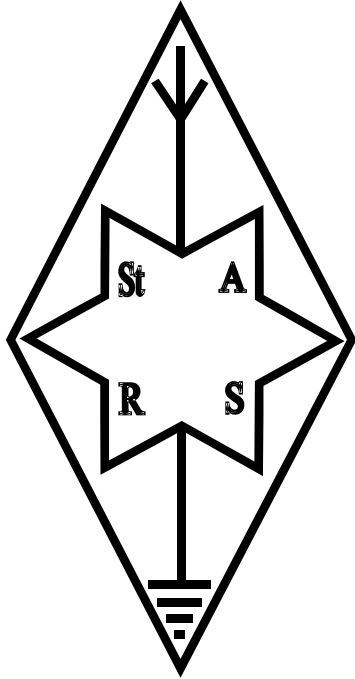


STARLITE

G6OI
1938

The Award Winning Newsletter for Members and Friends of
Stourbridge and District
Amateur Radio Society
incorporating
Old Swinford Hospital School Radio Club

G6SRS
1938



G4CVK

1969

ISSUE
03/2014



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MEETINGS

Visitors always welcome
The Society holds its full meetings on the
1st and 3rd Monday of each month at

**Old Swinford Hospital School
Heath Lane
Stourbridge
(8.00pm – 10.00pm)**

Additionally the shack is open during the same times on the
intermediate Mondays

Telephone Enquiries to :-
Hon Secretary
John Clarke M1EJG
(01562) 700513

Or by e-mail to :-
honsec@g6oi.org.uk

All correspondence/enquiries should be
addressed to the Hon. Secretary :-
STARS
c/o The Mill House
21 Mill Lane
Blakedown
Kidderminster
DY10 3ND

STARS Web Site URL :-
www.g6oi.org.uk



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NOTICES

75 Years Commemoration Mug – Last few Available

A unique opportunity has arisen to purchase special 75th anniversary mugs for StARS. Strictly limited edition - limited to those who actually order one!



Price is £4. Please tell either John (Hon Tres) or James if you would like one.

AGM

Again to remind you, March 17th is the AGM and to keep it free in your diary so you can attend this important event for the club.

SEEN ON THE INTERNET

Thanks for the following entry which was sent in by Foundation Course member Peter.

You may read or hear of the On-line 30 minute TV program for Amateur radio called TX Factor. The first episode was broadcast (put live) last Friday 21st. Below are the links to the show and to the main web site. The broadcast has been publicised by the RSGB and is well worth watching. The adverts from Martin Lynch are also interesting

Program: <http://www.youtube.com/watch?v=Ia5TeYPdwbY>

Main Site: <http://www.txfilms.co.uk/txfactor/>

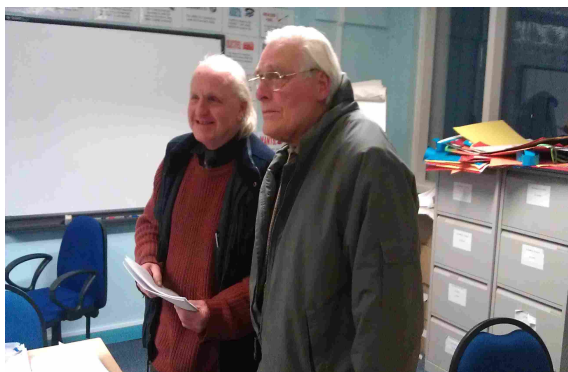
RSGB: <http://rsgb.org/main/blog/news/gb2rs/headlines/2014/01/31/new-tx-factor-online-tv-show-announced/>



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ROVING REPORTER

March 2014



(Above Quiz Winner Dr. Alan Parkes)



(Above Quiz Compiler – John Scott)

