

CHEPSTOW AND DISTRICT AMATEUR RADIO SOCIETY NEWSLETTER



July 2011

Editor Paul Dekkers M0SSJ (e-mail secretary@gw4lwz.com)

HF SSB Field Day on 3rd & 4th September 2011

Dan Taylor is co-ordinating the HF SSB Field Day and is looking for volunteers to help with the preparation and also get an idea of how many people can come along on the field day weekend to setup, operate and support. Please let him know if you can assist in any way. You don't need to commit to a full day; help setting up or just operating for an hour or so would be most welcome.

Diary dates for 2011

Tuesday 19th July Informal club night – Bring some kit and play

Tuesday 2nd August Talk – Caving & cave rescue (TBC)

Tuesday 16th August Informal club night – Bring some kit and play

Tuesday 6th September Talk – Optical Communications (TBC)

Saturday & Sunday 3rd & 4th September HF SSB Field Day

Sunday 25th September Railways On The Air (ROTA) at Dean Forest Railway - Norchard station

Railways On the Air 2011



ROTA 2010 at Dean Forest Railway

Railways on the Air (ROTA) 2011 will take place on the weekend of 24 and 25 September 2011. CDARS are planning to operate from the Dean Forest Railway Norchard station, just north of Lydney, on Sunday the 25th September. We are expecting some members of the Forest of Dean Amateur Radio Group to join us on this event as they did last year. This year as well as our radio activities there is a "Forties Weekend" (as in 1940's) at the station when there will be a number of old military vehicles as well as people in period military and civilian dress.

It would be good if we could display or ideally operate with some old (if not 1940's) radios and for those inclined to dressing up why not come along in period costume?

More information about ROTA can be found here: www.rota.m0php.net. and information about the Dean Forest Railway here: <http://www.deanforestrailway.co.uk/>

Dan Taylor's latest project "QRP to QRO"

My HF / VHF/UHF transceiver is the diminutive Yaesu FT-817. It is really compact but still a very versatile radio. However, one of the drawbacks for such a small package is that it is QRP, with only 5 watts output. At times it could do with a little help to bump up the strength of my transmitted signal.

So my goal was to get some more watts out without outlaying too much money. A linear amplifier is the answer, but what model should I go for?

I was contemplating a 12v commercial amplifier when I saw some used high power mosfets (SD2931-10 to be precise), on ebay £20 for a set of four. This is a good price and I quickly snapped them up, as each mosfet is over £50 new. Rated output power of each mosfet is 150 Watts. But now my project had got a lot more serious as instead of using one of the mosfets for a linear amplifier I thought about using all four.

The internet came to the rescue and after much pondering over various designs and circuits the Motorola EB104 application note seemed just what I wanted. Low drive requirement with lots of power out. More reading and searching of the internet revealed that Communication Concepts in America did a kit that you can buy, less the mosfets. http://www.communication-concepts.com/hf_amplifiers.htm

So after a bit of saving I purchased the kit. Construction was straightforward, but the metalwork took longer than the electronics! The mosfets produce a lot of heat and so a copper plate heat spreader has to be used between the mosfets and the aluminium heatsink. The copper has a much higher thermal conductivity than aluminium and so keeps the mosfets from overheating. The kit was not designed for my mosfets, but for the ubiquitous MRF150. This did cause some problems at first, with parasitic oscillations, but the judicious use of some ferrite beads cured the problem.

The following outputs were obtained from the amplifier running at 40V DC with 5 watts drive from my FT-817:-

1.8Mhz 508W, 3.5Mhz 411W, 7Mhz 403W, 10Mhz 403W, 14Mhz 457W, 18Mhz 259W, 21Mhz 298W, 24 Mhz 246W and on 28 Mhz just 185W.

The performance is quite disappointing on the higher bands, I put it down to the design of the output transformer.

Thanks to Rod and Dave for the loan of the kit to do the measurements.

I could use 50V and get another 20% more power out, but the lower supply voltage is much more forgiving for high SWR conditions. 50V would also be better in terms of linearity, ie my signal would be cleaner. But I decided to stick with the lower supply voltage for the time being. More drive would also increase the output power and the amplifier should be capable of 600 watts on most of the HF bands.

I configured the amp to turn the bias off to the fets when on receive to save on electricity and to keep the amplifier cooler.

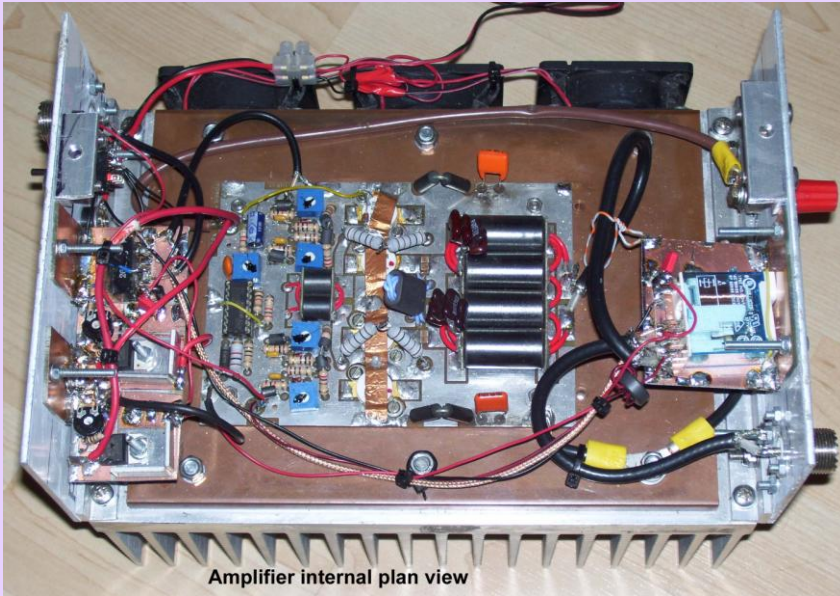
So much for testing in the shack, the time came to use the amplifier. For the amplifier's first outing on 11 th April 2011, I decided to go mobile on the way home from work , my chosen spot is between the two Severn bridges near to Aust. My aerial was quarter wave wire ground plane fibreglass fishing pole for 14 Mhz band, very basic but it always works well with low SWR. I connected three large 40 AH batteries in series to get 36V to power the amp.



