

STARLITE

The Award Winning Newsletter for Members and Friends of

Stourbridge and District Amateur Radio Society

Incorporating

**Old Swinford Hospital
School Radio Club**



Old Swinford
Hospital



G6OI
G6SRS

G4CVK

Issue Number 09/2016

Stourbridge and District Amateur Radio Society

Meetings Held at

Old Swinford Hospital School

Heath Lane

Stourbridge

(8:00pm to 10:00pm)

Visitors always welcome

*The Society holds its full meetings
on the 1st and 3rd Monday each month*

RSGB Affiliated Society

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Word from the President

Another month of meetings with lots of radio use – we’ve even started making contacts. This is partly because of yet another visit to the roof and some considerable adjustments to the G5RV to make it work properly again. And there’s still more to come – the HF and 70cms beam are connected up and working, and just need the rotator reconnecting to become fully usable again.

A big thank you to those that helped fix these antennas – especially for not being too abusive about my choice to stay firmly at the bottom of the ladder ;)

Talking of ‘helping out’ and ‘getting on the air’, I’m sure you’re aware that this weekend (3rd and 4th Sept) is the SSB Field Day. We are taking part again this year and we will be in the usual place. However, although we have people to help set everything up and operators to run the station, there are only just enough to get by – so if you’re available over that weekend please volunteer to help out, even at this late stage. If you need more information, or want to tell us you want to help contact Keith or any of the committee.

One last note: Steve Turner, who did the excellent talk on MRI, has confirmed the date for his follow up talk - he will be at the September 19th meeting. This is definitely one NOT to miss.

Tim G7TAC

Editors Comments

This month has seen the launch of Icom’s latest HF/50Hz transceiver. The IC 7610 is the replacement for the IC 7600. Also this month Kenwood announce that they are to produce a Tri band (144/220/430) D-Star handheld with full colour screen. Following the Tri Band theme Baofeng Tech, known as BTECH, have released the UV-5X3. The much loved UV5R gets an upgrade to Tri Band, which is all very good if you live in North or South America where 220MHz is an allocated armature band.

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Brush up your theory

Answers to last months; 1 =a , 2 =a , 3= a, 4= d, 5=d , 6=a

1. For which mode is a BFO used?

- (a) CW.
- (b) AM.
- (c) FM.
- (d) DATA.

2. Where in a TFR receiver is the aerial attached?

- (a) Demodulator.
- (b) Loudspeaker.
- (c) Frequency Multiplier.
- (d) Audio Amplifier.

3. If you were listening to a Single Sideband Transmission and the voice sounded high pitched but intelligible, which of the following would you do to make the voice sound more normal?

- (a) Adjust the Squelch.
- (b) Adjust the Tuning Control.
- (c) Change the Sideband.
- (d) Adjust the Tone Control.

4. Why do we use a dummy load?

- (a) It is a very efficient aerial.
- (b) It provides a known 3:1 SWR.
- (c) It allows you to test a transmitter without radiating a signal.
- (d) It allows to measure power.

5. The velocity of propagation on a coaxial cable is?

- (a) Greater than in free space.
- (b) The same as free space.
- (c) Less than in free space.
- (d) Zero.

6. In daylight hours, which of the following bands below would be suitable in working between Lands End and John O'Groats?

- (a) 160 m.
- (b) 80 m.
- (c) 40 m
- (d) 15 m.

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Early Ham Radio Equipment: Pre 1914

The early ham radio equipment used prior to 1914 included spark gap transmitters, coherers, crystal sets and the like.

The very early ham radio equipment was very different to that which is used today.

The technologies that were used for the early ham radio equipment included spark gap transmitters, coherers, magnetic detectors and antennas that were very different to those used today.

Early ham radio transmitters

The transmitters used by these early radio amateurs were almost invariably spark gap transmitters.



Spark gap from high power transmitter dating from early 1900s.

The most common way of generating the high voltage required was to use an induction coil and a mechanism which broke the circuit periodically. Car ignition systems of the day were often put to good use to accomplish this as the components could be bought relatively easily. The high voltage from the coil was then connected across the spark gap. Typically a spark gap could be two brass spheres placed about half an inch apart. One of the major problems found when using spark gaps was the large amount of audible noise they generated. As a result many amateurs enclosed their spark gaps to reduce this.