The annual constructors contest proved an interesting evening. The four entrants to the competition is proof that there is still an interest in construction. Years ago construction played a major part in the hobby of amateur radio. Past competition entries ranged from home made transmitters, (The Gelso VFO was the basis in those days) receivers, test equipment and aerials. In those days AM was the order of the day, but things changed with the advent of SSB. Because SSB equipment was far more complex, the home construction of transmitters and receivers tended to decline. Although construction is still great fun wherever it is possible. When I first became licensed in 1968, I built a 2m transmitter receiver that would run from both a 12 volt inverter and from the car battery. I made contacts on that equipment from Sedgley Beacon and other high points. Eventually I used a separate car battery because of the drain from the equipment which was drawing 5 amps. Using valves, it was cheap to build and I had lot of enjoyment using it. I subsequently discovered the output power was only a quarter of a Watt when it was tested at one of the STARS meetings. I later built a 2m transmitter which had 12 Watts output power which I attached to a 10 element sky beam which was later used with my 2m SSB transmitter/receiver and linear 2. I still have the equipment, but have not used it for some time. It helped having access to chassis bending equipment at my place of employment at the time and having a well stocked box of components. Nowadays, I seldom do any construction, but the idea is always there, but my other interests seem to take precedence.

Returning to the subject of the competition; the contest entries came from Mark – quarter wave whip for 4m. New member Sean had the winning entry, a 2m slim Jim mounted on skirting board see photo in the next article. Wayne also entered a 2m fold up and waterproof Slim Jim and finally Alan Parke's entry was a motor control-unit circuit. So high was the standard, that it was difficult for the judges to chose a winner. After the contest there was a quiz comprising twenty two questions that had been set by our treasurer John Scott. A big thank you to John Scott for all the hard work that went into compiling the questions. I feel certain that you will all join with me now in a vote of thanks to him. Besides being treasurer, which he only accepted on a temporary basis 25 yrs ago, John does a lot of work for the society that is unrecorded. Once again very many thanks John.

Finally that time of year is with us again - The AGM - when I guess that new officers will be joining the committee and others may be standing down. One thing to keep in mind is that the success of keeping any society going is the election of officers who are willing to put in the hard work that is required for our society which has been running for 75 yrs and I have been proud to be a member for 63 years. I wish to see it continue, unlike other radio societies which have folded.



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Keep this thought in mind when you attend the AGM.

Your Roving Reporter Malcolm Palmer G8BOP

Best 73s and see you all at the AGM.

I have been having a spring clean and I have several items at cheap prices –CD players DVD players, printer/scanner with plenty of spare ink cartridge for an Epson RX500 that will also copy slides and Lexmark printer, CD player, audio cassette player, music centre and camera.

Offers for the lot as I have to make some space.



(Attending the Constructors Competition and Quiz Night - see above and below)



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The Slim Jim – Winner of the Constructors Prize



My interest in amateur radio has been a long one and in 2008 I passed the foundation course at the club with the help of Nick Moss. After passing the exam and getting my call sign, it was quite a while before the interest took hold; 5 years to be exact. My new-found interest has started to take hold with the recent purchases of HF receiver, dual band hand held, 2m mobile rig, amongst other things that are filling up my radio shack at the top of my garden. One thing that interested me was the wide variety of antennas available for different frequencies. After speaking to Nick it became clear that these can be comparatively simple items, the G5RV being a prime example. I must admit that when you first start to hear fellow amateurs talking about G5RV, Yagi, inverted V dipole etc., it can sound totally confusing to the uninitiated.

Within a very short period of time however, I soon learnt the meaning and the basics of the antennas. After a quick internet search for 2m antennas I came across the slim Jim. “WOW” I thought, it can't be that easy can it? Turning my head around from my computer screen I noticed I had a piece of old skirting board of the right length. So to work.

