



Dragnet

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Official Journal of the St. George Amateur Radio Society

PO Box 530, Engadine NSW 2233

Note: The views expressed in this publication are those of the editor and anyone else he has dragooned into writing, and not necessarily those of the Executive of the Society. Where ideas come from other sources, we have tried to give due credit and obtain clearance.



Do you recognise this set-up?

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What we would really appreciate is some more dedicated help and donations, rather than complaints from the vocal non-helpers.

Hymns ancient and modern

Club activities

Dragnet has shifted its focus to more technical matters. For breaking news on club activities, go to the club's webpage and listen to the WIA broadcasts each week.

The St George website

Where? Go to <http://www.sgars.org>

Many thanks to the website committee, we now have a really good-looking website that is up-to-date and works well. Let the site manager know if you have something to add – or send a 'Cheers and 73'.

Equally, if you have something you can't bear to throw away and would prefer to see it go to a radio amateur, contact the site manager to advertise it on the website – yk2gx@sgars.org.

Back issues of Dragnet should be available there now. In the near future, we plan that Dragnet will only be available via the website. We may still print a few copies for those of you who persevere in using smoke and mirrors for your wireless communications.

Silent key

It is with sadness that I report that John Sutton, a club member of long standing and secretary for many years, has passed away following an accident on his property. A service to celebrate his life will be held at the Presbyterian Church, 48 Bindea Street, Como West 2226, commencing at 1.00 PM on Monday 31st May 2010.

All John's friends from the Amateur Radio fraternity are most welcome to attend.

Amateur radio direction finding [ARDF]

This article has benefited immensely from the contributors listed at the end. Any errors are mine.

Definitions

Wayfinding is the process of getting from one designated way-point to the next designated way-point. Aircraft pilots identify the waypoints they will pass on a particular flight. Some GPS devices can provide this for pedestrians, hikers and car drivers, too.

Navigation is knowing where you are right now and determining a path to sail with some accuracy to another point. Sailing from London's Tilbury docks to Australia via Tahiti is an example. Driving a car using a road map is another. Remotely guiding an inter-planetary device is yet another. Finding your way around a computer screen or the internet is an abomination of the word.

Direction finding is determining the headings required to get to a known *rendez-vous* point. This is what a stranger in New York uses when wanting to get to Macy's.

Fox hunting is the radio amateur sport of finding hidden transmitters using very simple receiver and antenna equipment. The 'sport' element comes from competing with other fox hunters to find all the hidden transmitters – the foxes – in accordance with some predetermined rules.

Triangulation is the process of taking at least two bearings on a target in order to narrow the search for the target item, such as a fox. However, all antennas have some breadth in their polar responses; so, even two bearings are often insufficient. Taking three bearings increases the level of uncertainty as the three lines do not intersect in one point. In high speed fox hunting on foot, you may not have time to draw careful lines on a map – so, speed and accuracy are the trade-offs in triangulation.

History

In 1947, Thor Heyerdahl showed that a balsa-wood raft could easily have drifted on tides to help people migrate from Peru to the Polynesian Islands and on to Easter Island, long before the Spanish set about filling their coffers with gold stolen from the Inca people. The stone statues in Peru and several of the

Polynesian Islands are mute testament to these sailors' skills. How did they get there? Allegedly, these pre-Columbian sailors had an *aku-aku* – directions written in an ancient script, kept in a secret book. To maintain the radio interest, the *Kon-Tiki's* radio receiver was a National Radio Company NC-173 and the Norwegian ex-WWII-underground radio operators were Knut Haugland, and Torstein Raaby. Raaby provided valuable DF information during WWII that made sinking of the Tirpitz possible.

The Chinese and many other Asian peoples traveled the old spice route for hundreds of years. Some of the maps they used are remarkably accurate. But how did they know where they were at any point in their journeys? Their technology relied on the lodestone, a ferro-magnetic mineral that aligned with the Earth's magnetic field – an early compass.

The Maoris traveled by canoe probably from somewhere in the Polynesian group to colonise New Zealand around 1300 AD. It is unlikely they had maps, beacons, compasses or waypoints. As far as we know, they were not literate – so knowledge must have been passed by word of mouth. Yet several tribes arrived at the islands of New Zealand at different times. The stories passed down suggest a form of dead reckoning – we don't know how many were lost at sea.