With the spark generated the output was connected to the tuned circuit so that all the energy could be concentrated around a particular wavelength. In turn this was then connected to the aerial. Often the connection was made directly with no series capacitance in circuit with the result that the high voltage from the induction coil would appear directly on the aerial. Accordingly aerials had to be very well insulated and care had to be taken not to touch them.

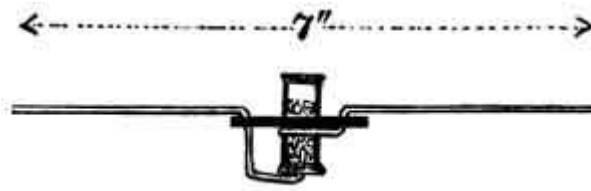
The tuned circuits in the transmitters were grand affairs. The coils were often ten or more inches in diameter and often wound on beautifully finished formers. Tuning was again accomplished using taps on the coils but sometimes variable condensers were employed. In view of the high voltages

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which were used these condensers were large. They often employed meshed plates which could be moved in and out to vary the capacitance.

Early ham radio receivers

Since the introduction of the first licences there had been a number of major improvements in the technology which was used. Originally coherers were the only form of detector, but then in 1904 Ambrose Fleming invented the diode.



Constructional details of an early coherer from around 1900

This was followed around 1906 in America by de Forest who invented the triode. However the most important advance for the amateur experimenter was the crystal detector. As valves were very expensive it gave a cheap and efficient method of detecting signals. A number of different types of these detectors were used. Early types used two crystals, but these gave way to more sensitive single crystal point contact detectors which were given the name "Cat's Whiskers".

Tuning in a receiver was generally accomplished using a variable inductor. Although capacitors (or condensers as they were called) could be used they were more difficult to make in a variable form.

Early ham radio antennas

In the early days of amateur radio and wire-less technology in general, many factors were very new and there was little understanding about the ways in which some items worked. Antennas, or as they were often called, aerials were no exception.

Often they were developed by trial and error. As the frequencies were low, they were often quite large.

Often antennas consisted of as much wire raised as high as possible. Others followed more standard designs.

One design which gained popularity was called a "flat top" as it had a multi wire top. Another popular design consisted of a cage of about six wires separated by a hoop at each end.

Typical home made Morse key

In these very early days of amateur radio it was not possible to buy ready built parts. Everything had to be made from scratch.

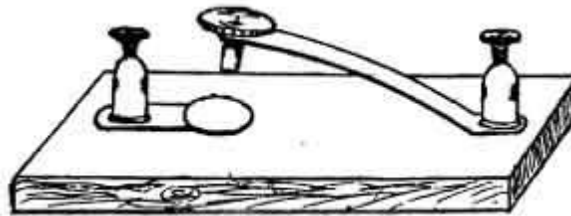
One example of this was a 'Morse tapping key' that was described in a book from the turn of the century called 'Wireless Telegraphy and Hertzian Waves' by S R Bottone.

This early item of amateur radio equipment was said to be "very convenient for the purpose of signalling and if the Morse system is used, it is more handy than a commutator."

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"To make the instrument," Bottone described, "the following simple plan may be adopted. A piece of mahogany about 6 inches long, 3 inches wide and half an inch thick is selected and after having been squared and smoothed up is fitted with a drawing pin at the centre of the narrower edge. This drawing pin is put into connection with a terminal by means of a brass strap about half an inch wide and about 1/32 inch thick. At the other extremity of the board a hole is drilled for a second terminal, under the shoulder of which passes a rather stiff spring (a piece of crinoline steel about half an inch wide will do very well), of such a length to reach and cover, when pressed down, the head of the drawing pin."



Design details for an early Morse key
or as it was called a 'tapping key' from 1900.

"A hole must be drilled at this extremity of the spring, exactly over the head of the drawing pin, and in this hole must be fitted a stout piece of brass rod, which can be sweated or screwed into the hole in the spring, and furnished above with a neat little knob of ebonite or boxwood."

Bottone goes on to describe how best to use the key with a transmitter.

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ISS SSTV on Baofeng handheld



The **Chertsey Radio Club** demonstrated that you can receive pictures from Space using just a Baofeng VHF handheld radio and a Lynx-7 Tablet

On Monday, August 15, 2016 radio amateurs from India to Brazil successfully copied Slow Scan Television images transmitted on 145.800 MHz FM from the Russian amateur radio station located in the ISS Service Module.

