

March 1970

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March 1970

radio communication

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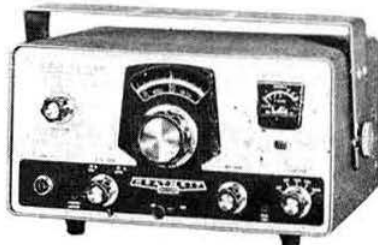
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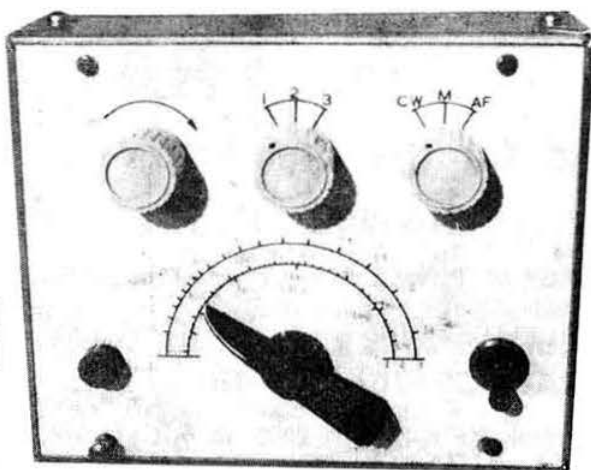
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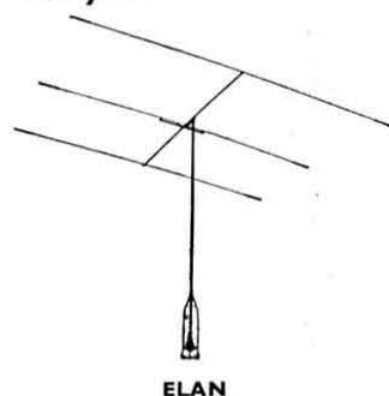
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A. O. Milne, G2MI, 29 Kechill Gardens, Bromley, Kent.

M. A. C. MacBrayne, G3KGU, 25 Purlieu Way, Theydon Bois, Essex.
Barry and Kay Priestley, G3JGO-XIW, 43 Raymond Road, Langley, Slough, Bucks.
G. M. C. Stone, G3FZL, 11 Liphook Crescent, Forest Hill, London, SE23.

Cambion components

Cambion Electronic Products Limited is prepared to accept small quantity orders from members provided that the value of any order is *not less than* £3 and that each order is accompanied by a remittance. It is suggested that where individual requirements are for less than £3 these should be combined within a club or society to bring the order value up to the minimum figure. Where Cambion components are specified in designs published in *Radio Communication* the price will be indicated with each component listing. The address of Cambion Electronic Products Ltd, is: Cambion Works, Castleton, Nr. Sheffield.

Can you help?

Eric Chambers, G2FYT, is trying to trace Flt Lt Coombes who was operating the RAF amateur station YI2XG at Habbaniya in September 1946. Eric would also like to know if anyone has knowledge of any of the operators of YI2AG who was around in June 1951.

G-HB reciprocal licensing

The Swiss authorities are now prepared to issue temporary licences to UK nationals visiting Switzerland for short periods. Fixed, portable or mobile operation is allowed and the licences will be valid for three months.

Application forms can be obtained from the Director General, Direction Generale des Postes Telegraphiques et Telephones, Berne, Switzerland.

Applications must reach the Swiss authorities at least one month before the licence is required and be accompanied by a photo-copy of the applicant's UK licence. The issue fee at present is 35 Swiss francs.

Call signs will be issued in the HB9X series.

Pirates caught

As a result of Post Office enquiries into the suspected unlicensed use of wireless telegraphy transmitting equipment, the following convictions have been obtained on using wireless transmitting

apparatus without the appropriate licence, contrary to the provisions of Section 1 of the Wireless Telegraph Act 1949.

Mr N. McCafferey, 18b St Oswald House, Liverpool 13, at Liverpool City Magistrates' Court on 6 October 1969. He was fined £25 with £20 costs and forfeiture of equipment.

Mr D. Fife, 72 Northwick Ave, Kenton, Middlesex, at Harrow Magistrates' Court on 7 October 1969. He was fined £10 with £10 10s costs and forfeiture of equipment.

Mr P. Owen, Leamington Road, Ryton-on-Dunsmore, Coventry, at Rugby Magistrates' Court on 10 October 1969. He was fined £25 with £10 10s costs and forfeiture of equipment.

Mr D. J. Punk, 23 Feinton Road, Sidcup, Kent, at Dartford Magistrates' Court on 13 October 1969. He was fined £10 on each of two charges, with £5 5s costs and forfeiture of equipment.

Mr P. J. Crabb, 1 Harestone Cottage, Yealmpton, at Plympton Magistrates' Court on 27 October 1969. He was fined £3 with £7 7s costs and forfeiture of equipment.

Mr N. Catford, 77 Burleigh Road, Sutton, Surrey, at Sutton Magistrates' Court on 29 October 1969. He was fined £15 with £10 10s costs and forfeiture of equipment.

Mr J. Parker, 25 Walker Avenue, Peacocks Estate, Wakefield, at Wakefield Magistrates' Court on 31 October 1969. He was fined £75 with £25 costs.

Mr S. Paskin, 76 Peacocks Avenue, Peacocks Estate, Wakefield, at Wakefield Magistrates' Court on 31 October 1969. He was fined £75 with £25 costs.

Mr M. C. Cutler, 117 Hazelbury Rd, London, SW6, at West London Magistrates' Court on 4 November 1969. He was fined £25 on each of two charges, with £10 10s costs and forfeiture of equipment.

Mr D. Remnant, 14 Norbiton Common Rd, New Malden, at Malden and Sutton Magistrates' Court on 26 November 1969. He was fined £10 with £3 3s costs and forfeiture of equipment.

Mr C. L. Smith, 103 Marescroft Rd, Britwell, Slough, at Burnham, Bucks Magistrates' Court on 8 December 1969. He was fined £10 with forfeiture of equipment.

Mr R. Ebsworth, 38 Marescroft Rd, Britwell, Slough, at Burnham, Bucks Magistrates' Court on 8 December 1969. He was fined £10 with forfeiture of equipment.

Mr A. E. Green, 17 Park Avenue, North Walsham, at North Walsham Magistrates' Court on 5 January 1970. He was fined £30 with £10 10s costs.

Mr J. B. Balls, 7 Park Lane, North Walsham, at North Walsham Magistrates' Court on 5 January 1970. He was fined £20 on each of two charges, with £10 10s costs.

Contests

The date of BERU in the list of contests which appeared on page 101 of the February issue should be 7-8 March.

G3UFW's top band transmitter

Mr J. Stevens, G3UFW, author of "A transistor ssb transmitter for top band," published in the January issue of *Radio Communication*, advises us that the unmarked inductor in the balanced mixer circuit diagram is RFC3, and that the values of resistors R29 and R30 should be 0.15Ω, not 1.5Ω. Also, the junction of C36 and R30 should be connected to the junction of L5 and R29, and not to earth as shown.

Test equipment manual

It is intended to publish in the near future a manual describing test equipment and methods. Many items of test equipment have been dealt with both in *Radio Communication* and the *Radio Communication Handbook* and it is felt that members may well have constructed some of these units and have discovered snags, variants and/or improvements. In addition, some members must have useful pieces of test equipment which have not yet been described.

In order that the new manual shall be as complete as possible, members are invited to send notes on their experiences with any measurement or test equipment

problems which they think are likely to help others. Improvements to existing designs or descriptions of entirely new pieces of equipment will be most welcome, as will suggestions for useful items even if no design can be offered.

Members are invited to send correspondence directly to the author, Mr H. L. Gibson, G8CGA, 132 Pine Gardens, Ruislip, Middlesex.

Another pirate

G3XWY, who operates on 14MHz cw only, advises that his call is being used on 1.8MHz cw and a.m. The illegal operator gives the name of Dennis. Any comments concerning identity or location will be welcomed by G3XWY.

The Institution of Electronic & Radio Engineers

The new telephone number of the Institution is 01-637 2771 (10 lines). Previous numbers are now discontinued.

Vhf Communications

The first volume of this recently introduced periodical was completed with the issue of November 1969. The four issues have contained more than 30 technical articles of interest to the vhf-uhf operator. Due only to the revaluation of the West German mark, the price of the annual subscription has risen to 30s. The UK agent is D. T. Hayter, G3JHM, to whom subscription payments should be made.

One of the features of *Vhf Communications* has been the availability of printed circuit boards and certain components for equipment described in its pages. At this time, when the difficulties of obtaining small quantities of components are increasing, this is a valuable service. The publishers of *Vhf Communications* and the German-language *Ukw Berichte* hold an agency for the sale of RSGB publications through which many copies of the *Radio Communication Handbook* and the *Vhf-Uhf Manual* have been sold.

Mullard golden jubilee year

Mullard Ltd is this year celebrating its founding in 1920 as the Mullard Radio

Valve Co Ltd by Mr Stanley Mullard, who is still a member of the board of Mullard Ltd at the age of 86.

Its initial product was high-power transmitting valves and from this beginning the company has developed into one of the UK's biggest electronic component companies.

The North-East Amateur Radio Group

A number of radio clubs in the north-east have recently formed a federation known as "The North-East Amateur Radio Group". The purpose of the group is to promote a series of bi-monthly lectures and to deal with matters of interest peculiar to the north-east. A newsletter will also be issued, the first issue going to all listed amateurs and SWLS in the region. The first lecture meeting will be held on 20 March in Durham City.

Unique in EI-land

Cathal O'Reilly, who recently passed the Post Office examination in theory and Morse and was issued with the callsign EI9CA, is the first Irish totally blind transmitting radio amateur.

The Post Office Radio Engineering Branch in Dublin was more than helpful in this unique case, and issued Cathal with a full licence, phone and cw for 80, 40, 20, 15 and 4 metres. The normal procedure is for all new EI amateur licensees to have "experimental permits" and they are confined for one year to the use of cw only, and only on the 20-40m bands.

Cathal, of course, wants to hear from fellow blind operators who could guide him in his new venture. Some local EIs are on hand to assist Cathal in many ways.

Plessey integrated circuits

Following the note which appeared last month, the Plessey Company has advised that small quantity orders should be sent to its distributors: A. C. Farnell Ltd, Kirkstall Road, Leeds 3; and S.D.S. Ltd, Hillsea Industrial Estate, Hillsea, Portsmouth, Hants. Either of these firms will supply any quantities up to 1,000 off of any of the Plessey circuits.

Licence figures

The GPO advises that the following numbers of amateur licences were in force at the end of October 1969:

Class A	13,413
Class B	1,897
Class A/M	2,561
Class B/M	235
Television	179
Model control	17,160

The Telegraphist Air Gunners Association

This 300-strong association is holding its 25th anniversary in 1972 and invites those radio amateurs who were in this branch of the Royal Navy to get in touch with a view to joining the association. It is felt that many more amateurs would join if they knew of the association's existence.

Mr J. R. Seager, G4AK, Woodbine Cottage, Park Road, Doddinghurst, Brentwood, Essex, a member of the association and of the RSGB, would no doubt be pleased to hear from anyone interested in joining.

Newark society formed

The Newark Amateur Radio Communications Society was formed recently and is seeking affiliation to RSGB. It meets monthly at the Mentally Handicapped Children's Centre in Newark, and prospective members are asked to write for further information to: J. D. Cree, BSc., G3TBK, 89 Charles St, Newark, Notts.

Silent keys

It is with regret that we record the deaths of the following radio amateurs:

J. R. Cooling, BRS17240, of 8 Merryfields, The Greenway, Uxbridge, Middlesex.

W. Stanworth, ex-G4WS, of 15 Thorncliffe, Lansdown Road, Cheltenham, Glos.

J. E. Tomlin, BRS30220, of 28 Red Scar Drive, Newby, Scarborough, Yorks.

RSGB Call Book

Please note an omission: G3EYD, E. Green, 81 Norris Road, Sale, Cheshire.

The address for G3JKO should read: The Spinney, King's Lane, Southwater, Horsham, Sussex.

Ropes and rigging for amateurs —a professional approach

by J. MICHAEL GALE, G3JMG, BoT certificated yachtmaster (ocean)*

PERHAPS the most important link in the radio communications chain is the aerial; the most powerful and sophisticated equipment in the world becomes a useless heap of junk when the aerial is lying on the ground. Aerial experiments also form one of the most interesting and fascinating branches of amateur radio but, while most amateurs are completely at home with a soldering iron in the shack, many feel a lack of confidence when it comes to erecting a mast and rigging an aerial.

Much has been written on aerial theory but scant attention has been paid to the equally important practical aspect of aerial erection. Electronic lash-ups are sometimes acceptable in the shack, where it is a simple matter to re-make the odd dry joint or broken connection, but aerials have to withstand the rigours of the elements and must be constructed with much greater care and expertise if they are to offer any degree of reliability. Knowing the right knot, and how to tie it, is just as much a part of the "complete radio amateur" as the ability to make a sound soldered joint. Rigging masts and wire aerials is a direct application of elementary seamanship and it is the purpose of this article to translate seamanship into "aerialmanship".

Rope

Rope comes in a wide variety of sizes, materials and forms of construction (known as "lay"). The most popular form is the traditional 3-strand variety with the "right-hand thread" because it is the strongest. It is given a right-hand twist because most people are right-handed and it is their natural tendency to coil the rope in a clockwise direction, which is correct.

Before discussing the multiplicity of materials let us be quite clear about its size. In Britain, rope is—or was—traditionally measured by its circumference in inches. This confuses most engineers, who are more used to considering something of round section by its diameter. Very roughly, the diameter of rope is about one third its circumference. So a $\frac{3}{4}$ in rope is about $\frac{1}{4}$ in in diameter. Under metrication, however, all this will be changed and rope will then be measured by its diameter in millimetres and a $\frac{3}{4}$ in rope will thus become a 6mm rope.