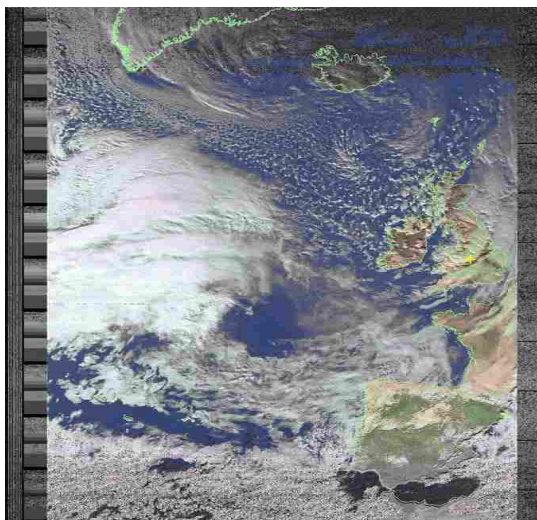
First I took the measurements and transposed them onto the timber, then using some spare 1.5 single core cable I fixed the cable to the timber using a cable staple gun. Before fixing the lower part of the cable I stripped the sheath to expose the copper ready for soldering. After fixing the cable I then drilled a hole to feed the coax through from the rear of the timber and soldered the feeder onto the copper cable following the diagram instructions. To form a rudimentary choke I wrapped the coax round a 32mm tube 12 times and held the coils in place with 2 cable ties. I must admit that it didn't look very professional, but when I think it was made from left over bits from within my workshop, it wasn't too bad. Quickly I soldered a PL259 onto the coax and hooked it up to the 2m rig and checked the SWR.

The SWR came out at 1.4, and after a flick round the frequency band I was receiving fine on it. Time to test. A quick call to Nick,” M3XMJ / G6DQN”.....G6DQN / P / M3XMJ receiving you loud and clear Sean..... Well how about that, what a result, it actually worked. After a successful test I took the slim Jim to show Nick and he suggested that I submit it to the club on project night. Hold on a minute I thought, it's not that good. Anyway here we are, after beating off stiff competition I find myself writing a piece for the club on my first attempt at antenna building. Just goes to show that hoarding junk can have its uses.

Sean Spicer (M3XMJ)

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Receiving NOAA Weather Satellite Pictures on a Home-brew Quadrifilar Antenna



Background and Inspiration

I had been interested in the Quadrifilar Helix antenna (QFH) since seeing G6OI's helical antenna on the roof during routine antenna maintenance a few years back. I thought it would be interesting to see if I could make a similar antenna and receive the NOAA (National Atmospheric and Oceanic Administration) weather satellites broadcasts from my QTH using either a scanner, or my Yaesu FT 7800. I checked out the internet and found quite a lot of sites with construction details for the QFH, in copper tubing and also coaxial feed. Not having soldered copper pipe and with an eye on cost, I opted for the cheaper coaxial QFH. I was particularly interested by Julian Moss's web page at : <http://www.g4ilo.com/qfh.html> as his construction was easy to follow and did not require a coaxial balun like other similar QFH projects on the internet. Also it used easily available plastic waste pipe from any DIY store although a wooden frame could also be used.