The Russian Cosmonauts were using a Kenwood TM-D710

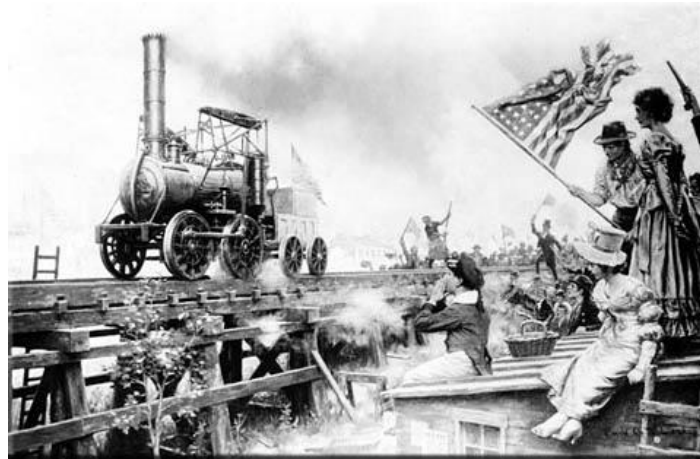
transceiver thought to be running about 25 watts output. It gave a good signal which could easily be copied on VHF handheld transceivers such as the popular Baofengs.

It expected there will be further SSTV transmissions on Tuesday, August 16. The ISS transmits 5 kHz deviation FM, if your transceiver has selectable FM filters you should select the wider filter for best results.

The Stourbridge Lion

The *Stourbridge Lion* carries particular importance in American railroad history as it was the first steam locomotive to be successfully operated during the summer of 1829, one year prior to the Baltimore & Ohio's "*Tom Thumb*", designed by Peter Cooper. There many "firsts" occurring between 1829 and 1830 in regards to steam power, as it became more and more obvious with each successful test that it was a proven method to move people and goods relatively efficiently and quickly (at least in regards to what was available at the time). The *Lion*, purchased by the Delaware & Hudson Canal Company, was not built in the United States but it did prove quite reliable, which is ironic considering after a successful round of testing railroad officials decided against using it. Soon after its trials the locomotive was put into storage and slowly withered away afterwards through sale and salvage. Luckily, the main boiler survives today and is owned by the Smithsonian Institution.

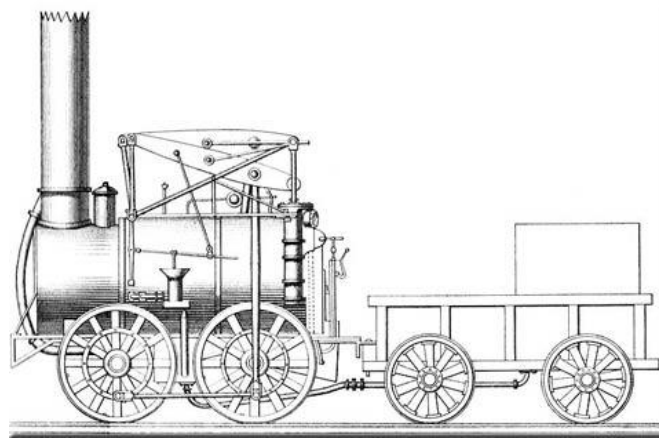
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By the 1820s the idea of railroads being a vital mode of transportation in both the United States and England was gaining serious interest. It was the Brits who first successfully developed steam power when Richard Trevithick of England showcased his initial design on February 21, 1804. By the 1820s a number of horse-powered or incline railways in the U.S. were either in the planning stages or under construction. One of these was the Delaware & Hudson Canal Company (later known simply as the Delaware & Hudson Railway) that was first chartered in 1823 to move anthracite coal from Carbondale, Pennsylvania to New York City. The idea was to use a series of incline railroads that operated with stationary steam engines to move loads of coal up and down the mines around Carbondale to the canal located at Honesdale, Pennsylvania. From that point it would then be moved over the water to New York.

