2m/70cm/23cm Quad band HT Antenna that is of high quality and high gain..... **£35.95**

WANT TO BUY MORSE?
Call us, visit us online or instore for a wide range of Morse products

MFJ'S ONLY OFFICIAL IMPORTER IN THE UK

MFJ-1835
This five-band (20, 17, 15, 12, 10 Meters) half-wave open-loop is perfect for restricted space or portable operation. **£209.95**

MFJ-949E

Full 1.8-30MHz operation 300W antenna tuner with peak cross meter. **£199.95**

MFJ-974HB
Fully balanced true balanced line antenna tuner. **£229.95**

MFJ-266

HF/VHF/UHF antenna analyser with all RF-diagnostic functions you need. **£389.95**

MFJ-1788X
MFJ's tiny 36 inch diameter loop antenna lets you operate 10 through 40MHz continuously - including the WARC bands! Ideal for limited space. **£529.95**

MFJ-1886X
0.5MHz-30MHz receiving loop for massive reduction in receiving noise and those with limited space. **£269.95**

MFJ-259C

HF/VHF/220MHz, 0.53-230MHz, SWR Analyser. **£279.95**

MFJ-993B
300/150W Dual power ATU 1.8-30MHz. **£299.95**

MFJ-991B
HF 300/150W Dual Power ATU. **£279.95**

YRC-1X

Yaesu Rotator Controller with USB port for remote control, Graphic LCD screen, userprogrammable callsign, 9/16" antenna direction display and more. **£369.95**

MFJ-16010

200W variable random wire antenna tune capable of matching almost any length wire from 160-10m. **£79.95**

AL-811XCE
Linear Amplifier 160-10m 600W 3 x 811A. **£949.95**

MFJ-969

HF+6m 300W antenna tuner with roller, antenna switch and XMTR. **£249.95**

MFJ-998

ATU with full 1500 Watts SSB/CW Digital & Analog SWR/WattMeter. 1.8-30MHz. **£729.95**

MFJ-269C

HF/VHF/UHF SWR Analyser. **£369.95**

MFJ-226

VNA Antenna Analyzer covers 1-230MHz, 1Hz resolution. ~~£359.95~~ **£339.95**

MFJ-461
Pocket size morse code reader no cables or extras needed. **£99.95**

MFJ-926B

Remote 200W ATU can cover the entire HF band. **£319.95**

MFJ-994BRT
Heavy Duty remote 600W ATU 1.8-30MHz. **£459.95**

MFJ-557

Deluxe Morse Code Practice Oscillator with a straight key on a non-skid heavy steel base. **£54.95**

INTERNATIONAL HAM STORES GROUP

ALINCO — NEW Digital/Analogue Handhelds

DJ-AXD4: UHF Version
DJ-AXD1: VHF Version
- DMR Tier I and Tier II
- RF output 1W to 5W

Heavy Duty, feature rich, with outstanding audio clarity

- 1000 channels in 16ch/zone
- Text messages
- IP67 dust & waterproof
- Key Lock, Talk around, TOT,
- Call Logs, DTMF tones,
- Scans and more!

£149.95

ALINCO

DJ-MD40: UHF
- RF output 1W to 5W
- 1000 channels in 16ch/zone
- Text messages
- IP54 dust & waterproof
- Voice recorder

£159.95

FlexRadio Systems®
SDR Transceivers

New Products released at Dayton 2017!

Flex 6400M/6600M

Flex 6400/6600

6600/6600M
Now with 2 SCU's, dual preselectors, new modular design and Smart SDR2

6400/6400M
Improved receiver performance, 4 slice receivers, preselector & modular design

Flex 6400.....Now with preselectors.....£1999.95
Flex 6400M... Including front panel.....£2999.95
Flex 6600.....Now with 2 x SCU's.....£3999.95
Flex 6600M... Including front panel.....£4999.95

All 6400/6600 versions can have optional GPS Disciplined Oscillator (GSPDO).....£724.95

With improved receiver specs. and lots more!
We are taking DEPOSITS NOW!

SIRIO Antennas

SY50-5
5 element
50MHz 10.5 dBi
£129.95

HF/VHF/UHF Beams
SY50-3.....3 el 50MHz 8.5dBi.....£99.95
SY68-3.....3 el 70MHz 7dB.....£79.95
SY27-3.....3 el (26-28)MHz 10.65 dBi.....£84.95
SY27-4.....3 el (26-28)MHz 13.15 dBi.....£99.95
SY-400.....6 el 70cms (wide band) 11.0 dBi.....£79.95
WY-140.....3 el 144MHz (wide band) 10.5 dBi..£89.95
Base Antennas
SA-270LN..Dual Band 5.35/7.95 dBi 2.79m.....£99.95
Mobiles
HP-2070R..Dual Band 1.00m.....£34.95
HP-2070H..Dual Band 1.08m.....£36.95

MASTRANT

Quality guy ropes and accessories
Full range in stock

P type general polyester Guy ropes

P2..2mm 100kg B/s £14.95
P3..3mm 200kg B/s £21.95
P4..4mm 400kg B/s.....£29.95

M type Thinner higher performance with Dyneema
M2 ..2mm 240kg B/s.....£31.95
M3 ..3mm 100m 390kg.....£49.95
M4 ..4mm 900kg B/s £119.95

Full range of Pulleys, clamps and fittings in stock

SPIDERBEAM

Antennas, Telescopic Poles, Aluminium Masts

UL-404L Ultra-lite Dxpedition antenna
Dipole covers: 40, 20, 17, 15, 12, 10.6m.....£109.00
Fibreglass Telescopic Poles
12mtr Heavy Duty..... £89.95
18mtr Standard.....£199.95
22m 'Long John' **NEW**.....£399.95
26mtr Standard.....£499.95
Base Plate for Fibreglass Poles..... £28.95
Aluminium Telescopic masts
10.metre Standard.....£299.95
10 metre Heavy Duty.....£325.00
12.5 metre.....£329.95
14.5 metre Heavy Duty.....£425.00

ALINCO POWER SUPPLIES

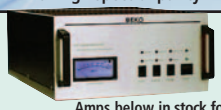
DM-330MWMkII
30A Deluxe Supply variable voltage, low noise, extra filtering
£129.95

DM-330FXE
30A Standard Switch mode variable voltage standard filtering
£119.95

DM-30E
Lightweight 30A Switch Mode Digital Volt/Amp meter
£89.95

BEKO

German engineered - excellent linearity with high spectral purity



Amps below in stock for immediate delivery!

HLV-950
Dual Band solid state amplifier
- Covers 50MHz & 70MHz
- Output 1kW for input from 1W to 25W

£2549.95

HLV-1000-10
1kW solid state amplifier 144MHz, Input: 10W max
£2495.00

HLV-350-7
400W (max) solid state amplifier for 23cms from 7W drive power
£2695.00

High grade Pre-amplifiers
- Noise - less 0.5dB
- Through power -2.5kW
- Fully protected

HPP-144..2m pre-amp 2.5kW thru power..... £669
HPP-432..70cms pre-amp 2.5kW thru power.. £669

Amps below available to order (4 weeks delivery)
HLV-770.....770W 70cms..... £2550
HLV-1950.....2kW 4m..... £4,495
HLV-2000.....2kW 2m..... £4,499
HLV-1100.....1kW 70cms..... £3,795

MOSLEY Antennas

New shipment just arrived!

TA-33MWSP..5 Band 4 element Beam.....£859.95
TA53MSP.....5 band 4 element Beam.....£1049.95
TA31JR..... Rotary dipole (14,21,28MHz)..£299.95
TA32JR..... 2 el. Beam (14,21,28MHz).. £399.95
TA33JR..... 3 el. Beam (14,21,28MHz)... £549.95
Mini 33AW.... Compact 5 Band Beam..... £699.95
RV-6C.....6 band Vertical (40-10m)..... £499.95

CUSHCRAFT Antennas

A50-5S
5 Element 50MHz Yagi
£259.95

A-3WS..... 12/17m 3 element Yagi..... £599.95
R-9..... 9 Band Vertical..... £779.95
AV18S.....18ft Vertical 80 - 10 m..... £164.95
MA5-VA....Vertical 10,12,15,17,20m, 2m..£379.95
ARX-2..... Ringo Ranger 2m Vertical.....£104.95
AR-270..... Ringo Ranger 2/70cm.....£164.95
AR-6.....6m Ringo Ranger vertical.....£129.95

AMERITRON Remote Ant Switches

RCS-4X.....4 Way 2.5kW SO239 100MHz.. £174.95
RCS-4LX.....4 Way 2.5kW SO239 100MHz.. £219.95
RCS-8VX..... 5 Way 5 kW SO239 250MHz.... £189.95
RCS-8VNLX...5 Way 5kW N type 250MHz.....£239.95
RCS-10X.....8 Way 5kW SO239 100MHz.....£194.95

NEVADA

QUALITY POWER SUPPLIES
2 YEAR WARRANTY!

PS-40M Linear
- 40A (max) with meter
- Voltage: 1.5-15V DC
- Cigar adaptor output

£129.95

PS-30M Linear
- 30A (max) with meter
- Voltage: 3.0-15V DC
- Cigar adaptor output

£99.95

PS-08..... Linear 8A (max) 13.8V DC..... £34.95
PSW-50.....Switch mode 50A (max) 9-15V DC..£129.95
PSW-30.....Switch mode 30A (max) 9-15V DC... £79.95
PSW-30H...Switch mode 30A (max) 9-15V DC... £69.95
PS23-SW1.Switch mode 23A (max) 13.8V DC... £59.95
PSW-07.....Switch mode 7A (max) 13.8V DC..... £29.95
PSW-04.....Switch mode 5A (max) 13.8V DC..... £24.95

ACOM

NEW ACOM A1200S
- 1.2kW solid state amp
- Covers 1.8-54MHz
- Large colour display
- Weighs just 12kg

LIMITED SUPPLY SO PRE-ORDER FIRST PRODUCTION SOLD OUT!

£2795

NEW ACOM A600S
- 600W solid state amplifier
- Covers 1.8-54MHz
- Ideal for portable or travel use
- Weighs just 12kg

~~£2399.95~~ **£2289**

NEW ATU-04AT 1.5kW Auto ATU

- Covers: 1.8-30MHz, 50-54MHz
- Fully weatherproof
- Four-way ant switch
- Works with Acom solid state amps through coax cable

£1099

TYT Digital Radio

TYT MD-2017
Dual Band Digital
- DMR digital & Analogue
- Dual time slot
- Colour screen
- Large frequency display
- Commercial grade
- IP67 waterproof rating

FREE DELIVERY £199.95

ALINCO MOBILES

DR-735E
Twin Band Mobile 'Rainbow' display

Full featured VHF/UHF transceiver
- Extended RX 108-174MHz, 400-479MHz
- Power 50/20/5W output
- Computer programmable

£299.95

DR-138HE... VHF/FM mob TX 144-148MHz...£169.95
DR-185H..... VHF/FM TX 136-174MHz.....£169.95

ALINCO HANDHELDS

DJ-V57
VHF/UHF Handy
- IPX7 waterproof
- Computer programmable
- Tough case
- Fully featured

£129.95

DJ-G7E
Tri-band Radio, die-cast chassis
- 2m/70cms/23cms
- 1000 memory channels
- Full duplex
- 39 CTCSS and 104 DCS encode/decode

£299.95

ANYTONE

AT-588
70MHz (4m) 50W FM Transceiver
Fully featured classic mobile for 4M
- Covers: 66-88MHz
- Memories: 200
- CTCSS/DCS/DTMF

£159.95

PC-588 Programming software & lead.....£19.95

ELECRAFT

ELECRAFT
Full range now available!

K3S
The new version HF+6m transceiver with many improvements

K3S/100-F..... 100W (Assembled).....£2999.95
K3S/10-F..... 10W (Assembled).....£2449.95
K3S/10-K..... 10W (Kit).....£2299.95
K3S/100-K.....100W (Kit).....£2849.95

KX3
160-6m
All modes + DSP

KX3-K.....(Kit)..... £999.95
KX3-F.....(Fully assembled).....£1079.95
KX2..... 80-10m 10W (Assembled).....£859.95

KPA-500
160-6m
500W Amplifier

KPA-500.....(Kit)..... £2449.95
KPA-500.....(Assembled).....£2649.95

KPA-1500 NEW - Arriving soon!
1500W HF+6M Amplifier with built-in ATU
Limited quantities - reserve yours now!!

Call for other Elecraft accessories

ALINCO

DX-SR9
HF Transceiver + SDR capability
- Receiver 150kHz-30MHz
- 3 Ceramic Filters
- Built-in CW Keyer

£599.95

DX-R8E
HF communications receiver - top seller!
- Frequency range: 150kHz-34.999MHz
- Modes: AM/FM/LW /MW/CW/LSB/USB
- Power: 11.7-15.8V DC (not supplied)

£469.95

INRAD

Full range of INRAD filters for Elecraft and Yaesu - **NOW IN STOCK**

YAESU
705F..... 500Hz CW..... £159.95
712F..... 300Hz CW..... £159.95
717F..... 2.3kHz SSB Collins..... £179.95
720F..... 2.0kHz SSB..... £179.95
726F..... 2.9kHz SSB..... £179.95

ELECRAFT
708L..... 250Hz CW..... £159.95
701L..... 400Hz CW..... £159.95
711L..... 1.8kHz SSB..... £159.95
716L..... 2.8kHz SSB..... £159.95

LOTS MORE on our WEBSITE!

MORSE KEYS

Bencher BY-1

Vibroplex Iambic Standard

Bencher BY-1..... £189.95
Bencher BY-2..... £239.95
Vibroplex Keys
Iambic Deluxe Paddle..... Chrome..... £239.95
Iambic Standard Paddle.... Black..... £169.95
Code Warrior Jr..... £169.95
Standard Vibrokeyer..... Black..... £189.95
Deluxe Vibrokeyer..... £239.95
Standard Straight Key..... £189.95
Deluxe Straight Key..... £239.95

MUCH MORE ON OUR WEBSITE 24/7.....SHOWROOM OPENING HOURS: MON - FRI 9AM - 5:30PM CLOSED SATURDAY

OPEN: Mon to Fri 9.00am - 5.30pm
Unit 1 Fitzherbert Spur Farlington
Portsmouth Hampshire PO6 1TT

www.nevadaradio.co.uk

ICOM

PRE ORDER NOW!

IC-7610
- HF/50MHz 100W SDR Transceiver

GENEROUS PART EXCHANGE on your old radio **£3599.95**

IC-718.....100W 160-10m base/portable..... £589.95
IC-7100...HF/VHF/UHF 4m (70MHz) touchscreen. £999.95
IC-7200...HF+6m rugged style transceiver.....£829.95
IC-7600...HF+6m twin DSP base transceiver.... £2399.00
ID-41E.....Dual band D-Star digital TX..~~£499.95~~ £479.95
ID5100E..Standard version Dual Band D-Star.....£574.95
AH-4..... Automatic antenna tuner 120W..... £333.95
SM50..... Top of the range desktop microphone £249.95
SM30..... New compact style microphone..... £119.95
SP23..... Deluxe extension speaker..... £249.00
SP38..... Matching speaker for IC7300..... £149.95

NEW

ID-51E Plus 2
- Dual Band Transceiver
- New Terminal Node and Access Point Modes

£449.95

Icom IC-7300
100W HF+6m+4m
- RF direct sampling
- Touch screen control

GENEROUS Part X CALL NOW!

£1199.95

INRAD RX-7300

New 2nd receiver socket option for the Icom IC-7300

Easy to install plug-in mod. requires no soldering, simple to install and easily reversible. Can be used for the insertion of accessory items into the receiver chain, like receive-only bandpass filters, low noise preamps, etc

Kit only..... £49.95
Fully Fitted by Nevada..... £99.95

PALSTAR

HF-Auto 1.5kW fully auto antenna tuner

Covers 6-160m
Output power: 2-1800W
Display: 4 line large print

£1599.95

AT-2KD Differential HF Tuner

Covers 6-160m
Power: 2kW RF

£599.95

AT-500 600W PEP manual antenna tuner

SAVE £30

Covers 6-160m
Built in 4:1 balun

SPECIAL OFFER!
~~£529.95~~ **£499.95**

AT-5K.....3.5kW manual tuner..... £1249.95
AT-4K.....2.5kW manual tuner..... £1024.95
AT-2KD..... 2kW Differential manual tuner.. £599.95
DL-1500... 1500W high power dummy load..£199.95
BK4C/1:1..4kW 1:1 ratio current balun..... £99.95
BK4C/4:1..4kW 4:1 ratio current balun..... £99.95

LDG

Z11-Pro2
(160-6m) 125W **£167.95**

IT-100..... For Icom IC-7100, IC-7000.. £209.95
KT-100..... For Kenwood 125W HF+6m..£209.95
YT-100..... For Yaesu 125W HF+6m..... £199.95
Z-100 Plus.... Economy tuner..... £169.95
AT-100 Pro II.....125W HF+6m..... £244.95
AT-200 Pro II.....200W HF+6m..... £259.95
AT-600 Pro II.....600W HF+6m..... £395.95
AT-1000 Pro II...1kW peak HF+6m..... £519.95
AT-897 Plus...For Yaesu FT-897..... £209.95
Z-817..... For Yaesu FT-817..... £129.95
M-600..... Large display meter..... £129.95
M-1000..... Extra-large meter..... £139.95
RT/RC-100..... Remote tuner + DC feed..... £249.95
RT-600..... Remote tuner 600W peak... £429.95

NEVADA Telescopic Masts

33 ft... Aluminium. 7 ft. retracted.....£99.95
26 ft... Aluminium. 5.5 ft. retracted.....£89.95
20 ft... HD Fibreglass 5.5ft retracted..... £179.95
30 ft... HD Fibreglass 7.5ft retracted..... £249.95

Also see our web for Spiderbeam masts and Mastrant guys and fittings

YAESU

SPECIAL DEAL

FT-991A
- Coverage: 160-6m, 145/433MHz
- All modes AM/FM/SSB/Data
- 100W HF/6m-50W 145/433MHz
- NEW colour waterfall display

SEE WEB FOR BEST UK PRICE!

FTDX5000MP....Premium Class Transceiver..... £3199.95
FT991A..... 160-6m Transceiver £1299.95
FT857D..... Multiband HF/VHF/UHF mobile..... £699.95
FT817ND..... All mode multiband portable..... £529.95
FT450D..... 100W all mode HF/6m+ATU..... £599.95
FT891..... Mobile..... £599.95
FT7900E..... Twinband 145/433MHz mobile.... £229.95
FT1DE..... Ipx5 digital handy..... £269.95
FT2DE..... C4FM/FM 144/430MHz digital H/H. £399.95
FTM400XDE..Twinband digital/analogue mobile.... £499.95
FTM100DE....New C4FM 50W Dual Band mobile... £299.99
FTDX3000D.. 100W HF/6m all mode TX..... £1429.95
FTDX1200D.. 100W HF/6m all mode TX..... £999.95
VX6E..... Submersible 145/433MHz handy.. £159.95
G2800DXC... Extra heavy duty rotator..... £899.95
G5500..... Azimuth/elevation rotator..... £644.95
G1000DXC... Varispeed heavy duty rotator..... £489.95
G450C..... Rotator + 25m cable kit..... £389.95
STA77..... Stereo headphones..... £79.95

IN STOCK!

Yaesu FTDX5000 MP
200W HF/50MHz Premium Class Transceiver with 2 independent receivers, plus many options

£3199.95

NEW

Yaesu FT-70D
Dual Band Digital Transceiver
- AMS (Automatic Mode Select)
- Sophisticated C4FM Digital Functions
- 5 Watts RF Power
- Rugged - IP54 rated

£189.95

DAIWA SWR Meters

CN-901HP
Professional grade with extra large display
- Freq: 1.8-200 MHz
- Power: 20/200/2kW

£129.95

CN-101L
- Freq: 1.8-150MHz
- Power: 15/150/1.5kW

£89.99

CN-801S11... 0.9-2.5GHz 0.2/2/20W..... £199.00
CN-901HP3... 1.8-200MHz 30/300/3kW..... £139.95
CN-901VN.....140-525MHz 20/200W N type..£119.95
CN-801VN.....140-525MHz 20/200W N type..£119.95
CN-103LN..... 140-525MHz 20/200W N type.... £89.99
CN-501H..... 1.8-150MHz 15/150/1.5kW..... £89.99
CN-501H2..... 1.8-150MHz 20/200/2kW..... £89.99
CN-501VN.....140-525MHz 20/200W N type.... £89.99

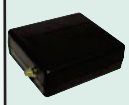
SDRplay

RSP-2
Enhanced SDR receiver
- Covers: 1kHz (VLF)-2GHz
- Supports HF & VHF antennas simultaneously
- Includes SDRuno software
- Software upgradeable

£156

RSP-2 Pro As above but in a rugged steel case

£189.95



RSP-1
Powerful wideband SDR
- Covers: 10kHz-2GHz
- Built-in filters
- Low noise floor
- USB interface
- Works with popular SDR software (HDSDR, SDR Console, Cubic SDR, SDRuno)

£119.95

KENWOOD

PRE-ORDER YOURS NOW!

LIMITED EDITION
TS-590SG-70
Celebrating 70 years of Kenwood
Only 70 Pcs made worldwide with luxurious crystal black finish and gold trim
Pre-order and receive a Kenwood 70th anniversary commemorative call sign plate

RRP £1980 OUR PRICE **£1695**

TS-480SAT.. 100W mobile/base HF/6m ATU/DSP. £659.95
TS-480HXE. 200W DSP mobile/base HF/6m..... £719.95
TS-590SGE..100W DSP HF/6m all mode TX.....£1159.95
TS-2000E....HF 50/144/430MHZ transceiver.... £1279.95
TMD-710GE.Twinband VHF/UHF/APRS/TNC/GPS.£479.95
TH-D72E..... VHF/UHF handheld GPS/TNC/APRS. £399.95
MC60A.....Classic style desktop microphone.... £122.95

IN STOCK!

Kenwood TH-D74E
Dual Band Handheld with APRS and Digital (D-STAR) capability
- Built in GPS
- Wide band receive: HF, VHF, UHF
- IF filtering / DSP

Soft Case for D74E £29.95 **£599**

Network Antenna Analysers

MetroVna DELUXE
with Bluetooth connectivity
- Covers up to 250 MHz
- Same spec as Pro below

FREE DELIVERY **£299.95**

MetroVna Pro Model
with Bluetooth connectivity

- Touch Screen - colour
- Freq coverage: 1-180MHz
- Measures: SWR, R, Z, X, phase, filters, Return Loss Transmission Loss
- Link by Bluetooth or USB

Phone not included

FREE DELIVERY **£259.95**

MFJ
We hold HUGE STOCKS!
If you don't see it in the list below, visit our web site for lots more!

MFJ-1835
5 Band Cobweb Antenna

£239.95

225.....1-180MHz graphic analyser..... £429.95
226.....Graphic analyser (1-230) MHz..... £359.95
259C.....HF/VHF portable antenna analyser.... £299.95
266.....New style HF/VHF/UHF analyser..... £349.95
269C.....HF/VHF Digital Analyser..... £369.95
385B.....Deluxe Comms. Speaker..... £54.95
407D.....Deluxe CW Keyer..... £99.95
461.....Morse Reader-pocket sized..... £99.95
492-X.....CW Memory Keyer..... £164.95
550.....Popular Morse code practice key..... £19.95
557.....Morse code key with oscillator..... £46.95
826B.....Digital SWR/Wattmeter..... £209.95
901B.....Versa Tuner 200W HF..... £119.95
912.....Remote 4:1 balun box..... £84.95
921.....2m Antenna Tuner..... £114.95
923.....2m Tuner & SWR/Power..... £249.95
931.....Artificial ground unit..... £114.95
934.....300W Tuner + artificial ground..... £219.95
941E.....300 Watts max Versa Tuner II..... £164.95
945E.....1.8-60MHz 300W manual tuner..... £149.95
948.....300W PEP reading antenna tuner..... £174.95
949E.....300W tuner + Dummy load..... £199.95
959C.....Receive antenna tuner + pre-amp..... £145.95
969.....300W tuner 160-6m..... £229.95
971.....Portable Ant. tuner 1.8-30MHz..... £139.95
986.....1.5kW HF tuner..... £369.95
989D.....1.5kW HF tuner..... £399.95
993B.....Auto Tuner 150W/300W..... £309.95
994BRT.....600W remote Auto Tuner..... £409.95
998.....1.5kW Auto Tuner 1.8-30MHz..... £719.95
998RT.....1.5kW remote Auto ATU..... £779.95
1020C.....Tunable Active Antenna..... £129.95
1025.....Noise canceller/signal enhancer..... £209.95
1026.....QRM eliminator + active antenna..... £214.95
1118.....High Current DC Multi outlet..... £94.95
1700C.....6 Way coax switch..... £144.95
1701.....6 Way coax switch 2kW (SO239)..... £89.95
1704 (P).....4 way coax switch 2.5kW (SO239)..... £84.95
1704 (N).....4 way coax switch 2.5kW (N type)..... £95.00
1705H.....RF By-pass switch..... £38.95
1707.....Auto RF sensing Ant switch..... £109.95
1708.....RF Sensing T/R Switch..... £94.95
1763.....3 Element 2m beam..... £74.95
1786X.....Loop (10-30)MHz 3ft dia..... £479.95
1788X.....Loop (7-21)MHz 3ft dia..... £529.95
1789B.....80/40m Dipole..... £64.95
1799X.....9 Band vertical..... £479.95
1868.....Discone antenna with cable..... £94.95
2980.....Wire vertical (40m-6m)..... £99.95
4416B.....Super battery booster..... £174.95

APACHE LABS

NEW

SPECIAL INTRO PRICE

ANAN 8000DLE - In Stock!
Stunning HF+6m 200W SDR Transceiver
- Modes: CW, SSB, NFM, AM, Digital
- Probably the best performing SDR released to date!
- Generous Part X available

~~£4199.95~~ **£3999.95**

HY-GAIN ANTENNAS USA

NEW RANGE designed by **Justin G0KSC!**

DB46M8EL
Dual Band 4/6m Yagi
- Covers 4 & 6m with 4 elements on each band
- Boom: 32mm dia. 2.1m long
- Gain: 6m 8.52 dBi/4m 7.86dBi

£299.95

LFA6M-4EL
6m 4 element LFA Yagi
Boom: 50mm dia. 3.9m long, Gain: 10.7 dBi..... £379.95
LFA6M5-EL
6m 5 element LFA Yagi
Boom: 50mm dia. 6.2m long, Gain: 11.8 dBi..£499.95
LFA-2M9EL
2m 9 element LFA Yagi14dBi boom 14.5ft. £289.95
LFA-2M12L
2m 12 el. LFA Yagi 15.8dBi boom 23ft..... £359.95
Hy-Gain Verticals
DX-77A.....10/12/15/20/30/40m..... £399.95
14AVQ..... 4 band 10/15/20/40m..... £229.95
12AVQ..... 3 Band 10/15/20m..... £179.95
AV-18VS..... 10 to 80m base loaded..... £164.95
Beams
TH-3JR..... Triband Yagi 10/15/20m..... £509.95

1kW - End Fed Wire Antennas

MyAnt EFW 80-10
Resonant on 80/40/30/20/17/15/10m
NO ANTENNA TUNER REQUIRED!
Length: 130ft

£159.95

MyAnt EFW 40-10
Resonant on 40/20/15/10 + WARC with tuner Length: 63ft

£149.95

CREATE Rotators

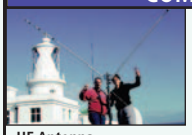
Japanese High Quality!

RC5-1
Medium Duty

£499.95

Rotators
RC5-3..... Medium Duty Plus..... £599.95
RC5-B3..... Heavy Duty..... £1244.95
Log Periodic
CLP-5130-1N.. 21 elements (50-1300)MHz.. £419.95
CLP-5130-2N.. 17 el. (105-1300)MHz..... £279.95

COMET



H-422
Rotary Dipole covers: 7, 14, 21, 28MHz

£289.95

HF Antenna
CWA-1000..5 band trapped dipole 19.9m long..£124.95
VHF/UHF Antennas
GP1-M..... 145/433MHz length 1.25m..... £59.95
GP3-M..... 145/433MHz length 1.78m..... £69.95
GP6-M..... 145/433MHz length 3.07m..... £99.95
GP9-M..... 145/433MHz length 5.15m..... £149.95
GP15N..... 50/145/433MHz length 2.42m..... £119.95
GP93N..... 145/433MHz+23cms length 1.78m.. £99.95
GP98..... 145/433/1200MHz length 2.94m.. £119.95
50MHz Antennas
CA52HB.....2 element Yagi..... £79.95
CA52-HB4...4 element Yagi..... £129.95
Quad Band Mobile for FT-8900
UHV-4..... Mobile whip 4-Bands 10/6/2/70cms. £89.95
Antenna Tuners
CAT-10..... 10W 3.5-50MHz Manual Tuner..... £99.00
CAT-300..... 300W 1.8-60MHz Cross Needle..... £199.95
Accessories
CBL-2500....Balun 2.5kW (CW) 1.8-56MHz..... £44.95
CBL-1000....Balun 1kW (CW) 1.7-30MHz..... £39.95
CF-30MR.... Low Pass Filter 1.8-30MHz 1kW CW.£59.95
CF-360A..... Duplexer 1.3-30/49-470MHz..... £49.95
CF-4160B....Duplexer 1.3-170/350-540MHz..... £39.95
CF-416A..... Duplexer 1.3-170/350-540MHz..... £39.95
CF-530..... Duplexer 1.3-90/125-174MHz..... £49.95

LOTS MORE on our WEBSITE!

PRICE PLEDGE WE ALWAYS AIM TO BE COMPETITIVE - SEEN IT CHEAPER? LET US KNOW!

PART EXCHANGE or CASH WAITING for your used gear!

023 9231 3090

nevada®

Design Notes

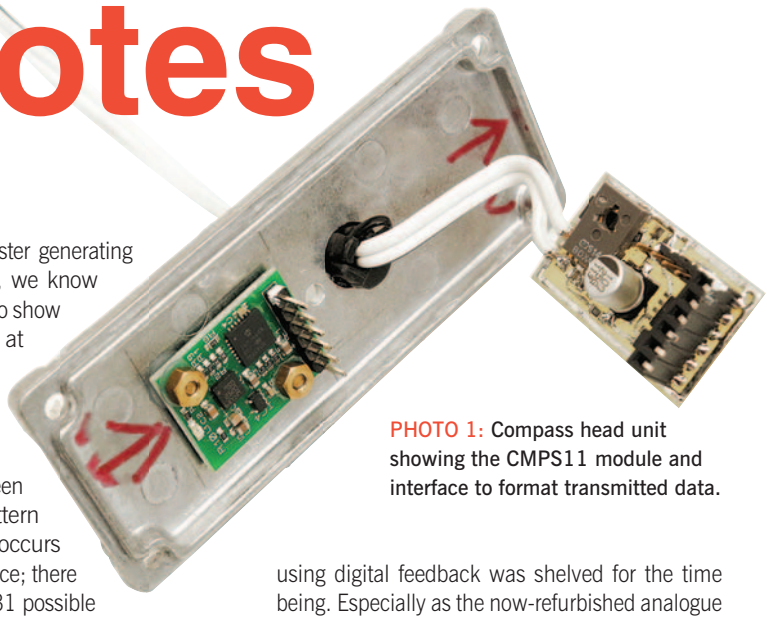


PHOTO 1: Compass head unit showing the CMPS11 module and interface to format transmitted data.

Antenna rotators

Recently, my antenna rotator with its digital readout display [1] started showing erratic and noisy operation. That meant dismantling and overhaul of the head unit – the fault was dirt on the track of the feedback potentiometer and was easily cured – but it set me thinking. What digital positional feedback mechanisms for an antenna rotator could replace the analogue pot? My rotator is used for positioning narrow beamwidth microwave antennas, so accurate readout to one or two degrees is required.

In the past, presented with similar rotator accuracy issues, other microwave ops have added a slotted disc to the motor and an optical or Hall Effect sensor in the head unit. Or better, a slotted strip around the rotator bell periphery. Digital hardware then counts the slots as they pass the sensor and turn the slot count into a readout of position. This is complicated by needing to keep track of which direction the motor has turned at all times, although that can be solved by using a dual quadrature sensor. More complicated to sort out is the recalibration every time the unit is reset or power cycled, it being near-impossible to keep a reliable memory of the last position. What is needed is some sort of absolute positional feedback – to perform the same task the variable resistor does but with reliable digital communication instead of a noisy and dirt prone analogue voltage. Absolute position shaft encoders do exist, but they are usually very expensive and difficult to retrofit into the head units of rotators. Amateurs use them for dish positioning for microwave EME systems where expense and complexity are less of an issue, but we want something easier and simpler.

Maximal length sequence

Discussing this on the RSGBTech Group, G3PLX suggested that the problems of both absolute positioning and direction of rotation could be solved if, instead of a regular slotted pattern around the complete periphery of the housing, the slot pattern represented a maximal length pseudo-random sequence (MLS). Such sequences are normally generated as pulse waveforms in hardware by feedback via exclusive-OR (XOR) gates from a shift register. For example from the five stage shift register shown in **Figure 1** with XOR feedback from the third and fifth stages. Generators of this type have been described several times in this column in relation to noise generation and spread spectrum. The beauty of such an MLS is that by knowing just any N consecutive bits of the sequence, where N is the length of the shift register generating the 2^N-1 long pattern, we know exactly where we are. To show how this works, look at the 31 bit (2^5 – 1) output from **Figure 1**, which is 00101100 1111100011011101 0100001. It can be seen that any five bit pattern (apart from 00000) occurs just once in the sequence; there are no repeats and all 31 possible patterns are present.

Returning to the rotator problem, Peter suggested that a 1023 bit pattern (as would be generated from a 10 bit shift register) could be turned into a pattern of slots around the periphery of the rotator bell housing, to be read by an optical or other type of sensor. That resolution would be good enough for better than 0.5° setting accuracy. Now, starting from initial turn-on, it would only be necessary to move the rotator a small amount in one direction to give enough of the pattern to determine where it currently sits. For a 1023 bit MLS, 10 bits would suffice, which corresponds to 10/1023 * 360°, or about 3° of initial movement to get immediate positional feedback. Taking note of the direction of rotation is essential, as the resulting bit pattern becomes reversed when turning in the opposite direction, giving a totally erroneous position!

Practicalities

Unfortunately, this elegant solution is beset by a few practical problems, the main one being bit synchronisation. As the (variable) rotator speed is unknown the feedback of the 0/1 pattern cannot be read correctly by a controller with just a single sensor of the slot pattern. The problem is identical to that of serial signalling formats as described in the July edition of this column. The variable speed issue is akin to the issues involved with stop-start signalling and baud-rate. It is necessary to add an additional clock signal to the slot pattern (to give something similar to SPI signalling), which now needs a complicated slot pattern and dual sensors for reading clock and data. Something using quadrature or Manchester coding may be persuaded to work, but the beautifully elegant idea was rapidly getting more complex so any idea I had of upgrading my rotator using digital feedback was shelved for the time being. Especially as the now-refurbished analogue feedback was working again!

Electronic compass module

This was developed as a backup readout and as a ready-to-go system for portable operation. The Devantech CMPS11 electronic compass module [2] was designed for use in drones and similar autonomous vehicles. It includes a fully tilt compensated and calibrated electronic magnetic compass with bearing readout to 0.1° resolution. It also outputs elevation to 1° resolution.

Communication with the CMPS11 module uses start-stop signalling at 9600 baud. The module is not, unfortunately, designed to transmit its data continuously, so it is not just a case of mounting the unit up the mast and sending the data back. To read a parameter, such as magnetic bearing or elevation, a single byte command has to be sent to the module to request a particular parameter to be returned. To make a standalone transmitter I added a 12F629 PIC to send the CMPS11 appropriate requests, receive the resulting data from it and echo the information back to a terminal. Initially for testing I had it send back continuous Az/El readings in plain text, also in 9600 baud start-stop format, to be read on a terminal emulator (*Putty*). **Photo 1** shows the head unit.

The module seemed pretty effective. It has its own processor on board (ironically, another PIC of the 24F family) to make sense of raw magnetometer readings, manage calibration, perform averaging and cope with multi-axis

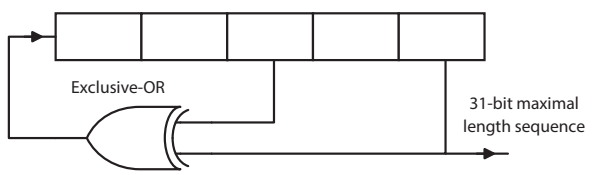


FIGURE 1: Five stage shift register with XOR feedback for a 31 bit MLS.

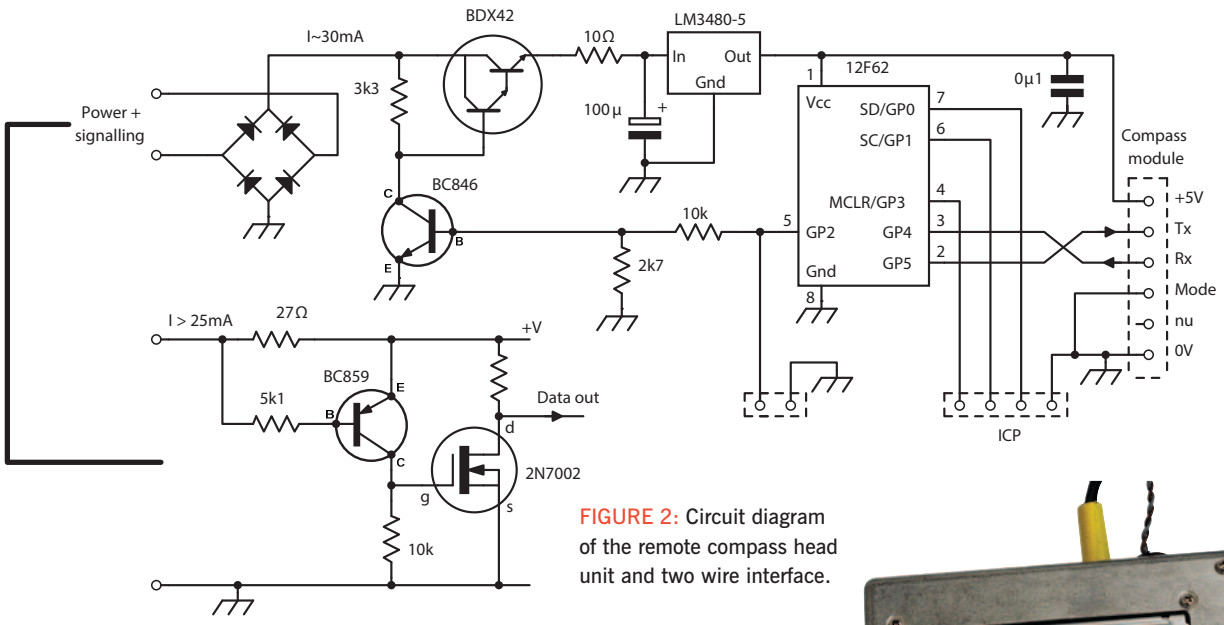


FIGURE 2: Circuit diagram of the remote compass head unit and two wire interface.