Materials required

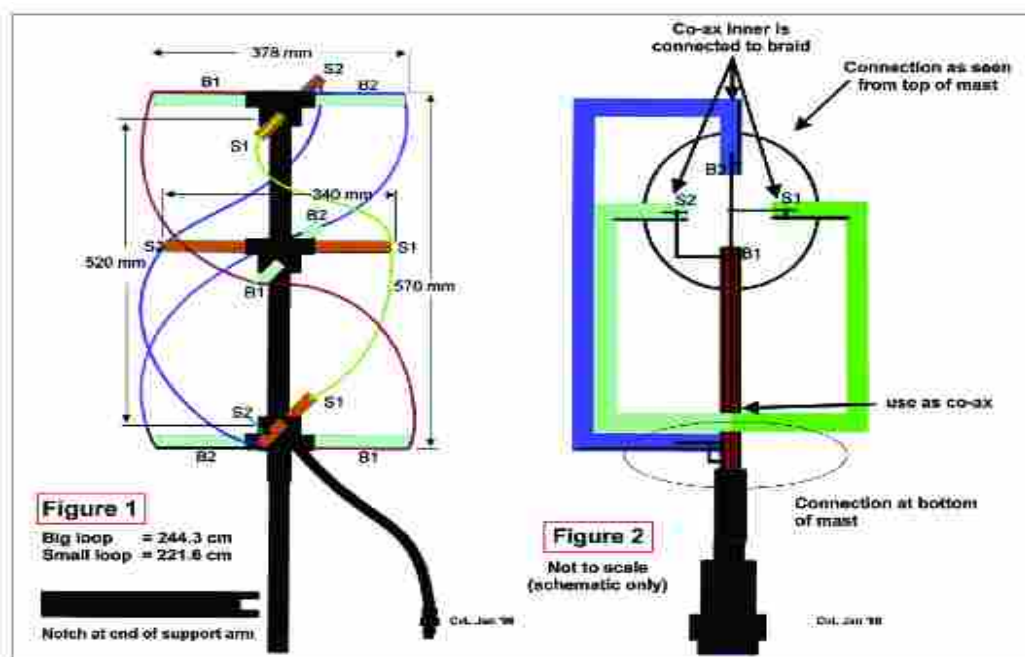
1 x 2m 40mm waste pipe (£2.25 Wilkinsons),
2 x 2m x 20mm waste pipe (£1.39 each Wilkinsons),
36 x tie wraps (Poundland),
5m of RG58 coax (£3.49 Ebay delivered),
PL259 (already to hand),
13amp electrical block of 2 split into ones (already to hand),
silicon sealant (already to hand) to waterproof if the antenna is mounted outside,
paint if required

Making the Plastic Pipe Frame

The 40mm plastic main pipe and 20mm horizontal waste pipes come supplied in 2m lengths. I was able to make two main masts out of the 2m length by cutting it in half. This means one has enough to construct the antenna with enough underneath the bottom pipes, to fix to a mast.

Measuring up and getting the holes drilled in line is a little difficult. I left a small gap of about 5mm at the top of the main pipe and marked up the holes for the longest cross section and drilled by hand. In hindsight, it would be better using a bench drill, but as long as it is not way out one should get good results. I bought and used a 20mm flat blade drill bit which I purchased from Ebay. It was only 99p including P&P! The quality of the plastic is fine and was a bargain. After drilling, I used a half round file to clean up the edges and also to make corrections if the hole is a little off. By filing a bit off a time and trying the 22mm waste pipe regularly, one can get a very tight fit.

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The above Figures are reprinted with the kind permission from Chris Van Lint (VK4CVL)

I cut the first holes starting from the top, 1.5 cms down for B1 and B2. Then two more at 90 degrees round from the top holes drilled and approximately 4.5 cms from the top for S1 and S2. Giving a 5mm gap between tubes. I then drilled 28 cms down from the top of the pipe, again at 90 degrees round from the last one drilled. The next 35.5 cms down from the top and again at 90 degrees around from the last one. Then for the bottom two horizontal tubes, I measured 56.5 cms from the top and 59 cms and drilled again 90 degrees round from the last one. So you end up with a turnstile looking construction. NOTE mine differs from Julian's diagram, as I have B1 & B2 the third tube down from the top as he has S1 and S2 there. I did this as I thought it spaced the larger loop out a little better than his design. So please use either. You can drill the top 2 and bottom 2 first and then evenly space out the middle 2, as I did. The 22mm pipes need to be cut 37.8 cms (B1 and B2 on the figure above) and you need 3 of these and 3 cut at 34 cms (S1 and S2 on the figure above). In Julian's construction, he cut his pipes a little longer than stated and cut 45 degree grooves to hold his coax in place. I decided to cut my pipes exact and then drill 2 holes in each end at 45 degree angles to secure the coax with small tie wraps. Once all the holes are drilled and the 22mm tubes are fitted, it is ready to paint if required.