During the early 1820s many believed that canals would be the wave of the future in transportation as few gave much thought to the unproven steam locomotive to be either reliable or useful. The D&H was able to complete its canal that began along Rondout Creek between Kingston and Rosendale, New York and headed southwest to Port Jervis using the Neversink River much of the way. From there it connected to the Delaware River and travelled due west using the Delaware River and finally the Lackawaxen River to reach Honesdale (as you can see, much of the "canal" was actually just connections to major rivers). The canal took less than a year to complete and was open by the spring of 1826. That April construction then began on the gravity line, which was its own company named the Delaware & Hudson Gravity Railroad.

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By 1829 the planned 16-mile line between Honesdale and Carbondale only was in service for about three miles from Honesdale westward, crossing the Lackawaxen River in the process. As early as 1827 when the railroad was still in construction the D&H's chief engineer at the time John B. Jervis was very interested in the development of the steam locomotive happening in England. He decided to send his deputy engineer Horatio Allen to Britain on two missions; one was to purchase strap iron for the railroad and the other was to study the steam locomotives being constructed there. Interestingly, despite his young age of only 25 Allen was given the responsibility of ordering up to four locomotives if he felt they would prove useful and reliable to the D&H's operations. Upon arriving in 1828 he met with several builders including the Robert Stephenson & Company and John Urpeth Rastrick of Foster, Rastrick & Company.

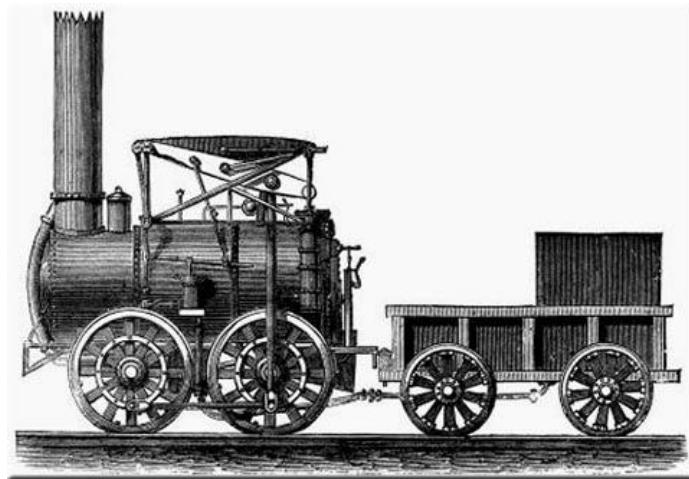
He first talked with Robert Stephenson, who, along with his father George were widely regarded as the experts in the field of steam locomotive manufacturing. Allen decided to place an order with their company for one locomotive, the *Pride of Newcastle*. However, it was Rastrick's company that received the other three orders and the first unit it completed was the *Stourbridge Lion* so named for the lion painted on the nose and place where it was built, Stourbridge, England. While there Allen also ordered the needed strap iron from a foundry in Wolverhampton, 390 tons worth. The cost of the *Lion* came to \$2,914.90 and arrived back in New York on May 13, 1829 disassembled. It was then sent to the West Point Foundry based in nearby Cold Spring for reassembly in testing. Its initial trials began on August 5, 1829 and proved to be in good working order. Also built by Rastrick's were the "*Delaware*" and "*Hudson*". They arrived at New York on the 9 August and 17 September 1829 respectively, but they were never used due to being destroyed in a warehouse fire.

The *Stourbridge Lion* was designed somewhat differently than the American-built "*Tom Thumb*" and *Best Friend of Charleston* which began operating a year later. It sported the now classic steam design with a horizontal boiler (and vertical smokestack) and driving rods followed by a trailing carriage (tender). Its wheels were built of wood with iron sheathing and featured an 0-4-0 wheel

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arrangement. Pistons that sat atop the boiler were driven by steam and were connected to the driving rods which powered the *Lion*. Despite the fact that Jervis had requested a locomotive that weighed only 4 tons so that the timber-constructed railroad could support the machine, the *Lion* weighed nearly 7.5 tons (which became a major issue later).

The locomotive's trial run took place on August 8, 1829 with Allen at the controls. This new-fangled machine drew a large attendance to watch the event, many of whom were quite sceptical and fearful that it would explode. As a result no one would ride the contraption but were stunned and amazed when it took off down the track without a problem and out of sight from the cheering crowd. It likewise returned without a problem and not only convinced those in attendance of steam's future importance but also in the process entered the history books as the first locomotive ever operated in the United States. In an odd twist of fate, its weight was too heavy for the track and resulted in D&H officials storing the locomotive instead of spending the necessary upgrades to use it in regular operation. It then sat out of sight after its initial trial run until 1834 when it was sold for its boiler to be used in a local foundry in Carbondale. After realizing steam was not to be used on the D&H Allen left the company and became chief engineer of the South Carolina Canal And Rail Road a year later in 1830.