Until comparatively recently all rope was made of one of several vegetable fibres such as hemp, manilla, cotton, sisal etc. Although these fibres have different characteristics, they all have one failing in common—they absorb water, swelling in both length and diameter in the process, and

they are attacked by bacteria and rot. For this reason rope was never very popular for use as permanent mast guys as it required continual adjustment and frequent replacement. Guys were therefore invariably made of galvanized wire, although this, too, eventually corroded, and they also had to be split up into short lengths by insulators to reduce the absorption of rf.

Modern ropes made from synthetic fibres offer a tremendous advance in that they do not swell when wet; they resist petrol, oil, acids and alkalis well, and, above all, do not rot. Also, synthetic ropes are generally much stronger than natural fibre ropes and are, therefore, ideally suited for use as guys.

Basically the principles of ropemaking have not altered for hundreds of years. Threads of the fibre are first twisted into yarns which are then laid together in a spiral twist to form the strand and, finally, the strands (usually three) are laid around each other to complete the rope. This method puts an even load on all parts since all the threads run more or less straight along the direction of the load. Look at a rope and see.

With synthetic fibres, however, there is one important difference. Natural fibres, which make up the basic yarn, occur only in short lengths called "staple" fibre. It is the loose ends of these fibres sticking out of the side of the rope which gives it the familiar hairy finish. Synthetic fibre, however, comes in a continuous filament—each one as long as the rope itself. This contributes to the greater strength of synthetic rope and also gives it a much smoother, shinier finish. This can make the rope slippery and difficult to grip, so sometimes the continuous filament is cut into short lengths to resemble staple fibre, thereby giving it the traditional hairy finish. It does weaken it a little, however. The continuous filament also allows the yarns to be plaited or braided. This makes for a kink-free rope (very popular with water-skiers) but it is not as strong as the conventional three-strand construction and it is much harder to splice.

One undesirable feature common to all synthetic rope is the fact that it melts. This is of little significance for most general purposes but it has to be watched very carefully by a seaman when easing a rope round bitts or cleats. This feature can be turned to advantage, however, as it obviates the necessity of whipping the ends to prevent fraying—while this is still the best way, a quicker method is to fuse the end in a clean flame then round off with wet fingers to prevent it sticking. This is best done before cutting; rotate a 1 in section of rope in a clean flame until fused all round then cut through with a sharp knife when cool. The two jobs can be done in

* 14 Wessex Road, Horndean, Portsmouth PO8 0HS

one by using a hot soldering iron (the professionals use an electrically-heated knife blade). The traditional method of whipping can still hold its own on a windy day, though, so is best not forgotten!

Just as the various natural fibres have differing characteristics, so do the various synthetic fibres and, to enjoy the full benefits, it is vital to understand their differences.

Nylon. This is a polyamide filament derived from coal and oil; it was one of the first synthetic rope fibres and is still the strongest. For example, a dry nylon rope of 1in circumference ($\frac{5}{16}$ in or 8mm dia) and of conventional three-strand construction (hawser-laid), will break at about 1.3 tons. White in colour, it tends to be rather hard to handle unless plaited or braided. It absorbs a little moisture and loses about 10 per cent of its strength when saturated. It resists strong alkalis well but is expensive.

Nylon's most important characteristic is its fantastic elasticity, enabling it to stretch up to 20 per cent before breaking. This makes it ideal for use in situations where high shock loads would normally break a wire—such as in towing, for example. By the same token, however, this feature makes nylon most unsuitable for supporting a mast; the guys could be tuned like guitar strings but the mast would still wave about like a Caribbean palm! However, nylon would be suitable for use as an aerial halyard; the elasticity would keep the wire taut under all conditions of wind and temperature, but there are cheaper ways of obtaining this desirable effect. Do not make the common error of referring to all synthetic rope as "nylon". If you ask for nylon in a ship chandler's, nylon is what you will get but it may be useless for your purpose.

Terylene. This is a polyester filament derived from oil. It is very similar in appearance to nylon but not quite as strong; the same 1in three-strand rope breaks at about one ton, but this strength is maintained when wet. In some respects Terylene is the converse of nylon in that it resists acids well and stretches very little under load. The small amount of stretch can be reduced still further by a pre-stretching process during manufacture, making Terylene a virtual non-corrosive substitute for wire with the added advantage of also being non-conductive. Pre-stretched Terylene is, therefore, the ideal rope to use for mast guys and halyards, but it is also, unfortunately, the most expensive.

Terylene is the trade name of ICI. The same material is made in the USA, where it is called Dacron by Du Pont, and by Hoechst Chemicals in Germany, where it is called Trevira. To avoid confusion, many rope manufacturers now describe the material as polyester.

Polythene. Also derived from oil, this was the first cheap general purpose synthetic rope fibre and is often referred to as "Courlene", which is the trade name of the basic fibre. In its early days it was always coloured bright orange but it is now available in a variety of colours, including black and white. The fibre, and therefore the rope, is hard, wiry and very smooth; the surface always feels greasy so this rope is easily recognized. It is about 50 per cent stronger than natural fibre ropes but not as strong as nylon or Terylene; the 1in size breaking at about 1,500lb. Under load the stretch is a little less than nylon but much greater than Terylene. It is very light in weight and floats.

When it was first introduced, polythene rope became

very popular for general use on account of its low cost, the price being less than half that of Terylene. There are snags, however, the main one being the extreme difficulty in making knots and splices hold securely due to its springy and "greasy" nature. It is still, surprisingly, popular for use in the manufacture of fishing nets, but for general purposes its popularity rapidly declined with the introduction of polypropylene.

Polypropylene. This is another oil-derived polyester fibre and the latest introduction into the rope field. It is the current most popular all-round general purpose rope on account of its excellent compromise with regard to performance and price. It has 90 per cent of the strength of Terylene (the 1in size breaking at about 2,000lb), yet is only half the price. Under load it stretches slightly more than Terylene but nothing like as much as nylon or polythene. It combines the acid-resistance of Terylene with the alkali-resistance of nylon. The fibre is a little harder than Terylene or nylon but not as hard or as "greasy" as polythene. It is light and floats.

When first introduced it was invariably sold under the fibre's trade name "Ulstron" and coloured green, but it is now available in a wide variety of forms and colours. The basic fibre is commonly a continuous round section filament about the thickness of a human hair called "monofilament" when made up into rope. It can also be supplied as an extremely fine strand which is then called "multifilament" in rope form. This form is much softer and more flexible than monofilament but is more expensive because of the extra work involved in manufacture. The fibre may also be rectangular in section; this is obtained by slitting a flat sheet or film of the material which is then called "fibreilm". This results in a coarse rope which tends to be rather rough on the hands but it holds knots and splices much better than any other continuous-filament rope. In addition, the monofilament fibre can be cut into short lengths to produce a staple-fibre rope of the traditional hairy appearance. Thus, this one basic material can be used to produce four very different types of rope, all with a similar strength!

These, then, are the current most popular ropemaking materials. For amateur radio use, pre-stretched Terylene/Dacron/Trevira makes ideal guys and halyards but is expensive. As this material suffers less from ultra-violet degradation than most other fibres, its use is especially recommended in those parts of the world which enjoy more than their fair share of sunshine. Nylon is unsuitable for guys but could be used for halyards, although this, too, is expensive. In the UK, Northern Europe and other places which would welcome some more sunshine, monofilament polypropylene, although quite a mouthful, is an excellent general-purpose rope equally suitable for use as guys or halyards at a price which will give years of reliable service at little cost.

Thimbles

Whenever the end of the rope is formed into a loop to transfer strain to a metal fitting such as a hook, eye-bolt or pulley, it must be protected by a thimble to spread the load correctly and prevent chafe. This is especially important with polypropylene which seems to be particularly susceptible to chafe. Thimbles are commonly pear-shaped troughs of suitable size to take a particular size of rope but they can

also be circular for special purposes. They may be made of galvanized steel, stainless steel or nylon. The stainless ones are extremely strong and expensive and are usually reserved for use with stainless steel wire. The traditional galvanized ones are "cheap and cheerful"; the finish tends to be rough, which partly defeats their object, and they eventually corrode anyway. They can also set up a highly corrosive electrolytic action if used in contact with a dissimilar metal at sea or in coastal areas. For synthetic ropes nylon thimbles are preferred; they cost very little more than the galvanized ones but cannot corrode, cause electrolytic action or damage the fibres.

Thimbles are measured by their overall length but the "score" (width across the trough) is also taken into consideration as this must suit the size of rope it is to take. When a thimble is spliced into the end of a rope it is known as a "hard eye"; without a thimble the spliced loop (eye-splice) is called a "soft eye".

Shackles

These are commonly D-shaped devices (although there are other shapes for special purposes) to link hard eyes, pulleys, eye-bolts, pickets etc. The author's wife calls them "nautical safety-pins" and they may be made of galvanized steel, stainless steel, manganese bronze or even nylon. Like chain, they are measured by the diameter of the bar from which they are formed and can range from $\frac{1}{8}$ in to 2 in or more. In the smaller sizes the diameter of the screwed pin which forms the stroke of the D is usually the same as the rounded part but, in the larger sizes, the pin is often one size larger.

Stainless steel shackles are very strong and last for ever but are extremely expensive and are usually used where expense is no consideration. The galvanized ones are strong and cheap but eventually rust where the plating is worn through at the points of contact, and the threaded parts, which cannot be galvanized, quickly seize with rust unless treated with thick grease—preferably anhydrous lanolin—at frequent intervals. Shackles made of manganese bronze are not as strong as those of steel but have the advantage that they cost only a little more than the galvanized ones but do not corrode. Nylon shackles are usually reserved for use with nylon chain which finds such light-duty applications as mooring marker buoys or marking out exhibition stands etc. The choice usually lies between galvanized or bronze.

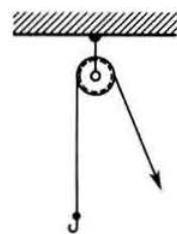
The unthreaded end of the pin is flattened and has a small hole through it. It is tightened by slipping it into the tapered slot in a special key or in the side cheek of a seaman's knife—not, please *not*, with pliers. Alternatively, the pin may be tightened by passing a thin, hard steel bar, such as a small Allen key, through the hole, but the main purpose of the hole is to enable the pin to be "moused", that is locked, by twisting wire through the hole and round the bar. For long-term use, especially at sea or in coastal areas, the wire should be of similar material to the shackle to avoid electrolytic action, i.e. copper wire with bronze shackles and galvanized wire with galvanized shackles. Marine grade stainless steel (EN 58 J) does not cause electrolytic action, so wire of this material may safely be used with any shackle or rigging screw and any non-corrosive wire such as copper may be used with stainless shackles.

Pulleys

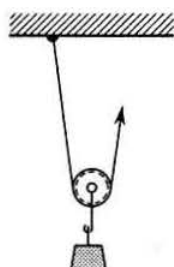
For reliable service in any weather conditions, only genuine

marine fittings should be used. They cost somewhat more than cheap washing-line pulleys but are a much better investment as they do not corrode, jam or seize, and require no lubrication or maintenance. Modern marine pulley blocks may be made with synthetic resin bonded fibre cheeks and sheaves and chromium-plated manganese bronze bearings and straps, or with stainless steel cheeks and nylon sheaves. The stainless type costs fractionally more than the other type but there is little to choose between the two in terms of strength and reliability. There is a **minimum** diameter of sheave for every size of rope and there may be up to three sheaves in one block.

For a simple halyard pulley, a straightforward single-sheaved block will suffice but to make up a tackle for raising a mast (or lifting out the car's engine) one of the pair of blocks must be provided with a becket. This is simply a point of attachment below the block for securing the fixed end of the rope. The apparent power gain varies directly as the number of ropes at the moving block. Thus, two single-sheaved blocks, one with becket, will give a 2 : 1 advantage in one direction and 3 : 1 in the other. A single and double gives 3 : 1 or 4 : 1, and a pair of doubles gives a 4 : 1 or 5 : 1 advantage according to the direction of pull. The term "apparent power gain" is used because power is a function of time and although a lifting tackle (pronounced *Tayckle*, by the way) may be rigged to give a 4 : 1 advantage, it will take four times as long (and five times as much rope) to do the job. In fact about 25 per cent of the advantage will be lost through friction in the sheaves.

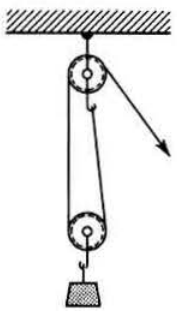


No advantage

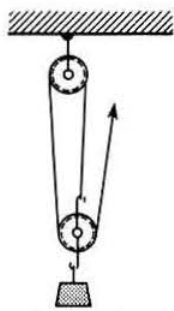


2:1 advantage

Single whip

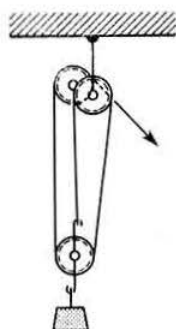


2:1 advantage

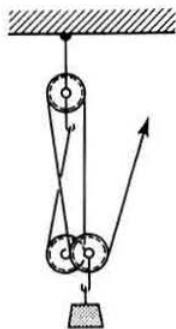


3:1 advantage

Gun tackle

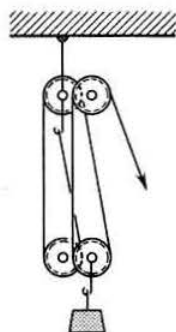


3:1 advantage

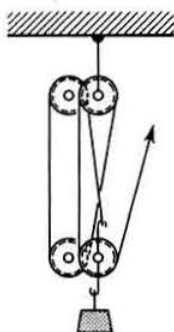


4:1 advantage

Luff tackle



4:1 advantage



5:1 advantage

Double luff tackle

Aerial wire

Have you ever wondered how the GPO land-lines remain intact year after year although your aerial frequently collapses? The Post Office is the world's expert in stringing wire between poles and keeping it there. One of their secrets is in the wire which is made to their own special recipe. The addition of one per cent of cadmium to the basic copper increases the tensile strength of hard-drawn wire by 50 per cent from 20 tons psi to 30 tons psi. It also increases the dc resistance by nearly 25 per cent but do not let this worry you too much; the vital thing is to keep some wire up in the air. Your highly-conductive pure copper aerial is quite useless laid on the ground. In the days of airborne hf communication, the RAF used quite thin stranded stainless steel aerial wire, and modern yacht installations invariably utilize part of the galvanized or stainless steel rigging for the aerial. And remember, stainless steel has a dc resistance nearly 53 times that of copper!