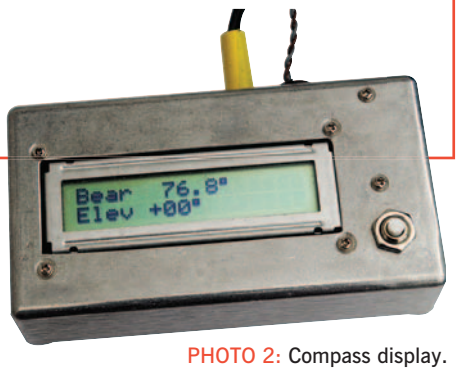


PHOTO 2: Compass display.

movement. Hand-held and compared against a quality yachting compass they were within a degree over the full azimuth range. It gives elevation output from 0 to 90°, so if mounted on an antenna could be used as an Az/El indicator for satellite or EME operation. Once the idea was proven, the returned data format was changed to binary values to facilitate later processing for a display module and to reduce the number of bytes sent down. Full details of the data format can be seen by studying the PIC assembler files at **[3]**.

A base unit, containing yet another PIC, reads the incoming serial data and applies an offset of 0-360° to allow for rapid calibration and arbitrary deployment on a mast. Calibration in the field can be made using either a beacon signal from a known location or against a separate magnetic compass. The offset is read from a 10-turn pot to make the in-field adjustment quick and easy. The result is normalised to 0-360°, with the display unit showing heading and elevation simultaneously on an LCD, as seen in **Photo 2**.

Two Wire interface

All this was being done while writing the July Design Notes, whose final sentence about the Dallas One-Wire protocol set my thought processes in operation. Could I use just a single cable-pair to supply power and read data from the head unit? By supplying +12V up to a head mounted regulator and using a storage capacitor, it is possible to send back data to the ground by interrupting the power supply for every '0' in the start stop data. Recall from July that the normal resting state of a start-stop signalling waveform is at '1' and the line pulses to '0' for the start bit and all subsequent zeros in the stream. So my returned data, sent as five 9600 baud bytes at 100ms intervals, should only mean power loss to the module for a few percent of the time.

Holding up the supply with a capacitor should be straightforward. Current consumption of the complete head unit is around 35mA and the 5V regulator has a minimum input requirement of 6.5V. The data format is five bytes at 9600 baud, ten times per second. If we were to assume all five bytes are zero (which will never happen, but let's assume it 'could'), this would correspond to an off period of about 9 bits * 5 bytes / 9600 baud = 4.7ms. Assume a minimum DC input voltage of 9.5V, so the maximum droop allowed for the capacitor is 3V. From the equation for charge on a capacitor, C.V = I.t, we see that to drop 3V at 35mA in 4.7ms, the capacitor needs to have a minimum value of 55µF. A 100µF capacitor is ideal. The data output from the PIC drives a series transistor that interrupts the power, causing current flow to drop to zero for every '0' in the data stream. You'd think that switching 35mA with a low/medium bipolar transistor ought to need less than 1mA of base current, but no. When a bipolar is operated at saturation – as it is in a switch like this – the gain drops considerably. So using a single BC859 type transistor in the switch actually needed a base current of something like 8mA to ensure a low drop across it of less than 700mV (which is quite a bit extra waste when total consumption is only 35mA). Hence the use of a BDX42 Darlington device in this position. For a final touch a bridge rectifier at the head unit means the connection of the two wire interface is polarity insensitive. **Figure 2** shows the complete circuit diagram of both head and base units.

At the base (display) unit, the drop from 35mA to zero for each '0' sent is detected by monitoring the voltage drop across a series resistor in the positive supply to the head unit. By arranging for this to have 1V drop at 35mA the detector can directly drive another bipolar B-E junction, transferring the demodulated data to the display controller – not shown in the diagram.

More practicalities

As the head unit is a magnetic compass, no iron or steel should be used close by. Stainless steel nuts and bolts, although not strongly magnetic, *do* exhibit a small amount of ferromagnetism so should be used sparingly and not close to the compass module housing. Ideally, aluminium fixings and brass or nylon screws should be used throughout. As the module is lightweight this shouldn't be an issue. At any temporary /P deployment, cord or PVC tape can be used to hold the head unit to a mast.

With its two-wire, polarity-insensitive interconnection and rapid bearing offset adjust, the whole system makes for a rapidly deployable azimuth and elevation indicator for /P and home use. PIC code in assembler .ASM format and compiled .HEX code for the head and display units can be found at [3].

A circuit diagram of the display unit will appear next month.

Websearch

[1] *RadCom* Jan 2009 page 38 or www.g4jnt.com/RotatorController.zip
[2] www.robot-electronics.co.uk/cmps11-tilt-compensated-magnetic-compass.html
[3] www.g4jnt.com/RemCompass.zip

Andy Talbot, G4JNT
andy.g4jnt@gmail.com

RSGB Convention, 13 – 15 October

The RSGB Convention will be held at Kents Hill Park Conference Centre, Timbold Drive, Kents Hill, Milton Keynes MK7 6BZ.

The RSGB Convention programme is developing and we will have exciting lectures covering HF and DXpeditions along with VHF and Technical ones. In addition, AMSAT-UK will be organising some of the lectures as the AMSAT Colloquium is being incorporated this year. So what are some of the highlights?

Plenty of radios to view on the ML&S stand that is open throughout the Convention.

Some lecture highlights

Pukapuka Atoll, IOTA OC-098 in North Cook Islands was last activated more than 22 years ago and this rare IOTA group was in demand by 92% of the IOTA members. Cezar Trifu, VE3LYC operated as E51LYC under difficult conditions. Using an IC-7000 with 100W and a multi-band vertical, a total of 5631 QSOs were logged with 3310 stations in 79 DXCCs.

In a talk aimed at all technical levels, Ian White, GM3SEK will explain that decibels are the 'currency' in which we measure our station's performance. We can count our gains and losses, save our decibels or throw them away, and eventually find our own answers to the age-old question: "What is one decibel really worth?" Ian will explain why we use decibels and why even 1dB can be worth more to VHF-UHF DXers than almost anyone else.

Rob Coleman, Technical Sales Manager from Semelab Limited presents an overview of MOSFET power transistor manufacture. Semelab is based in Lutterworth and have a global customer base for their power transistors. Rob has worked at Semelab for over thirty years and will explain how the transistors are designed and manufactured, also the features and characteristics. With an emphasis on performance, an insight into the testing and screening that takes place before the components are ready for sale.

An introduction to working DX while operating from a mobile perspective will be given by Alan Birch, G4NXG. He will provide guidance about what DX means, installation of equipment and aspects of safety, the importance of understanding propagation principles, optimum operating locations and how to improve your position in the listings of the leading HF DX awards.

The availability of good designs and relatively inexpensive high power LDMOS transistors has consigned most VHF valve amplifier designs to the history books. There are, however, tales of devices that meet an untimely end for one reason or another. John Quarmby, G3XDY will cover some of the key areas that need attention in addition to the basic amplifier RF design, focusing on protecting the amplifier input from overdrive and touching on managing the heat dissipated in the LDMOS device, plus amplifier control circuits and sequencing.

Single Operator Contesting can be great fun and many contesters like to improve on their scores year on year and, if possible, score higher than their competition, says Mark Haynes, M0DXR. Having two radios at your disposal can introduce complications and be simply 'too much' to handle – but it can also provide the foundations for achieving excellent results.

Kenneth Ransom, N5NVO, the ISS Ham Radio Project Coordinator at NASA, will host a question and answer session on ARISS, the coordination that is required to manage the ARISS program and the complexities of operating in manned space projects.

Noel Matthews, G8GTZ will give an update on the Digital Amateur Television experiments in the 71 and 146MHz bands, including the use of DVB-2S higher order modulations to enable full HD signals to be transmitted in 500kHz and also reports on the progress being made with Digital ATV on the 3.4 and 10GHz bands. He will also give an overview of the BATC Portsdown multi-band digital ATV transmitter project that is based on a Raspberry Pi.

Peter Guelzow, DB2OS, the President of AMSAT-DL, will describe the status of the Es'hail-2 Geostationary Satellite project in terms of design, development of the satellite, ground station equipment and launch opportunity

Carl Luetzelschwab, K9LA will review observations of antipodal propagation by amateur radio operators. He will follow this up with a review of papers in the scientific literature about antipodal propagation, and will take a general look at propagation to the antipode using VOACAP.

HF Propagation at Sunspot Minimum with Steve Nichols, G0KYA will tackle some of the big questions. When is it? What can we expect? How can we make the most of the HF bands for the next few years as we approach and pass sunspot minimum?

Whether you plan to visit for a day or stay for the weekend, you can book your weekend package or day tickets (and everything in between) at www.rsgb.org/convention The provisional programme for both days is also on the website.

RSGB 2017 Convention

The RSGB Convention packs in a full weekend of the very best amateur radio lectures from around the world. With five streams, there is "Something for Everyone". Join hundreds of others at the RSGB Convention 13 to 15 October for one of the best social events in amateur radio.

BOOKING NOW OPEN

- DXpedition Lectures
- Technical Lectures
- DXCC Card Checking
- UK and FCC exams
- IOTA Sessions
- VHF Lectures
- VHF Contesting
- VHF & HF Trophy Presentations
- HF Forum
- HF Lectures
- Construction Competition

LECTURES FOR 2017

- Botswana, A25UK 2017
- How Space Weather Affects Radio Signals
- AMSAT - Current status of FUNcube satellites
- Remote Amateur Stations: - the next generation
- World Radiosport Team Championship 2018

PROVISIONAL PROGRAMME NOW ONLINE

www.rsgb.org/convention

Kents Hill Park Training & Conference Centre
Milton Keynes, MK7 6BZ

Helping to make YOTA 2017 a success

We appreciate the help given

The RSGB would like to publically thank those who have helped with YOTA 2017. In particular Yaesu and ML&S who have not only become Super Supporters but have helped with prizes for the delegates to take home and, in the case of Yaesu, the loan of equipment for our SOTA activities.

As most delegates were travelling by air we were pleased to accept some small prizes that could be taken home by the lucky few in their luggage (see right). Yaseu donated an FT-65E dual band handheld radio as a prize and have loaned us two FT-817 radios for the SOTA activity at Wendover Woods in Hertfordshire. Moonraker have also donated one of their impressive new DMR handheld radios, the HT-500D. SDRplay donated one of their RSP2 radio receivers, whilst ML&S donated a MyDEL SF-401 frequency counter. CDXC has provided a copy of *DXpeditioning Behind The Scenes* for the budding DXpeditioners amongst them.

We are sure these will enhance the amateur radio experience for the young people involved, building upon their experiences during YOTA 2017.

Buildathon

Part of the YOTA experience is building equipment and we are extremely grateful to Hans Summers of QRP Labs who has developed a very impressive 17m CW transceiver for YOTA 2017. All delegates will get one of the kits to construct and take home. This kit will be available to the public in a 20m version shortly and Hans has agreed to write about the development and construction of the kit for *RadCom*. SOTABeams has also helped by supplying discounted 17m ground plane antenna kits for every delegate, which they will again get to take home.

Special event station

The radio activity is a huge part of YOTA 2017. Coordination and support of this is being handled by Camb-Hams, who are using the antennas and equipment of Radio Scouting (permanent fixtures at Gilwell Park) in addition to several other of their own stations and antennas using the callsign GB17YOTA. In the first day and a half, the youngsters had worked around 1700 QSOs, 1428 of which were unique callsigns between the five stations (VHF, datamodes, satellites, 6m and 20m).

International Space Station

ARRIS has been instrumental in the International Space Station contact that took place on 8 August. A big thank you to the UK ARISS team for making this happen.

Other thanks

We are grateful to these and all those individuals who have given up time to enrich the activities of YOTA 2017, be that on-air, construction, ARDF or SOTA. We are also grateful to our Blue Badge Guide Maggie Antoniuk for her half-day tours showing groups around Westminster and Central London. Our thanks go to the staff of the National Radio Centre for their assistance, Bletchley Park and the Science Museum. We also can't forget the help of Neville Broadbent, G8CDG and Geoff Wilkin, G0DDX who have given up over a week of their time to drive minibuses of delegates around the South East of England. Beyond the week of YOTA 2017 we are also grateful to the United Radio QSL Management Bureau who is handling all the QSL cards for the YOTA 2017 and other YOTA activities across IARU Region 1.

The help of the companies and volunteers has been invaluable in the running of YOTA 2017 and although we haven't been able to name them all here we are grateful to ach and everyone. To see a complete list of those who have helped, please go to www.rsgb.org/yota

The event was still underway as we went to press; we'll have a full report next month.

Our Helpers

Camb-Hams

QRP Labs

SB

SDRplay

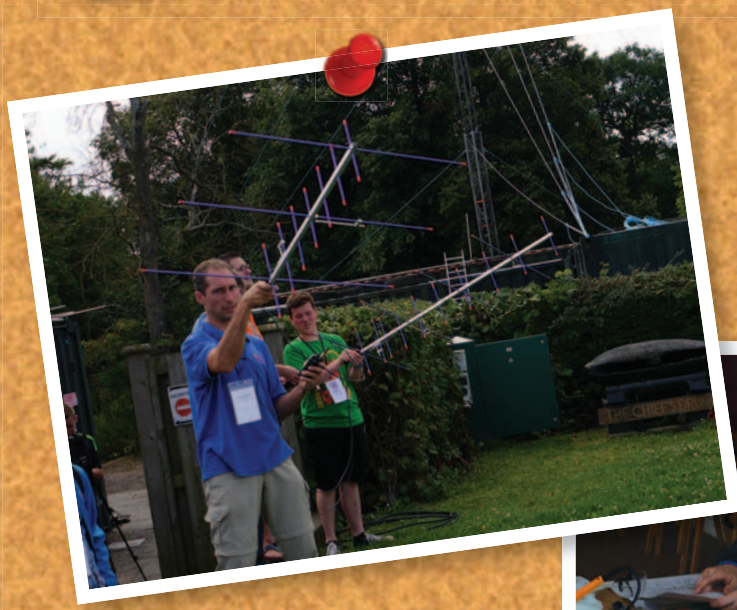
ARISS

RADIO SCOUTING

martin lynch & sons
The World's Favourite Ham Store

MOONRAKER
Radio Communications Manufacturer & Supplier

YAESU



These photos give a flavour of the first couple of days of YOTA 2017, ranging from an impromptu rounders game to operating GB17YOTA on HF, building a transceiver, operating via satellite and visiting London. We'll have a full report next month.

ML&S YAESU'S OFFICIAL UK DISTRIBUTOR

ML&S - the world's favourite *original* ham store

ML&S **0345 2300 599**

Web: www.HamRadio.co.uk

SAFE ONLINE SHOPPING
Shopping online with ML&S is safe and secure. E&OE

PayPal

FOLLOW US ON TWITTER AND FACEBOOK HamRadioUK

Martin Lynch & Sons Ltd. Wessex House, Drake Avenue, Staines, Middlesex TW18 2AP. E-mail: **sales@hamradio.co.uk**
Opening Hours: Mon - Fri: 8.30am to 5pm. Sat: 9am to 4.30pm. International Tel: +44 1932 567 333

Yaesu FTdx9000MP

Click! www.HamRadio.co.uk/ftdx9000

The ultimate machine in the FTDX-9000 range, the MP offers an incredible 400W transmission power and is supplied with the FPS-9000H external power supply with dual speakers and audio filters. Like the Contest, the MP is fully customisable to suit your own particular needs.

ML&S FROM £8299.95

MP: £8499.95
MP+: £9299.95
D: £7499.95

YAESU FTdx3000

Click! www.HamRadio.co.uk/ftdx3000

HF/6m Base Station

Looking for a HF/6m Base Station sized radio at a VERY LOW PRICE?

ML&S: £1449.95

NEW YAESU FT-991A

Compact base station radio with beautiful touch-screen display & 160-70cm coverage. HF/50/144/430MHz. All-Mode "Field Gear" Transceiver

Offering superb performance from Top Band to 70cm, the FT-991a is compact without being too small, easy to use without missing out on features and above all great value for money.

Click! www.HamRadio.co.uk/ft991a

ML&S NOW ONLY £1149.95

FT-991 HARDWARE UPGRADE KIT This Upgrade kit allows Yaesu Musen Distributors and Repair Service Centres to add the following advanced features of the FT-991a to the original FT-991: Real-Time Spectrum Scope, Multi-Colour Waterfall Display, Select from Seven Spectrum Scope Display Colours & Select from Seven Display Colours or Multi-Colour Waterfall Display. The kit can only be fitted by our workshop. **ML&S ONLY £480**.

YAESU FTdx5000MP ltd

Click! www.HamRadio.co.uk/ftdx5000mp

HF/50MHz 200W Transceiver Twin RX

ML&S NOW ONLY £3199.95

YAESU FTdx1200

HF/6m Base.
Sister Rig to FTdx3000

Can't quite stretch to the FTdx3k? No worries! The ever dependable FTdx1200 is available at a special price still less than £1000.

See ML&S video review
www.HamRadio.co.uk/ftdx1200video

ML&S NOW ONLY £929.95

Click! www.HamRadio.co.uk/ftdx1200

YAESU FT-891

HF/6m Base/Mobile

A modern day FT-857 without 2&70. Bang up to date in looks and smaller than a 2m only FM rig of 25 years ago!

Click! www.HamRadio.co.uk/ft891

ML&S NOW ONLY £599.95

YAESU FT-450D

The best value HF/6m Base with ATU on the planet.

~~ML&S: £650.95~~
NOW £599.95

Click! www.HamRadio.co.uk/ft450d

YAESU FT-70DE

NEW PRODUCT

Click! www.HamRadio.co.uk/ft70de

The FT-70DE is a 5W rugged designed (meets IP54) handie, covering 108-137MHz Airband AM and 2/70 transceive on FM/C4FM Digital. A massive 700mW of audio ensures extra-loud volume with Clear Voice technology. **ML&S: £189.95**

YAESU FT-65E

VHF/UHF 2m/70cm Dual Band FM Handheld

Click! www.HamRadio.co.uk/ft65e

The Yaesu FT-65e dual-band 2 metre/440MHz has three output power levels: 5, 2.5 or 0.5 watts. Receive coverage is 65-108 (FM broadcast band), 136-174 and 400-500MHz. The FT-65e is compact and light, yet ruggedly constructed. The speaker provides a full 1 Watt of powerful, clear audio.
ML&S: £129.95

YAESU FT-1XD

LIMITED STOCK!
144/430MHz Dual Band C4FM Handie.

Great quality from Yaesu with a really solid feel.

MLS& Only £219.95

Click! www.HamRadio.co.uk/ft1xd

YAESU FT-857D

Click! www.HamRadio.co.uk/ft857d

Want to work HF mobile? Thousands of Hams around the world use the FT-857D. 160m-70cm, add the optional ATAS-120D to your car and you have an instant HF station on 4 wheels. We even include the YSK-857 remote kit for mounting FREE.

Only £689.95 or with an ATAS-120A Auto-tune antenna only £959.95

YAESU FT-2DE HANDHELD

Advanced FT-2DE C4FM/FM 144/430MHz Dual Band Digital Handie.

ML&S: £389.95

Large LCD display

Click! www.HamRadio.co.uk/ft2de

YAESU FTM-400XDE

With FREE Snapshot Microphone (MH-85A11U) worth £99.95!

ML&S: £499.95

Large Colour Touch Screen Display

Click! www.HamRadio.co.uk/ftm400dxe

YAESU FT-8900E

High-power FM on 10m, 6m, 2m & 70cm. When your local repeater is busy, slip onto 10m & work DX!
ML&S: £279.95

FREE YSK-8900 Remote Kit

Click! www.HamRadio.co.uk/ft8900e

YAESU FTM-3200E C4FM 2M TRANSCEIVER

65Watt 144MHz with AMS 2m Mobile.
ML&S: £189.95

With new digital C4FM (Fusion).

Click! www.HamRadio.co.uk/ftm3200

FAST DELIVERY

You can now order from ML&S for delivery on a Saturday or Sunday!
Order before 3pm as late as Friday of each week and see it delivered at the weekend.

Web purchases: Just select Saturday or Sunday at the check-out or call to place your order for Saturday or Sunday delivery on **0345 2300 599**

DPD

ML&S NO.1 FOR NEW PRODUCTS

ML&S 0345 2300 599
Web: www.HamRadio.co.uk

SAFE ONLINE SHOPPING
Shopping online with ML&S is safe and secure. E&OE

FOLLOW US ON TWITTER AND FACEBOOK HamRadioUK

Martin Lynch & Sons Ltd. Wessex House, Drake Avenue, Staines, Middlesex TW18 2AP. E-mail: **sales@hamradio.co.uk**
Opening Hours: Mon - Fri: 8.30am to 5pm. Sat: 9am to 4.30pm. International Tel: +44 1932 567 333

New! Five Lovely Miniature Mobile Radios that are so tiny (and cheap!) you won't believe just how well made they are.

MyDEL **AT-788U**
70cm 18W 199mems, CTCSS/DCS. **£59.95**

MyDEL **AT-788V**
2m 18W 199mems, CTCSS/DCS . **£59.95**

MyDEL **Apollo11**
CB or 10m Band 15W 12/24V. **£79.95**

MyDEL **AT-778VU**
Twin Band 2/70, 30W 250mems, full feature
£89.95

MyDEL
DMR 2017 Duo Handie
At Last a Dual Band DMR Handie that's actually available RIGHT NOW from ML&S. Who Else? 2/70 4/5W output, Analogue & Digital, Optional GPS, 2.2Ah Li-Ion Battery & Charger included. **£179.95**

ML&S are now the sole distributor for West Mountain radio products!

The full range of RIGblasters, RIGrunners, PowerPoles and Battery Analysers are available today.

WEST MOUNTAIN RADIO

RIGblaster *The easiest way to properly connect your radio to a computer so that you may operate using over 100 existing and future ham radio sound card software programs. You will be able to operate any sound-card based digital mode that your radio could not otherwise operate.*

RIGrunners *RIGrunner product line offers the most convenient and safest way to connect all your 12 VDC equipment to a power source. RIGrunner utilizes a 13.8 VDC power panel with simple-to-use Anderson Powerpole® connectors. Standardize all of your 12 VDC connections using the amateur radio ARES & RACES, RSGB, ARRL Powerpole® system.*

DC Power Products *Power management devices to protect both the radio equipment and the power systems they are connected to. These devices provide both battery charge management and load management features.*

Click! *www.HamRadio.co.uk/ westmountainradio*

ML&S are the sole UK distributors for the DV Mega Range of products.

DVMEGA *is a collective name for digital voice and data related kits and modules. C4FM, DMR and D-STAR is supported with more digital voice and data modes added all the time.*

DV Dualband (VHF/UHF) radio shield
This shield is compatible with Arduino UNO or MEGA. This module has a 10mW UHF and VHF transceiver on board. In combination with an Arduino you make your own stand-alone dual band hot spot. This module, together with the AMBE3000 forms the basis for a self-assembly D-Star kit transceiver.

PHONEMA SPEAKERS

These hand-crafted high performance communications speakers from Spain are now available exclusively from ML&S. You might change your radio but you will keep your Phonema speaker for ever.

The ***Phonema Miranda*** *handles 10W with a frequency response of 120-1200Hz. It's housed in a compact enclosure featuring Rubber HM6, Acoustic Foam AG150 & Basotect. Minimalist design utilising a high-performance driver & best acoustic internals.* ***Only £149.95***

The ***Phonema KSP3*** *Speaker has been designed to match the Elecraft K3 series. Handling 30W of audio with a frequency range of 100Hz – 20kHz.* ***Only £145.99***

The ***Phonema Rhea*** *Speaker uses beautiful Sucupira wood and employs the same internal construction as the Miranda. Has a two input switch for two rigs, selectable via the front panel. Frequency range is a very low 75Hz through to 18kHz. Weighing in at a very solid 2.25 kilo's.* ***Only £219.95***

LATTE PANDA - 4G/64GB WITH WINDOWS 10 INSTALLED

THIS IS A COMPLETE KIT (not just a bare board)! All you need to get up and running. This kit requires the download of a Windows key on set up (within 90 days - it will work out the box). LattePanda is the first development board that can run a full version of Windows 10! It is turbocharged with an Intel Quad Core processor and has excellent connectivity, with three USB ports and integrated WiFi and Bluetooth 4.0. It also includes an Arduino co-processor that enables you to master the physical world by controlling interactive devices using thousands of plug and play peripherals. Harness the power of LattePanda to create and innovate!

KEY FEATURES
- *Full Windows 10 OS*
- *LattePanda is different from the Raspberry Pi and other development boards as it supports a complete Windows 10 system. With abundant software resources and a mature Windows ecosystem at your disposal, LattePanda gives your ideas more accessibility and power!*

RRP: £229.95
ML&S PRICE: £199.95

Click! *www.HamRadio.co.uk/ lattepanda*

mRS MiniVNA Antenna Analysers

Perfect for checking antennas and RF circuits for hams and commercial users.

MiniVNA Pro with Bluetooth
100kHz-200MHz..... **£364.95**

MiniVNA Extender For Pro only, extends range to 1500MHz..... **£299.94**

MiniVNA Tiny Huge coverage, 1MHz-3GHz, Android controllable..... **ONLY £419.95**

Click! *www.HamRadio.co.uk/ minivna*

HELiTRON DV4mini USB Stick for D-Star and DMR

NOW AVAILABLE IN 2M

DV4mini is a tiny but powerful USB stick that can change any PC into a HOTSPOT for the modes D-Star and DMR (C4FM Fusion is being prepared). It contains a powerful 32-bit micro controller as well as a complete 70cm transceiver and modulator/demodulator for GMSK and 4FSK (including raised cosine) as well as a USB interface.

ONLY £104.95.

Click! *www.HamRadio.co.uk/dv4mini*

SHARKRF openSPOT Standalone Digital IP Gateway & Hotspot

SharkRF

Supports DMR (Brandmeister, DMRplus), D-Star (DCS, REF/DPlus, XRF/DExtra, XLX), System Fusion (FCS, YSFReflector) networks.
More supported networks and features will be available with new firmware releases. Supports cross modem modes. Talk with your C4FM radio on DMR, and with your DMR radio on System Fusion networks! Very easy to use, works without a computer. No additional hardware required, works out of the box. All accessories included. Web interface for configuration and monitoring. Custom 2FSK/4FSK RF protocol support with TDMA. USB powered, low energy consumption, 20mW RF output. Runs fully embedded software written in pure C, running on an embedded real time operating system. No Linux, bulky Windows software or failing SD cards!

ML&S are the UK Distributor for this product.
ONLY £209.95

Click! *www.HamRadio.co.uk/openspot*

MyDEL Sark110 Vector Impedance Antenna Analyser

Pocket-sized Antenna Analyser providing fast and accurate measurement of vector impedance, VSWR, vector reflection coefficient, return loss, and R-L-C (as series or parallel equivalent circuits). Typical applications include checking and tuning antennas, impedance matching, component test, cable fault location, measuring coaxial cable losses, and cutting coaxial cables to precise electrical lengths.

ONLY £329.95

Click! *www.HamRadio.co.uk/sark110*

RF Explorer 3G Combo Hand Held Spectrum Analyser

Up until now the RF enthusiast have had to limit themselves to cheap "RF Power Detector/ Frequency counter" devices. But these are limited to display data for a single point of maximum power, and traditionally power metrics are too unreliable, in the order of 20dB or even 30dB inaccuracy. In contrast, a spectrum analyser like RF Explorer will display full frequency spectrum in the band, including carrier and modulated shape, it will display Spread Spectrum activity, if that exists, and will show bandwidth to monitor collisions, frequency deviation from expected tone, etc.

ML&S PRICE: £209.95

Click! *www.HamRadio.co.uk/rfexplorer*

MS-5 HANDS FREE MIC

Looking for a hands-free mic for your car that actually works?

The MS-5. A safety microphone for mobile or base use that really is "plug & play". Available for most Icom, Kenwood & Yaesu Radios.

ONLY £39.95

Click! *www.HamRadio.co.uk/ms5*

UK'S NO.1 CHOICE FOR KENWOOD & ICOM

ML&S OFFICIALLY THE UK'S NO.1 DEALER (AGAIN) KENWOOD

NEW

KENWOOD TH-D74E

Dual Band Handie with unique APRS, D-Star & HF SSB receive coverage.

ML&S PRICE: £599.95

Click! www.HamRadio.co.uk/thd74e

KENWOOD TS-590SG HF/6M TRANSCEIVER

160-6M BASE WITH ATU

Upgraded version HF & 6M FULL DSP Base Transceiver

The best-selling HF transceiver just got even better.

ML&S PRICE: £1239.95

Click! www.HamRadio.co.uk/ts590sg

KENWOOD TS-990S

HF+6M FLAGSHIP

RRP: ~~£5999.95~~ £CALL

200W HF/50MHz Base Station Transceiver with Dual TFT Display and Dual Receiver.

CANCELLED ORDER (UNOPENED BOX) FULL WARRANTY £4999.95

Click! www.HamRadio.co.uk/ts990

ICOM

Click! www.HamRadio.co.uk/ic7300

ICOM IC-7300 ML&S: £1199.95

100 Watt - HF/50/70MHz TRANSCEIVER with SSB / CW / RTTY / AM / FM

The IC7300 sports HF+6m+4m coverage, it's 100W, houses an eye-catching touchscreen TFT display and includes an internal antenna tuner.

NEW ICOM ID-4100E

Very first D-Star 2/70 mobile radio with built-in terminal mode/ access point.

ML&S: £474.95

NEW

Click! www.HamRadio.co.uk/id4100

The ID-4100 makes using DSTAR more fun and more comfortable thanks to the terminal mode/access point mode for the first time in mobile devices .This feature enables DSTAR via the Internet from any location you do not have access to a DSTAR repeater.

NEW ICOM IC-R8600

COMING SOON!

New 100kHz-3GHz Receiver with SDR technology from IC-7300.

*** PLACE A £100 DEPOSIT NOW TO BE ONE THE FIRST IN THE QUEUE! ESTIMATED PURCHASE PRICE TO BE AROUND £2500.***

Click! www.HamRadio.co.uk/icr8600

ICOM IC-7600

Mid-range HF base station. Last few in stock. 3-Year Warranty, only £2229.95. Generous Part-Ex Deals!

Click! www.HamRadio.co.uk/ic7600

NEW ICOM IC-7610 COMING SOON! PRICE £3599.95 TBC

NEW

The Icom IC-7610 is a complete redesign of the former IC-7600 following on from the huge success of the IC-7300. 100W, Dual band receive, Huge widescreen display. Delivery schedule is hopefully June/July 2017.

For more information with prices

Click! www.HamRadio.co.uk/ic7610

WOUXUN HANDIE, KG-UV9D PROPACK ONLY £149.95

- KG-UV9D Transceiver
- Two batteries
- Two belt-clips
- Software and transfer data cable
- Fast charger dock and power supply
- Hand speaker mic
- Battery eliminator
- Manual
- Wrist strap
- Leather case
- In-car charger
- SMA-PL259 adaptor
- Hands-free kit

Click! www.HamRadio.co.uk/kguv9dpropack

WOUXUN KG-UV950PL NOW WITH 4M! ONLY £289.95

Includes FREE programming cable and software for only £289.95.

Up to a full 50W output on 4m, this unique QuadBand mobile/base from Wouxun exclusive to ML&S. Bands covered are 4m / 6m / 2m / 70cm.

Click! www.HamRadio.co.uk/kguv950pl

ICOM IC-2730 DUAL BAND MOBILE ML&S £289.95

A practical easy to use Dual Bander with remote head.

FREE MBF-4

Click! www.HamRadio.co.uk/ic2730

ICOM ID-5100 ML&S ONLY £574.95

Latest 2/70 D-Star Touch Screen Transceiver from Icom. Bluetooth connectivity and second station control through an Android device.

Click! www.HamRadio.co.uk/ic5100

ICOM IC-7851 IN STOCK NOW!

Built to order like its predecessor, the new IC-7851 is set to be a master-class transceiver of the highest order. Based on the Limited production run and very exclusive IC-7850, the IC-7851 is available today to order. Top prices paid on all trade-ins.

Last few! IC-7700 200W base. Call Sales Now! 3-Year warranty included.

Click! www.HamRadio.co.uk/ic7851

ICOM IC-9100 ML&S NOW ONLY £2799.95

HF through to 23cms Base Transceiver.

UX-9100 23cm Module	£623.99
UT-121 D-Star Board	£180.00
FL-430 6kHz Roofing Filter	£60.00
FL-431 3kHz Roofing Filter	£60.00

Or Plus 4 Pack with all 4 options. Only £3649.95

Click! www.HamRadio.co.uk/ic9100

ICOM IC-7100 ML&S: £999.95

HF/6/4/70 Base & Mobile Transceiver with remote control head unit.

Click! www.HamRadio.co.uk/ic7100

MD-380 DMR HANDIE FROM TyT

FREE TYT CASE AND UK CODE PLUG £99.95

Simple to use, bomb-proof performance DMR 70cm Handie. In stock now! MD-390 also available.

Click! www.HamRadio.co.uk/md380

LOOKING FOR COMMERCIAL GRADE DMR FROM YOUR FAVOURITE STORE?

Hytera

Hytera AR-685 Handheld UHF, FM, DMR, GPS, 1 watt / 4 watt inc. PC45 cable and UK code plug. **£299.95**

PD-685G 70cm, Small, lightweight & slim this version has GPS fitted. **£499.95**

PD-785 Rugged version, Large TFT Display etc. **£419.95**

MD-785G Base or mobile with GPS. **£399.95**

X1P Ultimate DMR Handie, GPS & Bluetooth. **Price from £629.95**

Click! www.HamRadio.co.uk/hytera

NEW MINI-APRS-TRANSCEIVER PICOAPRS WITH GPS RECEIVER (KIT)

The World's smallest APRS transceiver with TNC offers many applications. Matchbox-sized, built-in GPS receiver.

The transceiver can not only be used as an APRS tracker and receiver for APRS data, but also as TNC (KISS protocol) for computer. **£159.95.**

Click! www.HamRadio.co.uk/miniaprs

ML&S NO.1 FOR SDR RADIO, ACCESSORIES, NEW PRODUCTS, AMPLIFIERS, AUTO TUNERS & MUCH MUCH MORE

TX FACTOR IS A TV SHOW DEDICATED TO HAM RADIO Click www.HamRadio.co.uk/txfactor

ML&S NO. 1 FOR AMPLIFIERS & AUTO TUNERS

ML&S - the world's favourite *original* ham store

ML&S **0345 2300 599**

Web: www.HamRadio.co.uk

SAFE ONLINE SHOPPING
Shopping online with ML&S is safe and secure. E&OE

PayPal

FOLLOW US ON TWITTER AND FACEBOOK **HamRadioUK**

Martin Lynch & Sons Ltd. Wessex House, Drake Avenue, Staines, Middlesex TW18 2AP. E-mail: **sales@hamradio.co.uk**
Opening Hours: Mon - Fri: 8.30am to 5pm. Sat: 9am to 4.30pm. International Tel: +44 1932 567 333

LDG ML&S have the largest stock of LDG outside the US.

LDG Electronics are the largest manufacturer of Automatic Antenna Tuners in the World.

LDG Auto Tuners are intelligent and designed from the start to work seamlessly with your radio. Press the Tune Button and the rig and the tuner will do the rest; reduces power, transmits a carrier, automatically matches the antenna to the rig, then restores the original power and mode.

Yaesu Tuners

LDG YT-1200 for Yaesu Transceivers
Auto-ATU for Yaesu FT-450, FT-450D, FT-950, FT-991, FT-991A, FTDX-1200 and FTDX-3000. **Only £244.95**

Also available LDG YT-100 as above but for FT857, FT897 and FT-100. **Only £199.95**
Also available LDG AT-897Plus, Bolt-on Auto Tuner for the FT-897D. **Only £189.95**

LDG Z-817 Auto Tuner for the FT-817/ND
Seamless control via CAT Port of 817. Internal battery tray for portable use. 100mW-20W SSB&CW, 5W for data. **Only £129.95**

Icom Tuners

LDG IT-100 for Icom Transceivers
Auto-ATU for ALL Icom 100W Transceivers. **Only £179.95**

Kenwood Tuners

LDG KT-100 for Kenwood Transceivers
Auto-ATU for Kenwood TS-2000, 50, 450, 480SAT (not HX), 570, 590, 850, 870. **Only £209.95**

Non-Rig Specific Auto Tuners

LDG Z-100Plus
Small, low cost 125W Auto ATU. Will tune from only 100mW of drive & has almost zero standby current once tuned. **Only £169.95**

LDG Z11Pro11
Portable version of the Z-100 with its own internal battery tray & manual controls for fine-tuning for using outdoor portable operation. **Only £179.95**

Generic Auto Tuners for any radio

AT-100Pro11
General Purpose tuner with Bar Graph LED readout showing power/SWR status. Will tune from only 1W and handle 125W SSB/CW. Manual tuning capability. **Only £244.95**

AT-200Pro11
As above with 200W RF power handling. Ideal for TS-990, FTdx5000, IC-7851 etc. **Only £259.95**

AT-600Pro11 As above with 600W RF power handling. Perfect for legal UK limit power amplifiers. (There must be some out there). **Only £395.95**

AT-1000Pro11
As above with 1kW RF power SSB or 500W data. **Only £519.95**

Shown with optional M-1000 large analogue meter. **Only £139.95**

Remote Auto Tuners

LDG RT/RC-100
Weatherproofed Remote Auto-Tuner with shack controller. Powered via the coax feedline & built-in frequency sensor. **Only £249.95**

LDGRT/RC-600
600W version of above. **Only £429.95**

LDG Accessories

LDG RBA-1:1
1:1 200W PEP 1.8-30MHz Current Balun allowing ladder or end-fed wires to be used with any 100W LDG Tuner or stand-alone. **Only £32.95**

LDG RBA-4:1
Voltage Balun version of above **Only £34.95**

Click! www.HamRadio.co.uk/LDG

NEW!
SPE Expert 1.5K-FA Linear Amplifier
£3849.95 Ready for pre-orders! See web.