What remained of the *Stourbridge Lion* passed into many hands over the coming years and was eventually acquired by the Smithsonian Institution in 1890. By that point the remaining boiler had been badly damaged through years of use, neglect, and even vandalism. An attempt to restore the locomotive has been attempted but without knowing what is original the project has never been completed. Also, a replica built by the D&H using the original blueprints resides at the Wayne County Historical Society in Honesdale.

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THE STOURBRIDGE LION

Technical specifications

Date built: 1827

Date used: 8th August 1829

Purchased by: The Delaware & Hudson Canal Co., Pennsylvania, U.S.A.

Length: 12ft 10-1/2in (3.924m)

Cylinders: Two 8-1/2 x 36in (215 x 914mm)

Driving wheels: 4ft 1in (1.244m)

Axle load: 8,624lbs (3,920kg)

Adhesive weight: 15,680lbs (7,127kg)

UK Rallies

Rallies/Events over the next month around the UK

4 September The Telford HamFest 2016

The Enigunity Centre, Coalbrookdale, Telford TF8 7DQ.

Open 10:15. Admission £3.50. Further info and Email details from Martyn, G3UKV, 01952-255416 or on the Hamfest website <http://www.telfordhamfest.org.uk>

10 September Caister Lifeboat Radio Rally [Saturday]

Caister Lifeboat Station, Tan Lane, Caister on Sea, Norfolk, NR30 5DJ.

Free entry. Open 09:30 (08:00 sellers) till 15:00. Details: Zane, 07711

214790, m1bfidx@ntlworld.com Web: <http://www.m1bfidx.wix.com/cl-radio-rally>

11 September 2016 Torbay Annual Communications Fair

Newton Abbot Racecourse, Newton Road, Newton Abbot, Devon, TQ12 3AF.

Open 10:00/09:30. Admission £2. Details and table bookings: Pete, G4VTO, 01803-864528, rally@tars.org.uk

17 September Fog on the Tyne Rally [Saturday] [New Date]

Whitehall Road Methodist Church Hall, Bensham, Gateshead, NE8 4LH.

Open 10:30. Entry £2. Details: Nancy, G7UUR, 07990-

760920, nancybone2001@yahoo.co.uk Web: <http://www.anarc.net>

18 September Great Northern Hamfest

Barnsley Premier Leisure Complex, Queen's Road, Barnsley. S.Yorks. S71 1AN.

Open 10:00/Traders from 07:30. Admission £3.50/kids free. Tables £15 (£5 for anelectricity supply). Details: Ernie, G4LUE, 07984-191873, <http://www.gnhf.co.uk>

18 September Weston-super-Mare RS Radio & Electronics Rally

The Campus Community Centre, Highlands Lane, Weston-super-Mare, BS24 7DX. (Just off M5/J21. Near Worle Parkway Station. 12 mls from Bristol Airport)

Admission £3, under 16s free. Enquiries for Stand hire etc: Mike, M0VLN, 01278-786684.

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23 to 25 September WACRAL Fellowship Weekend [Friday-Sunday]

Elim Conference Centre, de Walden Road, West Malvern, Worcs. WR14 4DG

Guest speaker Saturday evening, Editor of PW, Don Field, G3XTT.

Details: Shirley, 01924-229630.

September 25th Chippenham and DARS Amateur Radio Rally

* We have moved this year: Kington Langley Village Hall, Church Rd, Kington Langley, SN15 5NJ, 1.5 mls south of M4/J17.