Telephone wire is rather quaintly measured by its weight per mile; standard sizes being 40lb, 70lb and 100lb, which approximate to 18, 16 and 14swg, respectively. Either the 70lb or 100lb sizes make good aeriels. An aerial "farm" of hf rhombics and dipoles constructed entirely of 70lb telephone wire has been in successful operation for many years at the University of Sheffield's Radioastronomy

Research Station 1,350ft up in the Yorkshire Pennines—and a very bleak spot it is too! The same Department of Physics also used this wire at their research station with the British Antarctic Survey, so do not blame British weather for your aerial's demise! British Standard Specification 175/1951 reveals all about telephone wire.

Another secret, which goes hand-in-hand with the wire, is the method of joining and fastening it. A copper tube $3\frac{1}{2}$ in long and of oval section, just large enough to take the two wires side-by-side, is placed in a simple hand tool which clamps the ends while the centre section is rotated through 360°. This cold-welds the wires quickly and easily, making a perfect electrical and mechanical joint without annealing the wire.

If plain copper wire is used it must be of the hard-drawn variety; common sizes being 14swg or 7/029. Hard-drawn wire is usually left bare, although it can be covered; it cannot be enamelled as the drying process anneals it.

Joints and fastenings

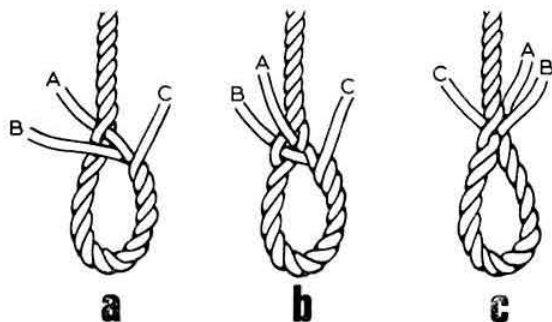
With wire aeriels, solder should never be used to make a mechanical joint. The necessary heat anneals the section of wire, making it soft, and the solder stiffens the joint so that tension and movement quickly fractures the wire at the joint. Unless telephone wire and the special "sleeve jointing" are used, there is little one can do with solid wire except to form a loop through the eye of an insulator or round a thimble and wind the short end round the standing part. It is easier on the fingers if the short end is first passed through a small hole near the end of a short piece of wood which can then be turned like a key. Do not try tying knots in wire!

With stranded wire the GPO uses an excellent, but simple, splice. The loop is formed and the short end laid alongside the standing part. Then one strand of the short end is untwisted back to the loop and wound tightly round both parts. Another strand is treated likewise and so on until the one remaining strand is wound round the standing part alone. This results in a beautifully tapered splice of great strength. The GPO standard is a minimum of two and a half turns of each strand and it is recommended that at least four turns be made. Have a look at the stay on a telegraph pole.

If the stranded wire is insulated and there is some reluctance towards stripping the covering, the two parts can be bound together by a flat seizing using waxed or tarred whipping twine. Do not use the new Terylene whipping twine; it is extremely strong but it slips. If the proper waxed twine cannot be obtained, ordinary thin string can be used provided it is made waterproof afterwards by melting—in beeswax or even candle wax with a warm soldering iron. This method is ideal at the elbow of an inverted L to avoid cutting and rejoining the wire. The temptation to use bulldog grips should be avoided at all costs. Not only are they extremely ugly and unseamanlike, they cripple copper wire and reduce its strength enormously.

For a temporary job, rope can be tied to an insulator with a bowline. This is an excellent knot for making a loop, being one of the few knots guaranteed not to slip under any circumstances and is readily untied. However, it is not generally appreciated that all knots greatly reduce the strength of the rope and should be regarded as temporary fastenings only. In the case of the bowline the strength is reduced to about 65 per cent. For a permanent job an eye splice is far superior, retaining 90 to 95 per cent of the rope's

The eye splice



- Break open the fused end of the rope, making sure that the individual fibres of the three separate strands remain firmly fused. Unlay 3 or 4 in of rope; form a loop in the form of a "U" with the unlay end on the right. Arrange the three strands so that two of them go off to the right and the third to the left, from underneath. Tuck the centre strand (A) under a strand of the standing part at the point at which the splice is required to start.
- Take the third strand (B), pass it over the strand under which the first tuck has just been made and tuck it under the next strand round. Always work from right to left.
- Turn the work over and tuck the remaining strand (C) under the one strand of the standing part now showing, working from right to left. Watch this move carefully as it is the most likely place for an error to occur. The usual mistake is to make the tuck from left to right as this seems to be the natural way.

If all is well, you should now have a strand of fibres radiating equally from each "crack" in a section of the standing part. OK? Then, believe it or not, you can now make an eye splice! All that now remains is to take each strand in turn, starting with any one, pass it over the strand in front of it and under the next one, pulling tight each time. Carry on ad infinitum until you run out of rope. In natural fibre rope a minimum of three tucks is required for reliability but with synthetic fibre rope at least five should be made. It is important to remember that these are **ABSOLUTE MINIMUM** figures; no marks will be lost for making many more but something vital like your mast, a ship or even a life may be lost if fewer tucks are made.

To finish off, when there is insufficient strand left to make another tuck, trim the strands to within about $\frac{1}{2}$ in of the rope with a hot soldering iron. Do not trim off too close or the tuck may pull out. Roll the splice under foot or between the palms of the hands to even out the tucks.

To make the tucks, the rope can be opened up by holding in the left hand and turning clockwise with the right. If the turns are too tight, an opening can be forced by inserting a blunt, tapered spike—a pencil makes a good substitute for the professional *lignum vitae* fid.

A hard eye is formed in exactly the same way except that the loop is formed round a thimble and the first tuck made as close to the thimble as possible. Work is made easier if the rope is temporarily seized to the thimble with light twine until the splice is finished.

strength, and it is much neater into the bargain. Besides, it is the mark of the expert and impresses visitors enormously. Do not betray the secret that splicing is one of the few things which turns out to be much easier than it looks. All the knots, splices and seizings used in superior aerialmanship can be learned in an hour for the price of a packet of cigarettes. Because of the smoother nature of synthetic rope, splices must be given a minimum of five tucks.

Masts

Apart from the conventional flag-pole, a wide variety of ideas has been successfully tried by ingenious amateurs. A lot depends on what can be obtained locally in view of the transport difficulties, and also whether the mast is to support a wire or beam, or is to be used as the radiator itself. Excellent masts have been made from builder's scaffold poles (especially the dural variety), lengths of galvanized gas or water pipe screwed together, and even empty beer or oil cans soldered together. The new plastic fall-pipes can also be stacked to make good mast radiators by taping four lengths of copper wire to the outside. The *Radio Amateur's Handbook* (ARRL) usually contains several excellent suggestions for masts constructed from lengths of timber. However, whatever form the mast takes, unless it is of the self-supporting Eiffel/Blackpool tower variety, the principles and practice of staying it remain the same.

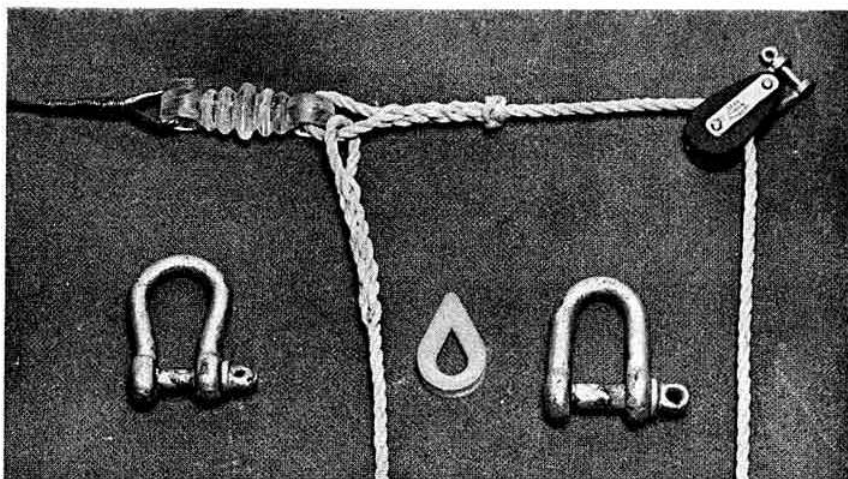
Earth

With most end-fed wire aerials, especially low-impedance ones less than half a wavelength long, a good earth connection is as important as the aerial itself as it forms part of the radiating system. The usual method is to make connection to buried water tanks, large plates, copper rods or tubes, or buried wires radiating from the base of a mast radiator. The success or failure of an earth system largely depends on the conductivity of the ground beneath the aerial. Ground of poor conductivity makes life very difficult and any means of improving the path of rf back to the transmitter will pay handsome dividends. Wire boundary fences can often be bonded together, while one enterprising amateur, who put out such a thunderous signal on Top Band that it crossed the Atlantic many times, even managed to connect together the metal roofs of the entire pre-fab estate on which he lived!

If you are taking over a newly-built house, a more practicable suggestion worthy of consideration is to cover the garden, or a section at least, with galvanized chicken wire before the seed is sown or turf laid. Your new neighbours will think you are mad and may try to avoid you, but if you tell them it is to ensure a weed-free lawn (or some other equally preposterous rubbish) they may even do likewise. You never know your luck! A full roll of chicken wire measures 150ft by 6ft and could be laid in a single strip beneath a Top Band aerial or cut into shorter lengths and laid side-by-side, binding and soldering together every foot or so. At the author's station, which is on the top of a mound of solid chalk several hundred feet thick, the garden is 30ft wide, so a roll of 2in mesh was cut into five lengths and laid across the garden. This makes the entire end of the garden, 30ft by 30ft (900ft²), beneath the mast radiator very highly conductive. This is backed up by four 150ft radials of 7/029 bare copper buried along the line of the neighbours' boundaries. As the neutral side of the public supply mains is earthed at the source, the effectiveness of an earth system is simply checked by connecting a heavy load between it and the live side and measuring the volt drop. Experiments in this direction can be very illuminating—or not, as the case may be! The author's earth system will run a 2kW electric fire with a drop of only a few volts.

Even a good earth can be wasted unless a really low-resistance connection is made to it. Marine radiotelephone installations, even low-power ones in yachts, use a copper

"Far-end" mock-up showing stranded wire spliced to insulator, yacht pulley and halyard spliced to insulator (finished off with wall-and-crown knot) and free end of halyard spliced through main splice. Also shown are samples of a thimble and two shackles. The "bow" shackle enables two thimbles to be accommodated



earth plate of at least 9ft² (or a patented gold-plated device which claims an area equivalent to 10ft²) fixed as low down as possible below the waterline and make connection to it via copper strip 50mm (2in) wide and 0.5 mm thick and a large brass bolt which is brazed to the plate. This size of earth strip is extremely convenient to use; it bends easily and can be run through door jambs and windows and under carpets very unobtrusively. This arrangement, and the almost perfect earth on which boats float, accounts for the much superior results obtained on the marine 2MHz band over average amateur Top Band performance.

Halyards

For most applications the $\frac{3}{4}$ in circumference ($\frac{1}{4}$ in, 6mm dia) size Terylene or polypropylene will be ample; only a really large or heavy array will require anything stronger. To prevent premature fracture due to movement in the wind, a wire aerial should be kept under constant tension. One method is to hang a weight on the lower end of the halyard, taking care to lash it loosely to the mast to prevent it blowing about. On professional installations a short weighted lever is usually fixed to the base of the mast. For amateurs it is easier and cheaper to incorporate a small spring close to the insulator at the far end. The type of spring used to tension small boat steering wires is ideal; they are made of galvanised or stainless steel and cleverly arranged so the spring is actually under compression and virtually unbreakable.

Perhaps the best way of all is to borrow marine radio-telephone technique and fit a neoprene insulator. This is a 24in length of synthetic rubber bar with a hard eye at each end and performs the dual purpose of insulating the aerial and providing tension. The halyard should be spliced to the insulator, taken through a pulley to the ground, and then back to the insulator where it is spliced through the first splice. This ensures that the halyard and insulator can be recovered should the aerial break. It also obviates the necessity of stowing a great heap of rope when the aerial is in position. For a really superior job, the main halyard splice should be finished off with a wall-and-crown knot. This puts a decorative knob at the end of the splice which prevents any tendency for the splice to be pulled into the pulley and jamming it. If the halyard lies close to the mast,

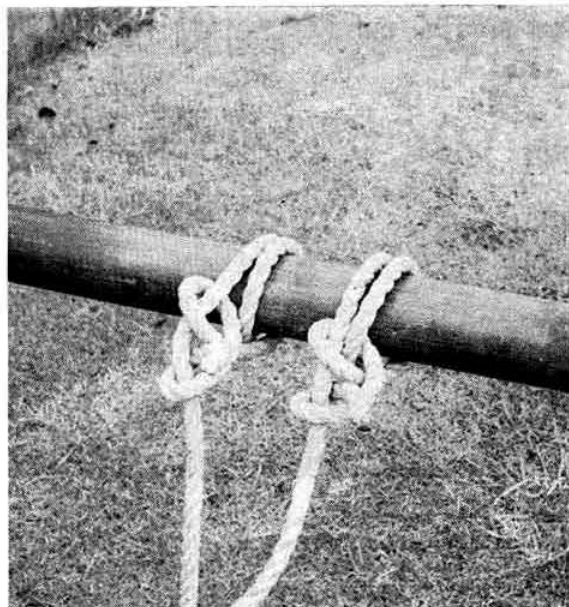
wind will slap it against the mast at frequent, regular intervals causing chafe and driving your neighbours to distraction. This can be prevented by positioning the pulley a foot or two away from the top of the mast or by giving the halyard two or three turns round the mast after the aerial has been raised.