Preparing and Soldering the Coaxial elements

Three pieces of coax are required.

Cut the first piece of coax to 221.6 cms long, this is the small loop. Strip back the outer protective coating a little and then strip back the inner coating a little. Twist inner and outer together and solder. Do this to the other end as well. This is the smaller loop which is now complete.

Cut the second piece of coax 122.15 cms long. Again strip back the outer coating a little and then strip back the inner coating, twist and solder inner and outer braid together both sides. This is one half of the large loop.

The third piece of coax is also the feeder and makes up half the big loop. I soldered a PL 259 connector to one end to attach to the scanner. The other end is stripped back, inner and outer BUT NOT twisted together. Measure 122.15 cms down from this non twisted end of the coax and carefully cut a section of the outer protective covering off the coax to expose the braid only. Now solder one end of your second piece of coax that is 122.15 cms long to this exposed braid. Tape up this joint with either electrical tape for indoors, or amalgamating tape for outdoor use. This then looks like a T piece with two equal lengths 122.15 cms as the top and a longer length with the PL 259 soldered on the end that hangs down. This taped up joint can now be tie wrapped on to the main vertical pipe just under the bottom longer horizontal pipe. Not too tight, to allow

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adjustment.

Putting it all together

Now we have to fit the coaxial elements to the frame. So we have the larger loop lightly tie-wrapped just under B1 and B2 at the bottom of the 40mm waste pipe. Both ends have to be attached to the B1 and B2 a half way down and then on to the top B1 and B2 pipes. Looking from the bottom, the coax elements should run clockwise to the top of the antenna and also turn 180 degrees in the process. So turning a half turn from the top to the bottom. Two small holes can be drilled in the ends of the tubes, so a tie-wrap can be pushed through and used to hold the coax in place. In the design, the coax runs along the bottom of the tube at the base of the antenna and along the top of the tube when the coax reaches the top of the antenna. More tie-wraps can be used to secure the coaxial elements to the top or bottom of the horizontal tubes, as required. The coaxial elements are better if they have steady sweeping curves to any turns, rather than sharp corners. The loose soldered end and unsoldered ends of this larger loop should reach to the top of the antenna and middle of the 40mm waste pipe at the top. We will connect these contacts up after fitting the smaller loop.

Again with this smaller loop we tie-wrap them underneath the horizontal tube at the base of the antenna, but to S1 and S2 tube. It is advisable to mark the middle of the smaller loop of coax and place it in the centre of S1 and S2 (base of the antenna halfway across the main vertical 40mm pipe). Then it is a matter of again snaking the coax up in a clockwise direction through 180 degrees to the top, using the middle S1 and S2 just to support the shape on its way to the top. Again the coax should run along the top of the S1 and S2 tubing to finish in the middle of the 40mm vertical pipe at the top. Adjust coax and tie wraps to iron out any problems in the lengths or kinks in these coaxial elements. You should now have the four connecting ends of the coaxial elements meeting in the top of the 40mm vertical waste pipe.

Connecting the elements

As per the diagram, one connector block is attached to one end of the large loop and one end of the short loop next to it. The exposed braid of the feeder is also placed in this connector block, so 3 wires are connected in it. The other connector block is connected to the exposed inner of the feeder and the other end of the smaller loop. I cut two grooves in the top of the 40mm waste pipe to help keep the coax in place. I then used waterproof sealant to waterproof the connections for outside use. This was after checking the antenna worked and connections were good.

Software

I found WXtoIMG software adequate for my needs, but there are other good free programs available on the internet if you search Google.

Summary and Thanks

I really enjoyed making the antenna and will help any club member who wishes to make their own antenna. Maybe we could have a construction night! Any member who requires a 20mm flat bit drill and doesn't own one, can borrow mine.

