

HARCNEWS

Newsletter of

Horsham Amateur Radio Club

Est. 1938



G4HRS

July 2006

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Notes From The Editor

Welcome to the July edition and I hope that you have been enjoying the fine weather. It's not so much fun operating field days in the pouring rain! You will find included an updated diary for the remaining months. I would like to thank Robin G3OGP for the write up of the June club meeting and Alister G3ZBU for the photographs of it.

The committee have decided to share the club meeting reports further and all members who attend the meetings are invited to take part. We are therefore looking for volunteers to write a report and if you would like to give it a go please let a committee member know.

Just after the June newsletter went to press I received an update to the Aspidistra report. Since it was too late to be included the online version available on the HARC web site was updated to include the changes.

If anyone who does not have Internet access would like

a copy of the updated script let me know. There is also extra information on the French trip and GB150VC.

After consideration I have decided that the printed version of HARCNEWS will in fact be available only in black and white for the time being as it had been found difficult and expensive to produce in colour and the online version will in future include extra information when available.

Along with the discussion at last years AGM to cut costs members are invited to request their copy of the newsletter to be sent by email instead of a printed version.

If you would like this then please let me know along with the email address that you would like it sent to. Any email address supplied will not be used for other purposes apart from communication with the newsletter editor. Finally please do send in any photos you may have along with your articles.

Good DX David G4JHI!

June Meeting Review:

Bring, Show, Tell

by the Members of HARC!

Tony G3NPF started the proceedings with 3 items. He had purchased a Tektronix scope from the Crawley junk sale for £2.00 (a rather high figure for a NPF junk sale purchase!) but it did come with 3 plug in units.

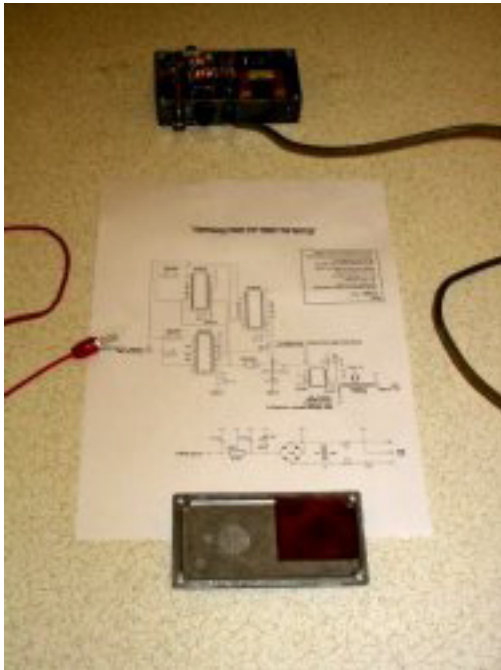
On testing it worked OK but the EHT failed after a period and was diagnosed to a failing 6GF5 valve that was duly replaced for the

princely sum of £9.00.

The EHT probe was also missing so a replacement was initially made using 20 x 10megohm resistors daisy chained around the shack which did not entirely meet with Anne's approval so a fibreglass tube was used with ends duly turned up on the lathe to contain the resistors and a useful probe



Prescaler



Prescaler with circuit

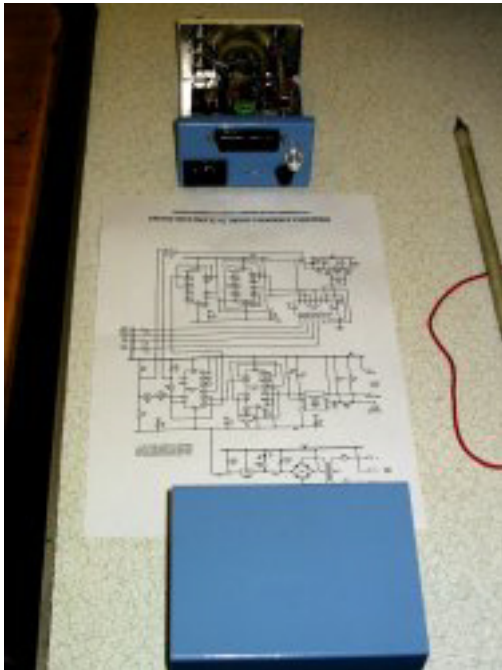
constructed.