If a tree is being used, some form of automatic tensioning device becomes vital. As the pulley cannot be shackled directly to a tree it must be shackled to the hard eye at the end of a length of rope, which is then tied to the tree with a round turn and two half-hitches if the strain is at right-angles, or a rolling hitch if it is not.

Guys

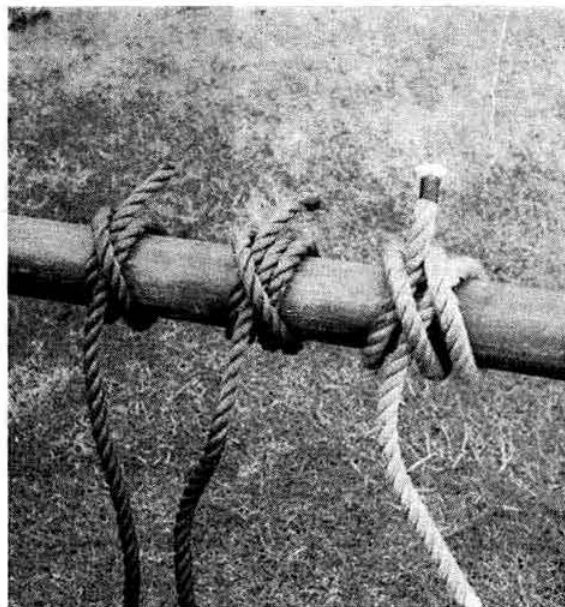
Non-rotting, non-stretching, non-shrinking, non-rf-absorbing Terylene or polypropylene makes excellent guys for radio masts. For light masts such as the 30ft by 1in ex-Army jobs the $\frac{3}{4}$ in circumference ($\frac{1}{4}$ in, 6mm dia) size with a breaking load of 1,200lb will probably suffice, but for anything heavier, or in case of doubt, the 1in circumference ($\frac{5}{8}$ in, 8mm dia) size is preferred. This latter size offers an 80 per cent increase in strength for only a 50 per cent increase in cost and is well worth the little extra to sleep peacefully through the winter storms instead of having nightmares about the neighbour's greenhouse. Bear in mind that the Board of Trade recommend that the maximum working load of a fibre rope should not exceed one sixth of its ultimate strength. In common with natural fibres, synthetics also suffer varying degrees of degradation from prolonged exposure to excessive ultra-violet radiation so it pays to err on the generous side regarding size and accept the increased strength as a bonus.

It is impossible to lay down any hard-and-fast rules regarding the number of sets of guys or the number of guys to a set as so much depends on the characteristics of the particular mast and the ground area available. As a rough guide, three guys to a set on a pitch circle diameter at least equal to the height of the mast is a good basis on which to start. A thin, flexible mast, such as the 30ft ex-Army job just mentioned, will require guying every 15ft or so, whereas a sturdy flag-pole may manage with one set at the top only. In theory only three guys per set are necessary but it may be



ROUND TURN AND TWO HALF-HITCHES on the left is the basic knot for making fast to a post where the strain is at a near right-angle. It is very secure, quickly and easily tied and is one of the few knots which can be tied while there is a strain on the standing part. The two half-hitches actually form a clove hitch.

FISHERMAN'S BEND or **ANCHOR BEND** on the right is a variation in which the first half-hitch is taken *inside* the round turn. It is even more secure than the basic round turn and two half-hitches but it cannot be tied under load and is difficult to untie. It is ideal for permanently securing a pulley to the branch of a tree



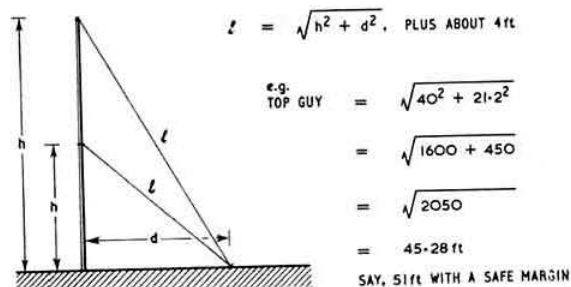
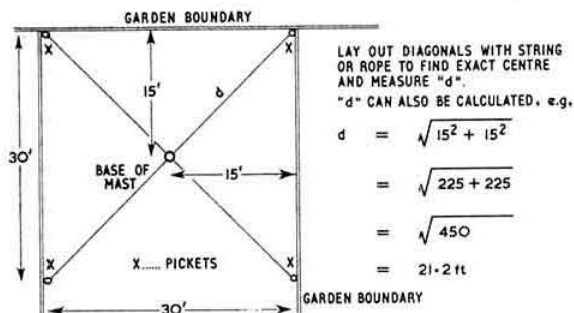
CLOVE HITCH on the left is also a simple secure knot for tying around a pole or post where the strain is at a near right-angle. It is simply a couple of half-hitches back-to-back.

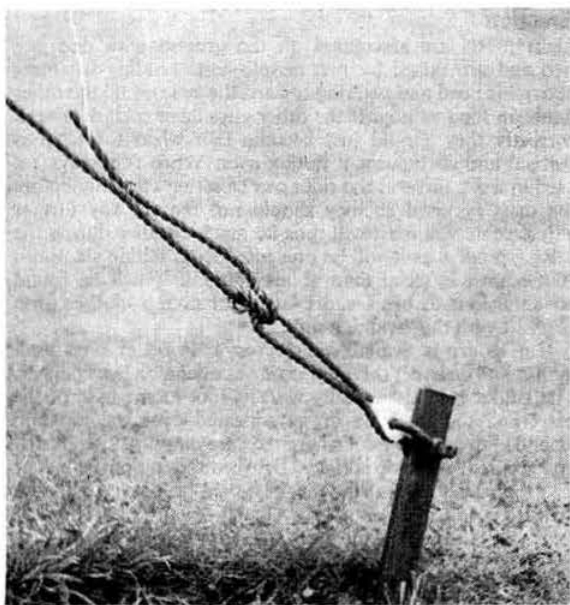
ROLLING HITCH in the centre is a development of the clove hitch with two turns before the cross-over instead of one. It should be used when the strain is more-or-less in line with the pole *against* the two-turn end. If tied on to a rope (either itself or another rope) the second turn should be jammed inside the first as on the right

more convenient to use four; a mast at the end of the average rectangular garden can then be anchored to the corners and down the sides.

Guy lengths can be measured by drawing a scale diagram or calculated by courtesy of Pythagoras. As the guy forms the hypotenuse of a right-angled triangle, its length will be the square root of its height, squared, plus the distance from the base, squared. Then add three or four feet extra for splices, hitches etc. See diagrams at right.

Guys should not be set up too tightly; once the mast is being held in position any further tension simply puts the mast under compression, which tends to buckle it in the middle if it cannot be pushed into the ground. This is why high-stretch ropes like nylon and polythene are unsuitable. As a general rule the guys should look tight but not feel tight. If the mast is to support a wire it should be given a slight rake away from the direction of pull so that the aerial will tend to straighten it. This will obviously put a greater strain on the guys behind the mast, but it should not be possible to provide an accompaniment to the Beatles on them! If the mast is stiff enough to support itself without an aerial it should only be necessary to use two guys, spaced about 100° apart, at the top anyway, to balance the pull of the aerial. If the pull is very strong it may be necessary to provide a second set at the middle to prevent buckling.





Guy made fast to an angle-iron picket with a rolling hitch around a thimble on to a shackle



Alternative method of securing a guy to an angle-iron picket by means of a lanyard and large shackle

Pickets

Again, a lot depends on the size and weight of mast and aerial and the nature of the ground but, as a general guide, lengths of 2in outside diameter galvanized pipe driven into the ground at an angle for two or three feet will make a good anchorage. The guy may then be tied directly to the picket using a round turn and two half-hitches, as the strain should be at a near right-angle. When all is settled the surplus rope should be bound to the guy to prevent any possibility of slip and to tidy the loose end. In soft ground it may be necessary to back up the picket with a similar one a foot or so behind, taking a stout lashing from the top of the first one to the bottom of the second.

Lengths of 2in by 2in angle-iron also make excellent pickets; a pair of old Vono bed rails can be obtained very cheaply. With the captive bolts cut off and a 30° cut in the centre of each you have a matched set of four pickets very quickly. Unlike tube or rod, however, the guy cannot be tied directly to the angle-iron; in this case a hole must be drilled near the top (with Vono rails it is already there) and a shackle fitted. If 1in circ (8mm) guys are being used, the shackle should be fairly large—say, 3/4in or 1in.

The guy is then cut a little shorter than required and a hard eye spliced in. A lanyard comprising 6ft or so of 3/4in or 1in circ (3 or 4mm dia) pre-stretched Terylene is then spliced to the eye and passed two or three times through the shackle and eye to form a simple tackle. To spread the load correctly and prevent chafe the diameter of the shackle should at least equal the circumference of the lanyard. Three turns will roughly equal the strength of the guy, and the reduction ratio thus obtained will facilitate setting the tension exactly. This system may look rather crude but it was universally used for the rigging of sailing ships for several hundred years (and still is occasionally) and has proved to be

extremely reliable as well as cheap. Have a closer look at *Cutty Sark* or *HMS Victory*.

Alternatively, if 3/4in circ (6mm) guys are being used to support a light mast, the guy may be passed round a suitable thimble and a smaller shackle can be used. The loop should be formed with a rolling hitch; if this is tied correctly with the second turn jammed inside the first it should be possible to slide the knot up or down the guy to set the length, but the knot should not slide down by itself when left temporarily. When the correct setting has been obtained a seizing should be applied close to the thimble to prevent any possibility of slip.

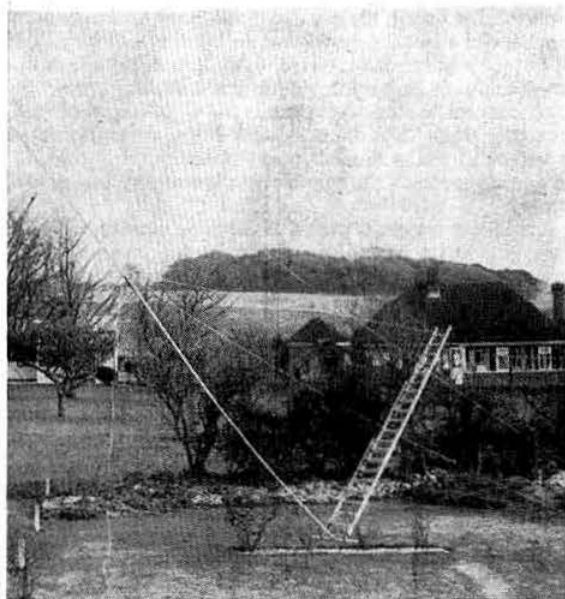
Pickets can also be obtained in the form of a screw made from 3/4in or 1in bar. Although not strong enough to be screwed into chalky or rocky ground, they are very easy to use in softer ground and are ideal for temporary installations.

Feeder

Most radio manuals contain details of many types of feeder for transferring energy to various types of aerial but fail to mention one very useful tip. Quarter-wave aerials, such as the ground-plane type, present a feedpoint impedance of the order of 25–35Ω at resonance but 50Ω coaxial cable is usually recommended as a feeder simply because coax of a lower impedance just is not made (manufacturers please note). It is not generally appreciated, however, that coax can be connected in parallel, the individual impedances summing in exactly the same way as resistors in parallel. Thus, for quarter-wave aerials, a better match can be obtained by feeding with two 70Ω, two 50Ω, or one 70Ω and one 50Ω cables to give effective impedances of 35Ω, 25Ω and nearly 30Ω, respectively.



Round turn and two half-hitches around a concrete fencing post showing two methods of protecting the rope against chafe with rubber or plastic hose or a strip of old carpet. Strips of old carpet or sacking should also be used to protect a tree branch against the rope biting deeply

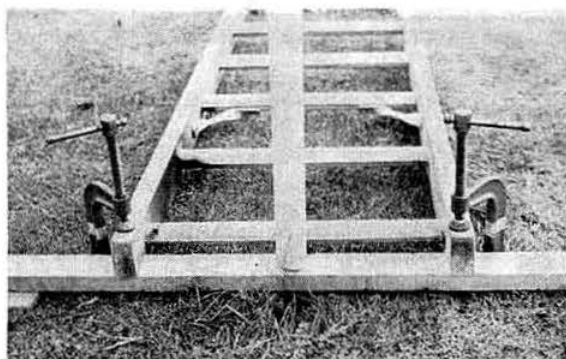


Look, no hands! A 40ft mast in course of erection by the gin-pole method. The whole arrangement is perfectly stable and under complete control at all times. It took the author, entirely unaided, about 45 minutes to assemble and lay out the mast (four 10ft poles) and guys, and 15 minutes to raise it and make the final adjustments

Erection

Light masts are assembled on the ground with one guy free and are raised by two people—one holding the mast above his head and walking toward the base while the other hauls on the free guy. If the other guys have been measured correctly they should just become taut when the mast is vertical and so prevent it falling over. When four guys are used in a set, those at the sides can be set up correctly before the mast is raised as they should not require any further adjustment. The mast will thus be much steadier during the raising process as it will be prevented from falling sideways. If the mast is more than about 20ft tall it will be found advantageous to use a short ladder or even a clothes prop to assist with the "walking-up".

If a ladder is available, however, it is better used as a "gin-pole" or lever; this method is essential with heavy masts. The ladder is held vertically with its foot at the base of the mast and the free guy or guys passed over the top and extended to a lower level where they are more easily adjusted and secured. A tackle is rigged between the top of the ladder and the picket and raising the mast then becomes a one-man operation.



Base arrangement showing a cross-bar temporarily clamped to the underside of the ladder. A round-headed screw partly driven into the foot of the mast rests in a hollow in the cross-bar. With the mast vertical, it can now be lifted into a suitable base socket close by, and the ladder removed

With their light-weight 30ft by 1in sectionalized masts the Army suggests they are raised by one man one section at a time, starting with the top like a chimney-sweep's brush, while others hold the guys to steady it. This takes more manpower than the gin-pole method and also takes great skill on the part of those holding the guys—it is difficult for them to judge if the mast is leaning towards or away from them and they must all ease their guys by exactly the same amount as each section is raised. This method really requires the services of yet another person to supervise and is not recommended unless there is insufficient room to prepare the mast on the ground.