18th and 19th century long-distance sailing relied on maps made by predecessors, 'shooting' the sun and stars and dead reckoning. A log trailed behind a boat spun a crude record of distance covered. Timepieces and maps were used to estimate longitude. Losses were heavy till Hunter produced his highly accurate timepieces that allowed James Cook and others to circumnavigate the globe without disaster. They also provided Charles Darwin with access to the Galapagos Islands and the beginnings of his 'survival by natural selection' theory.

In the early 20th century, when postal services started to shift mail by air, the aircraft losses were horrendous. Up till this time, wayfinding was by sighting landmarks, such as roads, towers, grain silos, colour-and-time-coded lighted beacons and IFR [I follow railtracks]. Radio comms were very difficult because of either the lack of sensitivity and selectivity of the super-regenerative sets, or the need to move several dials on the TRF sets. Once Edwin Armstrong's super-heterodyne receiver – one knob tunes all - was developed, radio comms became more reliable and aircraft losses fell dramatically. Dr Drake of the Aircraft Radio Corporation of Boonton, NJ, was one of the first to take a gamble on Armstrong's ideas, to design the Command series of radios. With the proliferation of airports and the desire to fly well away from ground, at night and during bad weather, came the era of radio directional beacons. These employed two transmitters

feeding directional antenna arrays. The letter A was transmitted by one and the letter N by the other. When the aircraft radio operator [and pilot] could hear a continuous tone [A and N inter-leaving] from the BC-453 or the R-23A / ARC-5 receiver, the aircraft was on a designated path.

Radio direction finding probably got its biggest push with the development of Radio-Assisted Detection and Ranging [RADAR] during WWII. This system relied on the time of transit of a pulse of RF sent from a transmitter, bouncing off a 'target' and returning to a receiver. A simple analog computer calculated the transit time and converted this into distance, to be displayed on a cathode ray tube's screen. Most early RADARs worked at around 50 MHz, called UHF in those days. These early RADARs produced confusing signals because of scatter from moving surfaces, such as the sea or changes in the refraction of the atmosphere during a storm. Later RADARs used the Doppler effect to identify whether the movement was coherent, ie, an actual target, and the radial velocity; Doppler filtering also helps distinguish between different kinds of targets – a flock of birds, or a low atmospheric pressure wave front. The higher the frequency, the better the resolution of the position of the target; and the smaller the transmitting and receiving antennas; steerable parabolic antennas at these frequencies weighed several tons. The higher the Pulse Repetition Frequency [PRF], and the smaller the pulse duration the better the resolution of the size of the target, ie, one weapons carrier or several.

The problem with the A-N system is that anyone can home in on the source – friend or foe. During WWII, the YG / ZB system was developed for helping aircraft that may have been zigzagging during a dogfight, return to an aircraft carrier that had to keep moving during a mission. The aircraft carrier transmitted a signal at around 240 MHz from the YG equipment modulated with a signal in the 500 to 800 kHz range. This modulating RF signal was further modulated with coded positional information, or even an A-N signal. The 240 MHz signal was sent via a rotating antenna in short bursts so that the enemy could not lay a fire line on the signal emitter. The aircraft carried the complementary ZB receiver with information about mission-specific, time-of-day frequencies. The ZB receiver was coupled to a BC-946 or R-24 / ARC-5 BC band receiver to decode the positional information. This was a remarkably successful use of radio direction finding for allied navigation purposes. The enemy did not 'crack' this system and details were not available till just a few years ago. Remember, at sea, there are not many grain silos and at 3,000 m, an aircraft carrier is very small.

RADAR ‘leaked’ to the Germans and the Japanese during WWII. Professor Yagi and his lab assistant Uda developed the parasitic antenna array for use with Japanese RADAR. This antenna is much lighter than a parabolic antenna, but its directionality is not so precise.

There have been many other radio-based wayfinding systems developed since then - LORAN, TACAN, VOR, ILS [ask John, VK2BBC what these initialisms mean]. All these systems – including the A-N system, RADAR and Doppler – rely on fairly high transmitter power [MW of peak pulse power], very sensitive receivers, highly directional, calibrated and stable antennas, complex signal processing, a large display device and long hours of operator training.