External view of amplifier showing large heatsink fins and cooling fans

Continued...

Dan's QRP to QRO project continued...

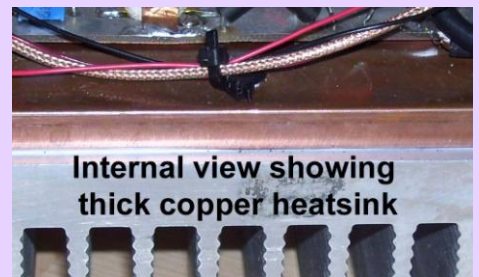


I put out a CQ and was answered by Serge RV9CM in the Urals, good signals both ways, so all was OK. Straight after I finished talking to Serge I was called by Phil VK3ELV in Australia! A long conversation ensued with a 57 signal report received from Phil. The band was clearly in good shape as I had 59+ report from Erwin YB0DJ in Jakarta Indonesia and also 59+ from V85SS in Borneo (which was a new country for me).

Conditions were not as good to the west but I did manage to work Bob VE3XM in Ontario with a 57 signal report both ways. I also contacted some more local stations in Europe at good strength before I had to pack up to go home. The last notable one was OD5RZ in the Lebanon which was also a new country for me.

The amp ran cool for the whole evenings operating time and so I was happy with its performance on the 14MHz band at least. I may be building another amp that will be better on the higher frequency bands, I already have the fets and solid copper heat sink. Watch this space....

Dan Taylor GW0EGH



Quiz question answer...

Last months quiz question was: Scotland has a list of discrete mountain peaks called Munros (named after the man who first catalogued them, Sir Hugh Munro) what is the equivalent list of discrete peaks elsewhere in the UK?



The answer is Marilyn's!

A Marilyn is a mountain or hill with a relative height of at least 150 metres (492 ft) regardless of absolute height. They are listed in a book *The Relative Hills of Britain* by Alan Dawson. It can be seen here: <http://www.rhb.org.uk/>

These peaks are in the Summits On The Air (SOTA) database which is why they are of interest to Radio Amateurs.

Training stop press:

Congratulations to Christopher Dempster and Gordon Fryer who passed the Foundation Licence exam this week. They are waiting for the results to be processed and once they have some kit sorted they will be on air with their new callsigns.

News from the RSGB: The Royal Naval Amateur Radio Society has launched its new website. All amateurs and anyone with an interest in maritime radio, especially those who have served or are serving in the Royal Navy, Royal Marines and other navies throughout the world, are invited to visit the site at www.rnars.org.uk. The site is under continuous improvement and visitors are invited to suggest additional features to enhance the site.

Communications and Electronics for Health talk by Henry Higgins:



Henry Higgins GW4ZVL gave a fascinating talk at the July CDARS club meeting.

Henry started with a brief history of the development of hearing aids from the first patent in 1892, through the first vacuum tube aid in 1921, the first transistor aid in 1947 through to the modern day hearing aids. More recent developments include radio communication between aids in both ears to improve the stereo effect.

Henry went on to describe the huge developments made in heart aids from full artificial hearts, which have not become common because of the significant power they require, to the latest pacemaker devices. Throughout his talk he emphasised how difficult it is, even with our very sophisticated technology, to come close to matching the human body in terms of how much work it can do with very little power input. Modern pacemaker batteries typically last about 7 years and the pacemaker can adapt to the bodies requirements with a dedicated sensor and processor. Latest pacemaker developments are remote wireless monitoring of pacemaker performance and patient health. This operates on two frequencies 2.5GHz for the normal sleep mode and when it is woken up, for instance by a signal from a consultants computer, it transfers data at 403 MHz. This is done to maximise the battery life. The pacemaker has a small patch antenna on its outside surface and at 403MHz the body is part of the antenna system, so antenna polarisation can be affected by the attitude of the body. An important element of the overall system is ensuring that each patient and device have a unique identifier with appropriate protocol and coding.

Henry then moved on to aids for eyesight which although they are limited in what they can do they can make a huge difference to an individuals quality of life if they previously have had no sight at all. Recent developments associated with treating glaucoma include an ocular hypertension sensor which is a strain gauge attached to a contact lens that monitors eye pressure continuously.

For internal examinations endoscopes have limited access from either end of the body so a camera pill has been developed which is taken orally and can transmit pictures (4 frames per second on 433MHz) of the whole of the internal tract. It is known as the M2A device (figure it out for yourselves!)

Other devices described include inter cranial cavity pressure sensors and the latest developments in movement restoration. In the latter, for instance, a sensor on the upper arm wirelessly sends a signal to a processor which stimulates the lower arm to grip.

New areas of development include blood oxygen and circulation monitoring, pressure monitoring, bladder control, and further developments to assist sight and hearing. Also under investigation are mechanisms to use the bodies own systems to drive a generator to recharge batteries.

The talk prompted a lot of questions and discussion on the issues raised.