SPE 1.3K-FA. Latest 160m-4m 1.5kW (700W on 4m) lightweight Solid State amplifier with built-in PSU. **£2599.95** or **£3529.95** with Auto ATU.

SPE 2K-FA. 160-6m 2kW The ultimate Solid State 2kW Amplifier with Auto ATU, multi-antenna sockets and more. **£4999.95**

Please note: prices subject to change due to currency fluctuation.

Click! www.HamRadio.co.uk/spe

HUGE CHOICE OF HF LINEAR AMPLIFIERS & ML&S

SPE RCOM OM Power

Acom 2000A. Fully automatic 2kW 160-10m HF Amplifier with built-in Auto-ATU. **£4999.00**

Acom 1500. 160-6m 1.5kW Amplifier using 4CX1000A/8168. Easy to use bar graph tuning display. **£2899.95**

Acom 1000. 160-6m 1kW Amplifier. Easy to operate with LCD message display. Acom's best seller. **£2399.95**

Acom 1010. 160m-10m 700W HF Amplifier using 4CX800A (GU74B) tetrode. **£1699.95**

Click! www.HamRadio.co.uk/acom

OM2000A+ 2kW Fully Automatic HF+6m Amplifier. Compact and powerful without the worry of solid state PA's. **£4499.95**

Click! www.HamRadio.co.ukompower

MICROSET DUMMY LOADS AND PREAMPLIFIERS

Click! www.HamRadio.co.uk/microset

Microset CF-30 50 Ohm 30W Dummy Load N-Type, Range DC - 850MHz - Power 15W/30W -VSWR 1.1:1 (1-500MHz), 1.5:1 (500-850MHz). **£49.95**

Microset CF-300 50 Ohm 300W Dummy Load N-Type, Range DC - 1.2GHz - Power 300W - VSWR 1.1:1 (1-500MHz), 1.3:1 (500MHz-1.2GHz). **£129.95**

Microset SR-100 100W Linear Amplifier 144-148MHz, FM, SSB, CW. Input power of 4-25W gives 100W out. Pre-amp gain 18d. **£244.95**

Microset PR-145A
VHF MAST ANTENNA PREAMPLIFIER 144-148MHz, low noise. Automatic antenna switch & P.T.T. facility, **£129.95**

Microset PRH-145A VHF MAST ANTENNA PREAMPLIFIER 500W throughput 144-148MHz, low noise. Automatic antenna switch, P.T.T. facility, 140-152MHz. **£219.95**

Microset PR-430A UHF MAST ANTENNA PREAMPLIFIER 430-440MHz, low noise. Automatic antenna switch & P.T.T. facility, Limit of band 420-450MHz. **£169.95**

Microset PRH-430A
UHF MAST ANTENNA PREAMPLIFIER 430-440MHz, 500W throughput, low noise, automatic antenna switch, P.T.T. facility, limit of band 420-450MHz. **£239.95**

Microset SR-200
144MHz 200W Linear Amplifier. 8-50W input, 200W out. Pre-amp Gain 18dB. SO239 sockets. **£409.95**

Microset PT-135
Heavy duty 35A 13.5V PSU. **£264.95**

Microset PR-2B
DUAL BAND VHF-UHF MAST ANTENNA PREAMPLIFIER with low noise. Automatic band selection. Usable with dual band antenna. **£229.95**

MFJ PRODUCTS - Lots more MFJ stocked!

Click! www.HamRadio.co.uk/mfj

MFJ-939	Plug & Play 200W ATU, you won't even know it's there!	£179.95
MFJ-974HB	Manual ATU for balanced line antennas, 160-10m	£259.95
MFJ-974	as above but without 160m	£234.95
MFJ-16010	Random Wire ATU 160-10M	£79.95
MFJ-949E	Manual ATU metered, Dummy Load, 1.8-30MHz, 300W	£199.95
MFJ-901B	Manual Mini ATU 1.8-30MHz, 200W	£119.95
MFJ-971	Manual ATU metered, 1.8-30MHz, 200W	£139.95
MFJ-904H	Manual ATU, metered, inc balanced, 1.8-30MHz 150W	£184.95
MFJ-969	Manual Roller ATU Metered 1.8-54MHz, 300W	£249.95
MFJ-993B	Auto ATU Metered 1.8-30MHz, 300W	£309.95
MFJ-1786X	Magnetic Loop 10-30MHz, 150W re-built & re-aligned by ML&S	£699.95
MFJ-1788X	Magnetic Loop 7-22MHz, 150W re-built & re-aligned by ML&S	£699.95
MFJ-259C	Antenna Analyser 530kHz-230MHz	£299.95
MFJ-266	V/U Portable Antenna Analyser 1.5-185MHz + 300-490MHz	£389.95
MFJ-269C	530KHz-230MHz, 415-470MHz Analyser	£369.95
MFJ-260C	Dummy Load 300W SO-239	£48.95

MyDEL CG-3000R Antenna Tuner

The best value remote wire antenna tuner now with remote control included. NOW ONLY £249.95

Click! www.HamRadio.co.uk/mydelcg3000r

PALSTAR ATUs & DUMMY LOADS

Palstar

Click! www.HamRadio.co.uk/palstar

New SP-30B/C	Real wooden enclosure housing speaker. Available in Cherry or Black	£129.95
New SP-30H	Huge real wood enclosure housing speaker. Available in Cherry or Black	£197.95
HF-Auto	1.5kW PEP fully automatic ATU for QRO	£1599.95
AT-500	600W PEP Antenna Tuner	£529.95
AT-2K	2000W PEP Antenna Tuner	£604.95
AT-2KD	Differential 2kW PEP Antenna Tuner	£604.95
AT-4K	2.5kW PEP Antenna Tuner	£1049.95
AT-5K	3.5kW PEP Antenna Tuner	£1199.95
BT-1500A	Balanced Antenna Tuner	£859.95
PM-2000AM	Power/SWR Meter	£249.95
PM-2000A	Base Power/SWR Meter	£229.95

PALSTAR DUMMY LOADS

DL-1500 (1.5KW) **DL-2K** (2kW) **DL-5K** (5kW) **See web for prices.**

SEE FULL RANGE OF OUR AMPLIFIERS & AUTO TUNERS ON LINE www.HamRadio.co.uk

ML&S NO.1 FOR ANTENNAS

ML&S ARE PROUD TO BE THE SOLE IMPORTER OF AUSTRALIA'S FAMOUS BUSHCOMM ANTENNA RANGE.

These wire antennas are made from high strength steel wire, designed to withstand the harsh outback weather and built to last for a reliable HF communication solution. No tuner required.

Click! www.HamRadio.co.uk/swc100

Bushcomm Horizon 2040 Centre Fed Two Band Antenna. *20/40m simple dipole for efficient operation. Only 13 metres in length.* ***£99.00.***

Bushcomm Horizon End Fed 3 Band - 10m 20m 40m. *This antenna is designed and manufactured in Australia and is intended to offer simple and very efficient operation. Only 12 metres in length.* ***£109.95.***

Bushcomm HORIZON 4080 Centre Fed Two Band Antenna. *40/80m simple dipole for efficient operation. Only 13 metres in length.* ***£119.95.***

Bushcomm Horizon Loop 20/10. *Designed to be used portable or as a small space permanent set up.* ***£299.95.***

Bushcomm Horizon Loop 40/10. *Designed to be used portable or as a small space permanent set up.* ***£329.95.***

Bushcomm HF Antenna Systems

Wonderwand Wonderloop Antennas

Wonder Wand Antennas U.K.

Designed and built in Great Britain

The UK's favourite rig-mounted antenna system!

WonderWand Widebander
1.8-460MHz with 1.3M Whip! **£129.95**
Wonder-TCP
40-10m Tuneable Counterpoise....£59.95
or buy both together for only £169.95!

NEW WonderLoop 750
7MHz-50MHz. Superb compact qrp portable loop for direct rig mounting.
ML&S Only £109.95

Click! www.HamRadio.co.uk/wonderloop

Super Antenna MP1DXTR80 Package

A complete portable antenna packaged based around the world's best selling SuperStick

MP1DLR Package includes:

- MP1B antenna (SuperSlider Coil, SW1 SuperWhip, 2 extension rods and nut)
- MR1C Counterpoise
- TM2 SuperPod Tripod
- UM2 SuperMount
- GB1 Go Bag
- FG1 Frequency Guide
- MC80 80-meter coil

Super Antenna Features:

- Ham bands: 40m-30m-20m-17m-15m-12m-10m-6m-4m-2m-70cm
- Frequency Range: HF 7MHz~30MHz continuous
- Frequency Range: VHF 48 to 144MHz continuous
- SWR: 1.5 : 1 or better
- Rated Power: 500W SSB; 300W CW / DIGITAL
- Antenna Weight: < 2 pounds (1kg)
- Also configurable for up to 450MHz
- Standard 3/8"-24 male thread for mounting
- TM2 SuperPod tripod included with carry bag
- MC80 80m coil included for 80m band
- Optional MR series radial sets available
- Optional MC60 60m coil for 60m band

All for only £229.95
Plus £10.95 post & packing

NEW IMPROVED VERSION

Click! www.HamRadio.co.uk/superantenna

MC2 2m Coil for MP1
2m Coil for MP1 series SuperSlider Antennas. Adds 2m 144MHz ham band. For use with current generation MP1 series vertical antennas. **£89.95**

Hustler Antennas

HUSTLER

Hustler are one of America's oldest manufacturers of Ham Radio antennas. The famous "White Whips" have been seen on many cars operating HF mobile. Their HF base range of 4, 5 or 6-BTV antennas are probably the easiest to assemble and get going and of course are ground mounted, operating with just an earth spike mounted close to the base.

Base Station Range
Free standing, max 7.3m tall, 1kW

4-BTV	40/20/15/10m.....	**£189.95**
5-BTV	80/40/20/15/10m.....	**£269.95**
6-BTV	80/40/30/20/15/10m....	**£279.95**

Click! www.HamRadio.co.uk/hustler

CIRO MAZZONI PROFESSIONAL LOOPS

In Two Sizes. Baby Loop & Midi Loop.

An Italian manufacturer **Ciro Mazzoni** has perfected the design and is able to offer two versions covering the entire 80m-10m range built to ultra-professional standards.

BABY LOOP £1299.95
6.6MHz-29.8MHz with Mk2 Controller. With RS-232 Rig Control interface.

MIDI-LOOP £1349.95
3.5MHz-14.5MHz with Mk2 Controller. With RS-232 Rig Control interface.

RS232 Control your new Ciro Baby or Midi Loop via either a Yaesu or Icom transceiver. As you change bands the loops follows automatically, no need to enter the frequency used via the keypad. **£79.95**

Click! www.HamRadio.co.uk/ciro

DX ENGINEERING

DX Engineering are an American manufacturing company that specialises in Antenna Hardware built to the highest quality. Their product range is so huge the entire list would fill this magazine.

Call us or check out www.HamRadio.co.uk/dxengineering

DIAMOND ANTENNAS
Huge selection always available

Click! www.HamRadio.co.uk/diamond

Base Antennas

CP-VU8	80m-70cm 200W Compact HF Base, only 2.7m Long!	**£419.95**
X-30	2/70, 3/5.5dB, 1.3m Long	**£44.95**
X-50N	2/70, 4.5/7.2dB, 1.7m Long	**£60.95**
X-300N	2/70, 6.5/9dB, 3.1m Long	**£89.95**
X-510N	2/70 Fibre glass 8.3/11.7dB gain. 5.2m long "N"	**£119.95**
V-2000	6/2/70, 2.15/6.2/8.4dB, 2.5m Long	**£99.95**
X-7000	144/430/1200MHz (2m/70cm/23cm) 8.3dBi (144MHz), 11.7dBi (430MHz), 13.7dBi (1200MHz) 5m Long	**£169.95**

Mobile Antennas

NR-770RSP	100W, 2/70, 3/5.5dB, .98m long, spring loaded	**£36.95**
MR-77	Magnet mount/antenna combination. Includes 13' RG58 coaxial cable with BNC or SMA connector	From **£25.95**
SG-7500	2m/70cm, GAIN 3.5/6.0, 41" long	**£65.95**
SG-7700	1/2wave C-Load radialless(144MHz), 2x5/8wave radialless(430MHz), 3.5dB(144MHz),6.0dB(430MHz). 1.06m long	**£79.95**
SG-7900		**£89.95**

Duplexers/Triplexers

MX-72N	1.6-150/400-460MHz Duplexer	**£38.95**
MX-62M	1.6-56/140-470MHz Duplexer	**£59.95**
MX-610	HF/6+2+70 (for FT-8900)	**£69.95**
MX-2000	6/2/70 Triplexer	**£79.95**
MX-3000N	2/70/23 Triplexer	**£69.95**

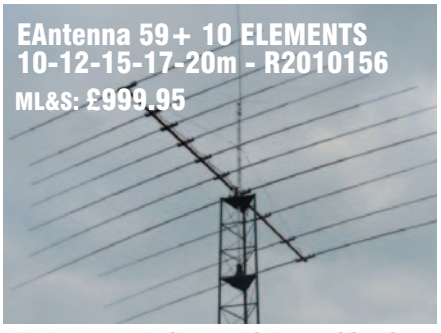
Switches

CX-210A	2-way, SO-239 Die Cast	**£46.95**
CX-210N	2-way, N-Type, Die Cast	**£54.95**
CX-310A	3-way, SO-239, Die Cast	**£59.95**
CX-310N	3-way, N-Type, Die Cast	**£89.95**

YAESU YA-30

The Yaesu YA-30 is very simple to use. Just open the box, roll out the antenna outside where you want to erect. Snap in the supplied spreaders, connect the high quality coax cable assembly (terminated with PL-259's so you don't even have to fit any plugs).
ML&S £229.95

Click! www.HamRadio.co.uk/ya30



LFA Antennas built to a high specification re-engineered using quality materials

The Famous EAntenna Range from Spain

Click! www.HamRadio.co.uk/eantenna

The new EAntenna 59+ is a 5 band, 10 element beam antenna with superb performance for a boom length of only 5.75 metres. Computer optimized design to attain the best performance from an antenna of this size. Start chasing DX now!

V/U Beams

R2010105	144LFA5 5 ele 2m beam	£89.95
R2010109	50LFA3 3 ele 6m beam	£119.95
R2010121	70LFA3 3 ele 4m beam	£84.95
R2010139	432LFA15 15 ele bea	£125.95
R2010251	ea270zb9 4/5 ele 2m/70cm beam	£74.95
R2010253	ea642zb7 2+2+3 ele 6m/4m/2m beam	£114.95

V/U Verticals

R2010800	ea270j dual band vertical j pol	£39.95

HF Antennas

R2010013	dbz40 double bazooka 7mhz wire antenna	£54.95
R2010048	ea1015204080dxs 5 band HF dipole	£119.95
R2010904	5 band cobweb 500W antenna	£284.95
R20109043	5 band cobweb 3kw antenna	£369.95
R2010050	ea101520dx dipole 3band HF dipole	£72.95

80th Commonwealth Contest 2017

"Solar zero! The sun was completely blank, no sunspots at all, one of the quietest periods for the preceding 12 months."

When Neville Shrimpton, ZL4AO, proposed in 1930 that "an Empire Radio Week be inaugurated…", he might have been surprised that it would still be celebrated 87 years later as the Commonwealth Contest (sometimes still called BERU).

The 80th Commonwealth Contest, 2017 must go down as one with some of the poorest HF conditions heard for a decade or more. But notwithstanding, entries into the Commonwealth Contest have been on a general upward trend for the last few years and the 80th was no exception with 275 entries received. There were 75 Open assisted, 77 Open unassisted, 28 Restricted assisted, 83 Restricted unassisted, 10 QRP and 2 Multi-op. 15 HQ stations were active this year. As part of the celebrations for the 80th contest six special Gx80CC HQ stations, representing different UK&CD countries added much extra interest especially for UK entrants. As part of the 150 years celebrations in Canada there were a number of VE special calls active too. Seventeen teams were entered into the team competition. Overseas travellers visited 3B8, 8P, 9G, 9H, C4, E5, V3, VY2 and ZF.

The following call areas were active: 3B8, 3B9, 3D2, 4S7, 5B (C4), 5W, 8P, 9G, 9H, 9J, 9M2, 9M6, 9V, E5, H40, J3, P29, V3, V5, V8, VE (VA) 1, 2, 3, 4, 5, 6, 7, 8, 9, VO1, VK 2, 3, 4, 5, 6, 7, 8, VP8, VU (AT), VY1, 2, XK (Yukon), ZB2, ZD7, 8, ZF, ZL1, 2, 3, 4, 6, ZM2, 4, ZS1, 2, 5, 6. By any measure, this is an impressive list of DX for a zero sunspot weekend!

9G5X looking north with a clear view. An amazing signal on all bands.

Results

The leader of the Open Unassisted section and winner of the Senior Rose Bowl is John Sluymer, VE3EJ, narrowly ahead of 9G5X operated by Iain, M0PCB. The effect of the poor conditions is most evident, although Iain had better HF QSOs and bonuses on 15m especially, John was still able to just hold the lead through superior QSO numbers and bonuses on LF. John's 223 total bonuses against Iain's 165 more than made up for the difference in QSO numbers, 760 to 971. A close run contest with only 135 points separating them.

Close behind in third place is Ron, CG3AT (VE3AT), followed by Dave, VE9CB, "What we experienced was just plain low-sunspot propagation. The G*80CC stations were a real treat, so congratulations to all of you for your activity", and then Colin, ZF2CA (G4CWH) said, "Huge fun as always pile-ups a challenge on each new band. 15m more open than people realised had to drag them there". Only 1000 points separated the top 5 stations.

Dave Lawley, G4BUO operating at M6T is winner of the Colonel Thomas Rose Bowl. Only 110 points behind Dave is Don, G3BJ who commented, "Poor conditions on 10/15 and rather disappointing on 80. Hard work – all QSOs felt as if they were 'hand-crafted'."

Kevin, VK6LW is in 8th place and the next highest VK is Barry, VK2BJ in 12th place, "The conditions were about as bad as they can get", followed by Steve, VK6VZ in 14th place, "lost much of last five hours through thunder and lightning".

Jim Fisher, GM0NAI is the top UK&CD 12 hours duration Unassisted entry and takes the Ross Carey Rose Bowl. The non-UK&CD entry and winner of the VP8GQ trophy is Richard Ferch, CG3KI.

The leader of the Restricted Unassisted section and winner of the Junior Rose Bowl is Peter Hobbs, G3LET operating as VY2GQ. Peter operated from VY2ZM's cliff top villa on Prince Edward Island. His set up mirrored his UK station with a 250ft long wire and a vertical for HF. In second place is 8P9IF (G3PJT) operating from the eastern side of Barbados.

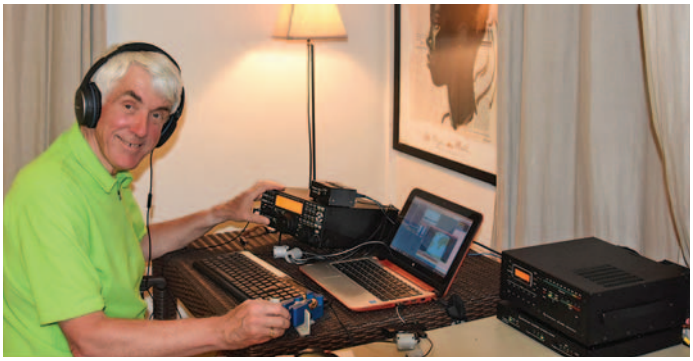
The top UK&CD Restricted Unassisted entry and winner of the John Dunnington Trophy is Quin Collier, G3WRR, another traveller but only as far as the Isle of Wight!

Dave Sergeant, G3YMC, who wins the Lilliput Trophy, was the highest scoring QRP entrant, with VE3PYG second.

Vladimir Milutinovic, VE3JM wins the Rosebery Shield for the leading single operator assisted station and is followed by VE3FU. In third place was Nigel, 3B8/G3TXF who operated from an islet just off the coast of Mauritius.

The leading Restricted single operator assisted certificate goes to Iain Haywood, G4SGX operating V31GX, with a vertical on a landing stage on the coast of Belize.

In the Multi operator section C4I (ops G3UFY and G3VYI) was first. "We had thunderstorms, S9 static all weekend, inverter batteries flat, generator fuel tap was blocked, 80m vertical blew down, hailstorms and more thunder on Sunday morning … great fun! The Malta Marconi Radio Circle, 9H1MRC (ops G3TJE, G3RXP and G4CXQ) was second. See the April *RadCom* News item for details of this excellent initiative.



3B8/G3TXF with Elecraft K3S, KPA-500 amplifier and KAT-500 ATU. Logging with *Win-Test* ("…still the best!"). (Photo courtesy of G3TXF).

VY2 GQ operating with SD and the grey line running to spot the openings. Radios were Elecraft K3 and P3.

Commonwealth medal

The Commonwealth Contest Medal goes to Mike Franklin, G3VYI. Mike has supported the Commonwealth Contest over many years as the adjudicator and by undertaking contest expeditions to 5B, 9H and VP9 and thus added plenty of bonus interest for all of us.

Team competition

The Team competition was won by Team Australia 1 (VK6LW, VK2BJ, VK4CT, VK3MI, and VK4SN). They just managed to hold off the determined challenge from Team Canada EH! (VE3JM, VE3EJ, CG3AT, VE9CB and VE3FU). Team Australia 2 (VK6VZ, VK7BO, VK2GR, VK2PN and VK3JA) came third.

Team A25UK DXpedition (G4BUO, G3BJ, M3W (G4FAL), G4FNL and G3PHO) came 4th and, as the highest placed UK team, win the special 80th prize. With the two ZL teams in 5th and 6th places, the southern hemisphere has done very well this year. Congratulations to all 17 teams who took part.

Just a note in passing, the Latitude Factor is designed to level the propagation playing field a bit. Members of teams south of the equator have their individual team score multiplied by a factor that is re-calculated each year to take account of changing conditions through the solar cycle.

Band analysis and propagation

The period immediately prior to the contest weekend was one of the quietest in this solar cycle. The surface of the Sun was spotless. Solar flux was about 70 and the A index around 12, which explained the poor HF conditions. There were very few contacts on 10m even between stations towards the equator. 15m was somewhat better but only at a level below which significant levels of activity of the North Atlantic path can build up. This forced most activity onto 20, 40 and 80m. 40m in particular carried a great deal of traffic but on 80m the disturbed weather of thunderstorms and high winds raised band noise levels. Interestingly, 80 contests ago, in 1931, the weather was much the same: sporadic propagation on 20m, and a 'washout' in ZL.

The 40m vertical antenna at 3B8/G3TXF regularly gets its toes wet in the waves. It has an excellent take-off to USA/Europe and Japan. (Photo courtesy of G3TXF).

Travellers tales

The 2017 Travellers Award goes to E51KTA (Dom Baines, M1KTA) who operated from the South Cooks. Dom operated from the QTH of Andy, E51AND but hand carried a selection of antennas etc, much of which he left on Raratonga for future trips. Dom said, "I almost covered the PA in Fanta, burnt through the coax just before the off and the piglets ate through the 40m feeder". Those are the sort of things that happen when a QRPer encounters a QRO amplifier. That said, Dom provided a great opportunity for Gs to work South Cooks. Not one of the easy places to work.

From the main Commonwealth Contest site go to the DXPEDITION 2015 drop down menu where you can select detailed 2017 reports from 3B8/G3TXF, C4I, 8P9IF, VY2GQ, E51KTA and ZF2CA. They are amusing and very well worth reading.

HQ stations

To celebrate the 80th contest, the RSGB HF Committee agreed to permit special HQ stations in each of the seven UK&CD areas, namely GU80CC at GU4YOX op 'YOX, 'EON, 'CHY, GM80CC at GM3WUX, G80CC at G0ORH, GW80CC at GW0ETF, GI80CC at GI4DOH and GJ80CC at MJ0ASP. The organisation of the special G*80CC calls from Ofcom was handled by Iain, M0PCB and the RSGB. Six out of the seven areas were represented this year. In addition, there were HQ stations in VK, ZL and VU. Canada had a total of six on the air. Many soapbox comments were received about the UK HQ stations, "Great to have so many HQ stations for the 80th commemoration of BERU", "hopefully this will continue in 2018", "G*80CC stations were a real treat". Difficult weather affected most of the RAC HQ stations in Atlantic Canada. VO1RAC by VO1MP was cut short by a major wind storm and 30 hour power outage. Many thanks to all the excellent HQ stations for providing many bonus QSOs on all bands.

Silent key…

First to be heard and the last to disappear… Joe, 7Q7BP became a silent key just after this year's contest had ended. Joe has given many entrants many bonuses over the years and will be sorely missed. For some, Joe was their only QSO with Malawi. Rest in Peace old friend and many thanks from all of us.

Bob Whelan, G3PJT/8P9IF
bob@g3pjt.com

Adjudicator's Comments (John Cockrill, G4CZB)

Log standards were generally very good and only a small number of entrants had problems where assistance was requested. The average 'Unique, Busted or Not-in-the-log' (usually known as UBN) was 3.17% with some of the leading stations having less than 1%. Entrants are reminded to ensure they are using up to date contest information direct from the current RSGBCC website page as some external sites had incorrect information about the deadline for logs. Although the RSGBCC does notify changes to other sites listing contest information, the RSGBCC has no control over these so cannot guarantee accuracy.

Much more contest information is at https://berucontest.wordpress.com/ and the full results are at www.rsgbcc.org/cgi-bin/hfresults.pl?Contest=Commonwealth%20Contest&year=2017

Prince Edward Island, VY2GQ, the view to UK over the icefield of the St Lawrence seaway.

The 81st Commonwealth Contest will be on 10 and 11 March 2018, so put it in your diary now and start planning.

Selected Soap Box comments

5B4AHJ: Had lots of fun on 15/20 Saturday but Sunday was marred by large static crashes from nearby thunderstorms… Only two QSOs on 10m, 9J2BO and 3B8/G3TXF.

8P9IF: A cockerel got into villa, I spent 15mins chasing him out with a broom! Tuning knob on the K2 went very stiff made S and P a pain. 80m antenna failed just after band opened, too dark to fix.

9H1MRC: Many thanks to all the guys at the MARC Malta for making us so welcome and for allowing us to use their Club Station. (See *RadCom* February 2017)

G3PHO: This year's score is almost identical to last… just two more Qs and 5 more points. No Qs on 28MHz and only a baker's dozen on 15 meant the other three bands had to produce the bulk of the final score. In spite of poor conditions I managed 3B8/G3TXF on all bands except 10m as well as 9G5X (massive signal!) and ZF2CA.

G3ROG: I really liked the introduction of additional HQ stations in the UK, hopefully this will continue in 2018.

G3VPW: Thoroughly enjoyed yet again. Surprised even to make many DX contacts on 40 and 80 despite S4 VDSL-2 noise.

VE3BR: Compared to 2015 the conditions were waaay down! 10m was dead and – at its wake – 15m was giving a eulogy by trying its best impression of a severely depressed 10. With SFI=70 and A=12 this was NOT the time for a vertical.

VE9CB: What we experienced was just plain low-sunspot propagation. I did work a couple of VUs on 20, one on 40 and HQ stations AT3T was a nice plus. The G*80CC stations were a real treat, so congratulations to all of you for your activity. Most of the RAC HQ stations in Atlantic Canada were on, however I understand that VO1RAC by VO1MP was cut short by a major wind storm and power outage. Thank you to VO1MP, VE1RSM, VY2LI and VE9BK for activating those stations. I never made a single contact on 10m. Even the skeds with stations around the Maritimes within 200km all failed. My QSO total is pretty good in these conditions, but as usual, my bonuses are much lower than I would like. I always have a tough time working more than a very few ZL and VK stations. BERU is my favourite contest. Congratulations to RSGB on hosting this great event through 80 runs. What an amazing record!

VE3VHB: Like the G*80CC idea please continue. Seemed to be many Gs missing this year.

VK2BJ: 10m was dead, 15m almost the same and no Gs heard, 20m atrocious, 40m and 80m both well below average. Lack of stations from many Commonwealth areas.

VK3MI: Not many DX calls from outside the Asia Pacific area made it into the log… C4I and 9H1XT from the Mediterranean, 9G5X from Africa and ZF2CA from the Caribbean… Nigel 3B8/G3TXF on 4 bands – he had an outstanding signal in VK3. The only other station (outside VK and ZL) worked on 4 bands was Dave G4BUO.

VK6LW: Typical low sunspot condx, 40 and 80 were good and also 15 was better than I would have expected. Just a few weak signals on 10.

VK6VZ: Poor HF condx meant 40m was the main band and 80m took weight also… cheered when Prasad's signal (AT3T/VU2PTT) came through at a good S4. Thanks to all who took part around the globe – and to those who organised the contest.

VO1HP: I was on a roll and feeling good until the lights went out… literally!… The power failed at 2pm Sat during a violent and frightening wind storm here… gusts to 160kmph… I had planned for 12 hrs this year but that was cut short. On Friday I had cranked down my tower to about 40ft based on the forecasts but had to bring it all the way down Sat morning as it was clear that this was going to be a bad day… power was gone for us 30 hours… came back last night 2100 local… still windy… during the powerless period the wind chill was about -20C. We are used to wind and wild weather but even for here this storm was extreme and violent…

ZD8RH: Rushed departure on this trip from UK via Falkland Islands – forgot to pack interface lead from radio to laptop, so no freq info in log. Wrong laptop power supply packed – unit I had generated S7 QRM on 7MHz!

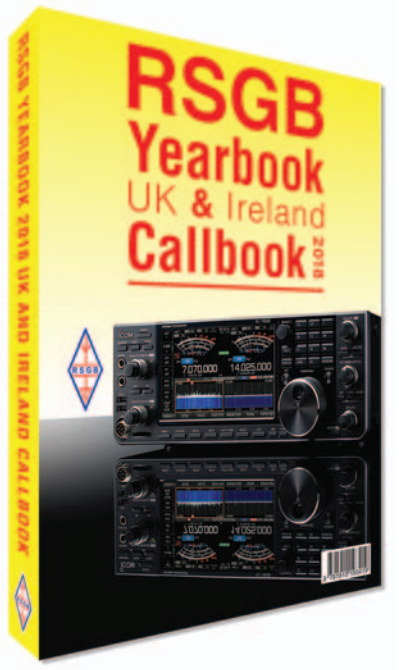
ZF2CA: No BERU traffic on 10m. EU sends BERU but antipodeans seem to send CC!

ZL6HQ: Terrible conditions but some nice surprises M7T and 9V1XT on a very dead 20m band at 1100UTC called by 9H1XT on 40m and of course my only African 3B8/G3TXF. Also 20m opened LP to the UK around 2030UTC most unusual. Power outage lightning storm and social engagements limited operating time.

ZM2B: Extremely poor propagation, plus a severe rain storm with lots of lightning and long periods of rain static on all bands on all antennas equated to a contest that I didn't really enjoy. The usual and expected LF/HF short path opening to UK didn't happen, the long path opening towards the end of the contest was much better. Worked 50 G stations, my lowest number since 1987. VEs were also scarce, just two 20m contacts. Stations not worked – anyone in Cyprus or Gibraltar, 9G5X and the rest of Africa. Re the Caribbean, only ZF2CA and V3 are in my log, 8P9IF isn't. 3B8/G3TXF was a struggle via long path, but made it into my log a couple of times. Unexpected but welcome contacts included H40FN and VK8DX.

Book Review

RSGB Yearbook 2018



One of the year's big events is the launch of the *RSGB Yearbook 2018* at the National Hamfest. It is so popular that an entire *pallet* of copies will be taken to the event! This year the *Yearbook* will be even more popular as it's now at a new lower price (£2 less than the previous price).

The *RSGB Yearbook 2018*, incorporating the UK & Ireland Callbook, has been fully revised. Not only does it contain a complete listing of UK and Irish callsigns, it also has a huge section of information on the RSGB, amateur radio clubs, licensing details and operating information. Within the RSGB there is a wealth of knowledge and experience that can be tapped into – if only you know where to look. The *RSGB Yearbook* 2018 has the detail you require to access that information with everything from Planning to EMC and QSLs to Awards.

The *RSGB Yearbook 2018* is an invaluable resource in many areas.

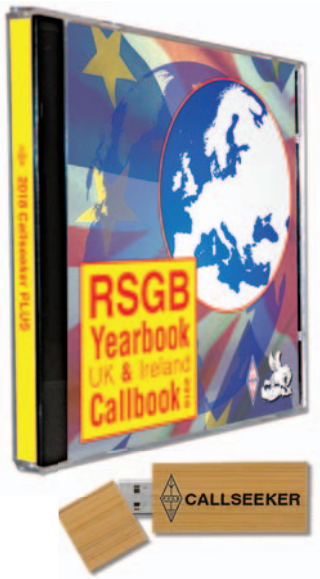
Clubs are the lifeblood of the amateur radio community. There are hundreds of radio clubs up and down the country, many of which appear in the Featured Clubs section, where you can read more of what they have been getting involved in recently.

The *RSGB Yearbook 2018* also deals with every aspect of amateur radio operating you could wish for. Repeaters, datacomms, weak signal work, CW, satellites – and many more. There are almost 200 pages of detailed information that will keep you in reading matter for ages!

The second part of the *Yearbook* is devoted to the UK & Ireland callsign list – and runs to over a million words! It contains the latest database information from the UK licensing authority, a complete list of UK Special Contest callsigns, the Irish callsigns listing, plus listings of UK licensees in surname and postcode order. There are over 85,000 callsigns from the UK licensing authority and when you include the Ireland callsigns that goes up to around 87,500 entries. All this information now at the new lower price too!

210 x 297mm, ISBN 9781-9101-9341-9, Published by RSGB
Non Members' price £17.99, Members' price £15.29

Callseeker Plus 2018



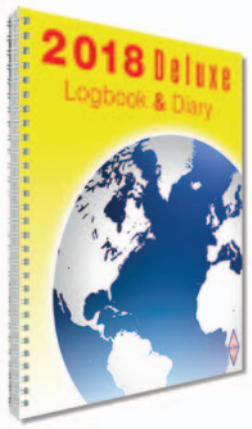
Callseeker Plus 2018 is the callbook with a difference. It is fully searchable and contains a vast number of callsigns – not just the full UK set, but the callsign data from over 20 additional European radio societies. Prefixes include 2, 9A, DL, EA, EI, ES, F, G, HA, HB9, I, LX, LY, M, OE, OH, ON, OZ, SM, SP, SV Z3 and ZB2. There is no software to install; the no nonsense, easy-to-use Eurocall interface just simply *works*. Type in a callsign and presto! Up comes the information. No internet connection is required, so it's also ideal for field use – and there are no horrid, bandwidth-sapping animations flashing all over the place either. This year now comes with a Raspberry Pi interface and so can be run from your Raspberry Pi in conjunction with other amateur radio software.

But that's not all. The CD also contains a wealth of bonus information including the Information (front) section of the *RSGB Yearbook 2018*. There is further information and software from five other countries. Overall, this CD is packed with fantastically useful information and should never be far from your computer.

The information is available in two versions, a USB memory stick or a CD, both at the same price.

ISBN (memory stick) 9781-9101-9343-3, ISBN (CD) 9781-9101-9342-6, Published by ITFM
Non Members' price £16.99, Members' price £14.44

Deluxe Logbook & Diary 2018



So much more than just a logbook, the *Deluxe Logbook and Diary 2018* contains a wealth of carefully-selected information that you need at your fingertips when you're operating. Reference material like the DXCC prefix list, a locator map, band plans, major contests – it's all here.

There is, of course, a full logbook section. Unlike some other logbooks, the spiral binding means that the pages lie perfectly flat on your work surface. And the handy diary makes it easy to make a note of skeds or any other pertinent information.

210 x 255mm, ISBN 9781-9101-9344-0, Published by RSGB
Non Members' price £4.99
Members' price £4.24

All these items can be purchased at the National Hamfest on 29 and 30 September. Each Yearbook purchased at the National Hamfest comes with a free document bag (or spend £20 on other books to get a free document bag). Limited to the first 100 customers each day, whilst stocks last.

RSGB Staff
radcom@rsgb.org.uk

The HB0/GM4UYE Liechtenstein DXpedition 2017

General view of the Chalet Panorama site and our aerials.

Once a year, Stirling & District ARS goes on a trip away. It encourages team working and develops the skills of newly licensed members for portable and general operation. This year we decided to go to Liechtenstein.

Why Liechtenstein? Well, it was well sought after by GM and other areas, it was somewhere different and we could drive there with all our gear. Prior to making any formal plans, I contacted the Liechtenstein Authority: although part of CEPT it's still a requirement to let them know we were attending. A few points were clarified by them; they permitted supervision so one callsign could be used, they permitted Intermediate licence holders to operate under supervision or on their own as HB0Y/ and they also quizzed the # symbol on the new Ofcom licence where the Regional Secondary Locator is placed if necessary. The Liechtenstein Authority stated that if the callsign is used as GM4UYE in the UK then to sign HB0/GM4UYE including the secondary locator, it is of note that in our licence conditions it states that the host country requirements supersedes that of Ofcom's provisions. After we ironed out the licensing details then it was onto the venue.

When looking at Liechtenstein it is surrounded by mountains so, when picking a base, we had to look for one that had a clear take off to Scotland (GM). After some searching we found Chalet Panorama on Airbnb. This chalet is located in Triesnberg and is approximately 1200m above sea level. The owners are very ham friendly and it has some stunning scenery.