Fox hunting is a relatively recent sport. It started with the advent of hand-held radios. These began as a ham-based development of the Motorola BC-611, a WWII low-HF, infantry-based, crystal-locked transceiver about the size of a full-grown loaf of bread and about as heavy as Sunday’s roast dinner – but it don’t half look ‘cool’. The antenna on the BC-611 was a short vertical with very low efficiency and no directionality. Well, not quite – an enemy could triangulate your position and rain heavy mortar upon you to persuade you to cease your transmissions and deace forthwith. A directional antenna at low HF is hardly practical for running around in wooded bush-lands – ideal places for hiding foxes.

In the 1950s, *Popular Mechanics* produced a series of simple, hand-held, super-regenerative transceiver designs for use in the 70 cm band. One of these used the readily-available 955 acorn triode while the more advanced designs used a 958A in place of the 955 and a 3S4 as the audio amplifier. In the USA, these hobbyist designs didn’t catch on as much as in Europe. Here, they really took off, aligning with the Scandinavian interest in fitness and the new outdoor sport of orienteering.

While some fox hunting activity takes place on 80 m, most is conducted at VHF, and in particular, 2 m. The Yagi-Uda, loop and Adcock antennas are most frequently used, because they are light, fairly directional, and easy to build, stash and repair.

Applications

The applications for wayfinding, navigation and direction finding are legion. They include airline pilot route planning, air traffic control, taxi driving, truck driving, stolen vehicle recovery, vehicle speed estimation, bush trekking, search and rescue [remember - always carry an Emergency Position Indicating Radio Beacon [EPIRB]], meteorology, space travel, and such military applications as ground-hugging RADAR and guided weaponry – smart bombs and missiles.

Most of these, except EPIRBs, are a long way from fox hunting. Here the application is used to train people in direction finding, target identification and target finding– yes folks, the fox can be programmed to change character [frequency or emission mode] and can move during a contest.

Technologies

These are of two kinds – software and hardware.

Software

The essence of fox hunting is that the sporting event organizers are licensed radio amateurs who decide:

- what kind of foxes to deploy
- where to deploy them
- frequencies of emissions
- modes, power and timings of emissions
- timings of fox position changes
- a set of rules for determining the nature of the contest, eg:
 - having fun
 - first past the post
 - most hidden foxes discovered
 - shortest distance covered
 - least time from start to completion
 - who buys the tea and scones.

Hunters do not usually require radio amateur licences, as all they are doing is listening; where there is a likelihood of people getting lost or injured, a regular hand-held radio and the appropriate licence can be invaluable.

Where the fox hunt is to cover a large geographic area, the organiser or the hunters usually require maps. Topographical maps showing density of flora are the most helpful, because then you, as the hunter, can plan how to traverse the terrain in which the fox may be hidden.

With motor sport, the organizer must provide the full plans of a sporting event to the Confederation of Australian Motor Sport, police, road authorities and other emergency services, and seek permissions from them to run the event. Fox hunting in this country has not progressed to that extent yet. In many Asian countries, Radio Sport is big bikkies and governments are involved; for instance, for a long time, the only way to get an amateur licence in China was to be a member of a Radio Sport association.

Hardware

The organizer always provides the transmitters that act as foxes. In addition the organiser may allocate liaison frequencies to help people who are learners, or who get lost or injured.

In some cases, the organizer provides the receivers and antennas, and some training in their use. This is usually quite simple equipment where a varying audio tone indicates field strength, ie, closeness to the fox. Few hand-held radios that amateurs can afford have reliable signal strength indicators; there are too many variables involved – the alignment of the antenna with the transmitter, the shape of the transmitted signal's wave-front in variable terrain, the closeness of the antenna to other reflecting, refracting or absorbing surfaces, the condition of the radio's battery.

Except for highly sophisticated 'sniffing' equipment, the nature of most antennas is that as you get closer to the emitter, you lose the sense of directionality. So, you need to be able to attenuate the incoming signal. The attenuator can be as simple as putting the receiver in a metal foil cylinder with only the antenna outside, or it may be a step-switched attenuator. Another method of attenuating the incoming signal is to place the antenna close to your body, with the antenna pointing away from you – here your body acts as an RF shield, assisting the directionality of the antenna.