More than many others, if this job is worth doing it is worth doing well. If your mast and aerial are rigged according to the principles outlined in this article, you may relax in the comfort of your shack through the storms of many winters. Remember, if it is done properly, it need only be done once.

Receiving amateur TV transmissions

by P. BLAKEBOROUGH, G6ACU/T G3PYB

THE first introduction to amateur television often comes from hearing the sound transmission or an associated talk-back in one of the vhf or uhf bands. Then the true nature of those rasping pulses in the 70cm band is appreciated, leading quickly to a desire to see for oneself just what the pictures being transmitted look like. By this time, you will be close to becoming "hooked" on amateur television.

The purpose of this introductory article is to provide some practical guidance on the important first step of how to receive amateur television pictures. Usually this involves:

- (1) Acquisition of a suitable (usually very secondhand) television receiver of a type which can be modified.
- (2) The purchase of a uhf television tuner, or the building of a uhf converter.
- (3) The modification of a television tuner to cover the 70cm amateur television band.
- (4) Provision of an effective 70cm aerial and feeder.
- (5) Provision of a low-noise 70cm pre-amplifier, preferably at the mast-head, to increase sensitivity.

Choice of a television receiver

These days, the amateur with an interest in television will usually find that a wide choice of secondhand television receivers is available locally. However, he will be wise to pick one with the following considerations in mind:

The controls should preferably be located at the front of the receiver, or there should be easy access to as many of the user and pre-set controls as possible.

Try to pick a receiver having readily available valve types. Popular television valves can often be obtained very cheaply or may already be in the junk box. On the other hand, some of the older and rarer valves will prove expensive if they have to be purchased. This is true particularly of some of the older line output valves, boost or efficiency diodes, and eht rectifiers (and if you are not too sure what these valve functions mean, it will be well worth your while to borrow an introductory book on television or television servicing from the local library).

Try to find a dual-standard (405/625 line) receiver, even if it does not have the uhf tuner attached. However, the Bush TV53 series (single standard) is recognized as being an excellent range to modify.

Look for a receiver having the preferred intermediate frequency. For 405-line reception this is 38.15MHz sound, 34.65MHz vision carrier; the corresponding figures for 625-lines are 39.5MHz vision carrier and 33.5MHz sound carrier. Dual-standard models are almost invariably designed for these intermediate frequencies; however, some of the older 405-line receivers used many different intermediate frequencies from a few MHz upwards, although most of these have long since vanished from the scene.

What is a fair price to pay? This will largely depend on the apparent state of the picture tube emission, the proprietor of the local tv "graveyard," or your ability as a price negotiator. But you should usually be able to acquire something reasonably suitable in the range say £1 to about £5.

The uhf tuner

By far the simplest method of coping with 70cm reception is to acquire a normal commercial uhf television tuner, assuming that this is not on the receiver when purchased. Here again a good deal of information on the techniques and circuits used can be acquired from the elementary or servicing books on television, provided that a recent edition is available. One example would be the fifth edition of the *Television Engineers' Pocket Book*, edited by J. Pat Hawker (G3VA) and John Reddihough, or any of the equivalent books which will be found in most local libraries.

Unlike vhf tuners, which generally use conventional "lumped constant" coils, the tuned circuits of uhf television tuners are almost invariably based on transmission line techniques. The forms of transmission lines are described in the pocket book mentioned above as follows:

The fundamental form of a transmission line circuit (Lecher line) comprises two parallel conductors. An open-ended line of this type when equivalent to an electrical half-wavelength has the characteristics of a parallel-tuned circuit; or a series-tuned circuit if the far end is short-circuited. In practice, the twin Lecher line is seldom used, but is replaced by a single length of rod in conjunction with the *trough line* formed by the sectionalized tuner chassis; the rod conductor and the surrounding chassis act rather like a short length of coaxial transmission line. In order to tune the resonant circuit provided by a trough line arrangement, the line is capacitively loaded at the "far end", and trimmers are attached for tracking purposes at the nodal points for the two extremes of tuning range: the active device (valve or transistor) represents a capacitance across the "near end" of the line.

While most valve-type uhf tuners use lines representing electrical half-wavelengths (although appreciably shorter than a physical half-wavelength, because of the capacitive loading), it becomes possible with transistors to use quarter-wave lines. This is because valve holders are situated to one end of the line, whereas the smaller physical size of transistors allows them to be fitted inside the actual body of the tuner. Quarter-wave lines allow smaller tuners to be designed, with lower capacitance tuning capacitors and fewer trimmers... however, in integrated uhf/vhf tuners (as fitted to some modern receivers) half-wave lines may be used to overcome the problem of insufficient capacitance swing for vhf.

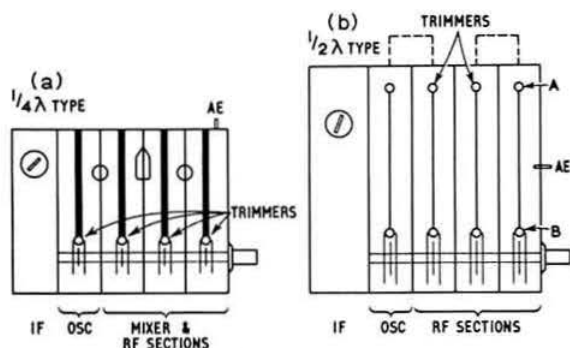


Fig 1. $\frac{1}{4}\lambda$ and $\frac{1}{2}\lambda$ types of uhf tuner

The type of uhf tuner which responds most effectively to simple modification to cover the 70cm band is a transistor tuner using half-wave lines. Before modification the television tuner will have been designed to cover Bands IV and V, that is from about 470MHz up to 960MHz.

Half-wave valved tuners can also be modified without great difficulty, but are less effective in having appreciably higher noise figures. Typically, a good transistor tuner will have a noise figure of roughly 7 to 10.5dB compared with say 10 to 15dB of a valve tuner using the PC86, PC88 type valves.

Tuners based on quarter-wave lines can sometimes be brought down to 430MHz by the addition of small capacitors across the tuning elements. However, this is a difficult modification and should be tackled only with considerable care. At uhf, capacitors are often so inductive that the frequency may easily rise instead of being brought down.

On the other hand, tuners based on half-wave lines can usually be re-tuned to 430MHz just by adjusting the trimmers. The simplest way of doing this is with the aid of your own or a local transmitter or other generator providing an identifiable signal on 70cm.

Set the tuner to the low frequency end of its range (roughly 470MHz). Fig 1(b) indicates the usual trimmer arrangement found with tuners having half-wave lines, and it should be noted that at the low-frequency end, the "A" group of trimmers will have most effect; the "B" group being swamped by the relatively large tuning capacitance.

First adjust the oscillator trimmer until the 70cm signal has been located; then adjust all rf section trimmers for maximum signal, preferably reducing the input signal as the circuits come into alignment. Since the 70cm amateur band

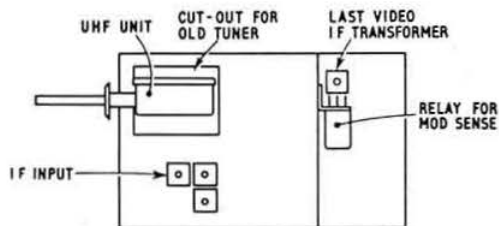


Fig 2. Uhf tuner and video switching relay

occupies only a little of the full tuning range, single frequency adjustment at the low-frequency end will usually prove almost as good as a full re-alignment of the tuner, and there is no need to worry about bandpass trimming of the signal-frequency circuits.

Some television receivers have separate chassis for the i.f. stages and for the scanning or timebase circuits. This is the case with the Bush TV53 series of models, and certainly this arrangement makes it much easier to modify the receiver. Fig 2 shows how a uhf tuner spindle can be placed so as to occupy the same position as that of an original vhf tuner. The uhf tuner can then be connected to the input of the i.f. stages by means of a 75Ω coax link. Where there is insufficient gain in the existing i.f. amplifier, it may occasionally be necessary to add an additional i.f. stage; this makes up for the fact that many uhf tuners are connected to the i.f. stages through the vhf tuner which provides additional gain. The purpose of the relay shown in Fig 2 will be described later.

Valved uhf tuners can usually obtain heater supply from the existing heater chain provided that this is of the 300mA type. Where a transistor tuner is used the heater chain must be bridged with a resistor equivalent in value and wattage to the heater supply taken by the former vhf tuner. A half-wave rectifier taken to a suitable point on the heater chain, together with some smoothing capacitance, can provide a suitable dc supply for the transistor tuner; most such units have negative earth.

Where a 405-line chassis is to be used for 625-line reception, some modification may be needed of the line timebase; on the Bush TV53 series, however, the range of line hold control is usually sufficient to allow this chassis to be used without modification. The British 405-line standard has positive video modulation, whereas the 625-line system has negative modulation, and one may also encounter the French 625-line system with its positive modulation. For all these reasons it is useful to incorporate a change-over relay (Figs 2 and 3) to reverse the polarity of the signal at the video detector diode. The relay should be mounted as close as possible to the detector so as to reduce stray capacitance; unless this is done the detector efficiency will be seriously impaired.

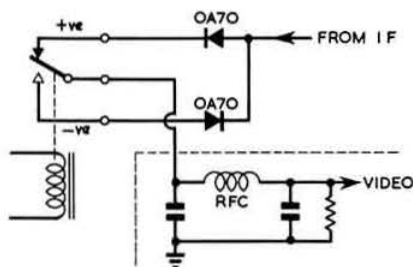


Fig 3. Positive or negative modulation switching

It is most important for any newcomer to television receiver practice to appreciate that, for many years, almost all British receivers have had their chassis connected directly to one side of the mains and may therefore be "live". This lack of isolation between chassis and mains supply—arising from the absence of any double-wound mains

transformer—is a factor which must be kept in mind at all times when dealing with a television chassis, both in trouble-tracing and also when using the chassis in conjunction with an add-on pre-amplifier or other unit. If at all possible, always make sure by means of a neon bulb that the chassis is connected to the neutral side of the mains supply. However, since most receivers have two-pin plug connectors for connecting the mains supply into the chassis, it is necessary to re-check for neutral chassis every time the equipment is operated with the cabinet back removed (and this should be avoided whenever possible).

Aerial isolation is normally supplied with commercial tuners; if this isolator can be retained the need for an isolation transformer is averted. However, if any additional units are to be added great care should be taken to avoid these resulting in any form of live chassis situation. For complete safety it may be advisable to buy an isolation transformer.

70cm receiving aerial

For good results, the importance of using a good aerial and a high-quality low-loss coaxial feeder cable cannot be over-emphasized. Ensure that the aerial is as high as possible and well clear of any large metal objects. There are many

aerials available today for uhf reception, but remember that you will need to achieve good results up to 440MHz. Examples of suitable amateur-television aerials are the J-Beam 8 over 8 slot, and the Parabeam made by the same company. This latter has very good directivity which can be used to advantage in situations where there are a number of stations.

A pre-amplifier is usually a necessity since you will be dealing with relatively weak signals; few amateurs can obtain noise-free pictures without an amplifier. The ideal arrangement, since it provides amplification before the feeder losses, is a mast-head transistor amplifier. This arrangement, however, involves extra switching problems for those who wish to use the same aerial for transmitting. It is difficult to recommend specific transistor types for uhf pre-amplifiers since the obsolescence factor in semiconductors results in a constant chase after new types. The improving uhf characteristics of fet devices makes these attractive in situations where there are a number of local transmitters, either amateur or any of the commercial services. For those in the less crowded "tribal reservations" higher gains and lower noise figures can usually still be obtained with bipolar uhf transistors.

Good viewing on amateur television!

AM facility for the top band to ten ssb transmitter

by D.G. PINNOCK, G3HVA

Following publication of the article "Where TVI is a problem, build this top band to ten ssb transmitter" in the January and February issues of *Radio Communication*, the author has received several requests for information on an a.m. facility, especially in relation to ten-metre band operation.

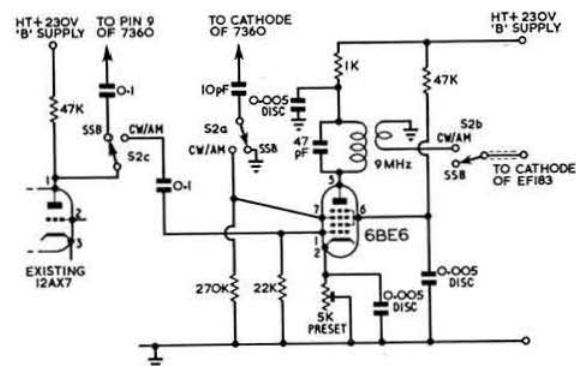
Using the transmitter in its present state there are two ways of introducing carrier while on speech, thus producing a compatible a.m. signal:

- by off-setting the front-panel balance control, and
- by making the 4.7K cathode resistor of the 6C4 triode variable, and using the "CW" position of switch S2a/b as an a.m. position.

In either case a signal comprising both carrier and one sideband will be produced, but, due to the difficulty of obtaining the correct ratio between the two, the resulting signal leaves much to be desired.

A third, and much better, method is to include a separate a.m. modulator, and this can be done by using a multi-electrode valve in lieu of the 6C4. A 6BE6 pentagrid serves this purpose adequately, especially as it also has a B7G base.

The modified circuit is shown below.



A little care in adjusting the carrier to audio ratio in this a.m. modulator will provide reasonable speech quality for those still wishing to use this mode of transmission.

The G3SEC tone pulser

by T. S. COOPER, M(SA)IERE, G3SEC/ZS6TC*

THE pulser to be described was designed as a companion unit to the two-tone oscillator shown on page 19.33, Fig 19.46, in the *Radio Communication Handbook*.

It was desired that the pulser should:

- (a) be fully transistorised,
- (b) include pulse shaping (to avoid clicks and harmonic generation),
- (c) have low voltage operation,
- (d) be compact (ie using a minimum of components) and
- (e) have adjustment of pulse rate and width.