Next item was a 3GHz prescaler to read high frequencies from a low frequency counter. The cheapest divider chips that would work at that frequency were divide by 128. These therefore required additional circuitry to get division by 1000. The circuit was found on a German web site.

The 3rd item was a frequency standard to provide clocking pulses for the frequency counter to maintain an accuracy of 10 to the minus 8.

It was discovered that the line frequency of a television picture provided by BBC/ITV & C4 is locked to a rubidium standard so a composite video source was taken from a TV SCART socket.

It is fed through a sync separator to provide line pulses which were processed to account for half line pulses and then divided to produce standard frequency outputs as well as a clock feed for the counter.



Above

TV sync derived
frequency standard

Left

With circuit

Next in the spotlight was Alistair G3ZBU with a very neat unit (no birds nest anywhere to be seen!) to control a remote pan and tilt head. This device used a PIC chip to control various functions and had what looked like a normal rectangular button that was multifunctional.

It could display 3 colours and also up to 4 lines of words up to 5 letters as well

as being a push button switch. In normal mode it would control/switch up to 8 cameras with standard pan and tilt functions.

By using a key switch on the side you could go into the set up mode and alter various camera movement and speed profiles. The button mentioned above would even show a graph of the movement profile.



Tilt head control

The original equipment that controlled these cameras is heavy and bulky so this unit, which was light and

portable, could be of great benefit when setting up a camera located on the top of a skyscraper.

Next up was Brain G3GDU who displayed a number of photographs that he entered into some competitions and explained some of the techniques required for obtaining the interesting effects. The black and white photo of 2 wine glasses against a black background was particularly interesting.

(The wineglasses being of excellent quality having been given away with 6 gallons of petrol in the 70s). The final photo was of an "airport" in Guyana with the wing of an Islander aircraft against a couple of

huts sans roof covering.

Brian explained that after having spent a week flying in this aircraft he was glad to finish his tour. The aircraft ploughed into a mountain in poor visibility a couple of weeks after he left!

David G4FQR showed the assembled masses an auto seeking FM radio that he had purchased from a £1 shop in Crawley and had obtained information from the Internet that these radios can be converted to work on the Amateur bands.



Ron holding his 80m loop

He also passed around a very well made PCB that will be the basis for a homebrew transceiver with a 20W MOSFET PA. Finally David showed us the fruits of his work when attending classes for watercolour painting techniques.

These included a number of works using 1, 2 and 3 colours. He explained that the best paintings had been commandeered by his daughter to decorate her flat. The final entry was from Ron G3PYC who had brought along the 80m loop aerial that he has been experimenting with over the past couple of years.

It consisted of a 3-metre length of 10mm copper tube and a couple of 10kV wide

spaced variable capacitors. Ron explained that he had originally fed the loop with a smaller loop but this produced a very narrow bandwidth between 1.5: 1 SWR points in the order of 1 to 1.5KHz.

Any change in the ambient temperature e.g. when the sun came out caused the antenna to go off tune. He solved this by placing a ferrite core with a number of turns wound on it at the current point of the loop and feeding that.

The ferrite ring acted as a current transformer and produced a bandwidth of 6 – 8KHz. This aerial would allow anyone living in a flat with no access to a garden to work 80 metres quite successfully.



Ferrite core

Chain Home

by Ron Polley G3PYC

The Arnold Wilkins 'Daventry' demonstration in 1935

Using the powerful BBC Daventry overseas broadcast station on 49m, 6MHz band; he set up 2 receiving aerials spaced around a half wavelength apart. One aerial connected directly to the receiver and the second aerial connected via an adjustable phase shift network.

