

STARLITE

THE NEWSLETTER FOR THE STOURBRIDGE AND DISTRICT A.R.S.



**G6OI
G6SRS**



ISSUE: AUGUST 2018



G4CVK

**STOURBRIDGE & DISTRICT AMATEUR RADIO SOCIETY
INCORPORATING
OLDSWINFORD HOSPITAL SCHOOL RADIO CLUB**

MEETINGS HELD AT

**OLDSWINFORD HOSPITAL SCHOOL
HEATH LANE
STOURBRIDGE
[8:00 TO 10:00 PM]**

VISITORS ALWAYS WELCOME

**THE SOCIETY HOLDS ITS FULL MEETINGS
ON THE 1ST AND 3RD MONDAYS EACH MONTH**

80TH ANNIVERSARY YEAR

[MARCH 2018 - MARCH 2019]

RSGB AFFILIATED SOCIETY

STARLITE

Telephone Enquiries to:-

Hon. Secretary
John Clarke M1EJG
[01562] 700513

Or by Email to:-
honsec@g6oi.org.uk

StARS Website URLs:-

www.g6oi.org.uk
<http://g6oi.ross-lewis.co.uk/index.html>

StARS Facebook Page:-

<https://www.facebook.com/groups/stourbridge.ars/>

All correspondence/enquiries should
be addressed to the Hon Secretary at:-

StARS
c/o The Mill House
21 Mill Lane
Blakedown
Kidderminster
DY10 3ND

Forthcoming Meetings

August 6 th	On Air. Informal. Digi Modes Group.
August 13 th	On Air. Informal. Digi Modes Group.
August 20 th	Getting Ready For SSB Field Day
August 27 th	August Bank Holiday – No Meeting
September 1st/2nd	RSGB/IARU Region 1 SSB Field Day
September 3 rd	On Air. Informal. Digi Modes Group.
September 10 th	On Air. Informal. Digi Modes Group.
September 17 th	Main Meeting – Subject tba.
September 24 th	On Air. Informal. Digi Modes Group.
October 1 st	On Air. Informal. Digi Modes Group.
October 8 th	On Air. Informal. Digi Modes Group.
October 15 th	Main Meeting – Subject tba.
October 20th/21st	Jamboree On The Air @ Norton Scouts
October 22 nd	On Air. Informal. Digi Modes Group.

Editor's Comment

Thanks to **John G8UAE**, I now have an “in-house” email address. This will be the prime destination for your correspondence or contribution to *Starlite* and I encourage you to amend your address book accordingly. The new prime email is:

g4xom@g6oi.org.uk

My outlook.com email will still be “live”, but will not be monitored so much, therefore any *StARS* related material **should** be sent to the above destination after 1st September 2018. Thanks for your understanding. *Editor.*

During the recent heatwave several meetings were held outside at the picnic benches in the school yard. The weather was generally pleasant, but became a little chilly around 9pm. At the first July informal, the following occurred

Geoff GØKVK advised that he'd been on the roof and repaired the G5RV supports, so the Club Station could be used once more. Well done, Geoff.

Wayne M5LLT could be heard having QSOs to the USA and South Africa, but was it on DMR, Echolink or via his hotspot? I'm intrigued.



Photo courtesy of James G7HEZ

Snake Oil Anyone?

Jim G4WAO sent this from his usual source **VK2MB** and says “*This should raise a smile among the lads.*”

The National Broadband Network is being installed in Sydney. I guess there may be issues with the installation??

Just don't spend any money !!!!!



Round Robin Membership Questions from Adrian GØNLA

1 When and how did you first gain an interest in Amateur Radio?

My first encounter with radio was in the wake of CB in 1971. This interest was soon extinguished one summer Sunday afternoon when most of the frequencies were occupied with very strong signals from SSB transmissions from Italian operators. I decided my best plan was to take the Radio Amateur's Examination (RAE) after being given a demo of 2 meters by John Tracey. I spent about an hour a day for three months reading the RAE manual and taking test examination papers. I applied to take the exam and sat the two-part exam at Dudley College.