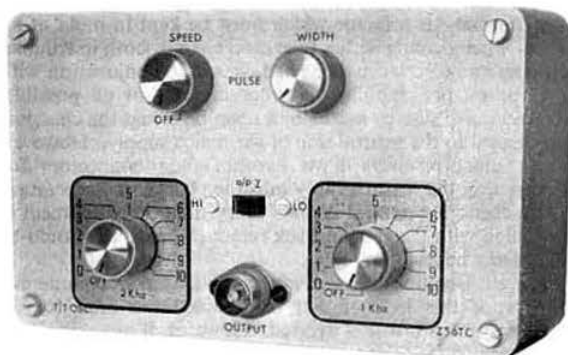
The multi-vibrator

With these requirements in mind a standard "flip-flop" pulse generator circuit (Fig 1) was utilized, with timing components R1, R2, C1 and C2, being selected as typical values for this type of circuit when used as a pulse source for electronic keyers.

C1 was reduced in value compared to C2 to allow for the insertion of the pulse-width control network comprising RV1, R6 and C3. At first glance R6 would appear to be superfluous, but it fulfils a dual function, ie (a) linearization of the dynamic range of the charging components R1 and C3 by allowing C3 to discharge more rapidly as the wiper on RV1 approaches the R6 end of the potentiometer, and (b) prevents C3 being removed from the circuit, which would cause the pulse width to become too narrow for the multi-vibrator to continue switching. This in part being due to the pulse shaping components C4, C5, C6 and D2. RV1 may be a potentiometer of 2.5k Ω or 5k Ω —both values were tried and found satisfactory. The value of R6 was selected by trial and error, so that the multi-vibrator continued to switch when RV1 was in the maximum pulse rate position. RV2 controls the base bias on TR1 and TR2, and thereby the pulse rate.

The pulse shaping components mentioned previously slow down the switch on/switch off times of TR1 and TR2 and consequently alter the pulse shape applied between the emitter and base of TR3.

As the values of C4, C5 and C6 are increased, so the pulse rise time will become longer and longer, and inversely the maximum pulse rate of the multi-vibrator will become less and less. With the values suggested, a maximum pulse rate of 14 pulses per second was obtained. This rate is well in excess of that required for the alignment of linear amplifiers or



chasing tvi. In practice there was found to be little to choose (visually on the scope screen) between slow pulse rate, broad pulse width, and fast pulse rate, narrow pulse width.

The heart of the pulser

The heart of the pulser, transistor switch TR3, kept the writer busy for quite a few evenings. The fact is that it is not the easiest of tasks to design a simple transistor switch with low power consumption, no spiking overshoot, non-symmetrical pulsing, breakthrough of the pulse itself on to the output waveform and at the same time obtain a good pulsed tone envelope shape with reasonable attenuation in the "output off" condition.

Much time was spent experimenting with series switching, this method eventually being abandoned for the reasons stated. The alternative was shunt switching, a mode which turned out to be highly successful and used a minimum of components, namely TR3, D1 and D2. D1 being the pulse steering diode and D2, as mentioned previously, assisting in the pulse shaping.

D1 and D2 must be of the small signal silicon type, with as low a reverse leakage as possible and fast switching capabilities. Germanium diodes were found to be unsuitable. C7 was necessary to prevent breakthrough of a local broadcasting station, due to the detector action of D1 and D2.

Loading of TR3 is most important if the output pulse shape is to be maintained when the gain of the TT oscillator is increased to maximum. The optimum value of load resistor R8 was found to be 600 Ω (low impedance output), and R9—6.5k Ω (high impedance output). The value of R9 is quite critical, and it may be necessary to select the correct value by trial and error, or temporarily substitute it with a 10k Ω potentiometer, and adjust the pot for optimum symmetry of the output pulse shape. If no oscilloscope is available, use a measured value of not greater than 6.5k Ω in position R9.

In the high impedance position of S1, R7—12k Ω is placed in series with the tone feed from the TT oscillator to the collector of TR3, thus raising the input impedance. Since the resistance from TR3 collector to emitter, in the conduct condition, is in the order of 8 Ω , this gives a theoretical attenuation factor, in the tone off condition, of some 63dB. In actual measurement it was not possible to read to more precise a figure than 50dB, as the signal was below noise level.

In the low impedance position, as can be expected, the attenuation factor was much lower—approximately 30dB.

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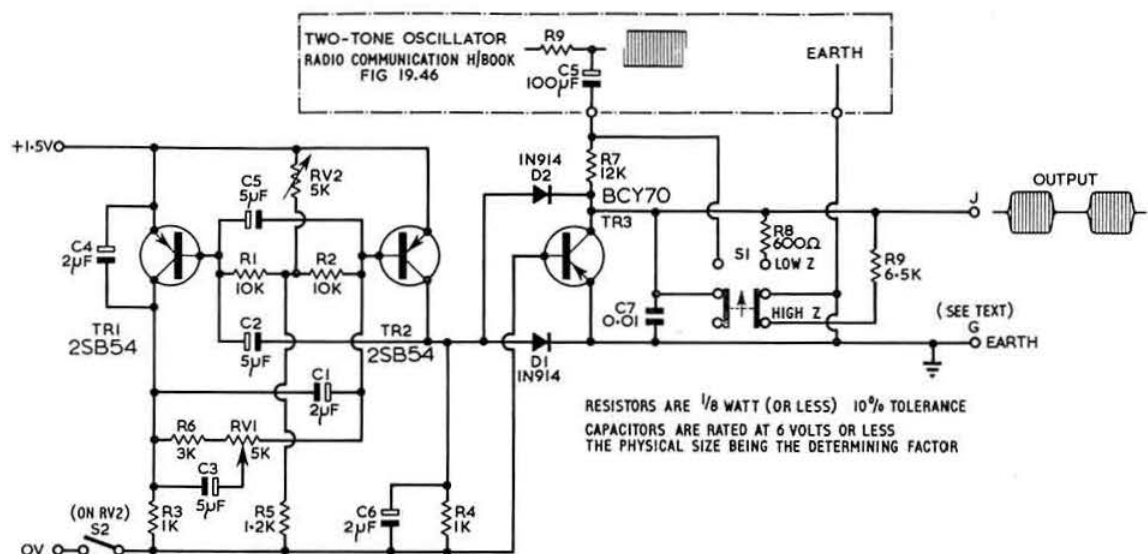


Fig 1. Circuit diagram of the pulser

This, though much lower than the high impedance attenuation factor, is of little consequence, since even if the linear amplifier was capable of the maximum legal power output of 400W pep, the remaining power, in the tone off condition, would be only 1.5W rms.

Since most amateur ssb transmitters are provided with high impedance microphone input facilities, the pulser will probably spend most of its time in that mode, with the advantage of the 50dB attenuation factor.

Substitution of components

For TR1 and TR2 transistor types 2SB77, 2SA49, NKT274, GT11 and OC71 were tried as pairs and mixed, and all proved to be reasonably satisfactory. High gain types should be avoided as these may cause the pulse rate to increase, so that the multi-vibrator will cease to function for reasons stated earlier.

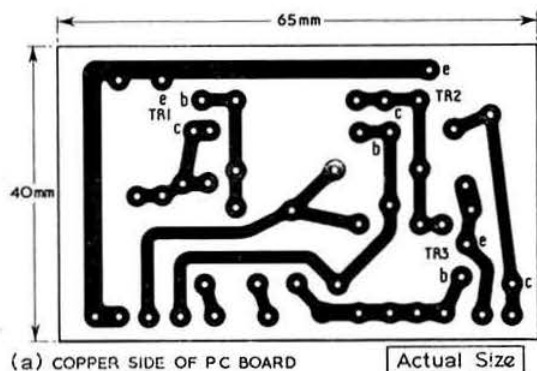


Fig 2 (a). Copper side of the pc board

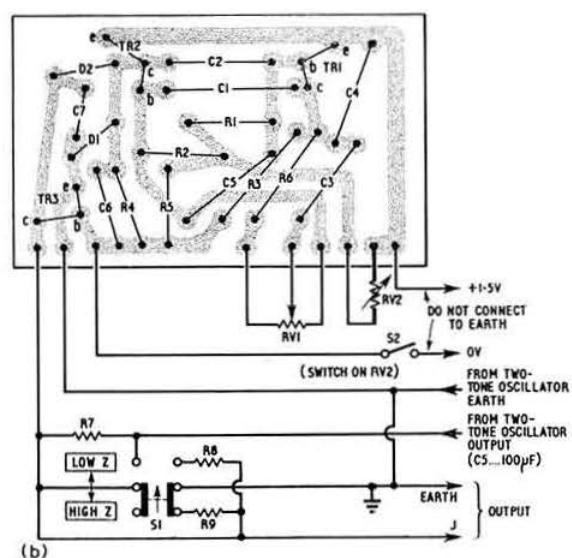


Fig 2 (b). PC board wiring

Suitable substitutes for TR3 are BFX29, BCY34 and BCY39. The BCY70 was chosen because of its small physical size.

For D1 and D2, OA200s could be substituted, but the 1N914s, specifically designed for high speed switching, were found to accord a marginally better attenuation factor in the signal off condition.

Construction

The pulser was wired on a pc board, details and size of which are shown in Figs 2a and 2b, the latter showing the location of components on the reverse of the printed circuit design.

Note that the 1.5V supply, derived from a pen-light battery, is floating. Neither the positive nor the negative

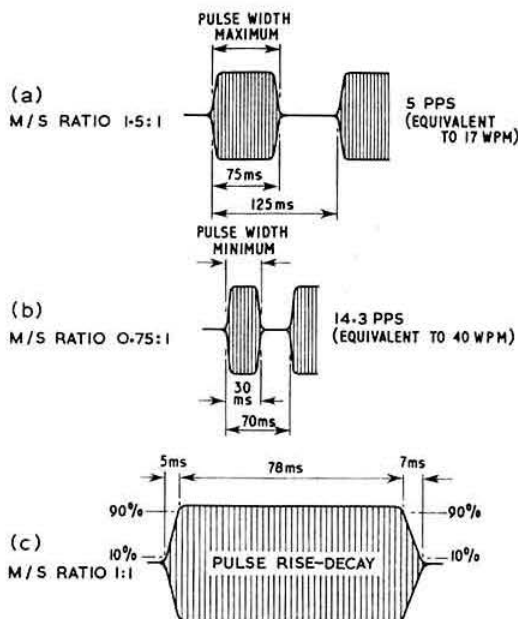


Fig 3. Pulse rates and widths

terminals should be grounded. The grounding point of the circuit is G.

The author constructed his TT oscillator and pulser as one unit. A general view of the location of controls is shown in the photograph. Voltage is applied to the 1kHz and 2kHz oscillators via a switch mounted on the rear of the relevant amplitude control.

Operation

When RV2 is fully clockwise, no voltage will be applied to the pulser (ie S2 is open) and the signal from the TTO passes unhindered to output J, via the high/low impedance

switch S1. To operate, simply switch on. It may be necessary to rotate RV2 a few more degrees after S1 has closed, before the multi-vibrator starts to pulse (at approximately 1pps).

It may be found that, if RV1 is in the narrow pulse width position, when switching on, the multi-vibrator will fail to start unless RV1 is backed off and the pulser switched off and then on again. If this does occur, the value of R6 is too low and should be increased.

Performance

The following measurements were taken on a Telequipment S51A scope. A single tone of 2kHz was fed from the TT oscillator.

- 1a. Minimum pulse rate in narrow pulse condition 1pps.
- 1b. Maximum pulse rate in narrow pulse condition 14pps.
- 2a. Pulse rise time at 5.6pps and m/s ratio 1:1 5ms.
- 2b. Pulse decay time at 5.6pps and m/s ratio 1:1 7ms.
- 3a. Attenuation of signal in off condition (viz space) at low Z—30dB.
- 3b. Attenuation of signal in off condition (viz space) at high Z—better than 50dB.
4. Fig 3 shows the actual pulse rate and width, with the speed control set to maximum and the pulse width control set to (a) maximum, and (b) minimum.
5. Operating voltage 1.5V at 2.5mA.

Components list

C1	2μF	All capacitors are 6V working.
C2, C3	5μF	
C4, C5	5μF	
C6	2μF	
C7	0.01μF	
R1, R2	10kΩ	All resistors 1/8 W, 10 per cent tolerance.
R3, R4	1kΩ	
R5	1.2kΩ	
R6	3kΩ	
R7	12kΩ	
R8	600Ω	
R9	6.5kΩ	
RV1, RV2	5kΩ	potentiometer
TR1, TR2	2SB54	
TR3	BCY70	
D1, D2	IN914	

Project Oscar

by W. Browning, G2AOX*

AFTER many cancellations, not due to any fault in the satellite, Australis Oscar 5 was successfully launched from California on 23 January 1970 at 1131gmt, with a Tiros M cloud-mapping and weather analysis satellite (now designated Itos 1), by a Thor-Delta 2-stage rocket, and the projected near-circular orbit was attained—Period, 115.08 minutes; incl angle, 101.56°; track separation, 28.77°;

height, 903/916 miles. (Note. All figures after decimal point are decimals of a minute or a degree.)

The actual separation of the two satellites from the second-stage rocket occurred when it was coming up over Kenya. From many reports now coming in from all over Europe, it was heard from about 1243 to 1307 in the UK, with good signals from both the vhf and hf transmitters. The modulation of the hf transmitter dropped to a value of about 10 per cent only, but the vhf signals are easily readable at all times, and all systems are working to programme. The hf transmitter is being cut off early on Mondays and on again every Friday, in order to lower the current drain from 70/75mA to 45/50mA and extend the operational life. After some variations in the temperatures during the first two days, they have now settled down to approx 40/45°C, internal, and 45/50°C, external.

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This is the first amateur satellite to operate several telemetry channels and capable of being controlled from ground stations, and no doubt will be the forerunner of a translator type that will re-transmit received signals and enable dx QSOs to be obtained. Apart from the launching rocket, this project represents a triumph for radio amateurs. It was designed and built by a team from Melbourne University, and was organized into launch by the new AMSAT Group in Washington. The somewhat complicated communication links between Melbourne, Washington and the UK, all done by amateurs on amateur frequencies, ensures that vital information can be exchanged two or three times a day, either by ssb or rtty.