The directional pattern of most Yagi-Uda antennas is fattest closest to the signal source. For a simple Yagi-Uda, eg, a three element beam, the front to back ratio is not that high – perhaps 10 to 15 dB. So, you may just be getting the normal, reduced pattern off the back of the antenna. On the other hand, loop and Adcock antennas have a figure-of-eight polar pattern; you turn the antenna till you get a null – this null can be as deep as 30 to 40 dB – but you get two nulls at 180°. With all these antennas, unless you have both direction finding and signal strength sensing antennas, you need to move and take another bearing to ascertain the direction between you and the fox.

Where the hunters are in motor vehicles, or where the fox is mobile, it also helps to know the relative velocity of the fox and the hunter; here, Doppler signal processing can be quite helpful.

Fox hunting can be a serious sport – some enthusiasts may spend a thousand dollars or more on smart, hunting equipment. And if you are really serious and wish to enter international sporting events, you need to be fit – to be able to carry all your sophisticated gear while running at high speed. On the other hand, you

can start and remain at a fairly simple level, making all you own equipment, or using kits.

Kits available

VK3YNG has compiled a webpage of fox hunting gear - sniffers, receivers and antennas - available. Go to:

<http://www.foxhunt.com.au/>

Ian, VK3MZ has a web page describing 80 m gear available for both vehicular and pedestrian fox hunting. See:

<http://pe2bz.philpem.me.uk/Comm/-%20-%20RF-Sniffer/-%20Ham/Ham-900-UltraTracker/eightd.htm>

Drilled circuit boards, pre-wound TOKO coils for L2/L3 and some of the other hard-to-get components are available from Ian, VK3MZ. Phone +61 3 9876 3643 or write to [Ian Stirling \(VK3MZ\)](#), 169 Glenvale Rd, Ringwood Nth., Victoria, 3134, Australia.

Kits for all the parts and the antenna are available through [Mark Diggins \(VK3JMD\)](#), 134 Howard Rd, Dingley Village, Victoria, 3172, Australia. Phone (AH) +61 3 9558 2959.

For a very detailed listing of transmitting and receiving kits available, see:

<http://www.ardf-r2.org/en/equipment.shtml>

Other useful urls

For what's going on in ARDF in Victoria, see:

<http://www.ardf.org.au/cgi-bin/menu.cgi>

To identify who uses ARDF, go to:

http://www.silcom.com/~pelican2/PicoDopp/ABOUT_HUNTS.html

For a fairly detailed history of ARDF, its sporting ties to orienteering and its strength in Northern Europe, see:

http://en.wikipedia.org/wiki/Amateur_Radio_Direction_Finding

A recent page on the WIA's website gives an update on an international fox hunting contest:

<http://www.wia.org.au/newsevents/news/2009/20090705-1/index.php>

Helpful contributors

Mike Bittner, W6MAB

Lenox Carruth, WA5OVG

Wayne Eleazor, WB5WSV

Mike Hanz, KC4TOS

Thor Heyerdahl (1957) *Aku-aku: the secret of Easter Island*, George Allen and Unwin, London

Paul Howarth, VK2GX for many of the urls above.

Bob Macklin, K5MYJ

Mike Morrow, KK5F

Dave Stinson, AB5S

Gordon Eliot White – of Command radios fame.

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From here and there

Printed wiring board design

This little stream of consciousness started with an innocent query about why TO-92 pack transistors were found in a board clearly designed for TO-18 packages. Why didn't the manufacturer just change the board layout to accommodate the newer, cheaper, plastic transistors?

It costs a lot to revise a board.

Dave Wise

No, it USED to cost a lot to revise a board, back in the 70s when this equipment was built, so that's why they went to this trouble to use the TO-92 transistors without changing the boards.

These days, revising a board costs almost nothing. A few minutes in your CAD program, then send the new Gerbers to the board house, and that's it. The only costs are your CAD time (not much for a minor change like this), and the new set-up costs (~\$25 at pcbcart.com where I get my boards), and perhaps any new set-up costs for the automated assembly equipment (which is surely far cheaper than

doing any hand assembly because something doesn't fit).

It was very different back in the 70s when PCBs were laid out and drawn by hand.