The stations

We decided to take three stations. Station 1 was an IC-7300 and KPA amplifier for 6m with a 6-ele homebrew beam. This was turned using a lightweight TV rotator. Station 2 was an IC-7300 and Acom amplifier with a hexbeam for 10/12/15/17/20m. Station 3 was another IC-7300 and Acom amplifier and dipole for 30/40m.

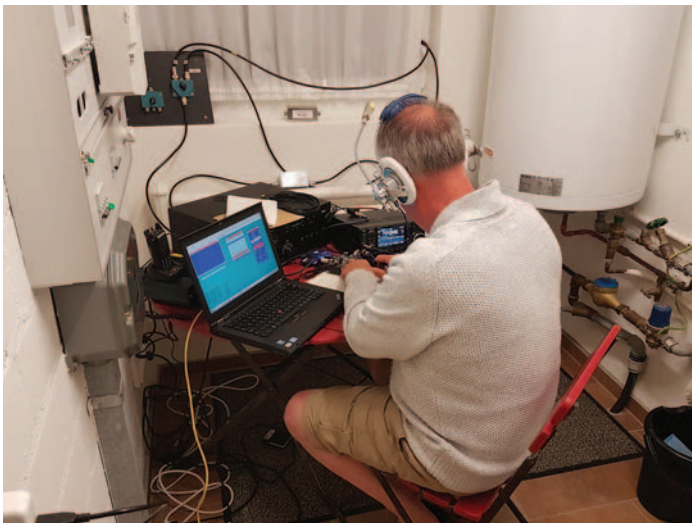
Four weeks before the trip we made up all our coax jumpers and coax run that we got from ML&S at a discount as it was for a club trip. We installed all the software onto our laptops and had all the rigs speaking to the laptops. The IC-7300 is great as only one USB cable is needed. We also decided that our trip was to help raise awareness and fundraising for Glasgow Sick Kids Hospital Charity (Yorkhill) where people have the option to donate when requesting our QSL card. Charles, M0OXO is our QSL manager and provides a great trusted service for this type of work.

The route to Liechtenstein

Now that we had the venue booked it was a case of planning the route.

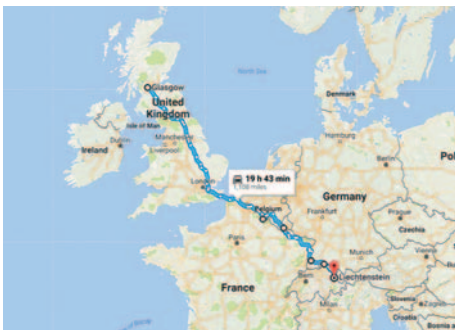
The route involved going from Dover to Calais, then heading towards Lille. Then into Belgium, around Luxemburg City, into Germany passing Stuttgart and thereafter

John, MM0JZB.



Rab, 2M0DRO.

Left to right MM0JZB, MM0OBT, GM4UYE, MM0MYL, 2M0BYS, 2M0DRO, MM0OKG and GM0OBX.



Google said 19 hours for the trip. We took 31.

into Austria and down into Liechtenstein. Google said this to be about 19 hours.

The time came on Tuesday, 30 May, where we packed all the equipment into the camper van having decided to use it and car for the 8 of us. At 8.30pm we left central Scotland and headed for Dover.

Travelling around the UK at night isn't the hardest and we arrived there for our 7.30am sailing to Calais. A quick breakfast and some sleep and we were in France. We travelled through France into Belgium and then Luxemburg (that had the cheapest fuel costs in all of the countries visited) and then into Germany. Here we got caught in a traffic jam that took about 1.5 hours to travel 2 miles. We finally got at to the chalet about 3am, 31 hours later, *not* the 19 we had hoped! The number of fuel stops and short comfort breaks all added up, along with slight driver error on specific exits. Upon arrival it was some sleep and up early for station assembly.

Getting on the air

Once the stations were fully complete we started on air. The 6m band was jumping and so were the HF stations. Propagation was strange in HB0. The 40m band would be open for 20 minute slots and then shut for 40 or so minutes and 30m was very similar. Unlike the UK it was hard to define when the bands were open and closed. We had some cracking runs on 12 and 10m, working ZL, KH and JA.

After a day or so operating it was apparent that no matter which way we pointed our beams, the signal strengths from stations would be the same. This was the same for 6m. Turning the beam into the direction of the country wasn't working out. The beams had to be pointed towards the hills using 'hill bounce'. We were getting told on air 'JA and BD were calling you lots' but there was simply no copy at our chalet. The hills and mountains there were definitely playing a major part in which way signals were being refracted for transmit and receive.

Whilst on air we spoke with Max, HB0/ON5UR who was operating further up from us. We invited him for a visit and he popped by to say hello and express his best wishes.

We experienced some lovely weather and also some thunderstorms that put a halt to our operating. Over five days we managed around 5000 QSOs including 500 on 6m. It was a very successful trip and everyone learned something new – the biggest learning curve being the antenna direction and mountain influence. In future we will stick with verticals when at a similar QTH.

Should you want to find out more about our station and donation page please visit www.qrz.com/db/hb0/gm4uye

Billy McFarland, GM0OBX
gm0obx@yahoo.co.uk

Audio splitter

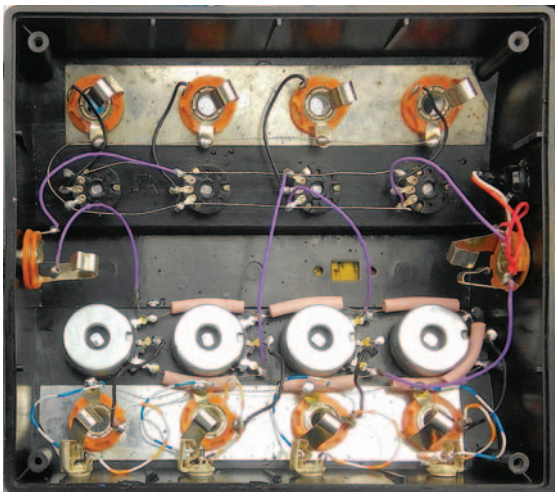


PHOTO 1: Inside the audio splitter showing two banks of variable resistors and socket sets (see text).

I am a bit deaf and at special events I can have trouble hearing incoming audio. This also happens when others are speaking nearby, for example at the club shack. So I tend to wear headphones – which are great for me but shut everyone else out from the receive audio. Not quite what you want when running a demonstration station.

The answer we found is the very simple audio splitter box described here. It takes high-level audio from the loudspeaker output of the radio and splits it into four (or more) mono outputs, each with its own volume control for convenience. In order to maximise flexibility, we put both 3.5mm and 1/4" (6.35mm) sockets on each output.

The circuit diagram is shown in **Figure 1** and **Photo 1** shows the internal construction. The device was built into an interestingly-shaped case from the junkbox that already had one 1/4" socket at one end. We added another on the other end, so that audio could be looped straight through. It was convenient to add eight outputs in this enclosure. The larger, metal-cased variable resistors at the bottom of Photo 1 are 100Ω and each is connected in parallel across the audio input. The wiper of each variable resistor feeds paralleled 3.5mm and 1/4" (6.35mm) mono sockets so that either size of plug can be used on each output channel.

As the variable resistors are driven directly from the loudspeaker output of the radio they act as four 100Ω resistors in parallel when no headphones etc are connected, meaning that the radio sees a load of 25Ω. When headphones or speakers are connected, the radio sees a lower impedance that depends on what's plugged in and the position of the volume controls. Most modern headphones are typically about 32Ω so if four sets are plugged in and all the volume controls are at maximum, the minimum load presented to the radio will be about 6Ω. This will be significantly less if lower impedance headphones, or loudspeakers, are used. Note that the variable resistors are only fairly low power devices so the audio splitter should not be used with audio sources capable of delivering more than a couple of watts or so.

Our prototype (**Photo 2**) also contained four higher resistance, physically smaller variable resistors (at the top of Photo 1) that are coupled to 1/4" mono sockets. This lets the device connect 'line level' equipment to the audio system. We have used this unit very successfully with a bhi noise eliminating speaker with internal amplifier when running demonstration systems: the operator can hear the full range of signals and noises, which their experience will let them filter 'by ear', whilst the public benefits from the noise reduction provided by the bhi system.

The great thing about the audio splitter is that I can use headphones at whatever volume setting I want without significantly affecting the audio fed to others. I get to hear just the radio audio, without distractions, whilst others can engage with visitors to explain what's going on. Once you get it all set up it works very well.

As described, this system uses mono sockets throughout. If you prefer you can wire up stereo sockets in 'mono compatible' mode, connecting just to the tip and ring, as shown in **Figure 2**. This will mean that stereo or mono headphones can be plugged into the socket and will work just as well. But be aware that you shouldn't use this method to connect to a stereo device such as an amplifier or sound card using a stereo lead because the wiring will be wrong. A mono to stereo lead should be used in this instance, with the mono side plugged into the splitter.

This project was developed by members of the Bedford and District Amateur Radio Club, with particular help from Vince Maund, G8CZP.

PHOTO 2: Outside view of the completed unit.

FIGURE 1: Circuit diagram of the audio splitter. Four output channels are shown but this can be extended as required. For (additional) high impedance 'line level' outputs described in the text, use variable resistors of anywhere between 1kΩ and 100kΩ or so – the value isn't critical.

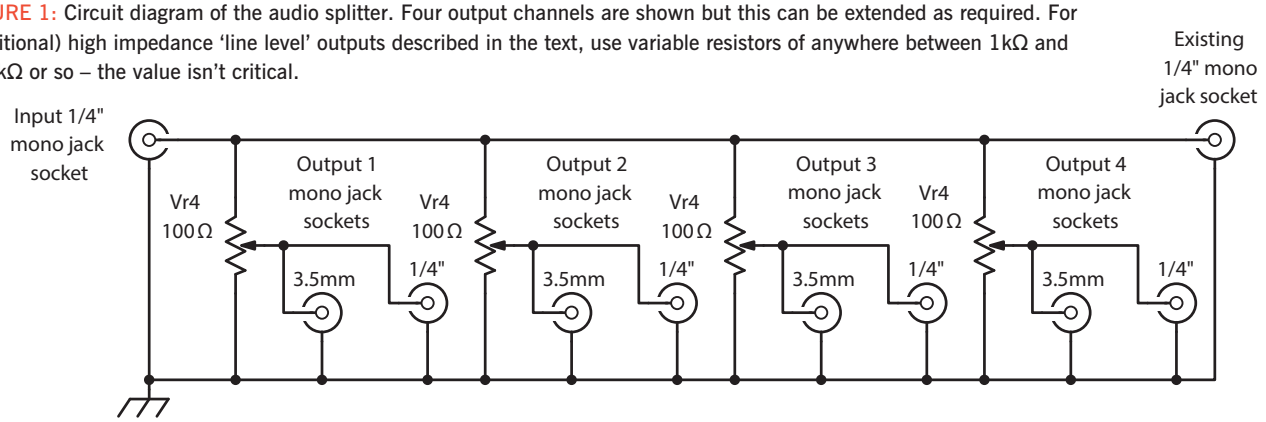


FIGURE 2: Wiring a stereo socket (with break contacts, not used) for 'mono compatible' mode. The connections go to the 'tip' and 'ring' contacts, leaving the 'sleeve' and switch contacts unconnected.

Glenn Loake, G0GBI
glen.loake@ntlworld.com

Get rid of noise and interference and enjoy "stress free" listening with bhi DSP noise cancelling product!

bhi

NES10-2 MK3

Amplified DSP speaker:

- Rotary filter select switch
- 8 DSP filter levels 9 to 35dB
- 5W input & 2.7W audio out
- 3.5 mm mono headphone socket
- On/off audio bypass switch
- 12 to 24VDC (500mA)

Simply plug in the audio and connect the power!

DSPKR

10W amplified DSP noise cancelling speaker

- Easy control of DSP filter
- 7 filter levels
- Sleep mode - Filter select & store function - Volume control
- Input overload LED
- Headphone socket
- Supplied with user manual and fused DC power lead

NEIM1031 MKII

Amplified in-line DSP module:

- Full user contrrol
- 3W audio - Speaker & line level inputs and outputs - Easy to use
- Use with a speaker or phones - 8 filter levels 9 to 35dB - 12 to 24VDC (500mA)

Compact In-Line

Compact handheld mono/stereo in-line DSP noise cancelling unit

- Easy to use rotary controls for all functions - New improved DSP noise cancelling - Use with mono or stereo inputs - 8 filter levels 9 to 35dB - Ideal for portable use & DXing
- Use with headphones or a small speaker -12V DC power or 2 x AA batteries
- Over 40 hours battery life
- Size: 121mm x 70mm x 33mm
- Suitable for use with Elecraft K3 & KX3

Dual In-Line

Mono/stereo DSP noise eliminating module

New improved DSP noise cancelling

- 8 Filter levels 8 to 40dB - 3.5mm Mono or stereo inputs - Line level in/out - 7 watts mono speaker output - Headphone socket - Easy to adjust and setup - Ideal for DXing, club stations, special event stations and field day events - Supplied boxed with user manual and audio/power leads - Suitable for use with many radios and receivers including Elecraft K3, KX3 & FlexRadio products

Revive your old radio or speaker with a bhi DSP install module: NEDSP1061-KBD low level audio module or the NEDSP1062-KBD amplified audio module!

ParaPro EQ20 Audio DSP Range *New!*

- 20W Modular Audio Power Amplifier
- Parametric Equaliser
- bhi Dual Channel DSP Noise Cancelling
- Bluetooth technology

Flexible, intuitive and easy equalisation for enhanced speech intelligibility

DESKTOP

- 10W amplified DSP noise cancelling base station speaker
- Rotary volume and filter level controls
- 8 filter levels 9 to 35dB
- Speaker level and line level audio inputs
- 3.5mm Headphone socket
- Size 200(H)x150(D) x160(W)mm, Weight 1.9 Kg
- For use with most radios, receivers & SDR including Elecraft & FlexRadio

Shape the audio to suit your ears!

bhi Ltd, 22 Woolven Close
Burgess Hill, RH15 9RR, UK

Tel: 01444 870333 www.bhi-ltd.com

VISA PayPal MasterCard

EA&O

FoxRex 3500
ARDF Receiver

The FoxRex 3500 is an 80m amateur radio direction finding (ARDF) receiver that is made in the Ukraine. Ukrainian DF receivers have long had an excellent reputation in DF circles but have previously only been available by finding an individual prepared to sell one to you.

The FoxRex 3500 continues the tradition of a very high standard of mechanical construction with the addition of many advanced features and is now available in the UK through KMK UK (www.mixw.co.uk).

It is, in fact, based on the advanced 80m receiver designed by Nick Roethe, DF1FO (http://df1fo.darc.de/indexeng.html). He ceased to provide PCBs for his design in 2010 and now KMK UK Ltd are stocking a fully built version. The main difference is that this new offering uses a loop rather than a ferrite rod for the H field antenna, very much in the Ukrainian tradition.

PHOTO 1: The FoxRex 3500 is pictured on top of the orange carrying case. The robust pair of headphones are on the left, the E field whip on the right and the (EU plug) mains power supply is at the top. The manual is not pictured.

Ergonomic design

The receiver is housed in a garishly coloured carrying case (**Photo 1**) that more or less guarantees that you will never leave it behind in a forest as a result of it being obscured by leaves etc. The excellent ergonomic design of the FoxRex 3500 can be seen in **Photo 2**. The forefinger and middle finger are resting on two coloured buttons (coloured blue and green) that control the 'sense' circuitry. The button labelled B is actually green and the one with the F label is blue. The thumb is able to reach a biased toggle switch that selects normal operation/menu/attenuator control. The thumb can also operate the rotary encoder that has a push switch.

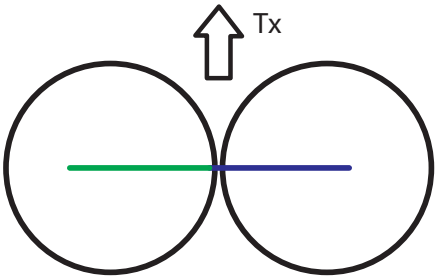


FIGURE 1a: Null mode. Signal null is obtained at right angles to the plane of the loop. Green and blue lines show the orientations of the two side of the loop antenna.

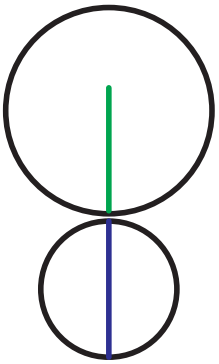


FIGURE 1b: Maximum mode. The loop is rotated by 90° and the green button is pressed. This gives a maximum in the direction of the green half of the loop. Hence the 180° ambiguity of the null can be resolved. If the blue button is pressed, the maximum is in the opposite direction.

How it works

The basic principle of a hand held HF DF receiver is to use either a loop or a ferrite rod to act as the main receiving antenna, sensing the H field component of the incoming signal. A ferrite rod will show a sharp null when the rod points at the transmitter and a loop shows this sharp null at right angles to the plane of the loop.

This sharp null is bidirectional as shown in **Figure 1a** and hence the directional result exhibits an ambiguity of 180°. This ambiguity is resolved by having a short E field antenna (whip) and then adding the output of the whip to the output of the loop. This causes the directivity of the combined antenna system to become stronger in one direction than it is in the other as shown in **Figure 1b**.

The FoxRex 3500 introduces a novel feature by colour coding each half of the loop and then having two push buttons to press. These buttons add the signals from the two antennas with one phase using the green button and then the opposite phase using the blue button. With the blue button pressed the maximum signal from the hidden transmitter will be received when the blue side of the loop is pointing at the transmitter and similarly when the green button is pressed and the green half of the loop points towards the transmitter.

In operation this means that the competitor first finds the direction of the null, turns the receiver through 90° and then presses the blue button and then the green button in turn.

The coloured button that gives the loudest signal signifies that that same coloured half of the loop is pointing at the transmitter. Hence the 180° ambiguity is resolved.

Audio S-meter

The receiver has an audio S-meter facility. Audio S-meters are something most people either love or hate! On the positive side, the human ear is more sensitive to a change in frequency than it is to a change in amplitude. An audio S-meter (the circuitry converts the amplitude of the signal to the frequency of an audible tone) is capable of making a 1dB change in signal strength detectable. Using the amplitude of the signal alone, a change of about 3dB is needed before it is recognised.

In the FoxRex 3500, the audio S-meter has to be selected in the menu and then it only works if the signal is strong enough to give a 50% reading on the S-meter bar-graph. This is quite useful since merely turning the gain down is sufficient to disable the audio S-meter.

In operation, a low pitched tone is introduced but when the transmitter keys on, the frequency of the tone increases by an amount dependent on the strength of the signal. Strong 'key clicks' are introduced as the transmitter keys and at least this gives a very distinctive and easily recognisable signal.

There is one problem with audio S-meters and that is they do not work very well if there is more than one signal present. During the testing of the review receiver a non-compliant installation (non-compliant in EMC terms to the European Community EMC directive) was within range and this noise source combined with the signal from the Fox, to give an inaccurate bearing to the transmitter. Without the audio S-meter operating, the keying from the wanted transmitter could be heard and a better bearing obtained by focussing on this signal alone.

In competition

Every experienced ARDF competitor, at some point in a competition, has been running down the bearing towards a 3.5MHz fox. In the four minute period that the hidden transmitter is off the air in Classic races, the competitor has passed the fox but has the same bearing for the signal null and just carries on running in the same, now wrong, direction,

On the FoxRex 3500 there is a feature called F/B-Zoom that allows a single button press to confirm that the wanted transmitter is still ahead. When the setting 'F/B-Zoom' is selected an audio S-meter 'tone' is generated (providing the signal gives more than a 50% reading on the bar graph S-meter) when you press the button with the stronger signal being received. In other words, when the tone appears, the colour of the button you are pressing is the direction indicated by the same coloured side of the loop pointing towards the transmitter. If this is the colour pointing in the original direction of the transmitter, a quick press on that coloured button has confirmed that the transmitter is still ahead, by the appearance of the distinctive audio S-meter tone.

The stated reason for the F/B-Zoom feature is to make the decision over the resolution of the signal null ambiguity, easier to resolve. I found a straightforward audio comparison worked well without needing this feature and the difference between the strength of the signals in the blue direction and the green direction was always very clear.

Changing rules for ARDF competitions have meant that Sprint and FoxOring competitions deploy transmitters using different frequencies. A sprint race will have four different frequencies in use. The FoxRex 3500 allows up to four frequencies to be pre-programmed into the receiver. Changing frequency is accomplished by a double press on the encoder knob. This changes the frequency to the next one in memory. Frequency 4 (when 4 are programmed) is changed to frequency 1. The frequency can be tuned in 100Hz steps so that it can be trimmed slightly during the competition if the transmitter is not exactly on the published frequency. The use of a synthesiser means that there are no issues with frequency shift as the battery voltage changes.

Another 'feature' of a conventional receiver in a competition is that as the competitor gets closer to the transmitter the gain has to be turned down. Sometimes in a well designed receiver this can be done with the thumb of the same hand that is carrying the receiver. In the FoxRex 3500 an automatic attenuator is provided that cuts the gain in 5dB steps when the S-meter reaches full scale. The S-meter is a bar graph on the liquid crystal display (LCD). Once the transmitter is found, the automatic attenuator needs to be disabled so that the receiver comes back to full sensitivity to hear the transmitters that are still required. This can be done by operating the toggle switch (with the thumb) and waiting a second or two.

This automatic attenuator has a distance estimation feature included. By entering the power of the hidden transmitter (5dB steps from 30nW to 30W) an estimate of the distance to the fox in metres is displayed on the small display.

PHOTO 2: The excellent ergonomic design of the receiver.

The final group of features are focussed on helping the competitor with the timing by showing which hidden transmitter is on the air and how long it will remain transmitting. This needs the competitor to set the internal clock at the instant of starting the competition. The feature can also give a useful alarm tone with 12 seconds before the end of the transmission. This setting can be adjusted in the range 1 to 30 seconds. The UK licence conditions require that unattended transmitters send the callsign of the operator who is responsible for the transmitter and this is done shortly before the transmitter ceases to send. Hence this feature of the FoxRex 3500 is rather redundant in the UK but useful when competing on the Continent.

Accessing the top level menu with the toggle switch is a rather non intuitive feature. You need to know that the top level menu information (frequency, clock and battery voltage) is only visible for two seconds before the receiver reverts to the level 2

Bob Titteringon, G3ORY
g3ory@lineone.net

TABLE 1: Comparison of the maximum range at which a standardised signal could be detected.

Receiver	Distance to 'just detectable' signal
PJ80 direct conversion Rx	150m
TCA440 superhet (PA0HRX)	1050m
OK2BWN Superfox 3.5GX	1300m
FoxRex 3500	1300m

TABLE 2: Range indication tests out to 50m with TX sending 3 watts and the setting of TX power assumed by the receiver as shown. Range shown when the 'jingle' sounded.

Range change	Dist to Tx 3W	Dist to Tx 10W
100 >		50m
50 > 30m	47m	40m
30 > 20m	38m	33m
20 >10m	31m	21m
10 > 5m	19m	5m
5 > 2m	3m	

menu described in the handbook. If the user switches to 'menu' and then looks at the LCD screen it is probably too late to see anything. Look at the screen as the switch in moved to the menu position and the data will be visible for a moment. Once the user knows what to look for, this is quite sufficient.

Testing

Looking now at a technical assessment. In FoxOring competitions with very low power transmitters, sensitivity is king. The usual rules about the band noise on 80m always overriding the receiver noise do not necessarily apply when a very inefficient small loop antenna is used. Previous Ukrainian receivers have always had excellent sensitivity. Sensitivity is dependent on the bandwidth of the receiver and the FoxRex is specified as 1.3kHz at 6dB down, which is a good compromise between getting good sensitivity without needing to have the tuning very precisely set.

Since 80m ARDF receivers have an integrated antenna and receiver it is far from easy to do meaningful comparison tests in the lab. Without an anechoic chamber it is much easier to simply do a range test by setting up a signal source and measuring the distance at which the signal is just detectable on a variety of receivers. The signal source chosen was a FoxOring transmitter with an extended 1.65m antenna. Distances at which four different receivers were just able to detect the signal are listed in the **Table 1**.

TABLE 3: Range indication tests from 500m down to 50m with transmitter sending 3W and the FoxRex set to 3W transmitter. Range shown when the 'jingle' sounded.

Range change	Dist to Tx 3W watts
500 > 300m	280m
300 > 200m	190m
200 > 150m	120m
150 > 100m	90m
100 > 50m	50m

With a FoxOring transmitter (very low power) using a normal 325mm long antenna, the signal was just detectable at 130 metres using the FoxRex 3500. This is a most useful characteristic for FoxOring competitions and an excellent result.

The next most important characteristic is to have the best possible difference between the signals received in the two directions of the loop 'null', with one of the buttons pressed (see Figure 1a). This is dependent on ground conductivity and there will be a height above the ground where this difference in signal strength is greatest.

Actual differences were measured between 15 and 20dB in the far field, which means that it is generally quite easy to decide which of the two directions of the null ambiguity, actually points towards the transmitter. The height above good conducting ground at which the best discrimination was obtained was about 1.3 metres. This is a good result around chest height for an adult. In the near field (for an electrically short antenna, this is a distance less than one wavelength from the antenna), the discrimination between the two directions of the ambiguity is much less good. In this respect the FoxRex 3500 is similar to many hand held ARDF receivers for 3.5MHz and typical of results obtained in the near field.

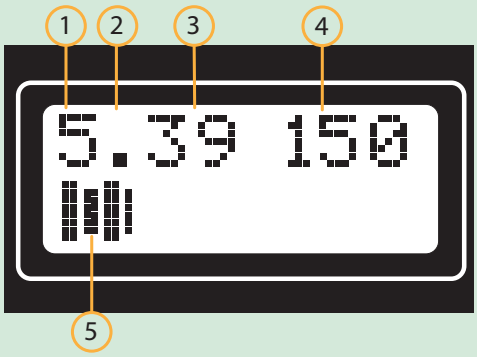
The distance estimation feature is potentially the most useful of the 'added' capability provided. To use this facility the transmitter power has to be set appropriately. In a test using a 3W ARDF transmitter with a vertical 8m wire for the antenna and an 8m wire as a counterpoise, the transmitter power was set to 3W. The automatic attenuator has to be enabled and as the transmitter is approached, the gain is reduced in steps of 5dB. Each time there is a gain reduction there is a short warning jingle in the headphones.

If the competitor then moves away from the transmitter, the gain of the receiver is not automatically increased and the range prediction is not updated.

It is possible for the competitor to obtain an 'updated' distance from the transmitter at any time, by waiting for a pause in the transmitter keying (keyed carrier is used for 3.5MHz ARDF), and quickly rotating the encoder anticlockwise with the thumb. When the carrier returns, the automatic attenuator will then operate and the current estimated range to the transmitter will be displayed.

The test results are in **Table 2**. The receiver was held with the plane of the loop pointing towards the transmitter but neither the green nor the blue sense buttons were pressed. The results are generally higher than the actual distances when the receiver

The small LCD screen is illustrated here, seen when in the main operating mode.



The first figure (1) shows the number of the hidden transmitter currently transmitting, assuming that the FoxRex has been pre-programmed with the total number of transmitters and the time at which the first one started sending.

(2) is particularly important. The number of dots displayed indicates which of up to four pre-programmed frequencies is in use. One dot for frequency number 1, two dots for frequency number 2 etc.

(3) shows the number of seconds remaining for the current transmission. This depends on synchronising the FoxRex internal clock with the competition clock.

(4) is the distance estimation to the transmitter currently being hunted. This assumes that the distance estimation has been turned on and this is a very important feature.

(5) is a visual S-meter.

was 'told' that a 3W transmitter was being used. Changing this setting to 10W gave better results.

A second test was carried out over a greater distance and **Table 3** shows these results. The transmitter again delivered 3W output and the FoxRex was set for a 3 watt transmitter. The results show that the predicted distances are a good indication of the true distances and the results are more accurate than is the case for the short range tests.

Ground conductivity, the presence of other conducting objects (as found in the back gardens of most amateurs) and near field effects all potentially influence the results. In international competitions there is an opportunity on the training day to choose the setting of the supposed transmitter power most suitable for the terrain.

Conclusions

The FoxRex 3500 is a superbly constructed DF receiver with excellent ergonomics. It has many features of which the range estimation is the most useful. The ability to store up to four frequencies and to adjust them in competition is also a very useful and desirable feature. It is a receiver for the experienced competitor or a beginner who aspires to a high level of competitive achievement. In both cases time needs to be spent learning the features and the associated memory settings. Much practice is required so that these can be implemented at competition speed and without having to look at the small screen.

With the plethora of 'features' the user needs to be selective to choose the ones that are of significant value to the individual. The settings can be optimised for the different forms of competition (Classic 5 transmitters, Sprint and FoxOring). The most valuable feature is the distance estimation, which is particularly good in the 50-600m range from the hidden transmitter.

KMK UK are thanked for providing the FoxRex 3500 for review.

Sport Radio continued from page 36

window is reserved for station running at 15WPM or less. The data (RTTY and PSK) session is on Thursday 28th. The rules of the Autumn Series are designed to encourage Foundation and Intermediate licensees into contesting, so expect more of them than usual to be active and please be supportive of them.

The VHF and Up bands

The 144MHz Trophy Contest takes place on the 2nd-3rd. There are five categories, three of them for single ops, so there are opportunities for all to strive and do well. **Photo 1** shows the antennas of last year's Open section winner, G8P. Overlapping the last three hours (and then continuing for one hour on its own), the fifth and final 144MHz Backpacker Contest takes place. Remember that in the Backpacker series the permitted power levels are now 5W and 25W. We then move into the Activity Contests, with the 2m FMAC and UKAC on Tuesday 5th, the 70cm FMAC and UKAC on Tuesday 12th, and the 6m UKAC on Thursday 14th. The Second 70MHz Contest is on Sunday 17th. Then it's back to the Activity Contests, with the 23cm UKAC on Tuesday 19th, the 4m FMAC and UKAC on Thursday 21st and the SHF UKAC on Tuesday 26th.

Best of the rest

The CWops CW Open is on Saturday 2nd. This contest has three separate 4-hour sessions and participants can enter any/all of them. The All Asian DX SSB Contest runs for the full 48 hours of the 2nd-3rd. The IARU 144MHz Contest coincides with RSGB's 144MHz Trophy Contest, so if you enter the RSGB event your entry will be submitted into the IARU event for you. You can opt out though. The Worked All Britain 144MHz Phone contest overlaps the other 2m events taking place on Sunday 3rd. The new series of UKEICC 80m contests starts this month, with an SSB session on Wednesday 6th. The series will run until next April. Don't forget the 60-minute submission deadline for logs. The second leg of the WAE DX Contest takes place for 24 hours over the weekend of the 9th-10th. This month it's SSB. Europe works non-Europe only. The UK Microwave Group (UKuG) have a contest on 24-76GHz on Sunday 17th. Also on Sunday 17th the BARTG have their annual Sprint 75 contest. All activity is at 75 bauds. Exchange a serial number only. The first of this autumn's CQ WorldWide contests is RTTY, on the weekend of 23-24th. On Sunday 24th the UKuG has a contest on 5.7 and 10GHz. The *Practical Wireless* 70MHz Contest takes place the same day. The CW leg of this month's UKEICC 80m series takes to the air on Wednesday 27th. Finally we come to this year's running of the UKEICC DX SSB Contest. It starts on Saturday 30th September and ends on Sunday the 1st of October. Exchange a signal report, serial number and UK/EI District Code, the signal report part of the exchange being optional. To encourage overnight activity all QSOs made by UK/EI stations between the hours of 0100 and 0459 are worth double points. Logs need to be uploaded within 24 hours of the contest end.

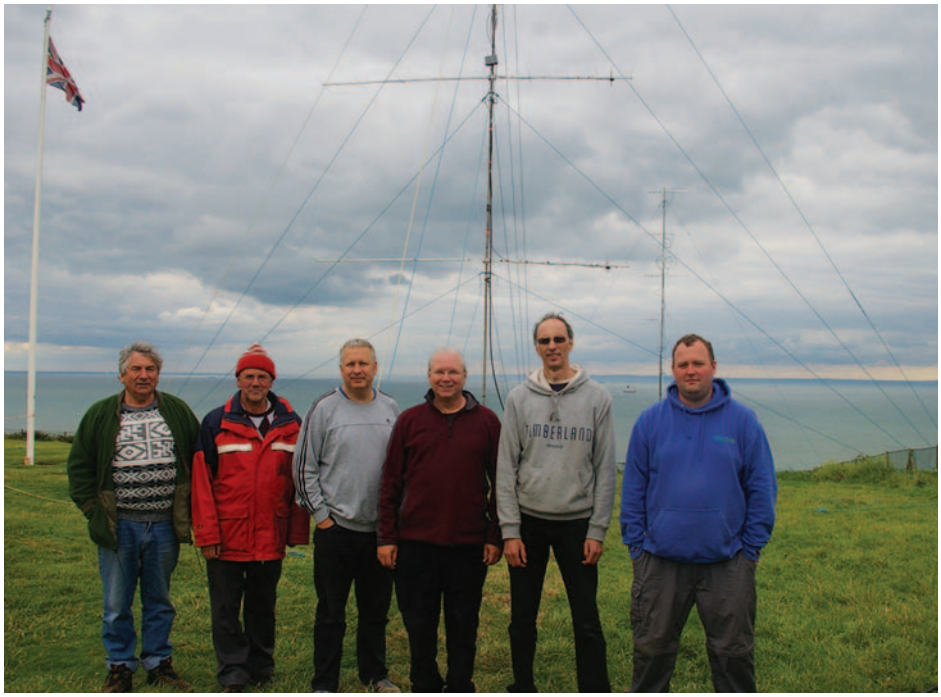


PHOTO 2: The G8P team who won the Open section of the 2m trophy Contest. France can be seen in the background. G0HFX, EI7FJ, EI3JE, EI3KD, G4CLA and M1DSE.

01922 414796 sales@radioworld.co.uk

RADIOWORLD

TRUSTPILOT

Opening Hours: Mon - Fri 9.00am - 5.00pm Sat - 9.30am - 4.00pm

WORLDWIDE DELIVERY UNBEATABLE PRICES FINANCE AVAILABLE

ICOM IC-7300
£1,199.00

Aesthetically, attractive looking base station, features a 4.3 inch touch screen colour TFT LCD screen with a high performance real time band scope.

FREE UK DELIVERY WHEN ORDERING THIS PRODUCT

Yaesu FT-991-A Transceiver
£1,299.00

"Purchase the FT-991-A + SP-10 together and get a cash back entitlement - £85.00"

FREE UK DELIVERY WHEN ORDERING THIS PRODUCT

FREE UK DELIVERY ON SELECTED PRODUCTS

New Releases from Yaesu

Yaesu FT-70DE
C4FM/FM 2m/70cm
Dual Band Handheld
£189.95

Yaesu FT-65E
VHF/UHF 2m/70cm
Dual Band FM
Handheld
£129.95

Yaesu FT-25E
2m Mono
Band FT Handheld
£89.95

Kenwood TS-480HX 200w
£699.95

TS-480HX HF/50MHz All-Mode Transceiver DX Distinction Creative Concept,Elegant Engineering,Tailor-made for DX' ing, the new TS-480HX HF transceiver raises the bar on portable performance. Despite its compact dimensions, it delivers an astonishing punch: 200W with a DC 13.8V supply.

Free Rock Jaw Over Ear Headphones Acero - Steel/Ebony Worth £49.96

Available Now!

Icom ID-51 PLUS2 Dual Band D-STAR Digital Transceiver

£449.95

The Icom ID-51A PLUS 2 is the third generation of the successful D-Star HT. Like the original ID-51A, it covers 2 meters and 440 MHz and receives two bands simultaneously (V/V, U/U & V/U). Output power is 5, 2.5, 1.0, 0.5 or 0.1 Watts. It is IPX7 waterproof and features a built-in GPS! The large 128x104 dot-matrix display is impressive. This radio has an astounding 1304 channel alphanumeric memory system.

www.radioworld.co.uk

YAESU K-PO RigExpert WHISTLER YUPITERU Uniden TONNA ELECTRONIQUE

Begali Keys www.i2rtf.com - pibegali@tin.it BAOFENG DIAMOND ANTENNA ALBRECHT KENWOOD

WATSON ICOM WEST MOUNTAIN RADIO TECSUN MFJ ...America's Best! TEN-TEC

LawMate UK ELECRAFT Cobra AnyTone and many more....

Part Exchange Buy In's Live Chat Blog Updates

Our Latest Used Equiptment

Icom IC-736 HF Transceiver With Auto ATU £599.00
Kenwood TS-850SAT HF Base Transceiver with ATU £699.00
Icom IC-775DSP HF Transceiver £1,399.00
Kenwood TS-570DG/E HF Transceiver £500.00
Kenwood TS-850SAT HF Transceiver £699.00
Alinco DX-70TH HF & 6m transceiver £399.00
Kenwood TS-870SAT HF Transceiver £799.00
Yaesu FT-990AC HF Base Station Transceiver £799.00
Icom IC-729 HF & 6m Transceiver £399.00
Yaesu FT-1000MP Mark 5 Field £1,299.00
Icom IC-7400 HF, 6m & 2m Transceiver £899.00
Icom IC-775DSP HF Base Transceiver £1,299.00
Yaesu FT-1000 200 Watt HF Transceiver £899.00
Yaesu FT-900AT HF Transceiver £549.00
Second Hand Icom IC-718 HF SSB CW Transceiver £439.00
Icom IC-718 HF All Band Transceiver £499.00
Kenwood TS-570DG/E HF Transceiver £539.00
Yaesu FT-897D Multiband Portable Transceiver £599.00
Icom IC-781 Multimode HF Transceiver £2,499.00

Kenwood TS-430S HF Transceiver £399.00
Kenwood TS-870SAT DSP HF Transceiver £799.00
Kenwood TS-570DG/E HF Transceiver £500.00
Alinco DX-77E HF Transceiver £399.00
Icom IC-7700 HF Transceiver with Built In Bandscope £3,995.00
Yaesu FT-950 HF Transceiver £799.00
Yaesu FT-450 HF Transceiver Without Antenna Tuner £399.00
Yaesu FT-450D HF/6m Transceiver With Antenna Tuner £449.00
Alinco DX-SR8 HF transceiver HF, 100W all mode £429.00
TS-590S Base Station HF DSP Audio Transceiver £899.00
IC-7410 HF/6M Ham Base Station Transceiver £949.00
Kenwood TS-990 Flagship Transceiver £4,395.00
Icom IC-7100 All Band All Mode Transceiver £799.00
Icom IC-7000 Multi Band Multimode Transceiver £699.00
Yaesu SM-5000 Band Scope £349.00
Icom IC-7410 HF Base Transceiver £949.00
Yaesu FT-950 HF Transceiver £829.00
Yaesu FT-857D Multi Band Mobile Transceiver £499.00
Yaesu FT-817ND All Mode All Band QRP Transceiver £449.00

All of our Used Equipment is tested and sealed with 3 months warranty for your piece of mind. We Part exchange and buy in your used equipment for cash. To find out how much your used equipment is worth please email sales@radioworld.co.uk with information of the item/s you have with the condition and photos so we can give you an accurate quote.