2 What was taking your course and exam like?

I didn't find the exam difficult as I suppose I had studied just to pass the exam. For the full licence which allowed one to use the HF bands, one had to be able to transmit and receive Morse at 12 words per minute. I enrolled at Dudley college one night a week for CW classes. Notably about half the course dropped out and the star pupil was a woman. I bought a Datong Morse tutor and practised receiving at 12-17 wpm on the nights I was not attending classes at Dudley. This went on for around four months and was tough. I got some assistance at work from an ex-army intelligence operator who used to spend his time copying CW signals in Russian at over 30 wpm. After around six months I took my CW exam at Pound Road in an old air raid shelter and passed at my first attempt. Passing the CW exam was very difficult. One does not learn Morse, the process is more akin to conditioning. Having passed the CW exam one is not really fit to go on the air. There was a hierarchy amongst CW operators whereby operators only respond to other operators who can keep up with them. For example an operator sending out a CQ call at 20 wpm would ignore any replies sent at 15 wpm. After a self imposed listening period I got on the air using CW. It was interesting to just see how far away one could make a contact on 5 or 10 Watts, often to the USA or South America, for example.

3 What has been your most interesting work job?

I have been lucky enough to be offered some foreign travel and made trips to work in France, Holland, Germany, Luxembourg and Sweden, although foreign travel is often less exciting than it seems. The Germany job which lasted four weeks was to work as stand-in at a Munich Bank after a member of the bank staff had been sacked. I was asked if I would undertake the job on Wednesday and was at work in Munich on the following Monday. At the time transactions were cash only and I was given £1000 pounds worth of Deutsch marks to cover my hotel bill and expenses. I was made to feel welcome and my German boss used to correct my English spelling mistakes in my reports! I had to use a German copy of Word for Windows which could not correct my mistakes.

4 Most memorable radio contact?

One interesting contact was to the US Embassy in Zaire in Kinshasa on CW which went on longer than the usual rubber stamp contact. It is a novelty to work maritime mobile and I have managed this on a couple of occasions. I worked a freighter off the port of Dakar,

Senegal and on CW and also a yacht again on CW that gave his QTH in latitude and longitude. Another interesting QSO to listen to was an American ham working a freight aircraft as aeronautical mobile over Keflavik, Iceland (sadly UK hams can't work aeronautical mobile). It was rewarding to contact the Ukraine using 3 Watts on a home brew magnetic loop and receive a 599 report.

5 Most frustrating electronic piece of equipment that you have ever owned or had to operate?

Not entirely the answer – As mentioned above the Datong Morse tutor is a good tool to help one improve ones speed, but after 20 minutes or more one can start to make big demands on one's ability to concentrate.

6 What other hobbies are you/have you been involved with?

Quite interested in photography. I used to develop and print my own black and white photos and also colour slides. I owned a lurcher that was good at catching rabbits. The rabbits were located with a spotlight attached to a motorbike battery.

7 What has been your most memorable car you have owned /own?

I bought a 1953 Diesel Series 2 Land Rover Defender in the days when there was no such model as the Defender. Conversation in the Land Rover was close to impossible over 50 mph and the heater was little use in the winter such that one had to alternate which foot was on the accelerator and on the heater. A possible rival to the Land Rover was an Austin A30 which was bought for £20 and was a joint purchase with my then girl friend and later wife

8 What event / activity / talk / visit from your membership of Stars is most memorable?

I particularly enjoyed the talk on MRI scanners.

9 Which member of StARS (past or present) has been most influential in your amateur radio life?

I don't know if I would pick out anybody in particular. In general I would say that most StARS members are knowledgeable in different fields and are always willing to share advice and assistance.

10 If you won £2000 on the lottery what would you purchase technology wise with it?

I would probably make a charity donation with the money. I very rarely buy a ticket and I am no fan of the Lottery and the £2000 would feel like money I never owned in the first place.

1927 Ahrens Fox by James G7HEZ

Not radio related – but I found of interest and needed to find out more.

If you are lucky enough to receive Freeview from Sutton Coldfield transmitter you are able to obtain the most number of Freeview channels possible. One channel you may of missed at channel 94 is PBS America (Public Service Broadcast) There are some interesting programmes on there and one I happened to see was *Ultimate Restorations*. The one programme was about rebuilding of an Ahrens Fox fire engine built in America in 1927. I had never heard of Ahrens Fox, but appears to be the Rolls Royce of bespoke Fire Engines, where the company made every part of the appliance, rather than buying in a chassis, an engine a pump etc and putting it all together.

