Carrier Wave

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Volume 3 Issue 5

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October 2007

Club News

INTERNATIONAL LIGHTHOUSE/LIGHTSHIP WEEKEND AT GIRDLENESS LIGHTHOUSE – Saturday & Sunday 16th & 17th August 2007.

We used the callsign GB2GNL this year again and we had planned to start around 08:00 for tent & antenna's on both days with the aim of being on air by 10:00 and finishing up around 16:00 or later by agreement if the band conditions were favourable. However the weather had other ideas. Having had a successful Saturday & disassembled all equipment & tent, Sunday proved a little unfavorable and prevented us from getting the tent or the antenna up so we had to abandon attempts to get on the air having endured lashing rain, a howling gale and a minor tent pole breakage.

RSGB SSB field day

This years event ran from 13.00z on 1st to 13:00z on the 2nd of September turned out well with an overall increase in the total QSO's generated and a points increase over last year with 490 valid QSO's..

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CONTEST:          RSGB-SSB-FD
CALLSIGN:         GM3BSQ/P
CATEGORY:         RESTRICTED
CLAIMED-SCORE:    124425
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In addition to the generator, we employed the use of a large 12v battery float which kept the TS2000 powered with the full 100W during re-fuelling. Although the logging laptop on its internal battery gave sufficient lighting to see the keyboard, we now see the need to get a bank of high power led's for illuminating the operators backup paper log. Thanks to all who turned up to help.

Inside this issue:

Visit the AARS on line at

http://www.radioclubs.net/aars/

INFLATION

Ramblings from the workshop of GM4HTU

I wanted to fit my 'BSQ transmitter with a VFO in place of the crystal. There are plenty of simple transistor circuits in the books and magazines, you have probably seen them. A Hartley or Colpitts circuit, or any of the many derivatives, a single fet, and that's about it.

Recently, I have been experimenting with a circuit described as a Butler oscillator, although I am not sure if this is correct name. It originally used cathode coupled valves so fets are a natural replacement. It is very simple: a very small capacitor couples drain 2 to gate 1 and the tuned circuit is between gate 1 and ground. A few resistors finishes it off. This frugality does not just have economic benefits: if a component is not there it cannot cause drift.

It is good practice to follow an oscillator with a buffer, to prevent the following circuits from affecting frequency stability. This is especially important if the VFO is remote from the transmitter. In an inspired moment I saw a way of adding a common base stage with very few other components, more frugality. A common base stage gives very good isolation between output and input, indeed, the only thing I could do to the output which had any effect on the oscillator was to short the collector to ground, a rather harsh test. It is usual to run the oscillator at low power to avoid self heating and drift, so I set the output to 1,5V peak-to-peak. Much lower than this and a change of frequency caused a noticeable change in output level.

Three transistors are not a lot for a good VFO. Did I mention it also has to work with a direct conversion receiver? Rick Campbell, KK7B and Roy Lewallan, W7EL, both masters in the art of direct conversion design, give very good reasons for running the oscillator at half the final frequency and then doubling. With the Butler circuit, or whatever it's called, this is not a problem. Double the size of the tuning inductance and capacitance, a slight adjustment of the feedback capacitor and you are up and running, or rather, down and running.

Ramblings from the workshop of GM4HTU… cont.

The usual doubler is a matched pair of silicon diodes, looking just like a full wave rectifier. In place of the large reservoir capacitor, to give dc, is a small RF choke, to give the second harmonic. Unfortunately a 1,5V signal will not make much of an impression on silicon diodes, so a small amplifier was required. That did the job and a nice, but low level, sine wave duly appeared. The loss in the doubler is about 10dBs and by the time the signal passed through the necessary filter it would be rather low level. Another simple amplifier was added to drive the band pass filter. This gave it the required boost.

After the splitter, to derive equal signals for the receiver and transmitter, I was left with two signals of around 2mW each. This is not enough to drive the transmitter so I added a simple feedback amplifier to boost it to around 20mW.

When I mentioned the receiver I should have explained that it's a single sideband, phase cancelling system, so it actually needs two oscillator feeds, in quadrature. A slightly larger amplifier did the business, delivering about 40mW, to allow for the quad network, phase trimming networks and a small attenuator, to keep it all resistive.

So there it is, a simple VFO, containing one voltage regulator, two matched diodes, seven transistors, one with a heatsink, four iron dust toroids, five ferrite toroids, a good sprinkling of resistors and capacitors (and probably a partridge in a pear tree).