Yaesu FT-857D
Now comes with Separation Kit as standard
£689.00
Why not add a TX Modification for an extra £12.00.

Radioworld Ltd, 263 Walsall Road, Great Wyrley, Walsall, WS6 6DL

HF

Conditions should be improving over the next few weeks as ionospheric chemistry becomes more favourable but there has been DX to work even during the summer doldrums.

Cezar, VE3LYC on Pukapuka Island (OC-098) that was last activated more than 22 years ago.

Last month I mentioned that the Chiltern DX Club is sponsoring a tent at the 2018 World Radiosport Team Championship (WRTC) in Germany and I was reminded by Fred, G4BWP that there is a second UK sponsored tent in memory of Bob Carpenter, G4BAH, who became a Silent Key in 2016. Bob was the inspiration and owner of the massive M6T contest station in Suffolk, which is still in use. The G4BAH tent is funded by members of the M6T team. Dave, G4BUO, a member of M6T, will be talking about WRTC 2018 at the RSGB Convention this October.

The Technical University of Munich's Institute for Astronautics plans to set up a WSPR radio beacon in Antarctica. Apparently this will be the first time a permanent WSPR beacon has been set up to study propagation conditions from the bottom of the world. They expect the project to last 11 years for a complete solar cycle. It will start up in November 2017. A WSPR transmitter and broadband SDR receiver will cover 160-6 metres simultaneously and will upload heard signals to the WSPR database. DL5XL will maintain the setup. This should be very interesting.

At the other Pole, the CG3EXP WSPR beacon on board the expedition vessel *Polar Prince* has been heard on 20/30/40m while the ship moves through the Northwest Passage. The voyage is part of the celebrations for the 150th anniversary of the Canadian Confederation and is due to finish at the end of October.

IOTA

The IOTA Contest was held at the end of July and conditions were better than most people expected. 10m was alive with European Sporadic-E and 20m delivered DX from around the world. 15m was a little disappointing with no VK/ZL/JA but there were a few Caribbean and North American stations coming through in the afternoon. Highlights reported include: KH7XS worked by G3SVD and G8AJM on 20m around 0600UTC; JAs, BY, HS and DU also worked by G3SVD on 20; JA/BY/E2 worked on 40m CW by G3YYD around 2000UTC; VK5GR, BD7YK, JA6GCE, HS3NBR, E2T and BY4JN worked on 40m by G3SJJ between 1730 and 1930UTC; VK7GR worked on 40 by G8AJM; and YB5BOY, XF2L and JO7KMB worked by G8AJM on 20m.

IOTA expeditions have been running into problems over the last few months. During the spring, the Arctic Legends DXpedition was called off due to thin ice but last month the AS-022 trip was delayed because the ice was too thick! RI0Z from the Komandorskiye Islands was also cancelled due to transport problems. The RI0C team eventually made it to Iony Island in the Sea of Okhotsk but had immense trouble getting ashore through the waves and were forced to abort after 48 hours of activity. Poor propagation or screening by cliffs prevented RI0C being heard in the UK and much of western Europe. Other IOTA trips cancelled included Trindade and Sherbro islands. Andy, VK5MAV had transportation problems but was successfully on the air from OC-267 and OC-160 after considerable hardships; his write-up can be found at https://dx-world.net/the-vk9mav-story

Another successful trip was Pukapuka Island E51LYC by Cezar, VE3LYC, who will be talking about it at the Convention in October.

Grant, VK5GR will be on the air from Niue (OC-040) as E6AG from 14-25 September. His website can be found at http://e6ag.net.

Franz Josef Land will be on the air soon when UA4RX gets active as RI1FJ. He will be at the Ernst Krenkel Observatory on Heiss Island (EU-019) and will be on the air for a year.

Mike, VE7ACN will be active from Kayak Island (NA-157) as NL6/AA7CH from 18-28 August.

DJ6TF, DK1BT, DL4WK, DL7DF, DL7UFR, DL7VEE and SP3DOI will be active as VP2MDL from Montserrat (NA-103) on 6-20 November. They will operate CW, SSB, RTTY and PSK31 on 160-10 metres with two stations. See www.dl7df.com/vp2m/ for logsearch and OQRS.

DL3DXX, LB8DC, N7QT, N9ADG, SM1ALH, SM5AQD, SM5GLC and possibly two more operators will be active as VK9MA from Mellish Reef (OC-072) on 3-16 November. They will operate CW, SSB, and RTTY on 160-10 metres with five stations. The website for the DXpedition is being developed at vk9ma.com

The Radio Club of Djelfa (7X2VFK) with the cooperation of ARU (the Algerian Radio-Amateur Union) has announced the activation of Grand Cavallo Island AF-104 as 7Y7AI from 30 September to 10 October. Before that they expect to activate Rachgoun Island AF-094 as 7Y94I from 1-10 September.

A new attempt at activating Pajaros Rocks (SA-100) off the coast of Chile will take place in March 2018. More information will be available nearer the time.

Tony, KQ2I will be on the air as YJ0AT from 29 August to 14 September from Efate with 100W to a 30' vertical, mainly on CW. Apparently he would like honest signal reports rather than automatic 599s.

Other DX

Russian ops RM0F, R2AD and RC5A plan to be on the air from Kasane as A25BI, A25SP and A25BE respectively from 15-25 September. Activity will be on CW and SSB on 1.8 to 50MHz.

Steve, N6SJ is heading to Bhutan from

Chris Payne, G8AJM's IOTA Contest antenna at sunset.

Philip, 8Q7PW/G4PWO and one of his antennas.

12-19 October with an Elecraft K3 and KPA-500 amplifier. Apparently this will be a CW only 160m operation and his main focus will be North America West Coast.

Alan, KE4TA will be active as 9X0TA from Rwanda for three years so should allow many people to cross this off their lists. He will be on 20 and 17 metres and possibly also 80 and 40 – though he says noise levels are very high.

Correspondence

Ken, CT7AGZ says that at times last month he thought his antenna had turned into a dummy load so poor were the conditions. But he did find some DX: 10m – ZD7BG; 15m – LU and PYs; 17m – LU8ENU, EA9HU, 4U1ITU, TY2AC, ZX2M, TF5B, ZS2I, VK4CAG; 20m – PJ2LS, YV5FRD, EA9HU, A92GE, 3B9FR, HI8CJ, PY2DNR, SO1WS, KH0/KW2X; 30m – TX5EG.

Fred, G3SVK also found conditions abysmal: 10m – Europe (Sp–E); 20m – LU4AT, 9J2BO, OJ0V, 8N4HQ, OH0/DL1SVA/P, OD5PY, NP2X, ZD7BG, ZP6CW, KP2/N5PV, A71EM, JT5DX, OH0Z; 30m – 9Q6BB, 9V1YC, OJ0V, PZ5RA, KP4JRS; 40m – J68JD, VK3CWB, V4/KE1B, OH0/DL1SVA/P, OJ0V, 9K2NO, YW450ARV, C31US, HB0/PC2L, FY5KE, VU2GSM, TI5/K3KS.

Gordon, G3PXT downloaded the new FT8 software as soon as it was released and has already worked 94 DXCC entities on the mode using a low 20m dipole. His FT8 QSOs included: 20m – A65DC, 4S7AB, J69DS, WP4JT, AP2AM, A45XR, ZP6ARO, JT1BU, OJ0V, HB0WR, JAs, YI3WHR, YBs, VUs, VRs, SU9JG, HK4SAN, BG4DRL, VK9VKL, ZF1EJ, VP9NM, A92AA, WL7SJ, OY1DZ, SO1WS; 17m – LU8ENU, TY2AC, VP8NO, TR8CA, OD5PY. He was trying for DXCC in a month but just fell short.

Peter, G3HQT took time off for a holiday but found TG9ADM and TX5EG (OC–064) on 30m and 9M6XRO on 20m.

Peter, G4XEX is still working on his planning appeal so his beam remains at ground level (or thereabouts). He noted a lot of Sporadic–E on 10m and quite a bit of DX on 20 including: on CW – J68DG, KH7B, SU9JG, XW4XR, ZL4TT, 3B8CF, P40X and on SSB – 6V5J, HS0ZIA, B9HQ, PJ4DX, HC1JQ, TL2K, VP8LP, VP2ETE, HD086QRC, A25JK, V51WW.

Andy, M0NKR also found some DX on 20m: T32AZ, V6J, VU2CPL, A43FD, A25JK, 8Q7PW, VU3NXI, VP8LP, plus EP2LMA on 40.

Chris, G8APB was busy on 17m JT65 and FT8 working many JAs and DU6GG, with ZS6ZP on 20m. He also worked half a dozen JAs on 6m on 5 July – though that is outside the scope of this column.

Finally – thanks as always to my correspondents, to DX-World, 425 DX News and Daily DX.

TABLE 1: 2017 Worked DXCC entities (ranked by All) showing Top 3 from RSGB or British Isles table in Club Log plus submitted scores or Club Log scores of recent correspondents where available.

Call	CW	SSB	Data	All
M0IKW	155	101	41	248
G4TUK	167	152	158	247
M0NKR	177	194	35	244
G4PTJ	194	98	0	243
G3SVD	157	160	50	227
G4IDL	178	0	34	185
GI4DOH	181	8	60	184
G3PXT	92	105	142	184
G4XEX	124	107	103	180
G3HQT	171	0	0	171
CT7AGZ	168	-	41	170
G3SVK	154	0	0	154
G8APB	72	57	64	107

TABLE 2: Forthcoming DX activity.

1 Aug – 31 Nov	HC8/G8OFQ
15 Aug – 5 Sept	TX5EG (OC-046)
16-25 Aug	TX5EG (OC-013)
17-22 Aug	A35JP/P (OC-191)
18-28 Aug	AL6/AA7CH (NA-157)
29 Aug – 14 Sept	YJ0AT
1-10 Sept	7Y94I
14-25 Sept	E6AG
15-25 Sept	A25 operation
16-28 Sept	5T5OK
18-22 Sept	FP by CUWS ops (NA-032)
26-30 Sept?	RI1F (EU-190)
30 Sept – 10 Oct	7Y7AI
12-16 October	VK5CE/8 (OC-198)
12-19 Oct	N6SJ in Bhutan
23 Oct – 6 Nov	VK9CZ (OC-003)
1-4 Nov?	Baiyah Island (AF-111)
3-16 Nov	VK9MA (OC-072)
6-12 Nov	OC-216 by VK5CE
6-20 Nov	VP2MDL
Early 2018?	D2 IOTA (AF-108)
Early 2018?	3Y0Z Bouvet (AN-002)
March 2018	Pajaros Rocks (SA-100)
10-20 Mar 2018	9M0W Spratly (AS-051)
April 2018	St Brandon by F ops

Martin Atherton, G3ZAY
g3zay@btinternet.com

ICOM

ID-4100E

VHF/UHF DIGITAL D-STAR TRANSCEIVER

A Great New Compact User-friendly Dual-bander

- Terminal and Access Point Modes
- Intuitive User Interface
- Full Matrix LCD
- Bluetooth Operation
- Fast Data Mode
- Voice and Data Storage
- Integrated GPS Receiver
- Wideband Receiver
- Selectable Screen Colours

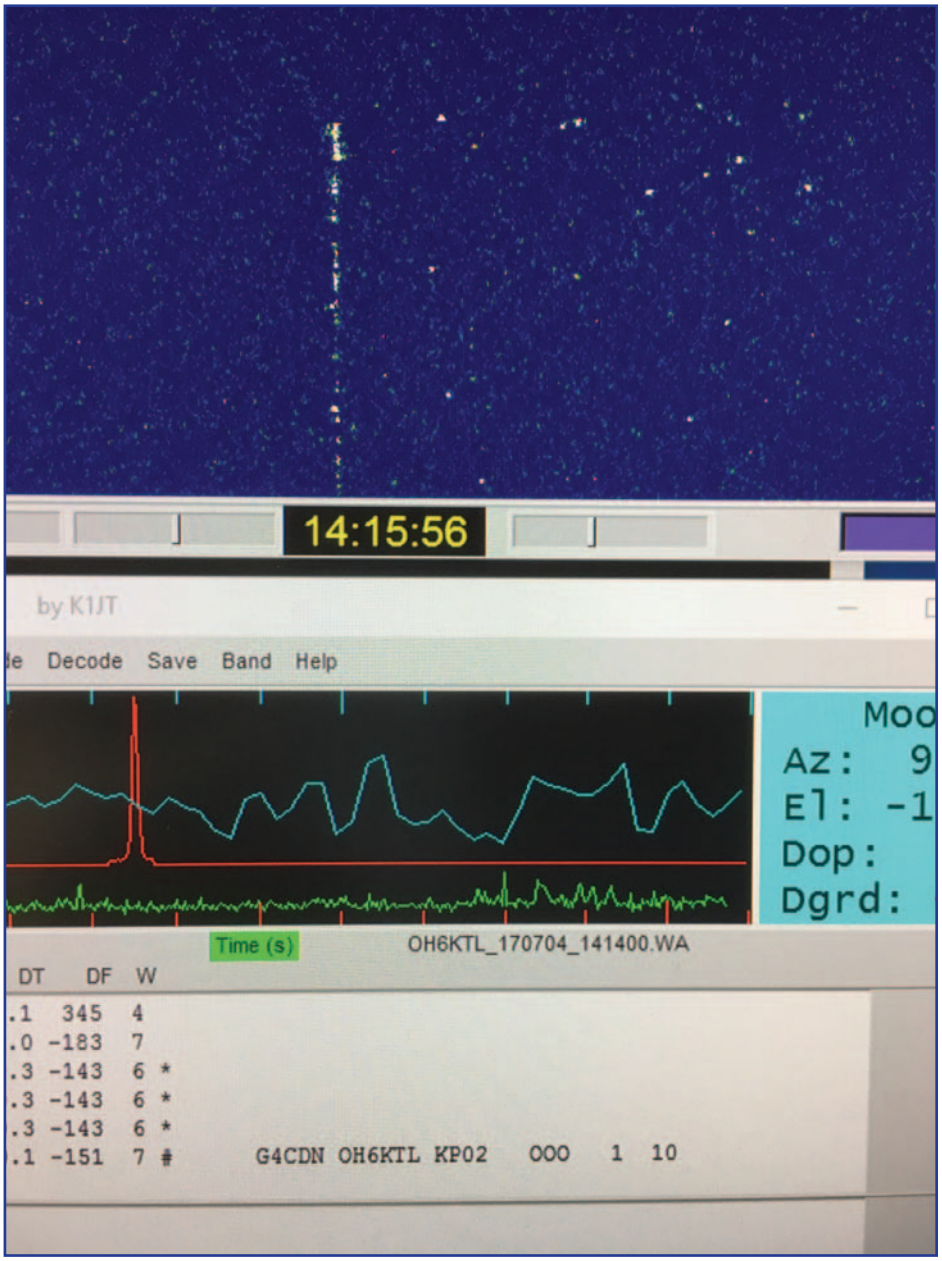
* Will only work through an ICOM D-STAR repeater enabled with G3 Software. NB: MBF-1 Mounting bracket is sold separately.

Count on us!

ICOM-UK Blacksole House, Altira Park, Herne Bay, Kent CT6 6GZ.
Telephone: 01227 741741 Fax: 01227 741742 e-mail: sales@icomuk.co.uk website: www.icomuk.co.uk

VHF/UHF

A bumper month of correspondence from readers with mixed results after June's Sporadic-E bonanza.



2m Ionoscatter signal from OH6KTL at G4CDN.

Dave, G7RAU/P says he worked fantastic DX on his holiday trip down to The Lizard (IN79). From 3 to 16 July, Dave completed 28 tropo QSOs down to The Canaries (EA8) on 4m, 2m and 70cm. Dave also worked CT3 on 2m and heard CU3 on 70cm. During the trip there were some really big signals from EA and CT1 was heard again on tropo taking advantage of the sea ducting to the south west. At times he could also hear all the French beacons in IN92, JN12 etc but sadly there was no activity. In an opposite direction he worked GM in Tropo from The Lizard. No Sporadic-E (Es) on 2m but lots worked on meteor scatter. He had QSOs on 23cm with F and G stations and on the last day heard EA2TZ/B peaking 599++. In the end, 256 QSOs were made.

Dale, 2M0WDG reports that had it not been for the last week there would have been nothing to report at all, except a 2W 6m activity night QSO with GM4JJJ (IO86GB) from Traprain Law (IO85PX) at around 30 miles. He only heard a single station on the 4m contest day, but MM0ZBH was very hard to hear so no QSO was attempted. However, that was before the 18th when 6m was open for about 6 hours. "I had hit a small opening on the 16th, where France was available and I managed to work two French stations on phone. On the 18th, the band was certainly wide open, allowing me phone contacts into The Netherlands, Germany, Slovenia, Italy, Spain and Portugal. Data modes additionally brought in Iceland and San Marino. It also gave me the chance to actually work MM0ZBH, although still very weak. The 19th was very much poorer, but for a time, 6m was open to the Czech Republic and Slovakia using JT65. New data mode FT8 was used on the 18th and while I still have not made up my mind on it, it did allow some quick QSOs with German, Spanish and Italian stations. The novelty of the month has been, of course, the SSTV transmissions from ARISS. Much to my surprise, with a cheap 2m/70cm white stick, I was able to gather six images of reasonable quality on the first night of the 20th into the 21st."

The *CQ* WW VHF Contest saw Bill, VE3CRU participate with partner VE3JAR. It looks like they managed a 1970kn contact between FN03vx to EM14ke. Bill also worked, via EME, the VC2EME expedition to Northern Quebec (FO10le). It took some time with the large pile-up but was a new one.

Ken, G4APJ (IO83) noted 9K2NO (Kuwait) on 50MHz at 0551UTC with UN6T, UN7TW, UN8GC (Kazakhstan) and T77C (San Marino, not far but unusual) later in the day. All heard, but none worked using WSJT-X RC1 JT65 mode. He worked lots of stations using the new FT8 mode, the best probably being EA8YV in IL18.

John, G4SWX (JO02) has had a lot of Es QSOs plus some EME, meteor scatter (MS), auroral and ionoscatter. On 10 July there

Richard Staples, G4HGI
g4hgi@live.com

G3PYE/P field day. Photo courtesy, Geoff, G0DDX.

G3PYE/P field day. Photo courtesy Bex.

was a MS QSO with T7/SP7VC who was only running low power with his antenna obscured towards the UK. The 16th brought auroral QSOs with SM2CEW (KP15cr 1901km) who is well to the North of the normally accepted 'boundary fence' from JO02. This QSO was with direct beam headings and tone 'A' signals with no Doppler shift. He also worked OH5LK (KP30on, 1820km) who was a good signal for about 30 minutes. On the 4th he worked Fernando, EA8TX (IL18qi) on MS + tropo on the 3050km path down to the Canary Islands.

Highlights from Bob, G8HGN (JO01) this month include, on 2 July in VHF NFD, when he worked EI9E/p in IO62 on 144 and 432MHz (actually stronger on 432). On the 3rd it was JG2BRI (PM84) and JM1IGJ (PM95) for squares 503 and 504 on 6m JT65. The 4th brought LA5JK (JP76) and F8ZW (JN38) for squares 505 and 506 also on 6m JT65.

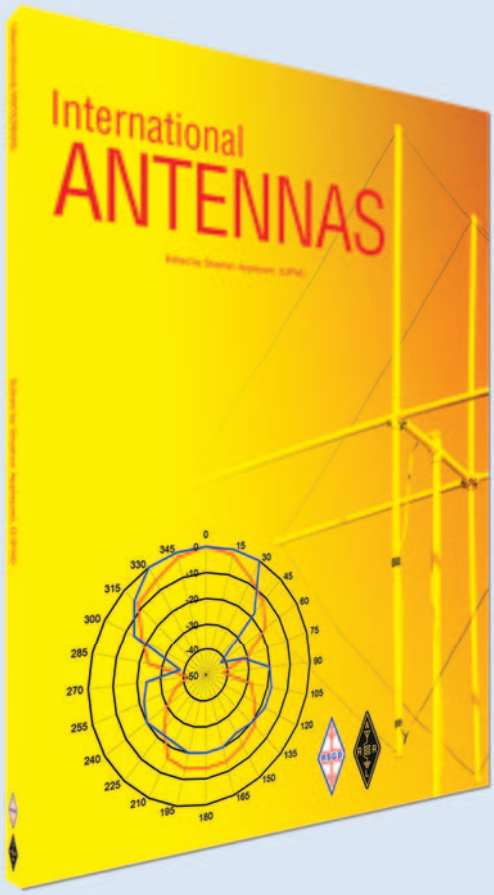
2m Sporadic-E openings continued throughout June with very nice openings for Lyn, GW8JLY (IO81) on 14, 16 and 18 June. In the opening on the 14th, between 1810 and 1903UTC, he worked IK7UXU (JN81HE) and IS0AWZ (JM49NG), both 59. He was particularly pleased to work Sergio, IS0AWZ on SSB as all his previous QSOs with him were on meteor scatter using FSK441. On the 16th, there were two separate openings in Cardiff, in the afternoon and in the evening. Between 1214 and 1401UTC he made QSOs with YO2YA (KN05WQ), LZ2FO (KN13KX), UW8SM (KN28IV), 9A9R (JN85QQ), 9A2SB (JN95GM), 9A5M (JN95GO), YU1ES (KN04GT) and YU1EV (KN04CN). He also heard but didn't complete with HA0HO and YO4GJT. During the evening event, between 1920 and 1928UTC, he worked RX1AS (KO59XW) at 2364km and OH2LIY (KP20MG). On the 18th, between 1754 and 1814UTC, he made QSOs with UA3WM (KO72QI) at 2624km and EW8W in KO42TV at 2230km, both stations were very strong at 59 plus. Since the 18th the intense Es openings came to a sudden end, at least at his location and not only on 2m but also on 6m too.

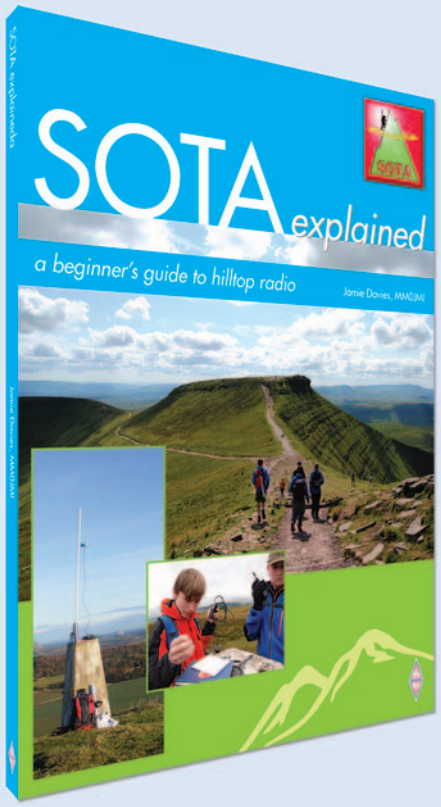
Troubled by noise, Carl, G3XGK used an SDRplay RSP1 (*SDRuno* software, useful for this form of measurement as it shows the noise/signal level on the antenna terminal) connected to a 2-ele HB Yagi. The bandwidth was set to 2.8kHz USB. With a 50Ω load he measured -130dBm and with the antenna connected measured -107dBm. After reading the piece on noise measurements mentioned in July *RadCom* by John, G4SWX, he took a measurement and sent it to John.

Richard, G4CDN (JO02) has been continuing ionoscatter JT65c skeds on 2m with Lasse, OH6KTL at 1575km. He says, "Using JT65c gives the ability to see faint ionoscatter traces that would be invisible to other modes, eg FSK441. JT65c also is more immune to symbol interference due to its wider tone spacing than other JT modes. The daytime success rate for ionoscatter QSOs over past few months is over 90% with many contacts taking only a few periods to complete. Interfering MS bursts, far weaker that can be seen using normal MS modes, are characterised by a small Doppler element making it simple to assess whether decodes are due to MS, ionoscatter or a combination of both. The path to Lasse normally proves very good from JO02 but I have also recently worked YU1EV, I3MEK, I2FAK, IK2OFO, S58M among others. Although these other paths can, on occasion, produce very good signal levels they are far less reliable than those achieved with OH6KTL. Tests with OH4LA at 1647km show a drop off of signal levels compared with those at 1575km. Remember, if you are working FSK it's always worth looking very closely for faint signals between the bursts or bursts that seem to decay a little slower than expected. If you feel that there maybe more to the display than just MS pings, suggest to the other station to switch to JT65c after the QSO and check for the tell-tale continuous trace of ionoscatter."

Alan, G4GNX wrote to say, "I just read your *RadCom* report regarding noise on the VHF bands and lessening of activity. I thought you might like to hear about my recent issues. It started a year or so ago and mainly affected HF, with a very spiky noise floor around S9+, I made some tests of my own with the mains power to my QTH turned off and concluded that the noise was coming from somewhere else, so I recently made an individual complaint to Ofcom. After one aborted complaint acceptance, I finally got them to agree to accept my log report over several months and they sent an engineer round. Connecting his analyser to my HF OCFD antenna, he was able to confirm the noise spikes and made some recordings before we took to the street with a DF antenna. On this first occasion we were unable to determine the source before his time ran out! There was a second visit and this time the engineer went off on his own to try to find the noise source. When he returned, he seemed pretty confident that it's from a switching PSU (probably a wall wart) in a nearby building. Unfortunately the resident was not cooperative and didn't want him to enter their home. He's now going to write them an official letter to try to gain entry to 'eliminate them from his enquiry'. I've also told him that if it's a reasonably priced device, I'm happy to pay for a replacement that's 'clean'. Other than risk starting a war with the neighbours (one of which is a hospital) I wonder what chance as licensed radio amateurs, we have in combatting this scourge that is ruining our activity? It seems to be a creeping menace. Noise to the southeast is always there in daylight. It's from a massive solar panel installation. I reported it to Ofcom but after completing two weeks of logs at Ofcom's request, they closed the case saying that solar panels are not covered. Fortunately I can beam east, north of east and south through to north without too much noise."

NEW TITLE





International Antennas

Edited by Stephen Appleyard, G3PND

Much is published across the world about amateur radio antennas. *International Antennas* brings together some of the very best material that has been published in recent years. There are over 50 articles included, with authors from Australia, Scandinavia, South Africa, the United Kingdom, the USA and more.

International Antennas has an emphasis on practical, rather than theoretical. You will find descriptions of the construction and performance of antennas, enabling the reader to build their own versions. These articles have been written by experienced radio amateurs who have been so pleased with the performance of their particular antenna, that they have been moved to put pen to paper to share this experience.

There is a huge range of antennas included in this book, covering 17 bands from VLF through to 70cm. You will find articles covering the 'stealthy' antennas, through to novel approaches and classic antennas. There are verticals, loops, beams and a host of unusual designs. There is so much in fact that the editor has provided a cross reference to see at a glance the bands antennas are designed for, and whether they are intended for fixed use or mobile/portable operation.

International Antennas is a fabulous collection of antenna articles from around the world. It is intended for everyone who is interested in amateur radio antenna design or is just looking for practical antennas to study and build.

Size: 200 x 279mm, 176 pages
ISBN: 9781 9101 9335 8
Non Members' Price: £14.99
RSGB Members' Price: £12.74

SOTA Explained

A beginner's guide to hilltop radio

By Jamie Davies, MM0JMI

Summits on the Air (SOTA), is one of fastest developing award schemes. For the active hillwalker and the home based chaser, this programme offers endless fascination. *SOTA Explained* sets out to provide the essential guide to this programme, hilltop radio and much more besides.

Taking a portable radio station into the hills and operating from a summit is a fascinating and rewarding way to combine the very best aspects of walking and amateur radio. Many appreciate the freedom this sort of operation offers and the benefits of having an elevated radio station far from urban electrical interference. At altitude, even modest sets can deliver astonishing performance: communication across the country and across the continent is routinely possible.

SOTA Explained provides advice for those who do not venture on to the hills but still want to participate in SOTA. There is a whole chapter dedicated to 'chasers', covering such topics as which bands to choose, how propagation affects your operation, chasing DX stations and rare SOTA activations. Not only does *SOTA Explained* detail how SOTA works but there is advice on safe hillwalking, setting up simple & cheap SOTA stations and modes of operation. There is technical advice on improving your first station, the antennas to choose and how to run SOTA stations on HF.

Be warned: after reading this book, you will never see a hilltop in the same way again.

Size: 174 x 240mm, 160 pages
ISBN: 9781 9101 9336 5
Non Members' Price: £12.99
RSGB Members' Price: £11.04

Also available on amazonkindle

E&OE (*All prices shown plus p&p*)

GHz Bands

Stop press: new 23cm Tropo record

A new UK and Region 1 23cm record of 2662km was set by Terry, M0VRL and Pedro, EA8AVI on 14 July 2017. Details and photo on page 12.

My thoughts on 1.3GHz in VHF NFD

Carefully putting on my tin helmet, I'd say that for many groups, 1.3GHz tends to be the 'also ran' band in VHF NFD, with most of the effort put in to the lower bands. That's a shame, as there's good DX up to 800km to be worked using aircraft scatter. Well-equipped stations in the north and west of the UK can work into PA, DL and F, where much of the activity was over NFD weekend. Big stations in the south and east were working in to OK. John, G4ZTR reported that the Colchester and A1 CG, G0VHF/P, made 101 QSOs on 1.3GHz, including three OZ and one each with OK and HB9. ODX was DL0HTW in JO60 at 845km. They used a DB6NT transverter and a Beko amplifier giving 350W to 8 x 23 element antennas.

With the apparent detrimental effect of climate change on Tropo conditions (discuss!) we all need to stop bemoaning the lack of Tropo and just 'up our game'. We need to improve our systems and look for the DX on modes such as rain and troposcatter, aircraft reflections and EME.

Being even more controversial, the amount of calling CQ and searching seems to be falling. I came on for the last hour or so of NFD, called CQ and announced my frequency on ON4KST chat. I couldn't help being amused by the stations who had probably been calling to no avail for hours who 'meeped' me and expected me to go and search for them on *their* frequency! I would have thought that, as entrants, they needed to work me more than I needed to work them and that they'd make the effort to find me. That aside I worked a few good ones, with ODX EI9E/P in IO62om at 475km on SSB. Notably, in 20 years on the 23cm band that's only the second EI station I've worked.

Barry, G4KCT commented on the lack of portables and reports that he only managed to work 16 /P stations. He didn't hear any stations from the continent but his ODX was EI9E/P at 59 both ways. Camb-Hams entered as G3PYE/P operating from G0DDX and G0TPX's luxurious camper, the '23cm lounge' (see bottom right of **Photo 1**). With just 45W to a 55 element Tonna they worked 48 stations including GM3HAM/P and several German stations.

Why not plan for next year to help your local VHF NFD group by providing a 1.3GHz setup and show them what can be done on the band?

5.7GHz

Andy, G4JNT purchased one of the 8W Gigawave amplifiers from the G3OHM Group at Martlesham and made up a 'junkbox' transverter with a handful of ERA modamps and the evanescent filter described on his website **[1]**. Initially he used no LNA and a flat plate antenna with about 23dBi gain to 12m of LDF-450 cable. In the May UKuG event he worked four stations in three locator squares. ODX was G3ZME/P at 199km. He's since added a HEMT LNA, again from an old surplus kit also purchased at Martlesham.

Aerial drone shot of the G3PYE/P site for VHF NFD by M0TAZ.

Here on the Fen Edge I had my first EME QSOs on 5.7GHz. The first was with OZ1LPR on JT4G, initially running 15W to my 1.9m dish. I've since added a second surplus Ferranti SSPA giving me 25W and I'm now up to 8 'initials' including 4 on CW.

10GHz

John, G0API reports receiving the EME beacon DL0SHF using his 60cm offset dish and an Octagon LNB. He simply lined up on the moon visually with a convenient near full Moon. Martin, G8OFA now has a receiving setup for 10GHz and from Salisbury Plain he copied GB3CCX with a 'Bernie box' converter **[2]**. He has plans in place to get on 1.3GHz soon.

During June, I managed rain scatter QSOs with G4ASR, IO81mx at 219km and F6DKW, JN18cs at 414km plus two 10GHz EME QSOs, with HB9Q JN47cg and OZ1LPR JO44uw. On EME I was running just 12W to my 1.9m 2.7mm mesh dish during the *Dubus* contest, and copied several weak CW stations.

24GHz

Dave, G1EHF, had his first contact on 24GHz while out portable in the 5.7/10GHz contest in June. Using a recently completed transverter and operating as M0HNA/P he worked the 31km path from Walbury Hill to Neil, G4LDR, with 59 reports both ways. His transverter is based on surplus DMC microwave link modules, with a retuned synthesiser and filter. Having recently collected the UK Microwave Group 24GHz loan kit, RSGB Microwave manager Barry, G4SJH and Pete, G1DFL plan to try and generate some activity on the band.

A sad note: G3NEO SK

To end this month, I think we should celebrate the life of Philip Bagshaw, G3NEO, probably the UK's oldest active microwaver, who passed away in July at the grand old age of 95. A true gentleman, I first worked him way back in the 1970s and met again recently at Finningley when he was in his early 90s. He was very much still full of life even then. Philip worked 1296MHz and pioneered 10GHz SSB in the early days of narrowband with a G3JVL transverter and 300mW to an 18-inch dish. RIP Philip.

Websearch

[1] http://www.g4jnt.com/EVANFILT.pdf
[2] The 'Bernie Box', *Scatterpoint* Jan 2009 – http://bit.ly/2sDzyn

John C Worsnop
PhD CEng MIET, G4BAO
john@g4bao.com

The TowerMate Tilt Plate

The TowerMate tilt plate is very well engineered.

This shows the pendulum assembly (centre) that locks the plate into position.

I can virtually guarantee that many *RadCom* readers will have never heard of a tilt plate, let alone know what one is for. But if you own a tower and large HF beam it might be seen as an essential part of the whole antenna structure.

A tilt plate essentially allows your beam to rotate about its axis as you lower your tower, so keeping it horizontal. The main benefit is that the antenna then comes down flat and can be lowered right down to ground level as you luff the tower.

Without a tilt plate you can really only lower the tower until the longest element on one side or the boom is just above the ground. This invariably means that you end up working on top of a set of steps or a ladder to reach the bolts that hold the antennas' booms to the stub mast above the rotator. If you have done this you will understand the problem right away – it is both inconvenient and dangerous.

A tilt plate also makes it a one-person job to luff the tower to do maintenance on the antenna – although a second pair of hands usually makes things a lot easier, especially with initial installations.

Tilt plates for radio amateur installations are quite common in the US, but less so over this side of the pond. One company in the UK is aiming to put that right.

TowerMate background

TowerMate is owned by Terry Burbidge, G4MKP and Derek Jordanou-Bailey. Terry has successfully delivered military HF, VHF and UHF communications solutions for 35 years and is also an amateur radio contester. Derek Jordanou-Bailey is a chartered mechanical engineer with 25 years of experience in the aerospace and automotive engineering sectors, focusing over the last 10 years in Formula 1 as the mechanical design leader on one of the latest hybrid racing engines.

Tilt-Over design

Together they have designed and produced the TowerMate Tilt-Over device, which aims to make it safer and easier to install large beams onto crank-up masts like a Versatower or similar. The main purpose of the TowerMate is to let you luff your tower and lower your antenna horizontally to ground level without having to take it apart. This allows you to service the antenna, putting right the effects of rain, snow, sleet, bird droppings, or high winds.

The TowerMate is obviously well thought out. Having established a personal need,

the business owners talked through the requirements and laid out a rough sketch on a paper napkin in a burger bar! They then turned the sketch into a CAD scheme model and then to a working balsa wood model. Having established that it actually worked they designed the mechanism to carry any boom antenna all the way up to 150kg weight and a 4m^2 projected area.

Extensive trials with square and round booms proved successful, which then then led to final minor changes for the production version.

The TowerMate looks very well engineered and is made from high-grade components. It is designed to withstand wind gusts up to 130kph with a maximum antenna projected area of 3.9m^2.

All steel and aluminium components are precision laser cut, including all fastener holes, by a leading UK manufacturer. Each unit is constructed following assembly drawings and all fasteners are torqued-up and then yellow paint-marked to ensure none are missed.

The TowerMate has a maximum width of 350mm, height 500mm and depth of 200mm. The all-up weight as shipped is 14.5kg and the materials used are high-strength aluminium plate and bright zinc plated steel. It also features off the shelf bearings and fasteners, complete with grease nipples on the two bearings that support the rotation of the device. The manufacturers recommend the two main bearings should be re-greased (through the grease nipples) annually.

The TowerMate also features a novel pendulum-based locking device that uses gravity as the tower is cranked upright to lock the plate into position as it nears the vertical. As you start to luff the tower, the pendulum automatically disengages. The locking mechanism is protected from the worst of the weather inside its housing, but it is recommended that it should be brushed clean regularly and checked to ensure that the pendulum swings freely. A spray of Waxoyl or a similar water-repellent material could go a long way to ensuring its longevity.