I would particularly like to thank Chris Van Lint for allowing me to reproduce the diagrams from his article. Reproducing the diagrams allows members who do not have internet access to view his schematic diagrams of the antenna and its connections.

continued on on next page



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Acknowledgement



Chris Van Lint's Article can be found at :-
<http://myweb.tiscali.co.uk/wxsatellite/cvl-qfh.pdf>

Andy Hill (M6APJ)

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ABOUT TIME TOO

What this article is about

Knowing exactly what the time is and the accurate measurement of time has become more important as advances are made in technology. In this article we briefly examine the adoption of a standardised time and the means of obtaining a standardised time from MSF.

Disaster at sea in 1707

In 1707 a fleet of ships from his majesty's navy commanded by Sir Cloudsley Shovel were returning from a naval action off the French Naval base of Toulon. As they approached the British Isles, they struck rocks off the Scilly Isles. Despite his high sounding name Sir Cloudsley had risen through the ranks of the Royal Navy. He started as a cabin boy at the age of 14 and rose to the rank of Admiral of the Fleet. A subsequent inquiry by the Admiralty reached the conclusion that the Scilly Isles accident was due to inability to calculate longitude and the ships were thought to be further east than they actually were. Over 2000 lives were lost in the incident. The fact that the accident took place at night and that few sailors were able to swim in those days were additional contributing factors to the heavy loss of life.

It is relatively straightforward to calculate latitude. To accurately determine longitude one needs to know the time at the Greenwich Meridian as part of the calculation. Clocks that would accurately display Greenwich Mean Time at sea had yet to be developed. Following the accident, Parliament offered a prize of £20,000 to the first person to build a clock capable of accurately giving the time and that would function aboard ship. Land based clocks that had this type of accuracy were available, but they would rely on a pendulum arrangement that would not be suitable for use at sea. If you wish to explore this subject further, the book By Dava Sobel entitled "Longitude" is well worth reading.

Moving forward to the advent of the railway

On land, the attitude towards knowing the accurate time of day assumed a lower importance and events were more governed by the seasons. Outside London, the time of day was more arbitrary and was set locally. It was fashionable for a local landowner to incorporate a clock into one of his buildings. This would help him regulate his estate and workers. This in turn would mean that there were groups of people in a locality who were using one time. There were of course groups which didn't bother or care about the time of day (Charles Dickens to name one). This state of affairs was inconvenient for the new railways and railway companies and in 1840 the Great Western Railway adopted London time or GMT as its time keeping standard and by 1855 GMT was adopted over 98% of our nations railway network. If the railways had adopted local time this would have led to chaotic timetables. There was a safety aspect too and time standardisation helped to reduce accidents as the number of lines and train routes increased. There were still time differences between countries and in 1880 Ireland time differed from GMT by 25 minutes.

The Pips

What was required was a way of informing the population of the standardised time and this was greatly aided by radio and prior to radio by the telegraph. Today we are familiar with the pips of the BBC Time Signal which was started around 90 years ago in 1924.

Today, if one listens to the pips on Radio 4 long wave and a DAB broadcast one will notice that the time signals do not necessarily coincide. The difference can be as much as ten seconds if one hears



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the time signal on an internet radio station.

The time signal from MSF

A more accurate time signal can be obtained from the radio station MSF. Note that MSF is not an abbreviation but a radio callsign with the letter M identifying the station as an English station and the SF is arbitrary. Initially MSF was associated with Rugby, later in 2007 the MSF station was moved from Rugby to Anthorn in Cumbria.

To listen to MSF set your radio to receive on 60 kHz using the CW setting. Many ham radio rigs tune continuously from 30 kHz up to 29.999 MHz. I had some initial problems hearing the signal using an ATU and a full size G5RV. The problem was solved by removing the ATU and attaching the G5RV directly to my rig. The signal is more audible at night, and is transmitted from an omnidirectional T aerial with a 17 kW signal which should easily be audible well beyond our shores. There is a similar German equivalent radio station on 77.5 kHz which you should also be able to pick up. This signal is from near to Frankfurt.