The receiver output being connected to an oscilloscope. The phase shift was set so that both signals almost cancelled, but leaving a small blip on the horizontal trace line.

A test aircraft was flown from a distance towards the test site and at some 8 miles a relatively weak reflected signal arrived at the aerials with a different phase angle to that from the direct transmission.

The reflected signal was therefore not being cancelled out by the phase shift network and thus caused a substantial deflection of the trace. After several trials from different directions the official observers were convinced, and immediate development funding was authorised.

Dr Robert Watson Watt, Arnold Wilkins and a picked team set about designing a Radiolocation system. They set the frequency between 26 and 51 MHz to suit the available power transmitting valves that were then available.

They decided on 4 different frequencies in this range so that in the event of jamming they could switch frequency at will. They subsequently found that the concept of 4

frequencies was unnecessarily idealistic; most static fixed CH stations on the East Coast operated on one or two frequencies in the 20 to 30 MHz range.

They also designed a lower power Mobile 'Radio' Unit to stand in for main stations under construction etc. These MRU's used 45MHz. With these frequencies the aerial configuration was designed to produce the required lobe pattern.

This had to be supported on 4 towers 360ft tall, un-guyed, made of steel, equispaced, in line and at right angles to the required direction of transmission, 'the line of shoot'. Each mast supported its own array of aerials giving a broadside effect.

The first station was built at Bawdsey, Suffolk just east of Ipswich. Other stations were spaced to suit the best coverage, from Ventnor on the Isle of Wight to the Orkney's. These were known as the East Coast stations.

The receiving aerials were mounted on 4 wooden masts, 2 pairs, and 240ft high. Wood was used to reduce any

possible reflections. Each pair of masts held stacked crossed dipoles and both pairs of masts were spaced several wavelengths apart.

The signals from these dipoles on each pair of masts were brought together via a radiogoniometer adjacent to the receiver. These signals were displayed on a CRT, the trace being horizontal and the echoes as downward spikes.

The tube was marked in miles from the left hand side. Rotating the 'Gonio', as it was called, made it appear that the aerials were rotating. The 'Gonio' was marked in degrees and the operator nulled out the echo, and the angle shown was the direction to the echo.

Nulling out a signal gave a much sharper fix. Alternative dipoles at different heights up the masts were used, via another radiogoniometer, in determining height. Range accuracy is quoted as plus or minus 1 mile on all ranges out to 200 miles. Height accuracy is quoted as plus or minus 500ft at medium ranges but worsening at greater distances.

Bearing accuracy is quoted as plus or minus 2deg under 'normally favourable conditions' and much less accurate on weak long-range echoes. The Post Office research laboratories designed and made the Electrical Calculators, which did the mathematics for the grid reference plots from the ranges and bearings as seen and target heights from the combination of angle-of-elevation and range data.

The East Coast early transmitters, Type T3026, used continuously evacuated water-cooled valves, with 25kv producing up to 450kw peak pulse power. The later Type T3026A, at 35kv producing up to 700kw peak pulse power. The pulse repetition frequency was 25 pulses per second and the pulse width being 5 to 40 microseconds in length.

The pulse timing of the transmitter was obtained from the receiver. The Identification of Friend or Foe (IFF). This was arranged in 2 types. The first heightened the echo intermittently, indicating friend, the second type not

only heightened the echo but also broadened the response considerably.

This indicated a friend but in trouble and possibly having to ditch in the sea. The operators could then inform Air-Sea rescue as to last known position if required.

Calibration. This had to be carried out for the original commissioning of a station. The commissioning team did the first but thereafter it fell to a couple of WAAF girls. A ship at anchor in a known triangulated position, a convenient lighthouse or rock and even church spires etc when the station was inland from the coast, were used for calibration.

These would be at set positions so that a bearing could be taken on an Autogyro, no helicopters in those days, which would circle the chosen object at a suitable height. The 2 girls would climb one of the transmitting masts to one of a pair of platforms at 160ft elevation.