What got me wondering and I had to look several times to check (and as you can see in the picture) I had this correct was it was right hand drive and I wondered why an American made vehicle was made this way.

I searched on the internet for the museum the engine was housed in and then found a contact email address. I emailed with my query and had the following reply within several hours. It makes interesting reading.

Hi James!

In the states many auto-mobiles and trucks started out as right hand drive. Autos converted to left hand drive pretty much before 1910, most fire trucks not until the late twenties.

The main reason was the cost. Fire trucks were low volume items and engineering was very expensive so they put it off. They even had advertisements touting the benefits of seeing the curb and hydrant locations better to justify this lack of change. The truck chassis layout didn't change much in the teens and twenties so they carried on.

The main reason was the engine layout had the exhaust manifold of the straight six engine on the left side and major rework of the exhaust was required to move the steering box over there. In 1929 American Lafrance moved the steering box over by re-routing the exhaust forward and down then under the steering box, which was less than ideal. The advent of V12 engines in the early thirties allowed them to design the new chassis with left hand drive from the start.

Or maybe they wanted to be able to sell them in the UK!

Thanks for the question, hope you enjoyed the show.

Regards,

Doug

Click on the links for website and further info.

[Further Pictures](#)

[PBS Amercia](#)

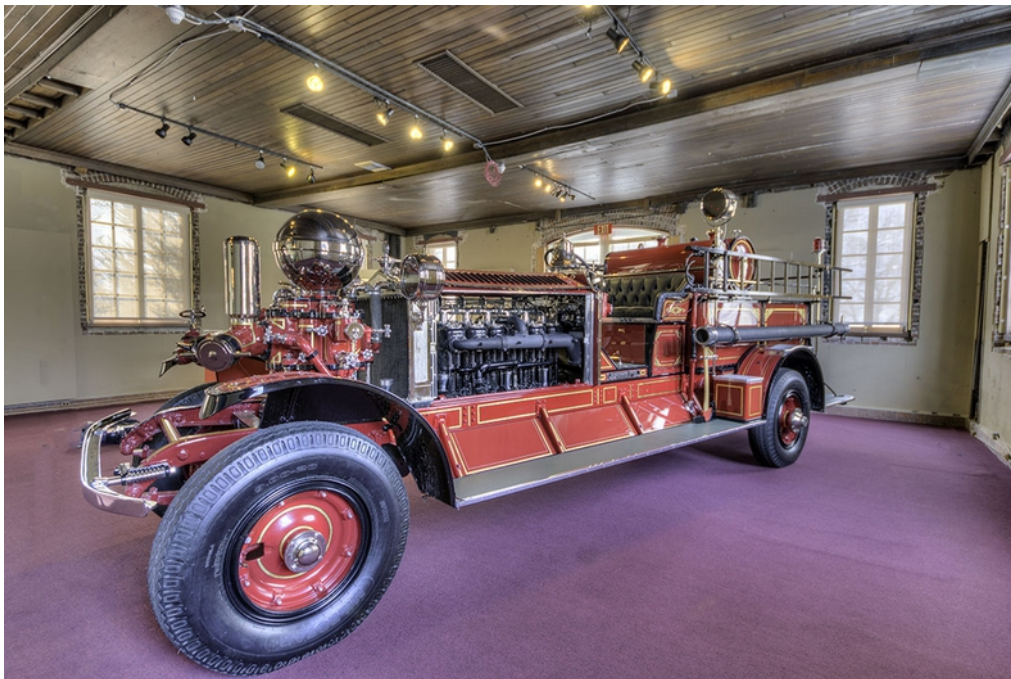
[Ultimate Restorations](#)

[Fire Museum](#)

The large Stainless Steel ball at the front, this sits on top of the water pump. Rather than a centrifugal pump a piston pump is used. A piston pump would pulse the water on every stroke making it hard to hold the hose for a period of time. The Sphere which was half full of air acted as a reservoir and shock absorber and smoothed out the pulses of each piston stroke. The piston pump from 1927 is equal to the power that a modern centrifugal pump can achieve.

If you want to see how **NOT** to launch a grand yacht you have just spent hundreds of hours rebuilding then watch the *Ultimate Restoration* about the Coronet. (link above)

The picture shows the restored 1927 Ahrens Fox. If you look carefully you can see that it is right hand drive. Better still see if you watch the whole 1 hour programme.