Prior to raising anything above head height, the manufacturer recommends users perform a safety check that all fastener nuts are fully engaged on their threads and tightened. A visual check of the components for cracks and damage should also be carried out.

It also comes supplied with two twisted copper safety wires that hold the two plates firmly shut. The wires are cut only when the unit is secured to the stub mast. The tilting plate can then be lowered under control by the installer to its operating position. The unit has been designed to remove finger traps and any guillotine action.

At 14.5kg the device can easily be carried by one person.

Chris, G0DWV mounts the clamps for the boom truss support.

You can see how the plate allows a beam to drop horizontally.

The main plate is drilled for a range of U-bolts, assuming you have a 2", 3" or 4" boom with M8 shaft sizes. If you wish to use a slightly different size bolt that doesn't

Steve Nichols, G0KYA
infotechcomms@googlemail.com

As the tower is cranked up the antenna automatically remains horizontal.

fit the current arrangement just let the manufacturers know. They will drill them for you free of charge or, if you wish, leave the plates blank for you to drill yourself.

In use

In the test at Chris, G0DWV's QTH using his Force 12 C31XR HF antenna the U-bolts in use were American and therefore an imperial width and size. Two minutes with a hand-held drill on the aluminium plate soon sorted the problem out, but it would be good to get the plate drilled to your specification from the outset.

So how do you use the TowerMate? First luff your tower so that it is nearly horizontal. Slide the TowerMate unit on to the stub mast and secure with the supplied U-bolts. Cut one lock wire and then, holding on to the TowerMate unit, cut the second lock wire and slowly lower the unit to its operating position. Now move your assembled beam into position underneath the stub mast and TowerMate unit. It helps if you have two people to do this. We found that it also helped to support the beam on two Workmates or similar. You can then offer up the antenna boom U-bolts to the TowerMate and secure it.

Although the TowerMate is supplied with U-bolts for the more common 52mm/2" stub mast, it has pre-drilled mounting holes for customers with 65mm/2.5" stub masts. Installation is identical to the standard size except that you will need to remove the supplied 52mm/2" U-bolts and replace them with your own U-bolts for the 65mm/2.5" stub. The manufacturer recommends you use Nylock nuts on the boom U-bolts for safety purposes.

The boom truss with the supporting cable can be seen near the centre.

At this point you can make sure that everything is straight and tighten the nuts. You can also route your coax, ensuring that it doesn't get in the way of the TowerMate as it rotates into the vertical position. The TowerMate can also support a boom truss on the left side of the sloping hanging plate for those antennas that need an additional wire support. Note that there is an angular offset from the vertical with a boom truss to prevent fouling of the truss wires when luffing and raising with a stacked installation.

It can also accommodate stacking with two TowerMate units in place with a minimum 900mm separation.

In use there is actually very little else to add. It just does its job, automatically and silently, leaving you to concentrate on cranking the tower up.

The device is warranted for a period of 12 months to the first user against poor workmanship and/or component failure. It also arrives shipped in double-skinned cardboard boxes, wrapped in soft polythene and sitting on corner foam protectors.

Availability

The TowerMate costs £399. Shipping costs do vary but is £15 to UK mainland addresses. It will also ship to anywhere within the EU at cost. Our thanks to TowerMate for the loan of the review model. See http://towermate.co.uk/ for more details or email towermateuk@gmail.com.

HF F-Layer Propagation Predictions for September 2017

Compiled by Gwyn Williams, G4FKH

	3.5MHz	7.0MHz	10.1MHz	14.0MHz	18.1MHz	21.0MHz	24.9MHz	28.0MHz
Time	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220
(UTC)	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020
*** Europe								
Moscow	651.....2666	354211134665	.153333456 21	..3544555 2..	..1222222...	...111111...	.....	.....
*** Asia								
Yakutsk	1........122	.2......1231	.....	.....	.....	.....	.....	.....
Tokyo	........22..	.......233..	.....11211..	.....1.....	.....	.....	.....	.....
Singapore	........221.	34411	......2343..	......222...	.....	.....	.....	.....
Hyderabad	1.......2333	1......23433	......12121.	......11....	.....	.....	.....	.....
Tel Aviv	53......1555	553....14555	.25211235531	..34333452..	...111111...	.....	.....	.....
*** Oceania								
Wellington	........1...	......113...	...1122.2...	...11.....	.....	.....	.....	.....
Well (ZL) (LP)	..1.....	.24.....	113......21.	..1......11.	.....	.....	.....	.....
Perth	........111.	.......2332.	......1221..	.....	.....	.....	.....	.....
Sydney	........11..	.......333..	......2211..	.....	.....	.....	.....	.....
Melbourne (LP)	.....	..13.....	...3.....	...1.....	.....	.....	.....	.....
Honolulu	.....	..21.....	...11.....	.....	.....	.....	.....	.....
Honolulu (LP)	.....	.....	.....	.....2...	.....2...	.....1...	.....	.....
W. Samoa	.....	...1.....	...1221.....	....111.....	.....	.....	.....	.....
*** Africa								
Mauritius	2........322	2......24432	.......3442.	.......232..	.......11...	.....	.....	.....
Johanesburg	22.......332	13......4543	.1......553.	.......2431.	.......232..	.......12...	.....	.....
Ibadan	555......455	5552....3555	3.5311124553	..242223451.	...2333342..	...11..12...	.....	.....
Nairobi	33......1333	441.....3444	..2....14441	..11...244..	.......12...	.....	.....	.....
Canary Isles	6652.....466	66641...3566	536532234664	1.153433563 1	...4555556 1.	...2322253..	...1111122..	....11.111..
*** S. America								
Buenos Aires	222........1	323.......23	1........121	.........2..	.........1..	.....	.....	.....
Rio de Janeiro	333........3	333......233	212......332	........131.	........12..	........11..	.....	.....
Lima	222.........	2222......12	...1......1.	.....	.....	.....	.....	.....
Caracas	3331......13	3333......33	....2....13.	....21...1..	.....	.....	.....	.....
*** N. America								
Guatemala	222.........	2213.......2	...2......1.	.....	.....	.....	.....	.....
New Orleans	3331.......1	3.12.......2	..........1.	.....	.....	.....	.....	.....
Washington	4443.......3	422.2.....23	....1111112.	.....21112..	.....	.....	.....	.....
Quebec	3442.......3	311.......23	........112.	......1122..	.....	.....	.....	.....
Anchorage	.....	..1.....	.....	.....	.....	.....	.....	.....
Vancouver	.13.....	..2.....	.....	.....	.....	.....	.....	.....
San Francisco	.22.....	1121.....	.....	.....	.....	.....	.....	.....
San Fran (LP)	.....	.....	.....	.......1....	.......1....	.......1....	.....	.....

Key: The figures represent approximate S-meter readings, whilst the colours represent expected circuit reliability. **Black** equals low to very low probability, **Blue** equals good probability and **Red** equals a strong probability. No signal is expected when a '.' is shown. The RSGB Propagation Studies Committee provides propagation predictions on the internet at www.rsgb.org.uk/propagation/index.php. An input power of 100W and a dipole aerial has been used in the preparation of these predictions; therefore a better equipped station should expect better results. The predicted smoothed sunspot numbers for October, November & December are respectively (SIDC classical method – Waldmeier's standard) 18, 17 & 16 and (combined method) 25, 25 & 26. The provisional mean sunspot number for July was 18.3. The daily maximum / minimum numbers were 63 on 12 July and 0 on 3, 4, 18-24, 27 & 31 July.

The latest Amate

ANTENNA BOOKS

INAN	International Antennas	£14.99	**£12.74**
SAS2	ARRL Small Antennas for Small Spaces 2nd Ed	£22.99	**£19.54**
RAWK	ARRL The Radio Amateur's Workshop	£22.99	**£19.54**
APHY	ARRL Antenna Physics: An Introduction	£26.99	**£22.94**
POAC	ARRL Portable Antenna Classics	£19.99	**£16.99**
AB23	ARRL Antenna Book 23rd Ed	£46.99	**£39.94**
NOVA	Novel Antennas	£14.99	**£12.74**
STL2	Stealth Antennas 2	£14.99	**£12.74**
AMAS	Antennas Mastered	£14.99	**£12.74**
ITAM	Introduction to Antenna Modelling	£9.99	**£8.49**
WAC3	ARRL Even More Wire Antenna Classics Vol3	£22.99	**£19.54**
AMFB	ARRL Antenna Modelling for Beginners	£37.99	**£31.91**
SUWA	Successful Wire Antennas	£13.99	**£11.89**
HFAE	HF Antennas for Everyone	£14.99	**£12.74**
AGAT	ARRL Guide to Antenna Tuners	£22.99	**£19.59**
ATRA	ARRL Antenna Towers for Radio Amateurs	£34.99	**£29.74**
ADNB	ARRL Antenna Designer's Notebook	£34.99	**£29.74**
AFVA	Antennas for VHF and above	£12.99	**£11.04**
UBAN	ARRL Basic Antennas	£29.99	**£25.49**
BSHA	Building Successful HF Antennas	£14.99	**£12.74**
MVAC	ARRL More Vertical Antenna Classics	£17.99	**£15.29**
PWA2	Practical Wire Antennas 2	£11.99	**£10.19**
INAC	International Antenna Collection	£14.99	**£12.74**
INA2	International Antenna Collection 2	£14.99	**£12.74**
ANTO	Antenna Topics	£18.99	**£16.14**
BKYA	Backyard Antennas	£18.99	**£16.14**
NACO	HF Antenna Collection	£19.99	**£16.99**
HFAL	HF Antennas for all Locations	£19.99	**£16.99**
SAFA	ARRL Simple & Fun Antennas for Hams	£22.99	**£19.59**
YAAC	ARRL Yagi Antenna Classics	£17.99	**£15.29**
ACV1	ARRL Antenna Compendium VOL 1	£19.99	**£16.99**
ACV2	ARRL Antenna Compendium VOL 2	£13.99	**£11.89**
ACV3	ARRL Antenna Compendium VOL 3	£13.99	**£11.89**
ACV4	ARRL Antenna Compendium VOL 4	£19.99	**£16.99**
ACV5	ARRL Antenna Compendium VOL 5	£19.99	**£16.99**
ACV6	ARRL Antenna Compendium VOL 6	£22.99	**£19.59**
ACV7	ARRL Antenna Compendium VOL 7	£24.99	**£21.24**
ACV8	ARRL Antenna Compendium VOL 8	£24.99	**£21.24**
WACS	ARRL Wire Antenna Classics	£13.99	**£11.89**
MWAC	ARRL More Wire Antenna Classics VOL 2	£17.99	**£15.29**
VACS	ARRL Vertical Antenna Classics	£11.99	**£10.19**

CALLBOOKS

WC17	Pegasus World Callbook Winter17 (CD+USB Stick)	£44.99	**£38.24**
CB17	RSGB Yearbook 2017 Edition	£19.99	**£16.99**
CS17	Callseeker Plus 2017 (CD)	£16.99	**£14.44**
MS17	Callseeker Plus 2017 Memory Stick	£16.99	**£14.44**

EMC & RFI

RFI3	ARRL RFI Book 3rd Ed	£23.99	**£20.39**
FRIN	Single Ferrite Ring	£2.25	**£1.91**
FIL7	Filter 7	£10.00	**£8.50**
FL15	Filter 15	£10.00	**£8.50**

VHF/UHF BOOKS

SIX4	Six and Four	£13.99	**£11.89**
VHF2	VHF/UHF Handbook	£14.99	**£12.74**
YGVU	Guide to VHF/UHF	£8.99	**£7.64**

SPACE & SATELLITES

HSAT	HAMSAT - Amateur Radio Satellities Explained	£9.99	**£8.49**
ARA2	Amateur Radio Astronomy - 2nd Ed	£16.99	**£14.44**
SAT2	ARRL Satellite Handbook	£19.99	**£16.99**

TECHNICAL BOOKS

GBRA	ARRL Grounding and Bonding for the RA	£22.99	**£19.54**
RH13	RSGB Radio Communication Handbook	£32.99	**£27.99**
AH17	ARRL Handbook 2017	£46.99	**£39.94**
RORS	Restoring Old Radio Sets	£8.99	**£7.64**
ELE2	Elimination of Electrical Noise 2nd Ed	£6.99	**£5.94**
WWJT	ARRL Work the World with JT65 and JT9	£17.99	**£15.29**
HAR2	Hart Reviews	£12.99	**£11.04**
AMPS	Amplifiers	£30.00	**£25.50**
BATR	Building A Transceiver	£12.99	**£11.04**
SWRE	SWR Explained	£7.99	**£6.79**
AYFR	ARRL Your First Amateur Radio HF Station	£22.99	**£19.54**
ACSA	ARRL Circuit Simulation and Analysis	£27.99	**£23.79**
HK18	ARRL Hints & Kinks for the Radio Amateur	£18.99	**£16.14**
EPR2	ARRL Emergency Power for Radio Comms 2nd Ed	£23.99	**£20.39**
TEQP	Test Equipment for the Radio Amateur	£14.99	**£12.74**
VARV	Valves Revisited	£16.99	**£14.44**
UNB2	ARRL Understanding Basic Electronics	£26.99	**£22.94**
HORE	ARRL Hands-On Radio Experiments	£14.99	**£12.74**
WEEK	Weekend Projects	£13.99	**£11.89**
RADN	Radio Nature	£16.99	**£14.44**
HFA2	HF Amateur Radio	£12.99	**£11.04**
RFDB	RF Design Basics	£17.99	**£15.29**
LPAR	ARRL Low Profile Amateur Radio	£14.99	**£12.74**
PSHB	Power Supply Handbook	£15.99	**£13.59**
PICB	Pic Basics	£16.99	**£14.44**
CIRO	Circuit Overload	£14.99	**£12.74**
ARES	Amateur Radio Essentials	£15.99	**£13.59**
HART	25 years of Hart Reviews	£14.99	**£12.74**
DMFO	Digital Modes for all Occasions	£16.99	**£14.44**
TTSB2	Technical Topics Scrapbook 1990-94	£13.99	**£11.89**
IRFD	Introduction to Radio Frequency Design	£29.99	**£25.99**

OPERATING & DX

SOTE	SOTA Explained	£12.99	**£11.04**
VRIG	The Vintage Rig Guide (including p&p)		**£5.99**
RIG8	The Rig Guide 8th Ed (including p&p)		**£5.99**
PR12	RSGB Prefix Guide 12th Ed	£9.99	**£8.49**
HFDX	HF SSB DX Basics	£8.99	**£7.64**
OPM8	RSGB Operating Manual 8th Ed	£16.99	**£14.44**
ARSH	ARRL Amateur Radio Public Service Hbk	£28.99	**£26.64**
LDX5	ARRL Low Band Dxing - 5th Ed	£34.99	**£29.74**
HBCB	Homebrew Cookbook	£12.99	**£11.04**
ROAR	ARRL Remote Operating for Amateur Radio	£19.99	**£16.99**
SSAR	Storm Spotting for Radio Amateurs	£19.99	**£16.99**
WLOD	World Licensing and Operating Directory	£12.99	**£11.04**
RADO	Radio Orienteering – ARDF Handbook	£9.99	**£8.49**
MOVE	ARRL's Amateur Radio on the Move	£14.99	**£12.74**
WHOS	Who's who in Amateur Radio	£14.99	**£12.74**

The Owl is OK

The trials and tribulations of a Radio Ham and a DX-er

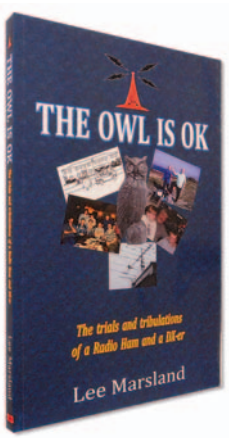
For over 30 years Lee Marsland has been a licensed radio amateur. In that time and in 'his own words', there have been plenty of 'trials and tribulations'. Lee brings to this book a light hearted look at his hobby.

Lee describes his first experiences taking the Radio Amateurs Examination run by the City & Guilds, through how he gained his Morse certificate, set up his stations, erected towers and encouraged his grandchildren to take and pass their own amateur radio examinations. The book is full of humorous anecdotes from Lee's life including the tale of the title that concerns RSPCA officer taking Lee to task about cruelty to his owl despite it being made of plastic.

Lee has written this book in an easy to read style that brings over his Liverpool heritage.

Size: 150 x 229mm, 180 pages, ISBN: 9781 9101 93372

Non Members' Price: £9.99, RSGB Members' Price: £8.49



FROM **FREE P&P**

Order on the internet at www.rsgbshop.org or you can order by post making cheques and postal orders crossed and made payable to Radio Society of Great Britain or telephone your credit card order to 01234 832 700. Open 8.30-4.30 (Mon-Fri). Send no cash. Post & Packing: Standard Delivery - 2nd Class Post (4-9 Days), For one item £1.95, For two or more items: £3.50, For orders over £30.00 standard delivery is FREE. Priority Delivery - 1st Class Post (2-4 Days), For one item £2.95, For two items: £4.95 , For three or more items: £5.95. Overseas: Worldwide Surface Delivery, For one item: £3.00, For two items: £5.00, Extra items: £1.00 per item. Worldwide Air Delivery: For one item: £9.00, For two items: £15.00, Extra items: £3.00 per item.

ur Radio titles

RSGB SHOP

COMPUTING & RADIO

MAPR	More Arduino Projects for Ham Radio	£39.99	**£33.99**
AFHR	ARRL Arduino for Ham Radio	£28.99	**£24.64**
HMAD	ARRL Ham Radio for Arduino and PICAXE	£27.99	**£23.79**
RTT2	RTTY/PSK31 for Radio Amateur - 2nd Ed	£7.99	**£6.79**
CIA2	Computers in Amateur Radio - 2nd Ed	£14.99	**£12.74**
HFDG	ARRL Get on the Air with HF Digital	£21.99	**£18.69**
VOIP	ARRL VoIP Internet Linking for Radio Amateurs	£15.99	**£13.59**
COMM	CoMmand	£16.99	**£14.44**

MAPS

RAMW	Radio Amateur's Map of the World	£6.99	**£5.94**

RADCOM

RC16	RadCom 2016 Archive CD-Rom	£14.99	**£12.74**
MR16	RadCom 2016 Archive USB Memory Stick	£14.99	**£12.74**
0RCB	RadCom Back Issues		**£4.95**
EAZI	RadCom Easi-Binder		**£9.99**
RC**	Radcom Single Year CDs 2001-2016	£14.99	**£12.74**
MR**	Radcom Single Year USB Sticks 2014-2016	£14.99	**£12.74**

RADCOM CD-ROM ARCHIVES

RC9600	RadCom 1996-00	£19.99	**£16.99**
RC9195	RadCom 1991-95	£19.99	**£16.99**
RC8690	RadCom 1986-90	£19.99	**£16.99**
RC8185	RadCom 1981-85	£19.99	**£16.99**
RC7680	RadCom 1976-80	£19.99	**£16.99**
RC7075	RadCom 1970-75	£19.99	**£16.99**
RC6469	RadCom 1964-69	£19.99	**£16.99**
RC5463	RadCom 1954-63	£19.99	**£16.99**
RC3953	RadCom 1939-53	£19.99	**£16.99**

IOTA

ID17	IOTA Directory 17th Ed	£11.99	**£10.19**
IFVR	Island Fever	£19.99	**£12.99**

MONTHLY PUBLICATIONS

QST1	ARRL Subscription 1 Year	**£51.00**
QST2	ARRL Subscription 2 Year	**£98.00**
QST3	ARRL Subscription 3 Year	**£145.00**
QSTC	ARRL Subscription Digital only 1 Year	**£33.00**
QSTC2	ARRL Subscription Digital only 2 Years	**£63.50**
QSTC3	ARRL Subscription Digital only 3 Years	**£93.50**

LOW POWER (QRP)

SPTB	Low Power Spratbook	£14.99	**£12.74**
QRP2	QRP Basics (2nd edition)	£14.99	**£12.74**
LPS4	ARRL Low Power Communication	£22.99	**£19.54**
INQC	International QRP Collection	£12.99	**£11.04**
MQRP	More QRP Power	£16.99	**£14.44**

LOGGING

DL17	Deluxe Log Book 2017	£4.99	**£4.24**
LBAR	Log Book - Transmitting	£4.99	**£4.24**
LBRX	Log Book - Receiving	£4.99	**£4.24**

MICROWAVES

MKHW	Microwave Know How	£12.99	**£11.04**
IMH2	International Microwave Handbook 2	£16.99	**£14.44**
MICP	Microwave Projects 1	£16.99	**£14.44**
MIP2	Microwave Projects 2	£16.99	**£14.44**

PROPAGATION

RPEX	Radio Propagation Explained	£12.99	**£11.04**
PRSS	ARRL Propagation and Radio Science	£27.99	**£23.79**
RDAU	Radio Auroras	£6.99	**£5.94**

MORSE CODE

MC12	Morse Code for Radio Amateurs 12th Ed	£8.99	**£7.64**

GENERAL BOOKS

BMIL	British Military Intelligence	£14.99	**£11.24**
LPUK	Launch Pad UK	£14.99	**£11.24**
SAGL	The Spies of Gilnahirk	£12.99	**£11.04**
CMSA	Churchill's Most Secret Airfield	£12.99	**£9.74**
CVYR	The Cray Valley Years	£14.99	**£12.74**
DDDP	3D Printing for Dummies	£21.99	**£16.49**
BOF	Boffin	£12.99	**£11.04**
MFAL	Haynes Millennium Falcon Manual	£16.99	**£6.99**
THR2	Haynes Thunderbirds Maual 50th Anniversary	£12.99	**£8.99**
FORT	Fort Bridgewoods	£11.99	**£10.19**
HSOY	Haynes Soyuz Manual	£21.99	**£16.49**
CRSI	Covert Radar & Signals Interception	£19.99	**£14.99**
CBL2	The Cable - the wire that changed the world	£9.99	**£7.49**
PGMS	Pigeon Guided Missiles	£12.99	**£9.74**
TDLB	The Three Dimensions of John Logie Baird	£16.99	**£14.44**
BBR2	The Birth of British Radar	£12.99	**£11.04**
INEG	Inside Enigma	£14.99	**£12.74**
IMAS	Images Across Space	£19.99	**£14.99**
H109	Haynes Manual for Messerschmitt Bf109	£17.99	**£15.29**
FCIR	Full Circle: A Dream Denied, A Vision Fulfilled	£10.99	**£9.34**
ABOC	A Bit of Controversy	£13.99	**£11.89**
TSOE	The Story of Enigma (CD)	£9.99	**£8.49**
TCCD	Perera's Telegraph Collectors CD	£9.99	**£8.49**
BOXS	1940s Amateur Radio Collection	£15.99	**£13.59**

SHORTWAVE LISTENING

VREX	Virtual Radar Explained	£6.99	**£5.94**

TRAINING

EXSE	Amateur Radio Exam Secrets	£12.99	**£9.74**	25% OFF
FNOW	Foundation Licence - NOW!	£4.99	**£3.74**	
IMD6	Intermediate Licence Book	£6.99	**£5.24**	
ADVA	Advance! The Full Licence Manual	£11.99	**£8.99**	
IEXM	International Amateur Radio Exam Manual	£14.99	**£11.24**	

LOW FREQUENCY

LFT3	LF Today 3rd Ed	£13.99	**£11.89**

RSGB Members' Prices displayed **BOLD** New books displayed RED

RSGB Shop Order Form

PLEASE PRINT ALL

NAME CALLSIGN

ADDRESS

POSTCODE | | | | | | | | TELEPHONE E-MAIL

QUANTITY	CODE	DESCRIPTION/TITLE	PRICE	TOTAL

P&P

TOTAL

PLEASE CHARGE MY CREDIT/DEBIT CARD | | | | | | | | | | | | | | | | | | | | | | | |

EXPIRY DATE | | | | START DATE | | | | CVV2* | | | ISSUE NUMBER | |

*3 DIGIT CODE FROM THE BACK OF YOUR CARD

SIGNATURE DATE | | | | | | | |

Radio Society of Great Britain **www.rsgbshop.org**
3 Abbey Court, Priory Business Park, Bedford, MK44 3WH. Tel: 01234 832 700 Fax: 01234 831 496

ATV

5.6GHz ATV for under £30

Amateur TV activity on the 6cm (5.6-5.8GHz) band is increasing due to the availability of cheap modules intended to transmit 'first person view' (FPV) back from drones to their operators. These units are widely advertised on eBay with titles including things like '5.8G FPV TX RX' and transmit-receive pairs start from under £30 including airmail delivery. Frequencies are usually set using DIP switches and most tune to our chosen FM ATV simplex frequency of 5665MHz (often called Group E Channel 3).

Using dish aerials of 30-60cm (such as a surplus Sky dish) with an appropriate feed, line of sight ranges of 80km can easily be achieved. During the latest ATV Activity Weekend, P5 (noise free) FM ATV pictures were exchanged over an 85km path using the equipment in **Photo 1**. These modules can provide a great introduction to microwaves and ATV – why not give it a try?

PHOTO 1: 6cm FM ATV transceiver setup.

Record numbers of amateurs enter IARU Region 1 ATV contest

The Region 1 IARU International ATV Contest was held on the second weekend in June. There was record participation this year with 95 entries and many more stations active. There were 23 stations on the air in the UK with all bands from 437MHz to 24GHz in use. In fact, the highest scoring UK station, Rob, M0DTS/P, used all these bands from his van-mounted portable station. Terry, G1LPS was also active across all the bands.

The overall winner was Francesco, IK3HHG operating on 23cm, 13cm, 6cm and 3cm from Monte Cesen, about 60km north of Venice. His best DX was 284km on 23cm and 13cm. Using 8W to a 1m dish he achieved 150km on 6cm, again showing the potential of the band.

Many of the stations active during the contest are also active during the BATC Activity Weekends, so remember to listen out for their talkback on 144.75MHz FM during the next activity weekend, 16-17 September. Activity is often pre-notified on the BATC Forum **[1]**.

BATC Convention, 9-10 September

This year's BATC Convention for Amateur Television (CAT 17) will be held at the Finningley Amateur Radio Society near Doncaster on 9-10 September. Non-members are particularly welcome.

Rob, M0DTS will be demonstrating his all-band portable ATV station on the Saturday, and there will be a varied programme of lectures and practical sessions along with a bring and buy sale. There will be a construction competition for the Raspberry Pi-based Portsdown digital ATV transmitters, and test equipment and expertise will be on-hand for anybody having difficulties with their ATV equipment.

In addition, there will be a surface-mount component construction workshop and lectures on filters and PAs (aimed at digital transmitters) to help operators make the most of their equipment and keep their transmissions clean and in-band. There will be plenty of time to meet up with others interested in ATV and to show off your latest project. Hope to see you there.

PHOTO 2: IK3HHG's winning station on Monte Cesen. Photo: IK3HHG.

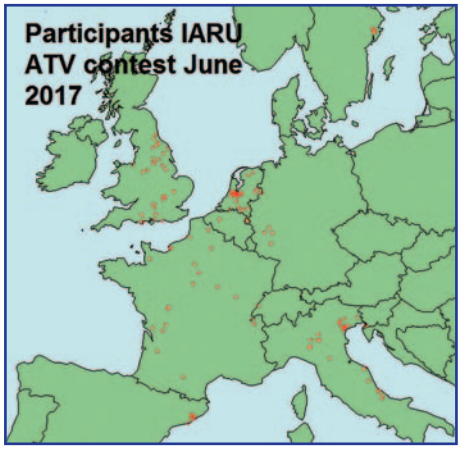


FIGURE 1: Map of activity in the IARU Contest.

Websearch

[1] http://batc.org.uk/forum/viewforum.php?f=75

Dave Crump, G8GKQ
dave.g8gkq@gmail.com

Please send news reports to radcom@rsgb.org.uk. To get future events listed here and put on GB2RS, email details of your meetings as early as possible to radcom@RSGB.org.uk Include your club name, RSGB Region number, contact name, callsign & phone number, date and details of meeting. Example: Fraser Road Radio Club, Region 9, Steve, M1ACB, 01234 832 700, 29 Oct, On the Air. We normally acknowledge all submissions within 3 working days: if you don't hear from us, please phone. We don't normally include 'closed', 'TBA' or 'every Tuesday'-type entries. The deadline for the October issue is 24 August and for November it's 21 September. For GB2RS, the deadline is 10am on the Thursday of the week of broadcast.

CLUB EVENTS CALENDAR

INTERNATIONAL

Pafos Radio Club, Cyprus
Richard, 5B4AJG, 00 357 97 857 891, 5b4ajg@gmail.com www.cyhams.org
Meets 3rd Thursday at DT's Bar. Visitors and holidaymakers welcome.

International Federation of Railway Radio Amateurs (FIRAC) www.firac.org.uk
Nets Sun 14.320MHz at 0830UTC, Wed 21.3MHz at 1430UTC g4gnq@hotmail.co.uk

NATIONAL

Amateur Radio Caravan and Camping Club membership@arcc.org.uk, www.arcc.org.uk
Caravan Rallies September - Kineton, Warks

AMSAT-UK, http://amsat-uk.org/
Open net every Sunday, 10am, 3.780MHz (±)

British Railways Amateur Radio Society m0zaa@brars.info, www.brars.info
Net Friday 1600 on 3.685MHz

Civil Service Amateur Radio Society
Weekly net every Tuesday, 8pm, 3.763MHz.

Radio Amateur Old Timers' Association MemSec@RAOTA.org, www.RAOTA.org
Nets: Wed 3.763MHz 1000, 1.963MHz 2100
Thurs 7.163MHz, 1100, 3.763MHz 1930
Sun 3.763MHz 1000

REGION 1: SCOTLAND SOUTH & WESTERN ISLES

Regional Manager: RM1@rsgb.org.uk

Cockenzie & Port Seton ARC
Bob, GM4UYZ, 01875 811 723
1 Normal club night
22 144MHz DF Hunt, 6.30, meet in Co-Op car park (east)

Livingston & District ARS
Cathie, 2M0DIB, 01506 433 846
5, 19 Training and operating
12 Talk
26 Operating and prep for JOTA 2017

Lothians RS
Mike, MM0MLB, secretary@lothiansradiosociety.com
13 Presidential address
27 Lecture at the Museum of Communication

Mid Lanarkshire ARS
Kevin, 2M0KVM, 0772 509 6279
1, 8, 15, 22, 29 Club night

REGION 2: SCOTLAND NORTH & NORTHERN ISLES

Regional Manager: Andrew Burns, MM0CXA
RM2@rsgb.org.uk

Aberdeen ARS
Fred, GM3ALZ, 01975 651 365
7 Junk sale
10 GM3BSQ/P at Seaton Park, Aberdeen
23-24 GB2RDR for Railways on the Air
28 Construction and on the air

Dundee ARC
Martin, 2M0KAU, 0776 370 8933
5 VHF radio hands on
12, 19 Club night/tuition
26 Talk

Glenrothes & District RC
Dougie, MM6KNR, dougie@digitalmaker.co.uk
6 HF Field Day debrief
13 Club night
20 My shack: Dave
27 QRZ profiles: Alan

Moray Firth ARS
Ian, MM0RPD, 0779 976 0590
5 Club meeting and prep for next surplus sale

REGION 3: NORTH WEST

Regional Manager: Kath Wilson, M1CNY,
RM3@rsgb.org.uk

Chester & District RS
Bruce, M0CVP, 01244 343 825
2-3 RSGB HF SSB NFD at Cheshire View

Isle of Man ARS
iomars@manx.net
2-3 SSB Field Day
24 *PW* 70MHz contest
28-29 *CQ* WPX contest

Macclesfield & District RS
Greg, M0TXX, Info@gx4mws.com
4 Shack on the air
11 Film night
18 40m helical vertical construction, M0TXX
25 Data modes talk, M1REK

South Manchester R&CC
Ron, G3SVW, 01619 693 999
7 Weather or not, part V, Peter, G3XGE
14 Sorting your junkbox
21 Mini lectures
28 Moonbounce discussion

Stockport Radio Society
Heather, M6HNS, 07506 904 422
5 Society meeting
11, 25 Advanced class
12 Net, 51.550MHz FM, 7.30pm, 50.270MHz SSB at 8.15pm
14 Net, 7.30pm, 145.375MHz
19, 26 Radio/skills night

Thornton Cleveleys ARS
John, G4FRK, 01253 862 810
2-3 SSB NFD/2m Trophy
4 Natter night, practical, on the air
11 Radio boffins continued, Stephen, M0HOI
18 Receivers, Mick, G4EZM
25 Construction contest

Wirral ARS
William, G4YWD, 0780 488 4245
1-3 SSB Field Day weekend
5, 7, 12, 14, 19, 21, 26, 28 Club open from 7pm
6 SSB Field Day debriefing
13 Pre official opening meeting
16 Official opening of new shack, 11am
20 AGM

REGION 4: NORTH EAST

Regional Manager: Ian Douglas, G7MFN,
RM4@rsgb.org.uk

Angel of the North ARC
Nancy, G7UUR, 01914 770 036
4, 11, 18, 25 On the air
11 Talk
18 Prep for Railways on the Air
23-24 Railways on the Air

Colburn & Richmondshire District ARS
Colin, 01748 876 391
14 General club meeting/training
28 Planning winter meetings

Denby Dale RC
Darran, G0BWB, 0797 442 3227
6, 20 Club night
13, 27 On the air

Durham & District ARS
Michael, G7TWX, dadars@gmx.com
6, 13, 20, 27 Club night
7, 14, 21, 28 Club net, 7.30pm, 145.475MHz

Hull & District ARS
Julian, 0775 957 7118
7, 21 Club night/On the air
14 Debate: should amateur radio and the internet be separated?
28 The Don Miller story

Ripon & District ARS
David, G3UNA, 01423 860 778
7, 14, 21, 28 Club night

Sheffield & District Wireless Society
Krystyna, 2E0KSH, 0788 406 5375
13, 27 Training and social night
20 Building a computer from first principles, G8AGN

Sheffield ARC
David, G6DCT, littlewood20@btinternet.com
4, 18 Club night
11, 25 Shack night

Spen Valley ARS
Russell, G0FOI, 01274 875 038
7 Curry night, Kashmir Restaurant
21 On the air

Wakefield & District RS
Charles, M0OXO@wdrs.club
1, 8, 15, 22, 29 Social and natter night

The next deadlines are 24 August, 21 September and 26 October. Send your news, dairy dates and photos to radcom@rsgb.org.uk and see tinyurl.com/radcompix for hints on taking good photos

REGION 5: WEST MIDLANDS

Regional Manager: Martyn Vincent, G3UKV
RM5@rsgb.org.uk

Bromsgrove & District ARC
John, G4OJS, 0788 9678 7303
1, 8, 15, 22, 29 Club night

Cheltenham ARA
Derek, G3NKS, 01242 241 099
3, 10, 17, 24 Net, 50.220MHz USB, 8.30am
5, 12, 19, 26 QRS CW, 3540-3550kHz, 8pm
19 Lunch
21 Suriname DXpedition, G4BVY

Coventry ARS
John, G8SEQ, 07958 777 363
1 G2FDC DF Trophy, 4th round
4, 11, 18, 25 Net, 8pm, 145.375MHz FM and/or 7.16MHz ± QRM SSB
7, 14, 21, 28 Net, 8pm, 50.175MHz SSB
8, 22 Net 145.375MHz instead of meeting
9-10 Coventry Festival of Craft, Coombe Abbey
15 The Great Egg Race

Gloucester AR&ES
Anne, 2E1GKY, 01242 699 595 (daytime)
4 On air 145.475MHz
11 AGM

Malvern Hills RAC
Dave, G4IDF, 01905 351 568
12 AGM

Midland ARS
Norman, G8BHE, 07808 078 003
3 Visit to Telford Hamfest
6 Open meeting, on the air, training classes
13 Committee meeting, training classes
20 General meeting, on the air, training classes
27 Pre-AGM meeting, social planning, training

Mid-Warwickshire ARS
Don, G4CYG, 01926 424 465
12 Bring an interesting item to discuss
26 Migration from Windows to Linux, M0OAE

Nuneaton & District ARC
Neil, M0NKE, info@ndarc.co.uk
1 Pint and chat, Harvester, 7.30pm
7, 14, 21, 28 Net, 145.475MHz, 9.30pm
15 My time as RSGB General Manager, Graham Coomber, G0NBI

Rugby ATS
Steve, G8LYB, 01788 578 940
2 My new antenna
5, 12, 19 UKAC
9 6m operation, talk by G3WOS
16, 26 HF & VHF shack on the air
23 Army Tactical Comms
30 GB7ME Rugby digital repeater

Salop ARS
salopamateurradio@gmail.com
5, 12, 19, 26 CW net, 4.30pm, 144.070MHz
6, 13, 20, 27 Club net, GB3LH, 8.30pm
7, 14 Natter night / committee meeting
21, 28 Quiz night/construction contest

Solihull ARS
SolihullRadioClub@gmail.com
7, 14, 28 Club net around 145.450MHz, 8pm
21 Club night

South Birmingham RS
Gemma Gordon, M6GKG,
gemmagordon.m6gkg@gmail.com
2 Loading trailer for Telford Hamfest
3 Club Stand at Telford Hamfest
4 Telford Rally debrief
5, 12, 19, 26 Coffee morning in the shack, 11am to 1pm, visitors very welcome
5, 15 Resorting and packing rally stock
7, 14, 21, 28 Training classes with Dave Murphy, G8OWL
11, 18 Rag chew

Staffordshire Portable ARC
Lynn, M6LIN, 0192 244 9668
2-3 SSB Field Day, Donative Farm
12, 26 Bolehall Manor Club meeting
23-24 Railways on the Air, Amerton Railway

Sutton Coldfield ARS
Robert, rob2e0zap@gmail.com
4, 18 Open net, ±145.250MHz, 7.30pm
11, 25 Club meeting
12 Open net, 70.475MHz FM, 7.30pm
26 DMR open net, gb7fw slot/local2, 7.30pm

Telford & District ARS
John M0JZH, 07824 737 716
2 Telford Hamfest
6 Committee meeting, GX3ZME OTA
13 Hamfest debrief
20 Talk by Richard Wilkinson
27 Winter projects discussion