The signal consists of a pulse each second with a double pulse at one minute intervals. I thought it may be possible to transcribe the signal by hand with say a tick or a cross and to analyse the data later, but this did not work for me.

Kits were available to receive and process the signal from a Birmingham supplier named Galleon. You may wish to undertake a construction project if you are so inclined. The eventual signal is fed into a computers serial interface, although serial ports are now often not available on more recent PCs. For those interested in building an MSF direct conversion receiver from discrete parts on Vero board or similar please look at <http://zen22142.zen.co.uk>. However if you do not immediately recognise what a BC549C is this may not be the project for you. If you do have an interest in building an MSF receiver I am sure there is sufficient expertise within the Stars group to make sure the project will not end in failure.

Today the SI unit of a second is defined by a Caesium Atomic Clock. The time for the earth to move around the sun or astronomical time varies very slightly from year to year. As such there is a very slight difference between atomic time and astronomical time. The values given by the MSF signal reflect this difference. For completeness

The SI Unit of a second is the duration of 9,192,631,770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the caesium 133 atom.

When I was first involved with Windows PCs, often time of day was set by an operator at boot-up. The time was then maintained using power from a button cell. As such often no two computer clocks would match within a company's computer network. Today, with distributed computers this would be a disaster in for example banking, where the time at which a transaction occurs is nearly as important as the cash figure the transaction was for. Today most computers get their time of day from servers which maintain and supply the current time on demand.

Global Positioning Systems are only feasible today because we are able to measure time accurately. The different times required for several satellite signals to reach a GPS receiver is used to fix position and altitude on the earth. Today wrist watches and clocks are available that receive the time of day from MSF transmissions.



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Further Reading

Decoding the MSF-60 Radio Time Signal

<http://timetools.co.uk>

National Physical Laboratory

<http://npl.co.uk>

Anthorn Transmitter Picture

<http://visitscumbria.com>

MSF Receiver Build Notes and Pictures

Do you fancy building your first receiver?

<http://zen22142.zen.co.uk>

Longitude by Dava Sobel

The True Story of a Lone Genius Who Solved the Greatest Scientific Problem of His Time.
Well worth reading.

Galleon Systems Limited

<http://www.cylex-uk.co.uk/reviews/viewcompanywebsite.aspx?firmaName=galleon-systems-ltd&companyId=13724262>

As usual any errors are mine.

Adrian Bryan (G0NLA) Starlite Editor



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YOUR COMMITTEE

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	KELVIN	M6KTR	
	ANDREW	M6APJ	
	ADRIAN Sims	2E0HBA	
	ADRIAN Bryan	G0NLA	

CALENDAR OF EVENTS

It should be noted that the Shack will be open every Monday evening unless shown otherwise in the Calendar

March	Mon 3rd	Open Shack Night - Or on air natter
	Mon 10th	Committee Meeting & Foundation Course Exam
	Mon 17th	A.G.M.
	Mon 24th	Open Shack Night - Or on air natter
	Mon 31st	Open Shack Night - Or on air natter
April	Mon 7th	Open Shack Night - Or on air natter
	Mon 14th	Open Shack Night - Or on air natter
	Mon 21st	No Meeting - Easter Monday
	Mon 28th	G4SPZ - Phil - Valve Testers
May	Mon 5th	No Meeting - Early Spring Bank Holiday
	Mon 12th	Open Shack Night - Or on air natter
	Mon 19th	Early Computing - John Tracey
	Mon 26th	No Meeting - Spring Bank Holiday
June	Mon 2nd	Open Shack Night - Or on air natter
	Mon 9th	Open Shack Night - Or on air natter
	Mon 16th	BBQ at Sheepwalks
	Mon 23rd	Open Shack Night - Or on air natter
	Mon 30th	Open Shack Night - Or on air natter