Please remember, the prime email for *Starlite* stuff is:

g4xom@g6oi.org.uk

Saw this on Ham Hijinks [hamhijinks.com]

FINGER-POINTING, NAME CALLING AS CLUB “FAILS MISERABLY” AT FIELD DAY

GOLDEN SPIKE, Montana – A group of northern Montana amateur radio operators is disbanding their ham radio club after their worst Field Day showing in 27 years.

The road to this year's Field Day was paved with potholes for the Gold Diggers Amateur Radio Club, as members endured heated confrontations, flying yeast rolls, overturned tureens of vegetable soup and ejection from two separate meeting locations – including a Catholic school altar guild room.

“To say we fell below expectations is putting it mildly,” says former club president Lou Rodden. “The members were so absorbed with making sure we had plenty of food, lawn chairs and drinks that we forgot to bring our radio gear.”

“It was NOT my job to bring the gear,” replied club member Junior Brown, when questioned by Ham Hijinks. Brown was chided repeatedly after forgetting to order food for last year's Field Day. “I may have overlooked the food then...but I would never forget the radio gear. Knuckleheads.”

Immediately after Field Day, president Rodden called a meeting of club officers. The group voted to disband the club effective July 1.

“Ain't nowhere to go but up!” said Rodden, who adds that he is now thinking about joining the Jackson Hole, Wyoming, “Jack-A-Lopes” contest club. “I even heard of one club in Arkansas that stopped operating at midnight so they could drink a pint of Fosters! That's my kind of club!”

Dr. Johnson Longsville, Contest and Promotion Outreach Director at the National Radio Retransmission Legion (NRRL), says this is the first time a radio-less Field Day has happened.

“I can't remember another group submitting 'zero' contacts on their log before. I'm a little surprised the Gold Diggers even submitted a log. Oh, we've had plenty of “two's and three's” before, usually due to radio failures or RF hash from a generator. But not because the entire club forgot to bring gear.”

[Editor's Note: [You can read more of our reporting on the Gold Digger's Amateur Radio Club here.](#)]

By **WBØRUR**, on the scene.

**This space (and more) is reserved for your
contribution!**

QRP Corner [n occasional feature]

Getting Started In QRP

Good operating practice states that radio amateurs should use the minimum transmitter power required to maintain effective communications. In most cases that would mean to QRP (reduce power), yet in reality pretty much everyone runs their HF rigs at full power, all the time. There are two big reasons why radio amateurs who have no real interest in QRP should familiarize themselves with it anyway. First, it forces them to refine their operating skills, and that's helpful no matter how much juice you're sending up the coax. Second, the time to know how to operate QRP effectively is before sh*t hits the fan (SHTF), when a few watts may be all you have to work with.

The easiest way to get into QRP is to "just do it" with the station and antennas you already have. Turn the power down to less than 10 watts and jump in. This is the point where QRP exposes a lot of shortcomings in a ham's equipment and operating skills. Here are a few common barriers and what you can do to correct them:

You need to refer to your radio's manual to figure out how to QRP the power down. Not even knowing how to reduce transmit power without looking it up means you have not put enough effort into correct operating protocol, nor do you know your equipment as well as you should.

What you need to know.

Modern radios have so many settings and menus that it's not realistic to memorize all of them, but if you do not have basic competency in the primary controls and features without using a reference, then study up and learn your gear before proceeding. You are, after all, a radio operator. Keeping your skills sharp should be a matter of personal pride.

You always run full power because your antenna is poorly tuned/not efficient.

This might be something you're willing to settle for at 100+ watts, but losing a few watts when all you have is a few watts is a very big deal. If you can't make any contacts with QRP, it may be because too much of your RF is lost before making it out of the antenna. A poor antenna effects your receiving capabilities, too.

What you need to know.

One key to successful QRP is having an antenna that sends as much RF out as possible. This will also give you an edge when running full power too. Do not lazily hide behind a lot of watts and an antenna tuner. Many radio amateurs are aware that their antenna sucks and instead of making it right they slap a tuner on it and call it "fixed". Regrettably, there is no shortage of hams who think a tuner is the answer to all antenna problems.