Wythall Radio Club
Chris, G0EYO, 07710 412 819
1, 8, 15, 22, 29 Nibbles Night in the Shack 7.30pm
3, 10, 17, 24 Club net, 145.225MHz or GB3WL, 8pm
5, 12, 19, 26 Morse class, 7.30pm
5 Free 'n easy club night
12 Committee meeting
19 Talk: the 3 –15
25 Curry night
26 BBC Relay, Ascension Island, Steve, G3ZVW

REGION 6: NORTH WALES

Regional Manager: Ceri Lloyd Jones, 2W0LJC
RM6@rsgb.org.uk

Dragon ARC
John, MW0JWP, 0751 503 1025
4 QRP in the bay
18 Construction competition

North Wales Radio Society
Liz, GW0ETU, 0776 019 0355
7 General meeting
14 Technical topic
21 DVD night
28 Operating on the Prom (weather permitting)

Wrexham ARS
Eifion, mw6eyu@gmail.com
19 *Titanic* signals of disaster, Dave Roberts

REGION 7: SOUTH WALES

Regional Manager: Glyn Jones, GW0ANA,
RM7@rsgb.org.uk

Aberystwyth & District ARS
Ray, GW7AGG, 01970 611 853
2 Across Wales walk
14 Waunfawr Hall Buildathon, GW0NVN and Mike Jollands
28 Net on 145.500MHz then 145.550MHz

Cleddau ARS
Heinz, MW0ECY, 0774 804 7008
11 Barbecue
23-24 Outdoor operations

REGION 9: LONDON & THAMES VALLEY

Regional Manager: Tom O'Reilly, G0NSY
RM9@rsgb.org.uk

Bracknell ARC
David, M0XDF, M0XDF@alphadene.co.uk
6, 20, 27 Open net, 145.375MHz, 8pm
13 Club project

Chertsey Radio Club
James, M6FLT, chertseyradioclub@hotmail.com
5 Social online gathering

Edgware & District RS
Mike, G4RNW, 02089 500 658
14 Discussion of summer activities, Steve, G0PQB
28 Bring useful gizmos of interest

Harwell ARS
John, G6LNU, 01235 223 250
14 Natter night

Radio Society of Harrow
Linda, G7RJL, lcasey@imperial.ac.uk
1 Club WW2 Radio Sets, Peter, G3YXZ
3, 10, 17, 24 Club net, 1938kHz LSB, 12 noon
4, 11, 18, 25 Net, 145.500/145.350MHz FM, 8.15pm
15 Backpacking radio, James, M0JCQ
24 Outdoor event, Old Redding car park, 2-5pm

Shefford & District ARS
John Burnett, john@hobart-europe.co.uk
14 What did you do in the holidays?
21 High Altitude Ballooning pt 2, Andrew, M0NRD
28 Development of the Typhoon, Alan Merriman

Southgate ARC
Keith, G8RPA, g8rpa@arrl.net
13 VPN speaker
22-25 Railways on the Air

Verulam ARC
Greg, M0PPG, 01582 413 345
14 Social with GB3VH Repeater Group
19 CQ Worldwide planning – beacons / Reverse Beacon Network / DX Cluster

REGION 10: SOUTH & SOUTH EAST

REGIONAL MANAGER: MICHAEL SENIOR, G4EFO
RM10@rsgb.org.uk

Bredhurst R&TS
Nicky, secretary@brats-qth.org
28 History of public safety communications, Steve, G3ZPS

Bromley & District ARS
Andy, G4WGZ, 01689 878 089
6, 13, 20, 27 Net, 145.500MHz (and QSY), 9pm
17 Foundation course day 1
19 Short talks evening

Coulsdon ATS
Andy, G0KZT, secretary@catsradio.org
3, 10, 13, 17, 20, 24, 27 Club net, 11am, 145.400MHz ± QRM; club net 5pm, 3.700MHz ± QRM
6 Net, 9pm, 70.425MHz

Cray Valley RS
Dave, G8ZZK, 0773 954 9822
7 Antenna modelling, Quin, G3WRR
21 The magnetron, Mike, G3LHZ

Crystal Palace R&EC
Bob, G3OOU, 01737 552 170
1 Antenna modelling, Quin, G3WRR
6, 13, 20, 27 Club net, 8pm, 145.525MHz ± QRM

Darenth Valley Radio Society
Mike, G8AXA, 0788 415 7776
13 ROA/natter night
27 Digital modes revisited, Mike, G8AXA

Dorking & District RS
David, M6DJB, djb.abraxas@btinternet.com
26 The ISS project with schools, Mike, G4EFO

Dover RC
Aaron, 2E0FQR, 0771 465 4267
7 Which digital mode? Matt, M1CMN
14 Personalise and design your own shack clock

Hastings E&RC
Gordon, 01424 431 909
27 View and discuss online AR YouTube videos

Hilderstone R&EC
Ian, 2E0DUE, secretary@g0hrs.org
2-3 RSGB SSB NFD & 2m Trophy
9-17 GB1KSS at Manston Spitfire Museum
14 Club night
28 Earthing for the radio amateur, Ian, 2E0IJH

Horndean & District ARC
Stuart, G0FYX, 02392 472 846
1 Natter night/social evening
15 Astrophotography, Graham Bryant

Horsham ARC
Alistair, G3ZBU, 07855 268666
7 DXing from Africa, Nick, G3RWF, RSGB President
14 Social at George and Dragon
22 Weekend away in North Wales

Mid-Sussex ARS
Dennis, M0YDC, 0747 630 1044
1 Fox hunt
8 Smart phones, Chris, G4ZCS
15 Radio night
22 Prep for Haywards Heath Town Day
23 Haywards Heath Town Day
29 Skittles evening

Southdown ARS
John, G3DQY, 01424 424 319
3, 6, 20, 27 Club net, 145.275MHz, 8.30am; cafe meeting, 12.30pm; CW net on 144.060MHz, 7pm
4 Bring 'n tell evening, 8pm
6 Hailsham Shack meeting 10.30am

Surrey Radio Contact Club
John, G3MCX, 020 8688 3322
1, 8, 15, 22, 29 Net, 145.350MHz, 8pm
4 Sub-sea telegraph cables at Enderby Wharf, Richard Buchanan
7, 14, 21, 28 Net, 70.300MHz, 8pm
10, 17, 21, 24 Net, 1905kHz, 9.30am
18 Chat and fix-it, John, G8MNY

Worthing & District ARC
Al, M0OAL, information@wadarc.org.uk
3 Monthly breakfast, 9am
6 Tea and chat night
13 Band III, Ron, G3SKI
20 Construction competition
27 Practical evening or workshop demonstration

REGION 11: SOUTH WEST & CHANNEL ISLES

Regional Manager: Pam Helliwell, G7SME
RM11@rsgb.org.uk

Appledore & District ARC
Alan, M6CCH, 01237 422 833
18 Open meeting

Bristol RSGB Group
Shaun, G8VPG, 01225 873 098
25 The TX Factor, Nick, 2E0FGQ

Burnham on Sea ARC
Charles, G0SKA, 01753 647 101
2-3 DX Picnic and RSGB SSB Field Day
4 Junk sale
18 Open evening for the public with stations on the air

Callington ARS
John, G4PBN, 01822 835 834
6 Club night

Cornish RAC
Steve, G7VOH, 01209 844 939
6 Committee meeting
7 Main meeting
21 Social evening

Exeter ARS
Nick, M0NRJ, 01363 775 756
5 Net, 7.45pm, GB3EX
12, 19, 26 Net, 7.45pm, GB3EW
13 VHF and UHF antennas
27 60m on the Grey Line

Gordano ARG
Malcolm, G4KPM, info@g4kpm.co.uk
27 Club meeting

Mid-Somerset Amateur Radio Club
David, G8BFV, 01749 670 085
11 Talk on $50 satellite and planning for ROTA

Poole Radio Society
secretary@g4prs.org.uk
1, 15, 22, 29 Activity night
8 CNC milling demo and talk, Paul, G0ODP
16-17 Operating from Norden Station, Swanage Railway
24 *Practical Wireless* 70MHz Contest

Riviera ARC
rivieraarc@gmail.com
7, 21 Club night
23 GB4BCR, 10am-5pm, Babbacombe Cliff Railway

Saltash & District ARC
Mark, M0WMB, 0781 054 8445
7, 21 Club night, all welcome

South Bristol ARC
Andrew, G7KNA, 07838 695 471
14 Railways on the Air briefing
21 Table top sale
23-24 Railways on the Air
28 Open house and on air night

Torbay ARS
John, G4VUD@TARS.ORG.UK
1, 15, 22, 29 Club night
8 Club night with business meeting

Weston Super Mare RS
Martin, G7UWI, 01934 613 094
3 DF hunt
4, 11, 25 Construction, operating, natter night
17 Rally at WSM campus
18 Main meeting, rally discussion

Yeovil ARC
Rodney, M0RGE, 01935 825 791
1, 15 Construction and on the air, Sparkford
2 Intermediate course at Davis Hall
7 Amateur radio activities, G3MYM
21 Morse practice, G3MYM
28 Problem solving and committee meeting

REGION 12: EAST & EAST ANGLIA

Regional Manager: Keith Haynes, G3WRO
RM12@rsgb.org.uk

Braintree & District ARS
Edwin, G0LPO, 01376 324 031
5, 19 Club net, 8pm, 145.375MHz
12 Railways on the Air planning
26 Natter night

Chelmsford ARS
secretary@g0mwt.org.uk
5 Radio Caroline by Martello Tower Group
7 Foundation course
18 Skills night

Colchester Radio Amateurs
Tony, 2E0FTQ, 0783 177 4669
21 My other hobby

Essex Ham
Pete, M0PSX, news@essexham.co.uk
2 Essex YL Net, GB3DA, 8pm
4, 11, 18, 25 Net on GB3DA, 8pm, audio feed at www.essexham.net
28 Online Foundation course

Felixstowe & District ARS
Paul, G4YQC, pjw@btinternet.com
3 Martlesham Airfield SES
11 ESWR post mortem
23-24 Foundation course, subject to numbers
25 Operating in Belize, Jonathan, G0DVJ

Huntingdonshire ARS
David, M0VTG, secretary@hunts-hams.co.uk
2-3 Club Field Weekend at Ramsey Rural Museum
9 GB1SMB, St Mary's, Buckden
14 Natter night
23-24 GB0NVR, Nene Valley Railway
28 Papua New Guinea, David, M0VTG

Loughton & Epping Forest ARS
Dave, M0MBD, 0798 016 5172
7, 14, 21, 28 Net, 144.725MHz, 8pm

Norfolk ARC
Chris, G0DWV, 01603 898 308,
6 Internet access at 30,000ft, Steve, G0KYA
13 World class super contest station, Tim, K3LR (Skype)
20 Digital modes, Mark, G0LGJ
27 Informal, Bright Sparks

South Essex ARS
Terry, G1FBW, 07986 070 040
12 The moving coil meter, Dave, G4AJY

Thurrock Acorns ARC
Gordon, M0WJL, acorns@taarc.co.uk
5 2m SSTV open net, 7.30pm
7, 14, 21, 28 2m FM open net, 7.30pm
18-24 Air Ambulance week
19 Autumn social evening

The next three deadlines are 24 August, 21 September and 26 October

REGION 13: EAST MIDLANDS

Regional Manager: Jim Stevenson, G0EJQ
RM13@rsgb.org.uk

Hinckley AR&ES
Bob, G8BFF, 0792 876 9767
7 *HMS Glamorgan,* John, G8CGW

Lincoln Short-Wave Club
Pam, G4STO, 01427 788 356
2, 9, 16 Open shack and on the air
6 Nibbles and natter night
7, 21 Repeater net, GB3LM/GB3LS, 8pm
13 G5FZ on the air
14 Club net, 145.375MHz, 8pm
20 Formal meeting
23, 27-28 National Hamfest prep & setup
29-30 National Hamfest

Loughborough & District ARC
Chris, G1ETZ, 01509 504 319
5 Club 70cm net
12 Vector analyser use, Andrew, G7SEG
19 Open forum on base stations and handhelds
26 Practical evening

Melton Mowbray ARS
Phil, G4LWB, 01664 567 972
15 AGM, club programme discussion

Nunsfield House ARG
Paul, G1SGZ, pr@nharg.org.uk
1 Arduino SDA
4, 11, 18, 25 Shack night
7, 14, 21, 28 Club net, 145.325MHz, 8pm
16 Remote listening
22, 29 Program planning/committee and club night

South Normanton Alfreton & District ARC
A Lawrence, 2E0BQS, 01246 456 625
4 Talk
11, 25 Natter night
18 Junk sale

Welland Valley ARS
Peter, G4XEX, 01858 432 105
4 Net, 28.475MHz USB, 8pm
18 Talk on 475kHz experiments by G1IVG and G0SFJ
29-30 National Hamfest

EVENTS ROUNDUP

REGION 2: SCOTLAND NORTH & NORTHERN ISLES

In June, members of **Glenrothes & District ARC** took part in the *PW* 144MHz QRP contest from East Lomond (Falkland) Hill. The club had been preparing for the event for a few months with Mick, GM0IET and Lawrie, MM0LJA building a new 12 element beam. It was a wet and windy day with heavy rain and gale force gusts interspersed by a few bright spots, allowing those who sought refuge in the operating tent (brought up the hill by Ian, MM0HRL) to venture out again. They beat last year's tally and made contacts from Inverness to the Isle of Wight covering 6 different squares across three of the home nations with Ireland eluding them. Thanks to MM0HRL and 2M0EWY for photos of the event. Photo (right) by Ian, MM0HRL and Alan, 2M0EWY.

Dundee ARC would like to welcome three new members who passed their Foundation exam. Steve, MM6JVP, David, MM6TKV and Colin, MM6KOJ are joining the ongoing tuition programme.

REGION 3: NORTH WEST

In June, Furness ARS ran a full 2m radio fox hunt. Covering the SD27 square, teams set out to find the cunningly hidden fox. The winning team of Chris, M0KPW, Martyn, M0TEB and Andrew, M6GUM found the fox in just under 35 minutes. Not bad for the team's first outing! The annual barbecue was held at Gleaston Water Mill, wher around 20 club members and family attended. In July, the club took part in a local family fun day with a demonstration station where the hex beam drew lots of attention. Despite the noise from some of the fun fair activities, they made a number of QSOs into Europe. Several visitors expressed an interest in the demonstrations and amateur radio as a whole.

Wearside EARS meets at the Scout Headquarters, Crow Lane, Herrington SR3 3TE. The shack is open and will be on the air and they invite visitors to have a tea, coffee or a chat. Contact Ian, G7MFN on 0758 106 8065.

Stockport Radio Society rally opened its doors to traders and visitors. The event welcomed record numbers of visitors, with many people who arrived empty-handed leaving happily laden down with their purchases.

While most people were still asleep, SRS members got the interior of club HQ at Walthew House ready for buyers and sellers. With the traders all set and ready to go 45 minutes early, they decided to open the doors early.

SRS would like to thank everyone that help make the rally a success, including rally organiser Nigel, G0RXA, stewards Nigel 2E0CKA, Evan M0TJU, Tony M0SAV, Neil M6NAE, Bob M6TMA, everyone that helped put Walthew House back to how it was before the rally – and of course to all the traders and visitors, without whom there wouldn't *be* a rally .

A final thank you goes out to Dave, M0OBW for presenting SRS with their Club of the Year 2016 Trophy.

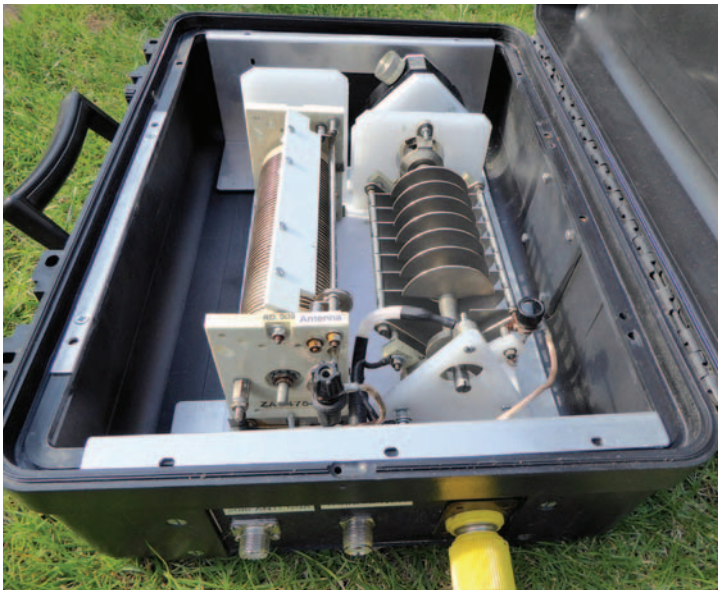
REGION 4: NORTH EAST

Pontefract & District ARS operated GB4CON at Farmer Copleys' Festival@the farm. This is an annual fun day with Viking battles, sheep shearing, military and farming equipment, welly chucking and the like. Operated by Nigel, G0BPK, he concentrated on 2m FM only because this is far easier for the public to understand than SSB.

Bishop Auckland RAC committee and members would like to congratulate Derek Addison (above) in successfully passing his Intermediate exam – well done.

REGION 9: LONDON & THAMES VALLEY

At **Verulam ARC's** meeting in July, Roger, M0RBK gave an illustrated talk entitled *My Love Affair with Impedance*. Roger explained the mathematics and electronics of resistance, reactance and impedance and how to adjust your equipment for optimum performance. Several homebrew aerial matching units were displayed demonstrating what can be achieved with recycled components (see below).

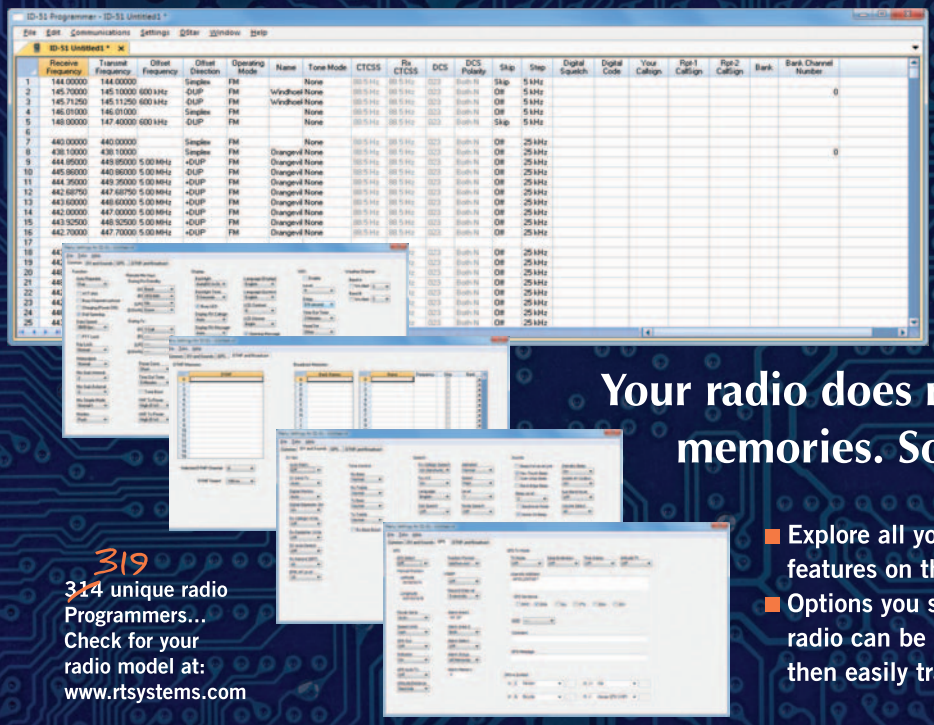


REGION 8: NORTHERN IRELAND

Bangor & District ARS took part in June's NFD near Bangor. Despite some torrential rain, they had the luxury of a caravan so kept moderately dry and warm. Expecting poor HF propagation conditions, they built an off-centre fed 160m dipole from *RadCom*, hoping to do better on Top Band. This brought a 60% increase in 160m QSOs. At one point the generator stopped due to a split fuel pipe, but fortunately only a few minutes were lost. The operators were Colin, GI4RQK, Keith, GI0SSA and Richard, GI4DOH. Many thanks to the loyal support team who made it happen and to the stations in the log.

GB8CCG was on the air as part of the London Open Garden Squares weekend. The station was located in the garden shed at Cordwainers Community Garden in Hackney, East London. Operators were Jon, M5AEO and Jim, G4AEH. The equipment was a FT-450 on HF with a windom antenna and a FT-897 and vertical antenna on VHF. Sadly, radio conditions were poor on HF, but about 30 contacts were completed, many around London on VHF. Members of the public visiting the garden were introduced to amateur radio and showed great interest.

Take the Mystery out of Radio Programming



Easy Editing Includes:

- Auto fill for many details.
- Calculations (offset frequency, offset direction, etc) are done for you.
- Allowable values match those of your radio.

Your radio does more than just memories. So does this software.

319
~~314~~ unique radio Programmers... Check for your radio model at: www.rtsystems.com

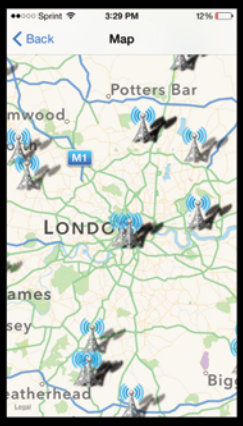
- Explore all your radio can do by seeing the features on the computer screen.
- Options you struggle to set from the face of the radio can be set up and saved in the Programmer, then easily transferred to the radio.

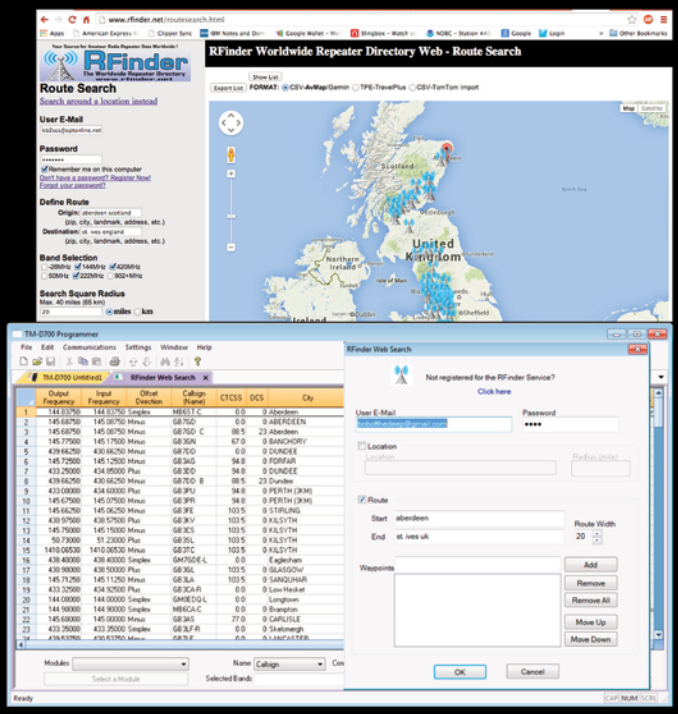
Available from RT Systems or Your Local Radio Dealer
800-476-0719 | www.rtsystems.com
Personal Assistance Mon.-Fri., 8:00-5:00, Sat. 9:00-1:00 Mountain Time

rt SYSTEMS

RFinder - The World Wide Repeater Directory
The official repeater directory APP of RSGB!

RFinder - The World Wide Repeater Directory now finds repeaters over routes worldwide using RT Systems! Support RSGB by choosing RFinder as your repeater directory. Whether you use Android, iOS, Web, RT Systems, CHIRP or RadioBuddy, access 50.000+ repeaters in 170+ countries worldwide with just one annual subscription of only ~£10! Fully integrated with UKRepeaters and BrandMeister. Find RFinder in Google Play or The Apple App Store. If you don't have a smart device, subscribe at www.rfinder.net.





www.rfinder.net - +44 (0) 1234 923 021 - +81 3457 95839 - +1 631 610 5120 - w2cyk@rfinder.net

REGION 10: SOUTH & SOUTH EAST

Members of Bredhurst RATS attended the annual village fete in Bredhurst. The interactive table went down well with local children and adults alike and they also made contacts on 40m and 2m. The June talk was on Crop Circles by Andy Thomas where they found a lot of science behind this phenomenon.

Horndean & District ARC meetings are now held at Deverell Hall, 84 London Road, Purbrook, Waterlooville PO7 5JU starting at 7.30pm. Visitors are always welcome, and membership is available. www.hdarc.co.uk .

At Dover ARC's 50th anniversary there was much to celebrate when past and present members, colleagues, spouses and siblings met up at the home of a founder member, Ian G3ROO. RSGB Regional Manager Keith Bird, G4JED attended, as well as colleagues from the French amateur club F8KGS in Cappelle La Grande 59180. GB5DRC was on the air thanks to Ian setting up a shack utilising 40m in his garden for all to use. The food was excellent thanks to Peter, M0PKH, Charlotte, M6CEH, Gary, 2E0FGC, John, G7SXJ, Stuart, M0IAQ and his wife Rose. Special thanks to Matt, M1CMN for the PA system and Richard, G4HHX for the music.

Through the summer months, Fort Purbrook ARC meetings become weekend events on Portsdown Hill, 330ft ASL, with a spacious marquee. At the last meeting there was a 3 band trap dipole and a 132ft doublet both on telescopic masts, a 2m beam and a roach pole vertical. Visitors are welcome to drop in.

REGION 11: SOUTH WEST & CHANNEL ISLES

Torbay Amateur Radio Society had a successful Show & Tell evening, when members brought in numerous items of hobby-related interest to discuss. One club member bought in a homebrew valve audio amplifier, which proved very useful to power the PA announcements. Also on show were the latest Elecraft KX3 together with a Flex radio. A demo of a hand held satellite aerial and transceiver using a satellite tracking app running on a mobile phone also proved to be very interesting. Many thanks to all who attended and especially to those who brought in their very interesting exhibits.

REGION 12: EAST & EAST ANGLIA

There was an eclectic variety of entries for the **Braintree and District ARS** construction competition, including upgraded Elecraft transceivers, a KRC-2 regenerative receiver, a portable power supply with variable voltage outputs and a frequency counter. After careful consideration, third *and* second places were awarded to John, M5AJB for, respectively, his kit-built air band receiver and QRP Sudden transmitter. First place, and the club's construction shield was awarded to Mike, G8DJO (see photo) for his scratch-built 360° time lapse night sky camera triggered by light change. This involved the use of computer software, electronic construction and fine engineering skills.

Colchester Radio Amateurs enjoyed a 'field weekend' at a local farm in Eight Ash Green and were given the opportunity of using the club equipment and setting up the HF rigs and the club's Crushcraft mini beam. Newer licensees were shown Morse contesting and Liz, G0MDL demonstrated portable CW operating using her FT-817. There were some notable contacts one being PH9HB/AM who was 200 miles from Athens, flying at 35,000ft.

Huntingdonshire ARS supported Buckden Village Fete with a working station. M0VTG and G4KLE set up the gazebo, assisted by G1KWF and M0OLG. The antenna, an off centre fed dipole, was erected at the rear of the gazebo, with the IC-7200 inside. The first contact was at 0916 with Rob, PA3GFY on SSB. Several amateurs visited, including G8CHC, G0AYX, M6TXR, G3NKQ (after working the station) and G1MVF. John, ZR6ART, who was visiting his son in Buckden, also came by. In total there were 26 contacts (22 CW) working into Norway, European Russia, Hungary, Czech Rep, Netherlands, Belgium, Germany, South France and even Hartford (G4LHI) using 80, 40, 30 and 20m.

Loughton & Epping Forest ARS members operated GB2NWA from North Weald Airfield. The airfield has a rich heritage and its history is re-told at the adjacent Museum. The team set up just one operations tent for both VHF and HF stations (see right), which were reasonably busy despite local noise. The club attended the Dunstable Downs rally and even had a pitch selling surplus items including equipment donated to the club by the family of David Burton, G0SFV (SK). June was a busy month starting with a well-attended Foundation licence course and exam. Ken Bryant, Craig, M6JQK, Simon, M6JOP, Bill, M6JOI, Richard Smith and Terry, M6JNV all passed. Numaan, M6UDH and John, M6JSU passed later in June.

Thanks to National Lottery players, **Bittern DXers** is celebrating an award of just under £10,000 by the Big Lottery Fund to help them introduce people to the endless possibilities in technology that amateur radio offers to young and old alike. With the money provided by National Lottery players, the group have purchased gazebos, radios and demonstration equipment allowing them to take a complete station to public shows and events. They are also very grateful to Martin Lynch & Sons Ltd and Telonic Instruments Ltd who helped extent the buying power of the National Lottery money. Peak Electronics and SOTABEAMS are thanked for their generous donations of equipment to help the project.

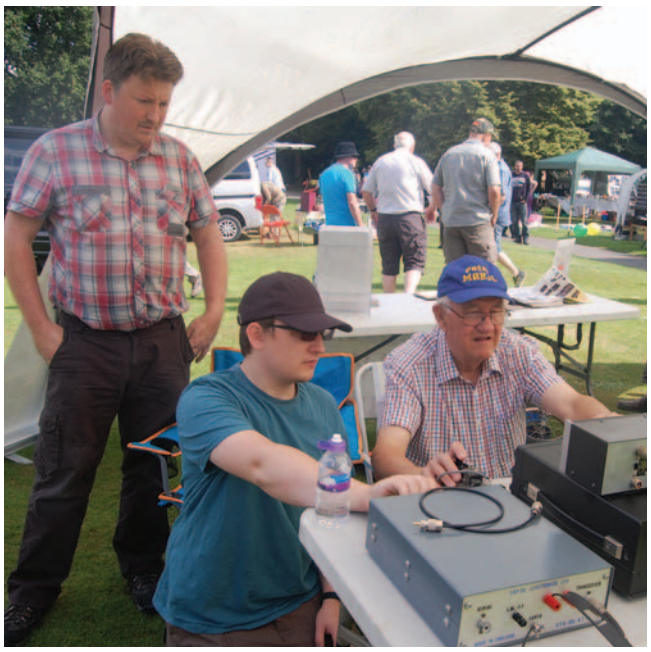
Peterborough & District ARC had a talk by David, G3RED on how antennas really work. He starting by saying all antennas are essentially dipoles and moved from the obvious wire dipole and beam with its elements being dipoles to the end fed using ground as the other part of the antenna. David then went on to talk about the mathematics of antenna design and understanding radiation patterns. GB8ASP operated in the park adjacent to All Saints in Paston with the station comprising a Kenwood TS-690SG into a Sigma multi band vertical HF antenna, a VHF station was also set up for local contacts. Two working Clansman radios were on display, which created a lot of nostalgia with some passing ex servicemen. The station created a great deal of interest with the general public and a member of a local Brownie pack and daughter of Eddie, 2E0DVQ completed all the elements of her communications badge.

REGION 13: EAST MIDLANDS

Leicester Radio Society undertook their first online examination for two candidates. Both had done the online course run by Bath ARC and both passed the exam. The process was easy and the club will be using this method again, thanks to the RSGB for their help.

Leicestershire DRM, Mark Burrows, attended **Hinckley AR&ES** recently to present Malcolm Williams with his Foundation pass certificate, which fulfilled his long-time ambition of becoming a radio amateur. Congratulations to him on his new callsign, M6XPO.

Spalding & District ARS took part in the village carnival with a small exhibition station and display of suitable posters and leaflets. They were kept busy all day, the Morse demo enabling visitors to send their name proving a big draw. The photo shows a young visitor with Nick, G4BMH enjoying the event who has since joined the society and is already listening on HF via a loaned receiver. As a PR exercise it certainly raised the profile of the club, gaining second place in the Best Stall category and first place in the tug of war.



Members of Lincoln Short Wave Club put on an amateur radio demonstration at Boultham Summer Fair, which was attended by many members of the public including the Mayor and Mayoress of Lincoln, the City Sheriff, former club members and members of neighbouring club RAF Waddington. Other visitors were Region 13 Regional Manager Jim, G0EJQ and Deputy RM Andy, G0FVI. Pictured is Jason, G7KPM, Steve, M6TSJ, Peter, M0EJL and Ian, G4EVK.

For Sale

FIBREGLASS TUBE
High strength tube, square box, rod, and other sections stocked in 6m lengths, can be cut. Engineered Compositions, Chester. Tel: 01244 676000 e. info@engineered-composites.co.uk www.engineered-composites.co.uk

SINOTEL UK - AUTHORISED UK
importers of Baofeng & TYT handhelds, Xiegu X108G HF transceivers. Accessories, antennas and more. www.sinotel.co.uk, 01926-460203, sales@sinotel.co.uk

CTCSS ENCODER AND DECODER KITS,
DTMF Kits and Modules, PIC Microcontroller Development Kits. www.cstech.co.uk

LINEAR AMP SWITCHING (PTT) CABLES.
Faster, safer Tx/Rx switching for your amplifier. For all common transceivers from only £11.99 + postage. Multi-band VHF/UHF version for FT-847, FT-736R or TS-2000. Selected cables with opto-isolation. For these and more great items go to technofix.uk

Wanted

VINTAGE RADIO & VALVES WANTED
national cash settlement for silent key, shack clearouts 07552 678725, vintageradio@btinternet.com

Equipment

REPAIRS TO RECEIVERS, TRANSMITTERS
New/Old, valve/transistor. Call 07903 023437 for details: www.kent-rigs.co.uk

RADIO REPAIRS BY M0NKL
Icom, Yaesu, Kenwood etc, plus linear amplifiers, please contact Nick on 07770 397668 or email np262@yahoo.com

Aerials

M0CVO ANTENNAS
For quality HF Wire antennas, BALUNs, UNUNs, VHF/UHF base or mobile antennas, all made in England, for QRP to QRO. Also available accessories and kits for home builders. At a price to suit your pocket. www.m0cvoantennas.com

WESTERN HF 10
67ft wire dipole 160-6m, full details lookup m0bzi at: www.qrz.com buy direct: m0bzi@outlook.com or 07748331458 reviews at: http://g0kya.blogspot.com/2010_08_01_archive.html **or** http://www.eham.net/reviews/detail/9424

G4TPH MAGLOOPS BACK IN PRODUCTION.
Remote tune and manual tune models for 40m through 10m. Details at www.g4tph.com

QUAD BAND COLINEARS.
10/6/2/70 Quad band 2.5/2.5/3.5/5.5 dbi gain only 1.2m length £59.95 ea 6/4/2/70 Quad band yes Includes 4m, 2.5/2.5/3.5/5.5 dbi gain 1.2m length £59.95 ea 2/70 Dual band 3.5/5.5 dbi gain 1.1m length only £37.95 ea. UK post £7.95. Website: mirfield-electronics.co.uk
Email: martin.stokes@hotmail.com or
Tel: 07825549430

NEW. QYT KT8900D 2/70 25/20w
base/mobile, 200 memories, CTCSS etc only £89.95. TYT MD380 DMR £99.95, MD380 spare Li battery £12.95, MD380 speaker mic £12.95. Free next day delivery. Mirfield Electronics, 07825549430 www.mirfield-Electronics.co.uk

HAMTENNA UK
Manufacturers of Antennas, Baluns, Ununs and suppliers of antenna wire and accessories. Checkout www.Hamtenna.co.uk

Miscellaneous

ALL UK STATIONS – CALL IN ON OUR 'M1CRA' CHRISTIAN NETS!
WACRAL welcomes all amateurs & listeners to our Sunday morning 'GOOD NEWS' nets, now at 0730-0830 on 3.747 MHz +/- QRM and, again, at 14.00-15.00 on 7.147 MHz. Or, do join us on Wednesdays 07.30 3.747 MHz +/- QRM, 10.00 on 7.147 MHz (if no contact established after 5 mins QSY to 3.747 MHz and 21.30 on 3.751 MHz, for nationwide Christian fellowship and relaxed chat. All UK Local times. See www.wacral.org for more net info and WACRAL details or just call Ian G4OPP on 01622 746650 or g4opp@wacral.org

VINTAGE FIREWORK COLLECTOR
will pay cash and collect from anywhere call Tony - 07956 506300 Licensed explosive storage

Cards & Design

LOW COST AND HIGH QUALITY QSL CARDS
By LZ1JZ QSL PRINT www.LZ1JZ.com

Classified advertisements 58p per word (VAT inc.) with a minimum of 14 words £8.12.
All classified advertisements must be prepaid. Please write clearly. No responsibility accepted for errors. Latest date for acceptance is 1st of the month prior to publication
Payment to: RSGB, 3 Abbey Court, Priory Business Park, Bedford, MK44 3WH

Advertising. All display and classified advertising enquiries (except Members' Ads, which go to memads@rsgb.org.uk) should be sent to: Chris Danby, G0DWV, Danby Advertising, Fir Trees, Hall Rd, Hainford, Norwich, Norfolk NR10 3LX
Tel/Fax 01603 898 678
e-mail adsales@rsgb.org.uk

Business Cards

Advertisers Index

FREE MEMBERS' ADS OF UP TO 40 WORDS

Email your Members' Ad to memads@rsgb.org.uk. You must include your name, callsign, phone number, email address and location (not counted in the 40 word limit). Optionally, attach your own photo of the item (min res 800 x 600, must be in focus and well lit). Max 1 ad per Member per month; other terms & conditions also apply (see tinyurl.com/MemAdsInfo).

FOR SALE

10.5m **TENNAMAST** 3-section ground socket mounted in very good condition. C/W cage & Goodwinch 12V DC winch. Powder coated Invisible Green. Re-wired in 2016 & requires only a new ground sleeve. £795. Mast dismantled but buyer collects. Duncan, G3WZD, 07515 869977 duncan.fisken@blueyonder.co.uk (Nr Bude, North Cornwall).

18m TILT OVER TOWER with beam antennas for HF, 6m and VHF, complete with 3-bed Lockwood 2 storey house on 1.5 acres of land in a QRM free country location near Nelson, New Zealand. Interested? Dave Stenning, ZL2CX, 0064 3 543 2182, dave@stenning.co.nz (New Zealand).

ALINCO DX70TH and EDX-2 ATU. Manuals. £400 + carriage. Microwave Modules MMT 432/144 transverter, 2m to 70cm + 15dB attenuator. Manual. £75 + carriage. J G Wylie, G4LYX, 0774 077 9802, rookwood376@gmail.com (West Sussex).