Open 10:00/09:30-disabled. Admission £2.00 under 16s free. Enquiries: Brian, G6HUI,

Tel 07722-242741, g6huim3hui@gmail.com Club WebPage: <http://G3VRE.org.uk>

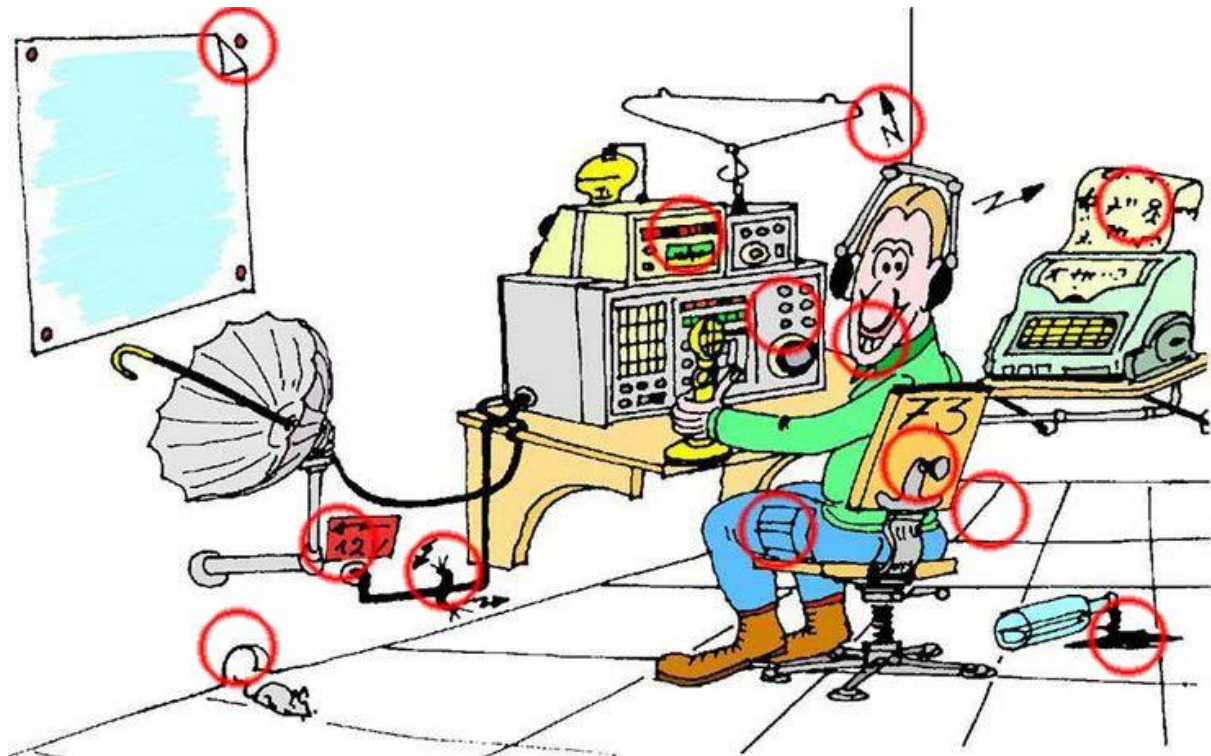
30 September & 1 October National Hamfest [Friday & Saturday]

Newark & Nottinghamshire Showground, Lincoln Road, Winthorpe, Newark, Notts. NG24

2NY.Disabled facilities. <http://www.nationalhamfest.org.uk>

Just a bit of fun

Did you get all 13?



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Dairy of Events

Sept 3rd - 4th - SSB Field Day.

Sept 17th - 25th - International Air Ambulance week special event station – tbc

Sept 19th Steve Turner - Medical Imaging follow up talk

21st November - Table Top Sale.

December - The Big StARS Christmas Meal.

16th Jan - A talk on Digital Radio Modes - date to be confirmed.

There will be £2 admission charge to non-members for attending main meeting talks / events. This is refundable against membership to the society.

Your Committee



President	Tim Childe	G7TAC
Vice President	Nick Moss	G6DQN
Secretary	John Clark	M1EJG
Treasure	John Scott	G8UAE
<i>Committee Members</i>		
	Wayne Mocroft	M5LLT
	Geoff Cooper	G0KVK
	Mark Cadman	M0TCG
	Keith Dixon	M0HPY
	Ross Lewis	M6RLZ

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For Sale

A Pair of 24" Galvanised Stand-off brackets £15.00 for more information contact peter@spareroomstudio.co.uk



And Finally

My thanks to Adrian (G0NLA), Bob (G4XOM), Tim (G7TAC) and Karen Clatworthy for the help in compiling this month's Starlite.

Peter Baker (2E0MVM) – Starlite Editor (editor@g6oi.org.uk)