If you are a radio amateur with a sub standard antenna due to physical limitations (Example: Antenna hidden in an attic because of homeowner association rules), then look over your setup carefully and determine where you can make improvements. I understand that not everyone has stacked monoband beams on a mountaintop. The internet is full of plans for effective antennas that will fit in small spaces. Make the best of what you have.

You tried QRP once, didn't make any contacts after a few CQ calls, and gave up.

It's worth mentioning that successful amateur radio operators practice their craft regularly and use mistakes as an opportunity to learn and improve. Giving up too easily has nothing to do with skill or equipment and everything to do with attitude. You have to want to. There is no advice for someone who does not care.

What you need to know.

Cranking up the power is not a valid substitute for patience and practice. One great way to build QRP confidence is to participate in any of the numerous QRP [contests](#) and [nets](#). These events bring together a large pool of operators specifically looking to work QRP stations, so the odds of making good contacts are greatly improved. The [MIDCARS net](#) operates every single day of the year from 0830-1400 EST on 7.258MHz. It is intended primarily as a net for mobile stations but they are QRP friendly.

With a little practice, you will quickly pick up the nuances of QRP. There are also hundreds of books and articles written on the topic as well as on line forums and discussion groups where experienced operators will be very eager to help you. Another way to get more out of QRP is to use CW and the very popular PSK31 digital mode as they tend to be more effective getting a signal through than SSB. No matter what path you take, keep focused, keep trying, and do not readily accept failure.

Do you need a dedicated radio?

Having a radio specifically designed for QRP (such as the Yaesu FT-817ND or TenTec Argonaut) is a great idea if there is room in the budget, but it's not required unless you need portability. Before you run out and plow hundreds of dollars into a radio, begin by practicing with the equipment you already own and upgrade to a specialty low power radio as your skills and needs warrant. In a future article we'll discuss taking the leap into a dedicated QRP station.



Yaesu FT817ND QRP Radio



Ten Tec Argonaut

Operating QRP as a portable amateur station.

For our purposes, portable is defined as a complete station that can be reasonably carried, set up, and operated by one person: Radio, antennas, power source, and accessories. Some hams will use a Yaesu 857D or an Icom 7200 as a portable so they have the option of going up to full power if needed. I recommend against buying a full power rig with the intent of running it as a QRP portable. The idea sounds great in theory; in real life it's got a lot going against it.

When using it in low power mode, you are lugging around a radio that is much larger and heavier than it needs to be. At the other end, to operate with full 100 watt RF output you

must also bring along enough electrical capacity (batteries, generator, etc.) to run it. Either way, you are committing to transport a lot of extra stuff for at best a modest payback.

I tried using a full power rig as a portable myself once and it was a dysfunctional mess. I eventually tore down the way too heavy “King Kong portable” 100 watt station. Now I have a five watt (max) FT-817ND and everything I need in a backpack. I compensated for the lower power with well-rehearsed operating procedures and homebrew antennas so carefully tweaked that they do not need a tuner. My success rate for making contacts is actually better than it was when I had the 100 watt rig. If you have any plans to operate as a portable station, then a QRP radio is almost a must.

Tech Vocabulary:

QRP: 1) A subset within amateur radio that specializes in HF communications with low transmitter power, typically less than ten watts;
2) a Q-signal in amateur radio that means “should I reduce power?” or “I am reducing power.”

PSK31: Phase Shift Keying, 31 baud. A data protocol that shifts the phase (as opposed to the frequency) of the bits in a data transmission. PSK31 is characterized by requiring very little bandwidth and being able to complete an exchange under very poor operating conditions.

Portable Station: A complete amateur station: Radio, antenna, power source, and accessories, that can be reasonably carried and quickly set up/taken down by one person.

The ham is constantly aware of how much electrical power is available and does not have the luxury of indiscriminately running 100 watts or more as a default setting all the time. Learning to establish effective communications via QRP not only gives radio amateurs more options when energy resources are limited, it also translates into better operating when energy resources are plentiful.

This information was found on an American web site, so the bad spelling is, obviously, theirs!! Editor.

This space is, also, reserved for your contribution!

More Memories From The Past

Many years ago, there was a period when I had a fairly healthy interest in construction. I remember one of my first [kit] projects was an FM broadcast receiver. Surprisingly, this worked just fine.