APRS TRACKER AVRT5/AP510. Bought for a project, no longer needed. With latest firmware and software. Fully working. Ideal for walking/cycling or mag mount on car. Comes complete with USB program cable/charger and software disk, £55 inc P&P. John Paine, M6IEM, 0797 321 1980, johnpaine@metronet.co.uk (Maidenhead).

DRAKE TR-7 HF bands transceiver with PSU, £400 ONO. Very good condition and working well with operator's and service manuals. Covers 10kHz to 30MHz receive and all HF including 60m transmit. Heavy so prefer buyer collects. Peter, G3PVX, 01404 813 059, peterpvx@yahoo.com (near Exeter, Devon).

ELECRAFT K3 100W, P3-F Panoramic adapter, Yaesu FT-991 + mic & book, TS-590S + mic & book, Alinco DX70 + mic, assorted PSUs 20-40A, Icom IC-2340H, Yaesu FT-90, RM BLA 350 linear, LDG AT100PRO, MFJ-991B Intellituner. Stephen, G7VFY 0795 654 4202, mister35mm@yahoo.co.uk (North London).

FT-817ND, boxed, complete with leads, manual, soft carry case, 12V 7Ah hour battery. Mint condition, hardly used, £425. Willing to post in the UK only for £20. Andrew Thomas, G8GNI, 01869 247 230, g8gni.radio@gmail.com (Bicester).

HEATH CANTENNA dummy RF load 50Ω 1kW, OK to 450MHz, with manual. £15 if collected or plus £5 by post but less transformer oil. Trevor Lumb, G0ARU, 01284 754 318, plumb@clara.net (Bury St Edmunds).

HEIL PROSET MEDIA PRO headset. Fitted HC-5 dynamic mic element and terminated in two 3.5mm jacks for your PC soundcard. Gives your internet-linked Tx & Rx Heil-quality audio. Used once. Boxed. £50 plus carriage. David, G5HY, 0791 261 9001, david@g5hy.com (Hampshire).

IC-7000 in as new condition, used only as a base station. Sold with microphone power lead and handbook, £550. Prefer collection or carriage at cost. Mike, G4OQG, 01249 443 037, g4oqg@hotmail.co.uk (North Wiltshire).

ICOM IC-7000, head cable and mounting bracket, microphone, mobile mount, handle, MB-65 mount, 5MHz mod, manual, *Nifty Guide*, LDG auto ATU, cables, Mydel MP-8230 PSU, PWR/SWR meter. Complete station; just add aerial! £600 ono. Buyer collects or carriage at cost. G3ZUM, 07931 360160 or brian.lonnon@tiscali.co.uk (Birmingham).

ICOM IC-2KL 500W solid-state linear c/w PSU, cables. £750. ICOM AT-500 500W auto ATU to suit, £400. ICOM IC-821H base 2m/70cm all-mode 40W xcvr, £400. All with handbooks and in very good nick. Walter, G3JKV, 01306 884 359, wb@g3jkv.co.uk (Dorking).

METROVNA PRO 180MHz antenna analyser in mint condition £145. Bencher HEX paddle in new condition. £220. Colyn, GD4EIP, 0762 441 3036 (Isle of Man).

MORSE KEY COLLECTION. A small collection of Morse keys in excellent condition for sale, ranging from £10 to £110. See morsekeysforsale.blogspot.com for details and pictures. Peter, G4AQA, 01482 655 856, peterdhall@yahoo.co.uk (East Riding of Yorkshire).

NISSEI 25A switch mode power supply. Cost £75, sell £40. Delivery £8. In near new condition and in original box. John, G3EGC, 01204 301 502, jvhoban@gmail.com (Bolton).

PALSTAR BT1500A TUNER, £250. MFJ 269, £100. Tigertronics USB interface, £40. Kent single paddle, £40. Yaesu FT-60E, £40. Yaesu FP-1030 PSU, £75. Colin, M0XED, 01227 904 492 (Canterbury).

SILENT KEY SALE, estate of M6NTZ. Kenwood TS-850S, £375 ONO. Zetagi 40A stabilised DC power supply, £50. Roband Vareco 33-10 (Icom IC-R70) receiver, £100. Sensible offers invited for Two RF signal generators HF 135 / G1 & G2, Advance signal gen type B4A, Marconi Instruments 560MHz digital frequency meter 2432A, Racal-Dana 1998 frequency counter, Heathkit HD 1422A ant noise bridge, Avometer 8 3kV DC + 3KV AC. Roy, M0RRV, 01405 812 134, roytaylor187@btinternet.com (S Yorks).

SK SALE OBO G4VHH. IC-765, IC-7000, IC-735, IC-740, IC-150 auto tuner, Watson 25A PSU, IC-515 PSU, memory keyer, TH-78 handheld, Datong Morse Tutor, Hustler mobile 6 band HF antennas. Tokyo Hypower 2m amp. Email for full list and photos. David, G3SCD, 0797 441 4419, david.g3scd@gmail.com (Lincolnshire).

SK SALE. AR88D clean, seen working on LF band, spare valves, manual, unused long time, requires service. Offers. Telequipment D1015 oscilloscope, working, Levell oscillator to 150kHz, Evershed & Vignoles megger, Manor Supplies UHF TV crosshatch generator, all open to offers. Roger, G4NVV, 01275 842 925, roger.english@tiscali.co.uk (Portishead).

TENNAMAST 10m Adapt-A-Mast wall mounted winch up mast with tilt-over kit and rotator cage pre-drilled for Yaesu rotators. Collection only, £350. Bryn, GW4ZHI, 01974 261180, brynhp@gmail.com (Aberystwyth).

TH-74E dual band 144/430MHz. As supplied, unmarked, unused, boxed as delivered complete. No VHF activity in my location, going for HF rig. Buyer collect or post at cost, £360 ONO. Don, G4GLH, 01539 720 654, Donald.lakes@icloud.com (Windermere).

TRIO TS-520 100W SSB/CW Tx/Rx, 80, 40, 20, 15, 10m. Very good condition. With operating manual but no mic or box. Buyer to inspect / collect, £125. G4XRV, 01494 758 361, Rupertg4xrv@gmail.com (Bucks).

YAESU FT990 AC + SP6 speaker, all filters fitted, VGC, £650. Eddystone EA12, amateur bands only RX, immaculate condx, £375. Heathkit SB220 linear amp, £390. MFJ 784B DSP filter, £115. Datong RF clipper, £35. Keith Lawson, G4AAH, 01623 642 719, kandmlaw@btinternet.com (Notts).

WANTED

9MHz LSB FILTER for Drake TR-4C renovation project. Prefer original Network Sciences filter, but as an alternative Inrad 1902 filter would be acceptable. Shaun Scannell, G3ZSU, 0787 200 8035 shaun1950@gmail.com (Market Harborough).

CW FILTER type YG-3395C wanted for Trio / Kenwood TS-520. Also interested in other accessories in good condition, such as DG-5, TV-502 and possibly TS-510 if fairly local. Steve, G4HXD, 0778 948 0344 (Stone, Staffs).

NATO MORSE KEY. Pensioner with 73 turns on the coil trying to find a reasonably priced NATO Morse key. Have used my friend's key and would love one to help me pass my Morse test. Barry, G1NPN, 0790 012 3495, ukbaz1@yahoo.co.uk (Wirral).

RACAL AUTOSTORE 8-track tape recorder and/or reproducer wanted to replay archived cassettes. Used to be used in business (and ATC) to record telephone / radio communications. Obsolete and manufacturer / maintenance support no longer available. G3UGJ, 0783 183 7069 (Oxon).

RAF TYPE 51/Walters Mk 5 Aircraft Morse keys & parts, also other post WW2 Walters aero Morse keys. Particularly the main keying knob, small and large knurled knobs & a cover for a Type 51 key from an Avro Vulcan. Scott, K9AP, ka9p@aol.com (Illinois, USA).

TEN-TEC T1330 QRP transceiver, for spares or repair, or unfinished or non working kit. Alan, G4MJO, alan023@btinternet.com (Harrogate).

TIPP-EX CORRECTION PAPER, typewriter, white, top copy. Don't throw your stock just because of going onto word processing! Godfrey, G4GLM, 020 8958 5113, cgmm2@btinternet.com (Edgware).

TO COMPLETE THE RESTORATION of my Marconi Instruments TF2603 voltmeter: Probe earthing sleeve 33631-901J, Probe earth spring clip 22328-013N and Coaxial T connector T7948. Dennis, G3LLZ, 01793 828 188 (Swindon).

VALVES to keep my old amplifiers working. 813s, 572Bs, 4CX250Bs. Pairs or singles.3-500z. One only needed. Bruce, G3WCE, 01692 538 794, g3wce@grimblepoos.co.uk (North Walsham).

National Hamfest

Britain's BIGGEST amateur radio event!

Friday 29 September & Saturday 30 September 2017

Show Highlights

- RSGB stand with RSGB committees and book stall
- Free parking
- Manufacturers stands
- International traders
- Club stands
- Special Interest Groups
- "Bring and Buy" stand
- Amateur radio car boot

Organised by

LINCOLN SHORT WAVE CLUB G8FZ • G8COL

RSGB

SEE YOU THERE!

www.nationalhamfest.org.uk

George Stephenson Pavilion, Newark & Nottingham Showground, Lincoln Road, Winthorpe, Newark NG24 2NY

USER HANDBOOK or even a service manual for an Anritsu MG645B Standard Signal Generator. Nigel, G3YSW, 0780 153 2970, itsworthing@hotmail.co.uk (W Sussex).

UP FOR GRABS

FOUR VALVE long/medium wave domestic Rx (pre 1950s). No maker info (home built kit?) Untested. Cabinet (full of woodworm) available. Yours subject to a reasonable donation to Anaphylaxis Society. Recipient to collect. P Carey, G3UXH, 0114 245 9081, g3uxh@stanage-edge.com (Yorkshire).

PYE WESTMINSTER W25 FM. Reputedly working but untested. Non-started project. Currently crystalled for 141.69375MHz Rx/Tx, includes crystals for 144.800MHz and 145.500MHz Tx/Rx (12.0666, 44.700, 12.125, 44.933). Buyer collects/pays carriage: it's heavy. David Leckie, GM4NFI, 01397 704 361, djcleckie@dive-boats.co.uk (Fort William).

HELPLINES

I would be grateful for any information on the Yaesu FT-728-R dual band hand held. Andy Chamberlain, G7CFC, 01902 865 304 (Wolverhampton).

I am researching the history of amateur radio clubs in East Yorkshire. Any information on radio clubs in Hull in the 1920s and 30s and Bridlington in the 30s will be much appreciated. Tony Cobb, G0WJK, tony.cobb.email@gmail.com (N Humberside).

Yaesu FT-270R info. Not the current handy, the 2m 5-25W mobile from the 80s. Any setup info welcome as all I have is a poor copy of the circuit. Keith, G1GHG, 01904 423 792, keithg1ghg@aol.com (York).

RALLIES & EVENTS

Members of the RSGB Regional Team will be present with a bookstall at the rallies this month marked with an RSGB diamond.

If *your* rally or event is not listed here,
PLEASE SEND US FULL INFORMATION
by email to **radcom@rsgb.org.uk**

2-3 SEPTEMBER
TELFORD HAMFEST & G-QRP CONVENTION
Enginuity Technology Centre, Coalbrookdale, Telford, Shropshire.
Combined social, Buildathon, guest speakers and radio rally. www.telfordhamfest.co.uk.

9 SEPTEMBER
CAISTER LIFEBOAT RADIO RALLY
Doors open 9.30am (traders 8am). Tables £10 inside, pitches outside £5 per table. There will be a raffle. Cafe & gift shop is onsite. Zane, 0771 1214 790, email m1bfidx@ntlworld.com. [www.m1bfidx.wixsite.com/cl-radio-rally].

9 & 10 SEPTEMBER
BATC CONVENTION (CAT 17)
Finningley Amateur Radio Society, The Hurst Communications Centre, Belton Road, Sandtoft, Doncaster DN8 5SX.

10 SEPTEMBER
TORBAY COMMUNICATIONS FAIR
The Racecourse, Newton Road, Newton Abbot, Devon TQ12 3AF.
Plenty of free parking on site. Doors open 10am, disabled access 9.45am. Entry is £2. Bring & Buy, RSGB book stand. On-site catering. Raffle. To book tables call Pete, G4VTO on 01803 864 528 or email rally@tars.org.uk.

17 SEPTEMBER
WESTON-SUPER-MARE RALLY
The Campus, Highlands Lane, Weston-Super-Mare BS24 7DX.
Large car park. Doors open 10am, adults £3. Trade stands, Bring & Buy, lectures, end-of-day auction, family activities & amusements. Catering on site. Contact mjones129@btinternet.com or 01278 786 684. [www.G4WSM.club].

22 to 24 SEPTEMBER
WACRAL CONFERENCE AND FELLOWSHIP WEEKEND (Diamond anniversary year)
Elim International Conference Centre, West Malvern, Worcestershire WR14 4DF.
Speaker: Nick Henwood, G3RWF, RSGB President "Where is amateur radio going?"

24 SEPTEMBER
PENCOED ARC TABLE TOP SALE
Pencoed Rugby Football Club, The Verlands, Felindre Road. Pencoed CF35 5PB.
Doors open at 10am and entry is £2. Tables are £10 each (first come, first served from 8.30am). Refreshments, hot food and drinks available Bookings with Madeline on 01639 767 056.

24 SEPTEMBER
BELGIUM RADIO & COMPUTER RALLY
Hall 'LOUVEXPO', rue Michel Debauque/Arthur Delaby, La Louvière (50km south of Brussels).
GPS N50° 29' 01" / E04° 10' 51"
Open from 9am to 4pm. 4000m², trade stands from UK, Holland, Germany, France, and flea market. Michel, ON7FI, +32 (0)475 45 45 78 or michel.dewyngaert@skynet.be. [www.on6ll.be].

29-30 SEPTEMBER
NATIONAL HAMFEST
Newark & Nottinghamshire Showground, Lincoln Road, Newark, Notts NG24 2NY.
Brought to you by the RSGB in association with the Lincoln Short Wave Club. The venue has free car parking and has disabled facilities. There will be trade stands, a Bring & Buy, car boot area, flea market, special interest groups and RSGB bookstall. There will also be representatives from the RSGB Services and committees. Morse proficiency test will be available. The venue has catering outlets and a seating area. [www.nationalhamfest.org.uk].

1 OCT – Hack Green Hangar Sale
8 OCT – (NEW DATE) Blackwood ARS Rally
13-15 OCT – RSGB CONVENTION
15 OCT – Holsworthy ARC Rally
15 OCT – Hornsea Amateur Radio Rally
21 OCT – Carrickfergus ARC Rally
21 OCT – Galashiels Rally

SILENT KEYS

We regret to record the passing of the following Members:

Name, Callsign	Date
Mr W J Purser, G2AXO	18/7/2017
Mr C S Hebden, G3GRQ	3/2017
Mr T R Whittaker, G3JNM	2016
Mr P A Miles, GW3KDB	14/7/2017
Mr B J Poole, G3MRC	6/2017
Mr A V Bryant, G3NVB	6/2017
Mr A Pampling, G3RSP	9/07/2016
Mr E H Ingram, G3TDX	6/2017
Mr R Andrew, GM3WFJ	21/02/2017
Mr A G Trend, G4BER	4/2017
Mr W R Fish, G4FBO	13/1/2017
Mr J R Guite, G4FNP	29/12/2016
Mr L B Povoas, G4FZL	25/6/2017
Mr K W Turner, G4GZB	5/2017
Mr D P Crompton, G4IAD	27/6/2017
Mr R D Purves, GM4IKT	26/6/2017
Mr J Hamill, GI4ORI	19/5/2017
Mr C Cattrall, G4UGK	12/1/2016
Mr P P Skivington, G4UUM	6/06/2017
Mr E Wallace, GM4XLU	
Mr J D Jones, GW6NSG	6/2017
Mr A Biggin, G7DGE	15/5/2017
Mr A L Scarisbrick, G7ELG	5/2017
Mr P L Kenyon, GW8CAK	6/2017
Mr F Lord, GW8VGG	15/6/2017
Mr J W Carden, G0CWH	31/5/2017
Mr D Binns, G0DOW	11/7/2017
Mr G A Slingsby, G0IWJ	7/2017
Mr R W Bygrave, G0KNJ	1/6/2017
Mr G Ryder, M0BNO	15/6/2017
Mr M I Moffat, M0MMI	5/2017
Mr A W Anthony, RS47659	8/5/2017
Mr A J Gibbs, VK6PG	27/05/2017
Mr J D Wightman, ZL1AH	1/7/2017

SPECIAL EVENT STATIONS

These callsigns are valid for use from the date given, but the period of operation may vary from 1-28 days before or after the event date. Details published here were kindly provided by Ofcom on 20/7/17.

Start	Callsign	Event Phonetics, Main Station City
01/09	GB2ATL	Air Training Corp, Orsett
	GB2ATC	Air Training Corp, Ordett
	GB5TAM	Tern Airfield Museum, Stromness
	GB4KMC	GB4 Kilo Mike Charlie, Kinver
	GB6SMD	Saint Matthews Day, Worthing
	GB1PCA	Prostate cancer awareness, Llanelli
	GB2CTK	Christ The King, Wakefield
	GB4GHF	Gloucester History Festival, Gloucester
	GB0BHM	Blackshaw Head Methodists, Hebden Bridge
02/09	GB0TRN	Train, Northampton
03/09	GB4NGR	Narrow Gauge Railway, Bucks
07/09	GB1LIM	Lowton Independent Methodist Church, Lowton
08/09	GB2WD	West Dean, East Sussex
	GB0SMF	St Mary's Fordingbridge, Fordingbridge
	GB0SMS	St Mary's Swilland, Ipswich
	GB0PPM	Pleasley Pit Museum, Pleasley
	GB8ASP	All Saints Paston, Peterborough
09/09	GB1SPP	Saint Peters Parr, Saint Helens
	GB1SPC	Saint Peters Church, Saint Helens
	GB0SPC	Saint Peters Church, Merseyside
	GB1WAA	Wales Air Ambulance, Dolgellau
	GB2CCP	ASE, Leigh
	GB0SMW	St Michael's Workington, Cumbria
	GB1SPN	CHOTA, Newport
	GB4DCF	ASE, Driffield
	GB0WMC	Woldgate Methodist Church, E Yorks
	GB1WAA	Wales Air Ambulance, Dolgellau
10/09	GB1LXX	Golf Bravo One Lima Xray Xray, Devon
	GB2HSC	Amateur Event, Lipock
	GB2DMR	Two Delta Mike Radio, Four Road Ends
15/09	GB1BOB	Battle of Britain, Torquay
16/09	GB2CR	ROTA, Corris
	GB0EA	Eastbourne Airshow, Eastbourne
	GB2VK	Victor Kilo, Caernarfon
22/09	GB0FLR	ROTA, Blythe Bridge, Stoke on Trent
	GB0SCR	Swindon Cricklade Railway, Swindon
	GB2RBR	Rocks By Rail, Oakham
23/09	GB1NYM	ASE, Pickering
	GB2KDR	Keith Dufftown Railway/KDR, Dufftown
	GB2ANG	Angel of the north, Gateshead
	GB0ROA	Railways On Air, Bristol
	GB2RDR	Royal Deeside railway, Crathes
	GB4BCR	Babbacombe Cliff Railway, Torquay
	GB2SDR	South Devon Railway, Buckfastleigh
	GB0SRP	Sierra Romeo Papa, Shillingstone, Blandford Forum

SAFETY DISTANCES FOR VHF AERIALS

Peter DeNeef, AE7PD

Further to my article on safety distances for small HF loop antennas (*RadCom* June 2017) I have been working on a companion article for VHF safety distances. However, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) RF safety guidelines, on which it is based, are presently being revised and their publication date is indeterminate. I have therefore agreed with the editors of *RadCom* that my article on VHF safety should go on my website at www.hamradioandvision.com/5-rf-exposure-safety/ so I can update it when the official guidelines are finalised.

JOINING COAX

Robert Dancy, G3JRD

Re page 25 in *RadCom*, July 2017. Coax connections like this have been used here for frequencies from 1.8MHz to 144MHz for many years and the characteristic impedance was always unaltered. In place of the shrink-on outer cover shown in G0JMI's article, self-amalgamating tape has been found to be very successful for keeping water out of the cable. Joining two completely different types of coaxial cable *of the same characteristic impedance* is also fine. Some years ago an experiment was conducted with two lengths of 50Ω coax, one very thin (about 4.9mm OD), and the other much larger (10mm OD). The SWR was still 1:1.

CONNECTORS

Christopher Beesley, G4OUG

I am absolutely fed up of seeing so many people complaining that they need different cables for each of their radios, that the software supplied is next to useless, and in many cases that *CHIRP*§ cannot be used with this or that radio. It is about time that *all* the manufacturers used standard USB interfaces, both hardware (connectors) and software (drivers and protocols). The memory inside the radio should be organised in such a way that a simple spreadsheet such as Excel can be used, the supplied software need only be an example table with a few example records (rows) filled in. Nobody would need any of these stupid serial cables that only work with one radio and one OS, and everybody would be able to use tables containing their own programming needs via several versions of Windows, Apple OSs, Linux distros, or whatever, for years to come without any problems. None of that is rocket science, other devices such as cameras have been doing it like that for a long time.

Ok, *CHIRP* would be redundant. That would be very sad in a lot of ways. But the current state of affairs is intolerable. How about everybody gets together and tells the major manufacturers that we will *not* buy any more of their radios until they implement the programming of them *properly*! If I knew how to start such a campaign I'd do it myself, but I am not *au fait* with social media or any of that stuff. Ideas please?

§ *CHIRP* is a free, open-source tool for programming your amateur radio.

10 METRES MIGHT BE QUIET, BUT…

Phil Rose, GM3ZZA

This afternoon I had an impulse and put a CQ out using JT65 on 10m. When I looked on PSKReporter website there were about 10 monitors in Europe and one in USA. Three of these had heard me. Unfortunately not one came back to me.

I then looked to see if there was anyone on 12m. Several monitor stations were active, luckily one called CQ and we made contact.

Even now these bands are usable. Maybe not for exotic DXCCs, but the bread and butter ones we all need to get the numbers. After all, the 12m contact was my first ever contact with England on that band.

All those monitor stations, put out the occasional calls, or at least reply! You might not need the QSO but the other station might. I have been licensed for 46 years, but not active for most of them, so still looking.

EXPERIENCES OF A STEM AMBASSADOR

David H E Coles, G7GZC

"D'you know, they can't even cut a straight line with a pair of scissors", and… "Using two hands to wrap something with masking tape seems to be beyond them". Both were said by independent educators who know I am supporting school science as a volunteer.

These are, or once were, basic practical skills gained during both conventional education and life at home. Things have changed in schools by the deletion of Craft from Craft, Design and Technology (CDT) as a curriculum subject.

My own sons benefitted from my practical instruction and help at home even as a visiting father.

As a result, I ask if either education or life at home elsewhere is at fault. Could practical skills become redundant? If so, one might continue to ask what the implications are for the future of amateur radio?

HOMEBREW

Bob Butcher, G3UDI

As I feel I'm of an age when two hours on dexterity, hand-eye coordination and brain function should be built into the daily exercise schedule. What better area than homebrew for this?

Tackle a simple project first, perhaps a mono-band SDR receiver with no surface mounting, something like a Kanga kit. Only then take on SMD in a small project, before ever moving to a small HF rig – there are several kits on the market. Set yourself realistic time scales: two weeks for a simple receiver, three months for a 1 watt Tx/Rx, 18 months for a complete 100 watt HF rig. Invest in quality tools too. Regular achievement is very important, however small the project or software: success becomes self-generating. Local amateurs and the internet community are wonderfully supportive, generous with time and expertise. We are all in this together!

CHOKE BALUN RE COMMON MODE CURRENTS

Bob Houlston, G4PVB

Some technicians indicate that choke balun coax coils wound on a toroid should not exceed six wide spaced turns (three one way and three in reverse) to avoid capacitance between the braid windings. I tried that but with disappointing performance. Some websites indicate twelve turns are successful… so I went for fourteen, seven one way and seven in reverse. Bingo! Faultless performance across the HF bands. A photo on my website g4pvb.eu.pn/cmc.htm shows RG58 C/U, FT240-31 toroid & plastic cable ties. (When winding toroids do wear eye protection, because the wire could flick into your face).

INTERESTING PROBLEM SOLVED!

Graham Furlonger, M0KTY

I have been experiencing problems with large birds, specifically seagulls, sitting on the top hat section of my Hustler 4BTV antenna. These pesky devils have already knocked off two radials and continue to sit on the capacity hat, causing droppings to accumulate below onto the mounting.

I have devised a cheap harm free method to combat this problem, which I thought might be worth sharing. I have used white/clear plastic cable ties attached to the aluminium tubing. They all point skyward. This has caused no change in VSWR on my antenna and has kept ALL birds completely off the aluminium. It works that effectively that I have also applied the same technique to my Diamond X200 radials.

I hoped that this information might help others having the same problem.

Letters published in 'The Last Word' do not necessarily reflect RSGB policy. 'Last Word' letters may be emailed to radcom@rsgb.org.uk Please note that letters submitted for 'The Last Word' may not be acknowledged. The RSGB reserves the right not to publish any letter, with no reason being given. It is a condition of publication that all letters may be edited for grammar, length and / or clarity. Due to the limited space available, please keep letters as short as possible.

OFCOM AND INTERFERENCE ISSUES

Stephen G Small, G4HJE

I read with interest the letter from Professor Mike Ayres (Last Word, June 2017) and his observations on the ambivalent response from Ofcom to his problem with RFI.

The issue of Ofcom's 2017 revised charter concerns me, including the relationship with the RSGB and the Amateur Service within the UK. With the requirement for austerity measures across the public sector it is not surprising that Ofcom, who act on behalf of government, are reducing their costly technical customer facing services whilst increasing revenue generation strand options, including the sale of spectrum to the highest bidder and acceptance of noise generating technology with scant regard for the impact upon the radio environment in general.

I recently read with interest the re-worked Ofcom charter that clearly reflects a Treasury-pleasing business portfolio. What was clearly missing was any commitment to protecting the spectrum from RFI and for the investigation and management of reported RFI. So why is this charter review important to the future of amateur radio and the spectrum in general? I fear that Ofcom have managed to write out the majority of its statutory responsibilities, whose delivery places a significant drain on their budget.

As amateurs we have no real voice, we no longer have a financial interest as licence holders as we no longer pay for the privilege. What notice do Ofcom take of the RSGB?

So what can the RSGB do? Instead of accepting the situation they should be seeking to ask informed questions of parliament through the National Audit Office and the appropriate select committee that holds Ofcom to account. If Ofcom is not soon held to account, we, the UK Amateur Service, will be consigned to RF noise obscurity through acceptance and appeasement.

The RSGB submitted a response (amounting to 5 pages) to the consultation on the Ofcom annual strategic plan. This can be found at www.ofcom.org.uk/__data/assets/pdf_file/0038/97967/RSGB.pdf but our submission was not acknowledged or answered when Ofcom published the consultation results. To make an impact we need to portray ourselves as operators on the Amateur Service that has two crucial roles: first, provision of emergency communications in times of natural disaster, civil unrest or terrorism; second, to attract people who will become the communication engineers of the future. The EMC Committee (EMCC) believes that protecting the spectrum from interference is key to maintaining communication on the amateur bands and thus to achieving both these roles.

*So we continually challenge the Ofcom approach at every opportunity. Their approach written in response to questions about their statutory duties is "*Our duty is to provide advice and assistance. We do not have a duty to enforce and we do not guarantee that interference will not occur. When deciding whether to investigate or to take enforcement action we are required to act reasonably and responsibly and maximise the use of resources and do so in a proportionate, accountable, transparent and consistent way. We treat each case on its merits."

The EMCC would welcome help from others with similar objectives to change Ofcom attitudes using MPs, ministers and all the bodies to whom they are accountable.

Please contact emc.chairman@rsgb.org.uk with any offers of help.

John Rogers, MOJAV
Chairman, EMCC

NEW ONLINE AMATEUR RADIO LICENCE

Eric Edwards, GW8LJJ

When I sat the RAE along with my contemporaries – and indeed those before us – I had no practical test. The exam questions were mainly technical, relating to radio theory and with hand-written answers and no boxes to tick. On passing the test the successful candidates were granted the B licence that meant that they could operate a transmitter from VHF and higher but were not allowed on the HF bands. To be able to operate on these lower bands it was a mandatory requirement to pass a CW test. I often asked why that was the only requirement to allow full access to all the bands. Obtaining a CW pass does not make you a better operator nor become more technical as the same test was applied. A licence is not required to make radios or other radio associated equipment. Even a transmitter can be built and tested albeit on a dummy load, but a licence is needed to be able to test and operate a transmitter on air. That's what the licence is for, to be able to operate a transmitter on air. With the abundance of quality commercial radio transmitters available at affordable prices it is no longer a need to make a transmitter so it could be argued that no electronic knowledge is required along with no homebrew skills. Many I have spoken to have said that their main interest in obtaining a licence was for the sole purpose of communicating and had no interest in building anything! Perhaps there should be two exams, a technical one where building and operating a homebrew station is allowed and an operator's licence where the requirements would be knowledge of propagation, licence conditions and to show that the operator can avoid and rectify any interference. There are licences, marine, aviation etc where no electronic knowledge is required but it is allowed to put a transmitter on air.

It is stated in the article that some theory questions are being removed anyway and are being replaced by SDR and digital technology, so perhaps we are getting towards a non-technical licence. It can be argued that this is a technical hobby and electronic knowledge is needed to obtain a licence, if that is the case why remove some of the technical questions to allow the non-electronic topics to be added?

The amateur radio licence is granted in the expectation that the amateur will engage in experimentation of a scientific or technical nature in a way which helps greater understanding of radio technology including the underlying technology, antenna design and electromagnetic wave propagation and communication. The current syllabus review is an opportunity to update knowledge of the changing technology and ensure that amateur radio continues to provide interest and challenges for self education.

Ian Shepherd, G4EVK
Board Director

SPECIAL CONTEST CALLSIGNS (SCC)

Ray Hills, G3HRH

Am I alone in thinking that it is illogical to require qualification through a prescriptive list of contests, mainly non-RSGB international events, and then allow the use of SCCs in all RSGB HF Contests? This unbalances the playing field in, for example, the 80MCC series. I have no problem with the concept of SCCs for those situations that gave rise to them. But, in my view, their use has extended too far. It should be restricted to those contests on the qualifying list.

At the start of 2013, Ofcom relaxed the rules governing the use of Special Contest Callsigns (SCC) to permit their use in any bona fide *contest. This was generally welcomed by the holders of SCC as, up to then, the use of SCC were restricted to 26 contests. The qualification criteria to gain a SCC were not relaxed however.*

Ian Pawson, GOFCT
Chair, RSGB Contest Committee

LAMCO

VINE antennas

01226 361700

5 DONCASTER ROAD, BARNSLEY, S70 1TH

ICOM KENWOOD YAESU

Uniden Komunica spiderbeam PRO.SIS.TEL.

LDG ELECTRONICS

ORIGINAL ANTENNA

ACOM

telecom ANTENNA

bhi Noise Cancellation Products

MFJ

SIRIO antenne

CRT

Cross Country Wireless

Groupe PRESIDENT ELECTRONICS since 1978

Maldol

SOLARCON

REX Rig Expert Ukraine

HEIL SOUND

SHARMAN multiCOM

JETSTREAM Shakespeare MARINE ASTATIC MICROSET ELECTRONICS Hytera DIAMOND ANTENNA

Time for an upgrade?

LAMCO APPROVED USED 12 MONTHS WARRANTY

Why not Part Exchange?

We guarantee to match any advertised price in this magazine*

The Family Business Supplying and Supporting the HAM Radio Community

It just makes sense...

sales@hamradio-shop.co.uk

www.hamradio-shop.co.uk

/lamcomms

My Favourite HAM store

ML&S - the world's favourite *original* ham store

ML&S 0345 2300 599
Web: www.HamRadio.co.uk

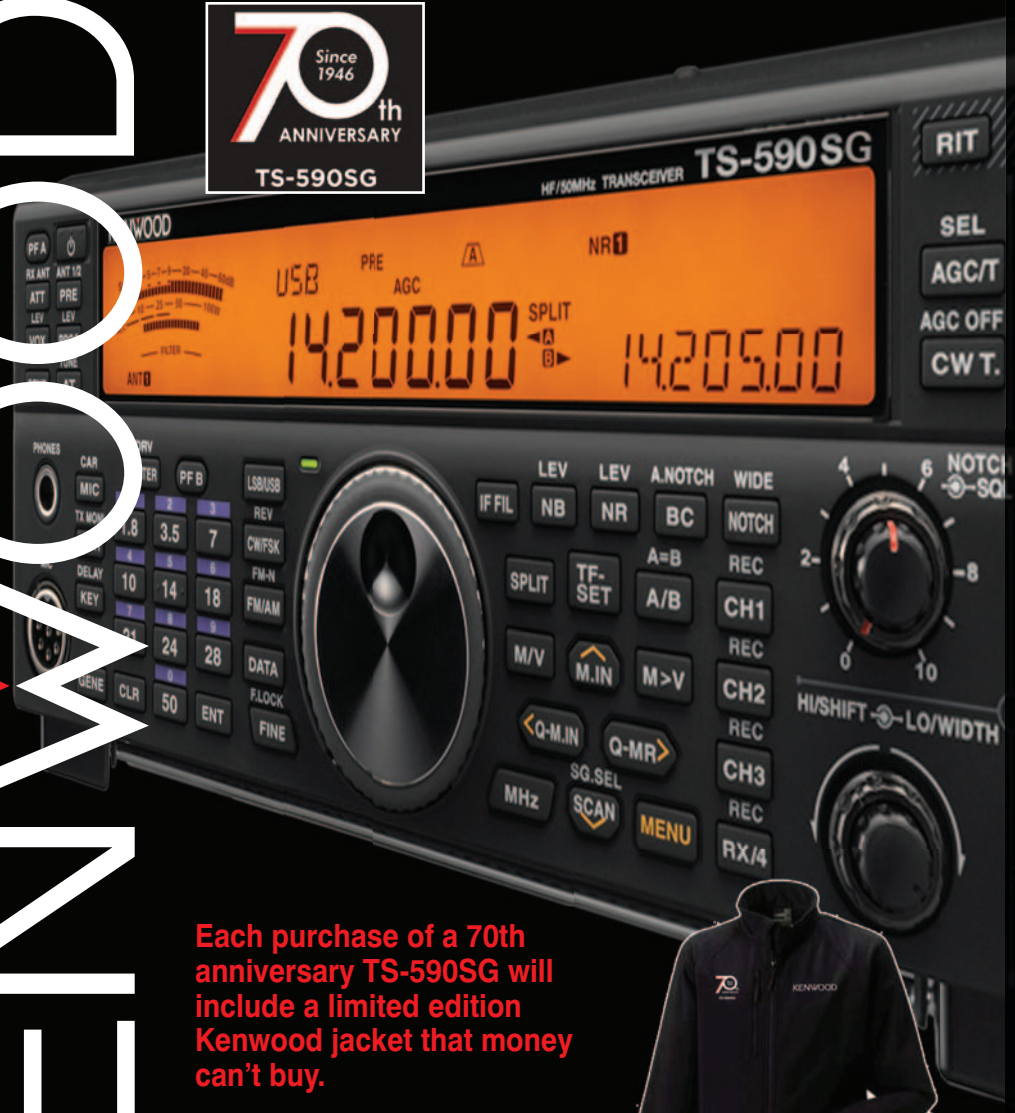
SAFE ONLINE SHOPPING
Shopping online with ML&S is safe and secure. E&OE

FOLLOW US ON TWITTER AND FACEBOOK HamRadioUK

Martin Lynch & Sons Ltd. Wessex House, Drake Avenue, Staines, Middlesex TW18 2AP. E-mail: **sales@hamradio.co.uk**
Opening Hours: Mon - Fri: 8.30am to 5pm. Sat: 9am to 4.30pm. International Tel: +44 1932 567 333

KENWOOD

Since 1946 70th ANNIVERSARY TS-590SG



Each purchase of a 70th anniversary TS-590SG will include a limited edition Kenwood jacket that money can't buy.

ML&S have secured the largest stock of this limited anniversary edition in the UK.

JVCKENWOOD Corporation is pleased to announce that, to commemorate KENWOOD's 70th anniversary, it is producing a limited edition of the TS-590SG – the renowned HF/50MHz transceiver noted for its exceptional RX performance and operating ease. This Special Black version of the TS-590SG, identified by a special serial number, will go on sale this September, with overseas availability limited to 250 units in the US market, and 150 units in Europe.
Based on the current TS-590SG HF/50MHz transceiver, this Special Black version features a distinctive front panel, main dial and glass screen. As a special deluxe model, it thus offers the highest levels of performance, functional versatility and quality in this product category – a reputation already established by the current model. We feel confident that this limited edition will more than satisfy the high expectations of our customers with an eye for elegant design.
A total of only 470 units of the Special Black TS-590SG will be made available worldwide, with a special serial number (unique for each market) applied to the rear panel.

Highest price paid for part exchanges. Finance available to UK customers subject to status.

Place your order now or call the sales team on 0345 2300 599

NEW

KENWOOD TH-D74E

Dual Band Handie with unique APRS, D-Star & HF SSB receive coverage.

ML&S PRICE: £599.95

click! www.HamRadio.co.uk/thd74e

KENWOOD TS-590SG HF/6M TRANSCEIVER

160-6M BASE WITH ATU

Upgraded version HF & 6M FULL DSP Base Transceiver

ML&S PRICE: £1239.95

click! www.HamRadio.co.uk/ts590sg

The best-selling HF transceiver just got even better.

KENWOOD TS-990S HF+6M FLAGSHIP

RRP: ~~£5999.95~~ £CALL

200W HF/50MHz Base Station Transceiver with Dual TFT Display and Dual Receiver.

click! www.HamRadio.co.uk/ts990

ML&S OFFICIALLY THE UK'S NO.1 DEALER (AGAIN)