Daniel W

Yeah, it's kind of amazing to think of the process(es) it took to design and manufacture a multi-level board like this way back when.

Mention was made that the components were probably mechanically inserted, etc., but I'm not sure that was the case. It appears the leads on things like resistors, etc., were preformed, but it appears the assembly was done by hand. The leads on the underside of the board were bent slightly to hold them in place until they were soldered and then the leads were trimmed. Some leads were bent just a little, some were bent a lot, and the trimming is somewhat inconsistent.

Most of the TO-92 transistors do stick up oddly; however one of them (one that I'm having to replace) was apparently done on a machine or else someone did a very different job of sprangling the leads. It hugs the top surface of the board a lot better than the others and looks a lot neater; however, it does make it harder to get a probe on the top side of the pads to take any measurements.

Barry - N4BUQ

Hi Barry, - I do remember that as far back as the mid to late '70s HP was stuffing pc boards on a magnificent machine made by "Universal", and those machines are still around doing a great job with axial-lead parts. The machine forms the leads as the parts come off the reels, trims them to a certain length, it inserts the parts into the board, and bends the leads on the bottom side, so the parts stay in place. After wave soldering, the boards go on a machine that cuts all the excess lead length. Those TO92 transistors you have probably came from the manufacturer with pre-formed leads. You could order them in a "reverse-formed" configuration for pc boards that were designed for TO18s, etc.

They also had spacers for transistors that were made of something like soap.

Those would hold the transistor at the right height during wave soldering.

Afterwards, the soap would dissolve during the board wash.

HP did not clean up solder residue after manual soldering or rework because of reliability concerns.

The boards were designed by cutting rubylith film which was also used in graphics arts and publishing. A great innovation came with the pen plotters which could be equipped with a cutting tip instead of a pen. The tip would score the rubylith film, and then one could peel off the unwanted material. At that time the boards at the Santa Rosa division were designed on 9825 calculators by entering coordinates (no graphics display!). The software was written locally, at the

division. There were no personal computers.

Vladan

I'm surprised they used RubyLith rather than taping the boards. It's much harder and if you err, you are screwed essentially.

John Forster

John,- Until the pen plotter came along, most boards were taped/masked. This division of HP did a lot of microwave circuits too, so rubylith was also used. If you had a board with a giant ground plane, a mix of rubylith and tape was often the easiest way to go.

With a pen plotter, you could make proofs with ink on paper and if all was well, you could use the plotter to cut the rubylith automatically. That method wasn't used very long because the Gerber plotters soon started taking data from the 9825 tapes.

Well, it's clear we grew up in the same generation! I still scratch my head about how it all changed.

As we speak, I am transitioning to newer layout software for pc boards and the user interface is driving me crazy. Some day I will be reminiscing about the good old days when we had to use the computer mouse to lay out something called a pc board ...

Vladan

Vladan - I can remember back about 20 years ago when TRW bought software to lay out 8 layer boards for their signal processor. (Doing cuts and jumps on those was a challenge) It all worked except for the one RF board. it did not know how to lay out the grounds, etc.

So they had to recall an expert for 6 months at \$60,000, a good sum then.

Will, WOOEM

How about Zener diodes?

The soft knee on low voltage Zeners is normal, as they are genuine Zeners, which rely on a narrow depletion zone and high field strength (300kV/cm) for operation, rather than avalanche devices (anything above about 6V), which have a much harder knee, and operate as a result of minority carrier chain reaction.

Dave

I forgot in my mail to the same effect (but with less physics - that was unlike me wasn't it?) that the temperature coefficients are opposite for Zener and Avalanche balance at around 5.6V, which is why voltage reference Zeners operate around

that voltage.

Craig Sawyers

From your note, is it true that all low voltage Zeners would have "softer knee"?

Greg A

A table of dynamic resistances is very illustrative, see for instance

<http://www.diotec.com/pdf/zpd1.pdf>

Albert

It also shows the transition from a negative temperature coefficient to positive at 5.6V. Zener based voltage references work by selecting devices at around 5.6V for zero temperature coefficient at the oven controller temperature, and then aging them to reduce drift. Nevertheless there are still difficulties, like hysteresis if a device is temperature cycled – so Fluke references have a thumping great battery for power failure, and transport to and from a standards lab for calibration. With care around 1 ppm per year drift can be achieved, as good as the old saturated Weston cells and a darned sight more convenient.