Next, in *Short Wave Magazine*, I saw an advert for the HAC All Bands Receiver. Intrigued, I bought one. It is a one-valve receiver, with not too many components. Following the instructions, it was built on an open board, mostly using “*ugly*” construction. The worrying part, for me, was that the transformer was open and could be easy to touch; with 240v going in and whatever coming out, there would have been a possibility of personal bits glowing bright – not an inspiring thought!

After getting licensed, I began to learn The Code and made a few Morse practice oscillators, followed by many headphone/speaker splitters [*I may include this in a future edition – again*]. Then I made a CW transmitter called the OXO, which was featured in the G-QRP Club magazine *Sprat*, issue #20. It's a simple circuit and may be used on any band. I chose 20m using a crystal on 14.030MHz. The circuit and some photos will be in the September issue of *Starlite*.

Some of you will remember Derrick Pearson G3ZOM, who lived in Kingswinford, and had a business called Jandek. He supplied kits for the amateur radio market. I purchased one of his kits, a 40m CW transceiver, which was very easy to construct with the comprehensive instructions. I put it in a nice aluminium box to complete the job. Derrick was kind enough to check it out for me and concluded there were no “*sproggies*” and that the output was 1.3 Watts – very good for an avid QRPer! On air, it was [maybe still is] a wonderful piece of equipment, with which I made many contacts, mostly in Europe. Not bad for a novice CWer with limited confidence at the time.

Since those days, construction has stayed firmly in my mind [*I'll get around to it – there's no rush!*], although I did construct a few aerials, such as 5-element and 10-element Yagis, both for 70cms and a couple of HB9CVs for 2mts. Besides these were the usual types of wire dipoles for various HF bands.

That's about the extent of my constructional memories. So, have you anything to share within these pages?? I'm sure we would all love to read about your experiences.

Please send them to g4xom@g6oi.org.uk

So is this space!!!

Single 5/8 Flower Pot Antenna

The Single 5/8 version of the Flower Pot simply substitutes a 5/8 wave-length section for the top quarter wave of the basic half wave antenna design. The arrangement is shown in the sketch below. The 5/8 λ radiator uses a 0.2 λ (shorted) co-ax phasing stub to resonate the 5/8 λ element. In a conventional 5/8 λ mobile whip, an inductor is used to bring the 5/8 λ element to resonance; however, in this Flower Pot style of antenna, using a co-ax phasing (or delay) stub suits the construction technique and has the advantage of being able to be precisely determined and cut at the construction stage.

The antenna configuration is similar to, but slightly shorter than, the “Gain Sleeve” antenna described in the RSGB Hand-book (6th Edition – figure 13.99, which itself is derived from the reactance – or shunt – fed 5/8 λ monopole antenna at figure 13.84 of the handbook).

The Gain Sleeve antenna achieves an effective radiating element length of one wavelength and, since the aperture is twice that of a half wave dipole, a theoretical gain of 3dBd (gain over a dipole) could be achieved.

However, note that the Handbook indicates that in practice, the Gain Sleeve antenna would realise about 2.5dBd. The effective radiating element length of the Single 5/8 Flower Pot is 7/8 λ suggesting it would have somewhat less than 2.5dBd gain.

2m Single 5/8 Flower Pot

Construction of the Single 5/8, whilst a little more involved than the basic half-wave antenna, is again fairly simple.

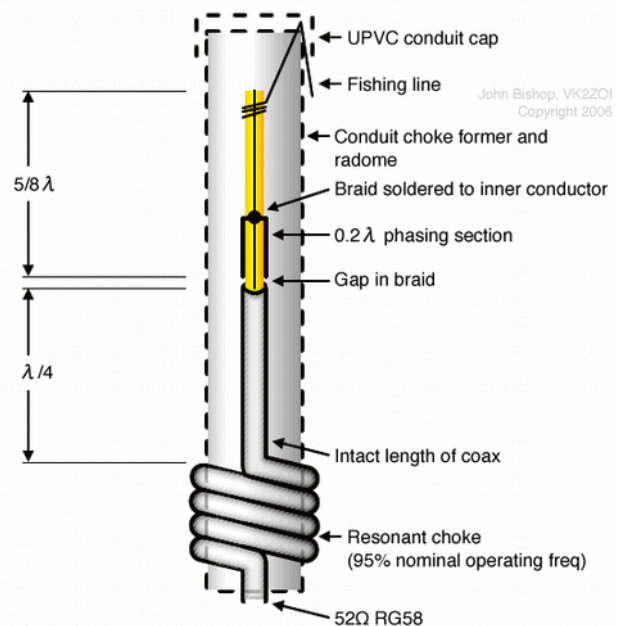
From the top of the co-ax, measure off an approximate 5/8 λ distance to locate the position of the feed point. Make this distance slightly longer than the exact 5/8 length (say 10mm) as you will trim the top element to length later.