In respect of the rtty links, this has been operated for over a year for me by G6JF, Reg Wigg, of Kingsbridge, Devon. It is the most accurate method of copying long columns of figures and instructions, many of the print-out sheets being several feet long.

It is now possible to copy nine consecutive orbits each day, (three N-S, then three NE-NW and then three S-N) from

approx 0100 to 1700gmt. It is particularly requested that the vhf frequency of 144-050MHz is kept clear during orbit times, as even a.m. phone signals have been heard, as well as cw.

Will reporting stations please completely fill up the report forms before submitting to G2AOX, as many are being received with only three or four entries, followed a few days later by another similar one. Also, reports marked "Orbit No XXX not heard YYYY-ZZZZgmt" are NOT required—usually the times quoted are wrong, as it has been operating continuously on 144-050MHz since launch.

Those stations that have lodged stamped addressed envelopes with G2AOX will continue to receive up-to-date predictions. Those stations who send a request with stamps or a postal order may have to wait for several days.

LATE NEWS. On orbit 273 on 14 February when Melbourne switched on the hf transmitter the increased battery load cut off the 2m transmitter. Signals are now only on 29'450 MHz and may be heard as a steady carrier with "Hi Hi" in Morse every 52 seconds.

Your problem?

During recent months a considerable amount of information concerning tv problems affecting members has come to the Society through the activities of the TVI Clinic. A great many of the cases fall into clearly defined areas, eg tv receiver deficiencies, transmitter deficiencies, and either of these categories allied with a definite social problem. By the latter it is inferred that the viewer has taken an attitude that precludes any attempt by the amateur to demonstrate the effect of high-pass filters or similar devices.

It is considered that in many of the cases falling into the first category, the amateur should take steps to cure the breakthrough. Let it not be forgotten that the Radio Amateur's Examination includes Interference in the syllabus, although the scope is necessarily limited. However, the knowledge of the amateur should at least be sufficient to render first aid. More activity along these lines could, in the long term, bring benefit to the amateur service in that the cost to the Post Office of interference investigation would be reduced. With the separation of the Post Office and the Ministry of Posts and Telecommunications, the latter assumes responsibility for the conduct of interference investigation but the engineers carrying out the work are seconded from the Post Office. It is believed that in 1969 the cost of interference investigation was in the region of 40s per hour, a figure which will undoubtedly rise in the future. It is obviously in the interest of the amateur to keep this expenditure to a minimum figure.

If the case is not capable of ready solution by the amateur and further co-operation with the viewer is unlikely to be fruitful, or if the latter adopts an unco-operative attitude, then, and only then, should the assistance of the Post Office be sought. It is not suggested that any attempt by the amateur to find a solution to the problem should include any modification of the tv receiver.

Commercial transmitting equipment is necessarily made to a budget and the quality of the screening and filtering varies considerably between the various manufacturers. Fortunately, UK manufacturers seem to have taken note of the requirements and design accordingly. In some cases the basic concept of the equipment is poor, and frequencies are chosen for oscillators which provide output on television-sensitive frequencies. Very few commercial transmitters exhibit screening and filtering to the standard shown by G3HVA in his recent article describing an all-band ssb exciter (*Radio Communication*, January and February 1970). Obviously, work of this type is going to increase the cost of a commercial installation, but surely the suppression of unwanted frequencies is well worth the extra expense. Pressure by amateurs could well persuade some manufacturers to devote more time and thought to design features calculated to lessen the chances of breakthrough problems.

Before a new transmitter or exciter is put into use a thorough check should be made of all points liable to affect the tv position. To suggest that a commercial unit should be modified is akin to sacrilege in these days but in many cases such treatment is necessary. With home constructed equipment there are no such inhibitions and it should be possible to build in all the desirable features. The existence of a low level of harmonic output does not necessarily indicate that the transmitting equipment is beyond reproach. The use of end-fed aerials, which sometimes use the mains wiring to some extent as a counterpoise, and the existence of key clicks and splatter can all bring complaints of tv due to overload from the fundamental transmitting frequency.

Summarizing the position—every operator should, in the interests of the amateur service, acquaint himself with the basic principles of tv and be prepared to deal with cases of breakthrough, calling in the Post Office only when initial measures have brought no satisfactory result. Further, ensure beyond doubt that the transmitting equipment in use incorporates such screening, filtering and harmonic suppression as is applicable in the area concerned. In other words, make sure that your own house is in good order.

TECHNICAL TOPICS

A monthly feature by PAT HAWKER, G3VA

A FEW months ago (7T August 1969) we tried to indicate some of the results which could stem from what we termed the "disincentive" aspects of current British licensing regulations. This attracted some comment, mostly favourable, though a few holders of Class B licences wrote to indicate, in no uncertain manner, that they had absolutely no interest in either hf or Morse operation, and clearly resented any suggestion that there could be more to amateur radio than a Class B 144MHz permit.

Now, we had tried to make it quite clear that our remarks were far from an attack on either vhf or the concept of the Class B technical licence, or showed a them and us attitude. But rather were they prompted by the belief that it was high time that someone should express publicly a modicum of alarm at the future consequences of the self-evident fact that for the vast majority of Class B stations, once the G8-three-letter call has been achieved, this is virtually the end of the line. Furthermore, the availability of the Class B permit—intended initially for those interested in advancing the technical development of amateur uhf and microwave bands—has become, in effect, an all-purpose licence which attracts not only the technically erudite but also very many newcomers who would otherwise have persevered with Morse and acquired a Class A permit. Recent licence statistics prove this point beyond any real doubt. This surely justifies our feeling that the present arrangement merits the term "disincentive licensing".

A question of call signs?

Can anything be done which, while retaining the undoubted benefits of the existence of a Class B permit, at the same time would encourage more Class B operators to follow the self-training aspects of their chosen hobby and take pains either to trail blaze the way to the microwave regions or to acquire the still highly useful A1 facility? The number of Class B stations using uhf is credibly reported today as being less than a few years ago, when the opening to Class B of 144MHz resulted in the big increase in Class B applications. But, for the moment, we are concerned primarily with the question of raising the number of Class B to Class A transfers.

It seems to me that one of the disincentives which work against such transfers is that in the process one loses a call sign with which the operator feels closely identified. To most British amateurs their call signs are a most valuable piece of personal property, the identity by which they are known to the amateur fraternity. We are fortunate in being able to keep our call letters even in the event of "emigrating" to GM, GC, GD etc. In this we have surely a tremendous advantage over our American friends, who have to change

their call identities whenever they permanently cross a call district boundary; some acquire and discard a whole string of calls over the years, and can now, after 25 years, turn in a three-letter call for a (pseudo) "vintage" two-letter one.

At present any G8A—, for example, who will have held his call for several years, and become widely known by it on the air or at the club or in print, is "rewarded" for passing his Morse test by losing his "identity" and being given a brand-new, unknown G3Z— call (just as, many years ago, we lost our 2BUH artificial aerial licence). To my, perhaps naive, mind this is quite a disincentive.

It would surely be preferable to return to the earlier practice (before the start of Class B but involving the amateur television permits) whereby call signs were issued in sequence from one block and then permanently retained. Clearly, the Ministry of Posts and Telecommunications would have to devise some means of distinguishing between Class A, Class B and amateur television licensees. The simple suffix system involves the problem of a double suffix when, for example, operating mobile or alternative address. It also makes it easier for one class of licensee to pirate the privileges of another class.

One tentative solution, surely, would be to institute a new set of prefixes—for example, based on the British right to "M" as well as "G". For many years British ships have used four-letter G and M call signs. Why not, for instance, allocate say M3ZZZ for Class B, becoming G3ZZZ when the holder is encouraged to change to Class A? Some such system would allow all licences to be issued in the same basic sequence and held permanently with, for example, MD3ZZZ the appropriate Class B call for Isle of Man operation.

It may well be argued that even if such a system were introduced the number of Class B to Class A transfers might remain fairly small—but at least one possible disincentive would have been eliminated. Or have we already reached the stage when nobody really bothers that the future pattern of amateur radio in this country may be permanently changed by the present Class B system?

I only hope that I can put forward this suggestion, meant as a constructive one, without bringing around my head further angry buzzing of Class Bees. Few of us ever really wanted to learn Morse except as a necessary evil to obtain a licence—yet extremely few amateurs have ever later regretted doing so, and this surely is what one means by good incentive licensing.

Linear integrated circuits

Recently it was pointed out in 7T that while many useful and novel circuits were appearing, based on the growing number of linear integrated circuits, it was felt to be of limited use in

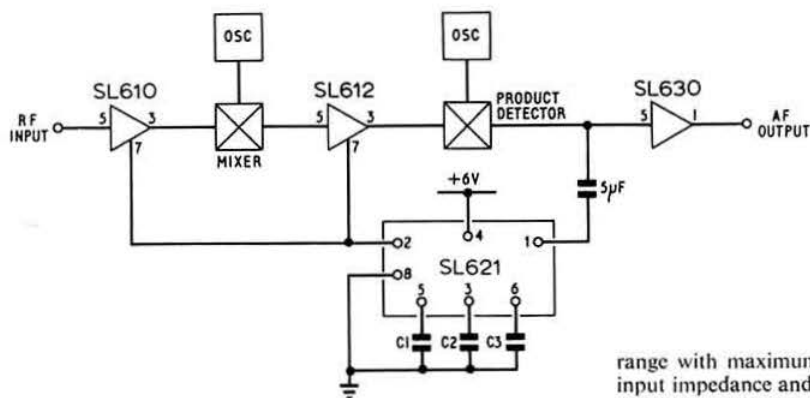


Fig 1. An SL621 agc integrated circuit used to control an integrated circuit ssb receiver. Values for typical time constants are C1 50µF, C2, C3 100µF. Time constants can be varied by changing values of these components

discussing these while most prices tended to be off-putting to the amateur who found it more economical to use discrete devices. That there is potentially a very real value in these units to the amateur, particularly in simplifying home-construction of what would otherwise call for large numbers of components, has long been evident. Some of the RCA CA-series have already made quite an impact, and this is true also of Motorola units, while several circuits are appearing based on Mullard/Philips linear units.

However, it is gratifying to be able to draw particular attention to some British-built devices that have much to offer to amateur communications. This is the Plessey SL600 series of "communications circuits". Peter Martin, G3PDM, has already referred to the value of the SL621 integrated circuit approach to agc for am/ssb/cw systems (*Radio Communication* December 1969). A note in the February issue explains that the price of this device has tumbled since G3PDM devised his circuit based on discrete devices to offer the same basic facilities.

This British device—known in the USA in its "industrial rated" SL621G version—has also been featured in an interesting article on 1.8-MHz solid-state receiver design by J. K. Gotwals, W3TNO, in *Ham Radio* (December 1969).

In a recent letter, David Wright, G3UUY, points out that substantial price reductions have put the whole SL600 series into a practical £1 and £2 category, and deserve to be better known. He is attracted particularly by the availability of rf/i.f. amplifiers with good cross-modulation performance, as well as the SL621 agc device; there are also the attractive-looking specifications for the SL640 and SL641 double-balanced modulators/mixers which would simplify the construction of homodyne/direct-conversion receivers.

The Plessey SL600 series

While we usually try and avoid making *TT* appear too much like a manufacturer's catalogue, it seems worth listing briefly the various devices forming this series, including prices for quantities in the 1 to 99 devices category, as supplied by G3UUY.

SL610/SL611/SL612. The SL610 and SL611 are low-noise, low-distortion rf voltage amplifiers with integral supply line decoupling and agc facilities. The SL610 has a voltage gain of 10 and a bandwidth of 140MHz, and the SL611 a voltage gain of 20 and bandwidth of 100MHz. Both have 50dB agc

range with maximum signal handling of 250mV rms; high input impedance and low output impedance. The SL610 is a low-noise, low-distortion i.f. voltage amplifier with voltage gain of 50, bandwidth of 50 and power consumption of only 20mW, 70dB agc range. Price of each of these three types is £1 4s.

SL620/SL621. These are agc generators of sophisticated concept. SL621 is designed specifically for use in ssb receivers in conjunction with the SL610 etc, detection agc voltage from the audio waveform with suitable hold period (see G3PDM article for a detailed description of its advantages). The SL620 VOGAD (voice-operated gain adjusting device) is an agc generator designed to work in conjunction with an SL630 microphone amplifier to maintain amplifier output between 70mV and 87mV rms for a 35dB range of input with one-second hold period to prevent noise increases during speech pauses. Price of each unit £1 16s. 3d.

SL630. This device can form a microphone or headphone amplifier, for example in conjunction with the SL620 to achieve automatic gain control. A switch connected between pin 7 of the device and the earth line provides a convenient means of muting the amplifier. Typically some 40dB of differential input voltage gain, or 46dB of single-ended input voltage gain is available. Output power depends on supply voltage but can typically be of the order of 100mW. Price £1 3s.

SL640/SL641. The SL640 is designed to replace a conventional diode ring modulator at frequencies up to 75MHz, eliminating the transformers and heavy carrier drive power requirements of a conventional diode ring, while providing a competitive performance. No external adjustments are necessary to achieve balance. Typically at 30MHz, carrier and signal leaks are about -40dB referred to desired output frequency. Intermodulation products -45dB with 60mV rms input signal. The SL641 is a version intended primarily for use in receiver mixer applications but offering lower noise figure and lower power consumption than the SL640. Price £2 4s.

Quadrature detection

Another current range of low-drain linear integrated circuits, which together are intended to make up a complete i.f./audio system for mobile business-radio fm receivers, is that by Philco-Ford (CP1057, CP1058 and CP1059). An interesting feature of the CP1058 is that this includes a complete fm discriminator based on quadrature detection. This particular unit takes an i.f. output from, say, a 10-7MHz crystal filter right through to af transformer with only a few external capacitors, volume control etc, and a single tuned circuit in

to the related technique used in some recent *Electroniques* 1-6MHz transistorized i.f. modules to improve the signal handling and age capabilities. These modules not only use back-to-back diodes to limit the signal applied to the product detector, but also, in the earlier stages, put diode attenuators in the signal paths, controlled from the agc line. Fig 3 indicates the basic arrangement, as applied between the first and second amplifier stages; a further diode is similarly used in the input to the first stage. Further details of these modules are given in the current *Electroniques Hobbies Manual*. G3XTQ has used two modules of this type for an amateur-bands and general coverage receiver and reports satisfactory overload characteristics.