Craig Sawyers

If we go deeper into this subject, sharpness of low voltage knee also depends on power rating of the diode (set the bias current) ie, in order to get sharper Zener knee, it is better to chose from more powerful Zeners - say work with 1W instead of 500mW parts...

Greg A

Back in the semiconductor dark ages (1970), when semiconductors still cost enough that you had to justify the use of each one, a clever trick I learned from a senior engineer was that a reverse- biased emitter-base junction has extremely sharp avalanche knee around 6 V. Low voltage Zeners were still quite expensive (more than \$1) and had very poor knees. If you could live with the slightly higher voltage from the transistor (which cost less than 10 cents) you could save a lot of money in your design by using a transistor in place of a Zener.

Dennis Tillman

Connecting transistors from my parts kit using reverse-biased emitter-bases on my 7CT1N. Using my Tek 2246A to monitor voltage.

I found the 2N4258 [151-0221-00] to be a good 5.9V@5mA, 6.0V@10mA and 6.2V@20mA. The 2N2219A [151-0103-00] to be 7.7V@5mA,10mA, and 20mA.

I found that 44mA was the most I could get. Saturation? Voltage was 7.78V.

I am very impressed. Amazing!

Jerry Massengale

[How's that for lab results without leaving your desk, eh? - Ed]

For a production design it is always problematic to use unspecified or parasitic parameters. That's not to say it ain't a neat idea, just a warning to be careful. The next production lot or manufacturer might have another voltage.

Another trick is to use a 78xx voltage regulator for a heater. With the output shorted to gnd it will act like a Zener but the internal thermal shutdown still works. I use it often if I need a TO-220 heater.

Stefan Trethan

Stefan, - Yes, I tried 2N2219A from 3 different batches, all were good Zeners but voltages ran from 7 to 10V. A Fairchild 2n2219a from 19th week of 1973 was 10V. Fairchilds with 818 date code read 7.9V and Motorolas from 213 and 8418 read 7.6V.

They are consistent within batches.

2N2219As are my favorite replacement part for NPN TO-39s.

Jerry Massengale

Make sure you mark the transistors so you don't use them where you need current gain. Reverse biasing the B-E junction kills beta; at least it does in microwave transistors.

Dennis Tillman

Once you have operated a transistor with the BE junction in breakdown, the low current beta and noise characteristics are degraded - so put those transistors aside.

David DiGiacomo

So then MTBF is greatly reduced...

Greg A

Where did you get that? The MTBF doesn't change at all. There are many ICs that use NPN BE junctions as Zeners.

>And do not use this transistor ever in "normal mode"...

Actually you can if you don't care about low current operation, or if you "anneal" the BE junction... however, it's easier to put the Zenered transistors in another drawer.

> And as I hear see knee voltage measured at same p/n is all over the place and depend on day code....

All transistor parameters are process dependent. B-E junction breakdown is pretty consistent though. All silicon transistors are 6 - 7V.

David DiGiacomo

That was used commercially; one example being NEC colour TV power supply regulator reference (linear regulator). It used a transistor junction as a Zener.

Don Black.

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Useful urls

File hosting

Can anybody recommend a site to temporarily host a 15 MB file that is too large to email as an attachment?

John Forster

Send it to RapidShare <<http://rapidshare.com/>> , they also send an email to the recipient and hold it there for 60 days free.

Ignacio, EB4APL

Also <http://www.yousendit.com> does the same thing. The recipient gets a short email with a clickable link to download the file.

Larry, WOQE

Please try dropbox.com. Note: dropbox.com has no time limit. 2GB FREE. Many very rich features. Works with smartphones like iPhones.

John Allen

I watched the dropbox.com video. There's no way I would use it for "my Africa trip" like they suggest. Because this would certainly involve distributing personal information and leaving it on their servers allowing them to peruse it at their leisure.

I would certainly recommend it for exchanging large manuals or other large files that have no private information. Although it requires the installation of an application on your PC that compromises your security. Since there are other alternatives, like the ones that John mentioned, that can share files without having to install applications I would rather go with those others myself.