At the feed point, cut away the outer sheath and braid so as to form a 2-3mm gap.

From the edge of the gap, measure off the distance for the 0.2 λ section. For solid polyethylene dielectric cable, this is 276mm for 2m and 755mm for 6m. From this point, expose sufficient braid to be able to make several pigtails to be soldered to the inner conductor and then the braid and outer sheath for the remainder of the top element length can be stripped off. At the 0.2 λ point, cut into the inner dielectric to expose about 3mm of the inner conductor and solder the braid pigtails to the inner conductor.

Trim the top element to length. It will be most unlikely that you have to further trim the antenna later but you could leave a small, extra margin to allow some later adjustment if desired; however, builders of this antenna have reported that further trimming was unnecessary so you should have confidence in cutting the element to length at this stage.

To complete construction, follow the same procedure as for the half-wave antenna. As in the half wave version, use a length of nylon fishing line to pull the radiator taut and clamp it



in place with the conduit cap. The length of the conduit above the choke can be 10 to 20mm longer than the total length of the quarter wave and 5/8 wave elements.

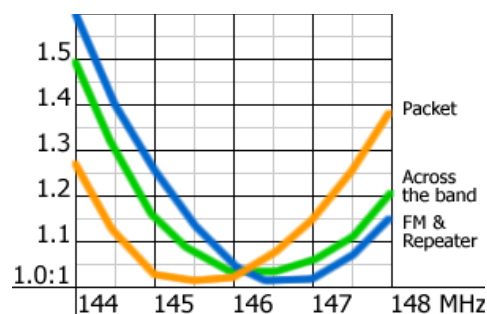
The Single 5/8 has a slightly sharper VSWR response than the basic half wave Flower Pot and, although a VSWR of less than 1.5:1 across the 2m band can be achieved, the antenna can be cut to favour the high FM portion of the band or the lower packet portion. The dimensions derived during my experiments for 2m are given in the following table; these dimensions have since been validated in further builds of the antenna.

Desired Portion of Band	Upper 5/8 element	Bottom "λ/4"	Choke Coil
Across the Band	1228mm	465mm	9 turns on 25mm former
FM & Repeaters	1224mm	465mm	
Packet low band	1236mm	480mm	

The VSWR curves for the three antennae are shown in the next figure. Note that the "Across the Band" curve purposely favours the higher end of the 2m band.

VSWR curves for three antennae. Note that the "Across the Band" curve purposely favours the higher end of the 2m band.

6m Single 5/8 Version (and using the Antenna at Other Frequencies)



The physical/mechanical properties of conduit are not conducive to building a 6m or a lower frequency version of the single 5/8 antenna because conduit is not sufficiently rigid to maintain straightness and it retains a set after a hot day.

I have, however, built a 6m single 5/8 by terminating the top end of the phasing stub onto a standard mobile base mounted on a conduit cap and using a plain (braided) mobile whip for the remainder of the top 5/8 element. This way the conduit length is approximately halved and is less susceptible to bending. If you want to try building one doing this, the length of the whip will, depending on its diameter, probably be marginally longer than the equivalent length if it was made using the co-ax inner. Also when using a whip, the overall length of the 5/8 element will need to include the length of the phasing section. Otherwise, the dimensions readily scale from the 2m antenna.

The antenna can be scaled to any operating frequency using the choke data given previously. Note that the 2m single 5/8 is close on 2m long; 25mm conduit is mechanically OK for this length and this suggests that the ideal application of this style of antenna is for frequencies around 2m, ie boating, aircraft and the VHF two-way communications bands.

When working out the phasing stub length for other frequencies, don't forget to take the velocity factor of the cable into consideration.

Coming next month: Double 5/8 Flower Pot Antenna

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