One girl would have a Theodolite to take a precise bearing whilst the other had

a telephone. She would transmit the bearing of the calibration object, with Autogyro, to the operators who would adjust the equipment accordingly.

For height calibration an ordinary aircraft would fly over the calibration point at various known altitudes. Sometimes one of the girls would panic and freeze when starting the descent.

Getting her down numerous flights of near vertical open steel ladders could take a lot of time and effort. On one occasion an Autogyro was circling a spire on a Sunday morning when one of the parishioners opened fire with a shotgun. The pilot postponed the calibration. The congregation apparently could not hear the vicar.

After the East Coast stations were fully operational the remainder of the coast from Ventnor westward through Wales to the Hebrides a simpler type of station was used. Only two 325ft guyed steel masts were used for

transmission and a pair of 240ft wooden masts for reception.

Two bands in the 20 to 60 MHz range were used and the pulse length was 6 to 9 and 12 to 17 microseconds. The transmit valves were air cooled, sealed off valves, type T3018A or B with 24kv delivering up to 300kw. The performance from these stations was generally comparable to the earlier East Coast stations.

From late 1941, Radar as it became known moved upward in frequency to 200 - 300 MHz. This made height finding much easier to determine. Also it enabled self contained mobile operation stations to operate in the field.

The Germans incidentally started their radiolocation in this frequency range and the Battleship Bismarck had it installed, but when it fired the first broadside with its main armament, against HMS HOOD, the blast shattered the Radar aerials.

To be continued

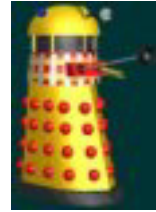
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TV Addict



A strange noise then a blue police box appears the door opens and out pops the Doctor along with assistant Rose Tyler. Currently 13 exiting episodes of Doctor Who are in the run with adventures from aliens such as the Cybermen, Cassandra and Madam de Pompadour.

Even K9 is seen to return in episode 3 School Reunion. All the wobbly sets seen in the older series have been done away with and all the latest technology has been used to produce the latest series that has been

filmed in and around Cardiff.

Episode 7 The Idiots Lantern is where the Doctor climbs up the Alexandra Palace TV tower and saves all the viewers who were watching the 1953 Coronation from losing their face forever!

BBC1 Saturdays at 7pm will get you a seat in the Tardis and although the latest series is almost at an end there are numerous repeats on BBC3 followed by screenings on UKTV Gold and available on DVD.

Please send contributions for the August edition of HARCNEWS to the editor by 15th July. Items received after the deadline will be held over until a later edition.

All input is subject to suitability and available space.

Any comments, letters or new ideas very welcome especially for the new features of this newsletter.

For items sent by email please send to this address:

harc.news@g4jhi.co.uk

Web Trawl

Jim's Old Radios is a collection of vintage equipment. On first visit it is worth visiting the introduction page. Information can be found of valve and transistor radio sets some of which have been restored and details of this are listed for the appropriate item.

The left hand side of the site has easy navigation to the relevant sections. There is even a page Restoration Notes that is an index to

all the items that have been restored.

There are also telephones, tape recorders, test equipment, record players and TV sets. It is interesting that a certain time lord's programme appears on a dual standard Sony TV9-90UB from 1966! One thing of note is that many items even list which type of valves are used inside the equipment.

www.exleyj.karoo.net

Radio Diary

July 3rd 80m CW Club Championship 20:00 - 21:30

July 6th Club Night: More Codes, Ciphers and Stenography
- G3ZBU

July 12th 80m SSB Club Championship 20:00 - 21:30

July 13th Social Evening: Bax Castle, Two Mile Ash

July 15th Martin Lynch Summer Boot Fair 09:00 - 16:00

July 16th MsMichael Rally & Boot Sale

July 20th 80m Data Club Championship 20:00 - 21:30

All above times are BST

Club Meetings and socials start at 8pm