Tony Langton GM4HTU

Programme of Events October 2007

Thursday	4th	October	2007	Junk Sale
Thursday	11th	October	2007	Construction + On the Air
Thursday	18th	October	2007	Mini Talks
Thursday	25th	October	2007	On the Air + Morse Practice
Sunday	28th	October	2007	Bus trip to Galashields Rally - £20.00 Enquires to I. Munro GM4GVK

Programme of Events November 2007

Thursday	1st	November	2007	Junk Sale
Thursday	8th	November	2007	Construction + On the Air
Thursday	15th	November	2007	Western Peripheral Works by Colin, GM4TVB
Thursday	22nd	November	2007	Annual General Meeting
Thursday	29th	November	2007	Presidential Address

Lessons learned from SSB field day 2007 and other events

Logging was another story on its own. Perhaps HRD was not the best choice for a contest and having all of GM3BSQ/P logs on file didn't help. It proved difficult to spot genuine dupes. SD would have been the more appropriate logging software. However I was able to devise a method of bulk transferring the data from HRD directly into SD post input screen. I discovered an operator input flaw of mistyping a letter O instead of a number zero into HRD. SD by comparison warns of invalid callsigns. SD is also one of the very few logging programs to include ALL of the RSGB contest rules & scoring so can output correctly to the Cabrillo logs for direct submission to the HFCC.

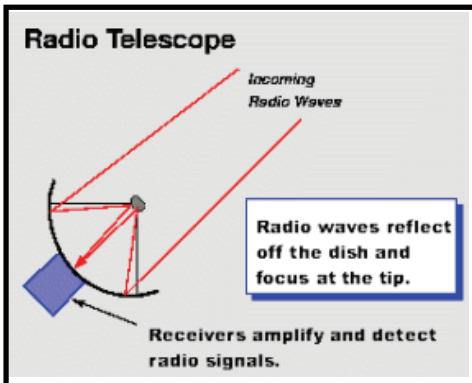
The tent faired the variable weather well & we only had minimal crane fly visitors this year. We had three genuine visitors at 02:00z from the lighthouse cottages who seemed intrigued with our efforts, their interest being from a helicopter pilot communications angle.

Martin Collier's talk on WSJT digital communications raised a few eyebrows with terms like 1st and 2nd period, sync pulses, frequency differences, soft decoders, confidence figures, full period bursts, real time spectrum displays etc. Along with recorded logs indicating thousands of miles on 6m, 2m & 70cms on seemingly "flat" conditions. These modes are not for the fainthearted and a computer, it would seem, has now become an essential addition to the shack along with internet access.

If you are still interested, the latest improved software can be downloaded from http://physics.princeton.edu/pulsar/K1JT/

Ham Radio Deluxe's digital programme Digital Master 780 now has a beta release which includes CW as one of its many digital modes along with PSK 31, 63, 125, MFSK 8, 16, Throb 1,2,4,X4 and RTTY

Technical



Radio telescopes are used to study naturally occurring radio emission from stars, galaxies, quasars, and other astronomical objects between 30MHz and 300GHz. At wavelengths longer than about 1.5 GHz, irregularities in the ionosphere distort incoming signals. This causes a phenomenon known as scintillation, (twinkling). The absorption of cosmic radio waves by the ionosphere becomes more important as wavelength increases. At frequencies higher than 30Mhz, the ionosphere becomes opaque to incoming signals. Radio observations of cosmic sources at these frequencies are difficult from ground-based radio telescopes. Below wavelengths of a few cm, absorption in the atmosphere becomes increasingly critical. At frequencies greater than 30GHz, observations from the ground are possible only in a few specific wavelength bands that are relatively free of atmospheric absorption. However, between 1 and 20 cm, the atmosphere and ionosphere introduce only minor distortions in the incoming signal. Sophisticated signal processing can be used to correct for these effects, so that the effective angular resolution and image quality is limited only by the size of the instrument.

Snippets

What Is Natural Radio?

Natural VLF are audio-frequency radio signals of Earth in the 200 Hz to beyond 10 kHz range which are not man-made but occur naturally in nature. The most-spectacular phenomena are heard between 400 Hz and 5 kHz

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Solar-Cycle 23 was at its peak during the years 2000 to 2002 and increased solar-activity spawned copious VLF phenomena here on Earth. Activity on the Sun and its Solar Wind, lightning, aurora and meteor showers all help create the great variety of VLF phenomena that can be monitored. Interest, whether for research and experimentation, or simply for the sheer enjoyment of listening, adds yet another realm of nature's beauty!

For Sale **Ian Munro GM4GVK (01224 316787)**

- Pair of Magnum–K Speakers 25 Hz to 20 kHz, 3 speakers with 12" Bass unit gives excellent quality. Dimensions 15" x 24" x 11.5"
- Heathkit HW-8 QRP Rig. 80-10m approx 2W o/p. Includes mains PSU and Manual. **£100.00**
- Goldring variable speed turntable, Shure 75 pick-up

For Sale **Stan Sutherland GM4BKV (01224 691716)**

- Projector screen
- Epson 45 printer
- J mast, Aluminium

Wanted Articles for inclusion in future newsletters.

- Please submit articles for inclusion in the October issue by Thursday 27th October 2007.

73 from GM3BSQ