Victor Silva

There are lots of file sharing sites out there that allow this, for example <http://www.box.net> , their free option gives 1GB of storage and a maximum file size of 25 MB - only one of many. Or submit it to ebanan - that is a generic depository for test equipment and other technical resources.

Craig Sawyers

Heathkit

If any of you are looking for original Heathkit manuals, I just added several hundred more to my inventory of original Heathkit manuals for sale.

They can be seen here:

http://members.cox.net/radiostuff9/manuals_fs.htm

I don't have a lot of ham radio manuals but I do have a lot of obscure Heathkit manuals.

Dave N7RK

Mil radio

Hello guys, In this link you would see great pics of military radios. All the equipments are in Argentina.

<http://foro.aacvm.com.ar/viewforum.php?f=24>

Patricio Butty

Documentation for the MD-522 is on line, see:

<http://www.prc68.com/1/GRC106.shtml#L>

Brooke Clarke

You can use the following link to access a 28 minute "History of Ft. Monmouth Movie" on line directly:

http://cecom.army.mil/historian/Movies/Ft_Monmouth_History_400x300.wmv

Al Klase

A while back, the Nova science series on Public Television featured a program on Bletchley Park and the Code breakers titled "World War II Mind of a Code Breaker". It's a great documentary and for anyone who missed it the first time around, it now available on You Tube via this blog:

<http://rijmenants.blogspot.com/2010/04/mind-of-code-breaker.html>

The 120 minute show has been broken down to 12 segments of 10 minutes each.

Jerry Proc

I have just posted a video on my blog testing a Yugoslavian RU-20 transceiver between Belgium and Spain on 20m SSB.

<http://ec1cw.blogspot.com/2010/03/testing-yugoslavian-ru-20-aka-prc-515.html>

Diego EC1CW

<http://ec1cw.blogspot.com>

Hi gang - I just happened upon <http://www.cdvandt.org/> - tons of interesting info - particularly take a look at the exhibits

http://www.cdvandt.org/exhibits_new.htm - Holy Cow!

Nick

www.navy-radio.com

Morsiacs

Mitch is selling Vibroplex

http://members.tcq.net/nzeronv/files/vibroplex-for-sale_cq_2009-11_p67.jpg

73, John Dilks, K2TQN

Test equipment

Hi all, after seeing all of the RACAL comments I have been racking my brain for the name of a place I found and where I got a manual for my 9009 Modulation monitor, and I have found it at last. They have heaps of RACAL manuals, they are MAURITRON Technical Services and they are in the UK,

<http://www.mauritron.com>

they have paper as well as downloads and the prices are reasonable and the quality I got was excellent.

Don

How about a Tektronix training video? Showing up on YouTube:

http://www.youtube.com/watch?v=oWQglwYs_Hs

There was a guy on eBay selling crystals for QRP and other popular frequencies in FT-49? (miniature HC-6/U holders with wire leads) and also the cylindrical 'watch crystal' holders for a VERY reasonable price each, especially if you bought several of them at once.

Does anybody remember his email address or website?

That'll be N4ESS.

<http://www.expandedspectrumsystems.com/prod4.html>

Majdi, NORMZ

Refurbishing our beloved gear

Editor's comment – sorry, run out of space - more next time. I would be only too happy to see member contributions to publish.

Society committee contact details

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Dragnet material

Dragnet material can be sent to the Editor via:
Email: brianclarke01@optusnet.com.au (preferred at the moment)
or mail to the editor's home address which is OK in the Call Book.

Visitors are always welcome at our meetings

Meetings are currently held on the first Wednesday of the month at 1st Kyle Bay Scout Hall, Donnelly Park, Kyle Parade, Connells Point, commencing at 7.30pm.

St George A.R.S. Nets

The Society conducts regular nets on the 2 metre and 80 metre bands. Fortunately, those participating are very interesting, with a few good stalwarts being there on most occasions. Encourage your non-club member friends to join in – there are several such who join us regularly. So, come on, switch on the rig and spend a few minutes on either of the following:

2 Metres

146.800 MHz (VK2RLE repeater 6800) every Thursday evening at 2000 hours local time followed by a SSTV segment commencing at 2030 hours.

80 Metres

3567 kHz +/-QRM every Sunday evening at 2030 hours local time. Why 3567? – ask a club member!