The same basic technique also turns up in a four-diode adjustable low-level limiter suggested by Goubeau Bernard in *Electronic Design* (October 11 1969): Fig 4. Operation of this circuit is explained as follows: two opposite polarity bias current sources are connected in series with the bridge to supply equal currents; when only small signals are applied, the bias currents keep the diodes forward biased, and the waveform is unchanged; when large signals are applied, either D1 and D3 or D2 and D4 become reverse

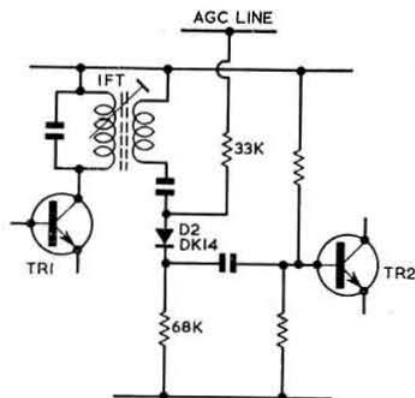


Fig 3. Detail of diode attenuator arrangement used in the *Electroniques* i.f. modules

biased, and bias current is then forced to flow through either D2 or D3 and R; in this case the output voltage is $I \times R$ or $2 \times I \times R$ peak-to-peak.

Bernard points out that if R is 50Ω and the bias resistors are set to 6K, the bias current is virtually constant. With bias voltages of +12V and -12V, bias current I will be 2mA in each branch, so that the output is limited to 0.2V peak-to-peak. The bridge thus acts as a limiter with the limiting level determined by load resistance R and bias current I.

Uses of the diac

This month the emphasis is decidedly on semiconductor devices, but perhaps this is inevitable with so much commercial research and development concentrated squarely on this side of electronics. Roger Wheeler, G3MGW, has been stirred by the reference in the January *TT* to the use of a diac (bi-directional controlled rectifier) as trigger diode for thyristor and triac type power control systems, to mention some of the many uses of the diac as a component in its own right.

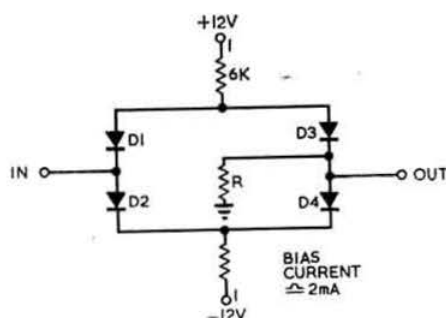


Fig 4. Diode bridge used to form an adjustable low-level limiter

He points out that the diac or "bi-lateral trigger diode" is virtually a semiconductor version of the familiar neon (stabilizer) tube even though it relies on very different principles. Most of the trigger diodes are intended for about 20-30V operation, and this restricts their use primarily to higher voltage applications. Current price is often around six shillings in small quantities.

The diac can thus be used in many of the circuit arrangements which are more commonly associated with neon tubes. In the past some attempts have been made in *TT* to point out that the simple neon can form the base not only of the relaxation oscillator but quite complex multivibrator-type arrangements, and have even been used as radio-frequency oscillator/transmitters. At one period in the early 'twenties and 'thirties neon-tube transmitters were used on lower-frequency amateur bands (see *TT* October 1963).

G3MGW provides three circuits indicating non-trigger applications of the diac which he has investigated, all based on the Motorola MPT28 unit. These include the basic

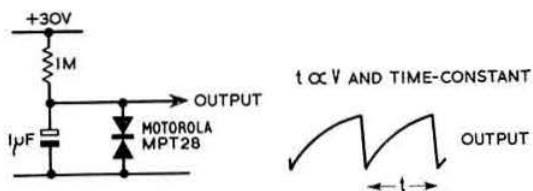


Fig 5. Basic relaxation oscillator using a diac

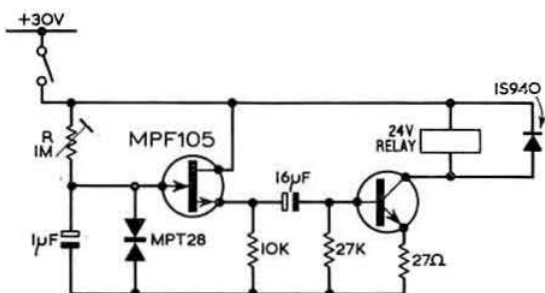


Fig 6. Pulser unit for transmitter and similar applications

relaxation oscillator (Fig 5), a pulser which by varying R has a frequency of operation varying from milliseconds to seconds (Fig 6), and a bistable type oscillator arrangement: Fig 7. In this arrangement, by varying the R and C values the range of output frequency is from Hz to over 1MHz; output amplitude is fairly low but usually around 1V peak-to-peak. G3MGW notes that the frequency of this type of oscillator is extremely dependent on the supply voltage, which could be a useful feature for a voltage-controlled oscillator or perhaps as a semiconductor version of the old neon tube transmitter.

High impedance Schmitt trigger

The use of Schmitt triggers to provide a form of sensitive electronic switch for squelch, age, sidetone or regenerated signal oscillators is finding an increasing number of amateur applications. The conventional semiconductor Schmitt trigger uses two bi-polar transistors and presents the problem that when the input transistor conducts, the input impedance becomes quite low; as a result it is common practice to put an emitter follower in front of the main Schmitt circuit so as to provide a low-enough driving impedance. Henry Olson points out in *Electronic Design* (November 22 1969) that substituting a mosfet for the input bi-polar transistor results in a Schmitt with a high input

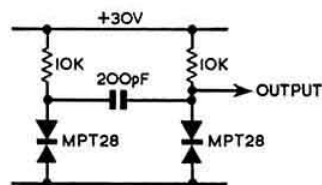


Fig 7. A bistable type oscillator using two diac units

TVI TIPS

by B. Priestley, G3JGO

Linear amplifiers

A good linear amplifier can be expected to have a harmonic content no worse than its driver, so that the most likely type of tvi is television set overload by the increased fundamental signal.

However, it is pointed out in Ref 1 that the omission of a cathode tank circuit in a grounded grid linear can result in serious envelope distortion and "this waveform distortion also might cause mysterious tvi troubles as a result of the high harmonic content of the wave". In fact, the example shown has the second harmonic about 12dB down and the third about 18dB, which would not be good in a Class C stage!

The obvious remedy is to install a cathode tank circuit, perhaps as an add-on unit, on the lines of Ref 2. If the coax between the driver and linear is less than 1/20th wavelength

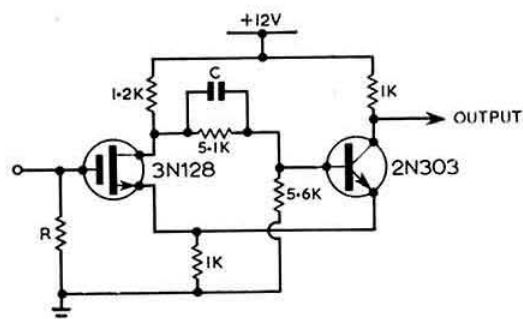


Fig 8. High-impedance Schmitt trigger using mosfet in conjunction with bi-polar transistor

impedance (Fig 8), and that such triggers can be driven directly even by another fet or by valve circuits. A typical valve for the gate charge resistor (R) is 1M Ω , and the speed-up capacitor C is usually about 51pF. The circuit shown has an upper trip point of +3.5V and a lower trip of +3.0V, giving 0.5V of hysteresis.

Here and there

Those who may have found their interest stirred by last month's appeal for more hf slow-scan tv activity may like to know that a useful introductory article on present practices appears in *Ham Radio* (December 1969).

It is regretted that in the January *TT*, Fig 3 (a simplified diagram representing the ATES technique for achieving a stabilized low voltage rail) the series resistor was omitted between the chassis rail and the junction of the zener diode and the base of TRI. This omission and other matters relating to the correct operation of this circuit have been questioned by Tony Carr, G3OSU.

long then the driver tank circuit will serve the same purpose. This is not too serious a limitation as even at 28MHz a foot of coax is permissible.

The use of an extra 1pF between the driver and linear has been advocated. However, a low-pass filter represents about $\frac{206n}{f_c}$ feet of coax, so that a three-section filter with a 35MHz cut-off is equivalent to some 17½ft of coax. If the filter has a capacitive or series-tuned trap output, the harmonic source impedance seen by the linear may be low enough to prevent serious harmonic generation, although envelope distortion of the fundamental could still be adversely affected by the filter. A low-pass filter with a parallel trap in series presents a very high impedance at its notch frequency, of course, and this could result in a very large harmonic voltage at the linear cathode. Thus it is clear that the cathode tank circuit should be tried first if the addition of a linear results in harmonic tvi.

Ref 1. ARRL *Single Sideband for the Radio Amateur*, "The grounded grid linear amplifier", by Orr, Rinaudo and Sutherland.

Ref 2. *QST* May 1968 pp 34-5. "A tuned input circuit for grounded grid linear".

FOUR METRES AND DOWN

A monthly account of vhf activity and
news compiled by JACK HUM, G5UM*

Book now for next month's VHF Convention

Try running two separate and parallel lecture sessions instead of only one as in former years: the Society's VHF Committee when planning the 1969 VHF/UHF Convention thought this would be a good thing to do. Observing how well this ground plan had worked at an earlier Wolverhampton event, they decided to put it into operation at the "Winning Post" at Whitton last year. The opinion expressed by almost all who took the trouble to express one at all was that the two-stream plan was very much liked and should be used again in 1970. Accordingly, this will be the arrangement for "Convention Afternoon" at next month's "Sixteenth Annual" on 25 April.

Bert Allen, G2UJ, and Peter Balestrini, G3BPT, both members of the VHF Committee, will chair stream "A" in the main hall and stream "B" in the smaller hall, respectively, for what will be a three-hour tech-session of exceptional attractiveness with adequate time to regain the breath during a tea break that will be longer than before, 25 minutes of it from about 3.30pm.

Several of the lectures have been finalized and one or two more need the last dots and dashes added to them. The full programme will be given here next month. And at the dinner which follows a couple of hours after the lectures close there will be, as in past years, a very distinguished electronics personality as guest of honour.

Plus all the usual attractions, of course: bring and buy stall, trade show, RSGB bookstall, and a raffle for a large number of newly-purchased components and accessories.

The price has been held at a very reasonable 35s all day, 7s for afternoon only, 28s for dinner only. Frank Green, G3GMY, 48 Borough Way, Potters Bar, Herts, will be pleased to accept cheques now. Tickets should be going out in early April.

Girdle round the earth

After several delays quite outside the control of AMSAT, and even less of its Melbourne designers, Australis Oscar 5 was successfully launched into inner space—which is what 910 miles up represents—on Friday 23 January. If everybody who was lying in wait for it, tape recorders poised, succeeded in getting its HI and telemetry tones safely into the reels, this should be the best documented of any amateur radio satellite.

Ron Ham, BRS15744, at his Storrington listening post on the Sussex Downs, clocked up the first orbit of AO5 at 1247gmt, exactly as predicted by G2AOX, and producing an RS59 signal. "How good to hear HI from space again

after five years," he says. Back in 1965, in Oscar 3 days, his wife Joan observed that the "diddley dit deedit" emitted daily from the radio room "... was enough to drive anyone round the bend." In 1970 she tunes the gear and monitors the orbits which come round while Ron is absent at work.

As for the G2AOX predictions, British listeners' vigil on 144.05MHz almost wholly relied for its fulfilment upon these. Bill Browning was inundated with requests for information: this went automatically to all who had lodged stamped addressed envelopes with him as recommended earlier. The calibration curves he made available have been valuable for deducing battery current and voltage, and such factors as Oscar's skin temperature and internal temperature.

* * *

An odd occurrence coinciding with the advent of AO5 is reported by G3UFP of Rickmansworth in Hertfordshire. During Orbit 200 on 8 February at 1035gmt a telegraphy signal was heard at RST559 about 8kHz higher in frequency than the satellite's transmitter. It turned out to be from G15ALP of Londonderry. He was audible both on a second receiver at G3UFP and with many other 2m watchers, several of whom called the Northern Ireland station without success.

G3UFP goes on to say: "G15ALP continued sending in several periods during the time I was copying Oscar. He disappeared while calling, as Oscar was losing strength, although I copied Oscar for another three and a half minutes after he had gone. No similar signals were heard during later passes. Coincidence?"

In suggesting that this phenomenon comes into the realm of coincidence, G3UFP doubtless has in mind the thought that if there were to be reflection from a space object as small as Australis Oscar 5 then why does it not occur from some of the other 350 items of metalwork, both debris and active, many of them of some size, which circumnavigate the earth daily? Reflections from less elevated devices such as aircraft have been suspected of inducing or assisting 2m contacts between stations along the flight path.

Small in size though AO5 may be, it does possess one advantage over other space objects by carrying aerials resonant in the 2m band, and conceivably capable of functioning as passive reflectors from ground-borne transmitters.

Any other theories?

Early work above 2GHz

Amateur experimental work on frequencies above 2,000MHz has been going on for a considerable time, often and undeservedly unheralded and unsung because much of it is performed by small groups operating in isolated circumstances.

* Houghton-on-the-Hill, Leicester, LE7 9JJ.

Members who have operated on 2GHz and above are invited to send to *Four Metres and Down* details of any record-making contacts they may have established, stating call signs of stations worked and when, and best contacts made.

It is important to begin to document this evidence before it recedes so far into the past that all that is left is fallible human memory.

"Seventy" redivivus

When a couple of years ago the 144-146MHz band was extended to Class B licensees, unifying UK policy with that already existing on the Continent, it was predictable that the newer comers would select it as the easier band to start on, *vis a vis* 432MHz.

What was perhaps less predictable was the mighty proliferation of G8-plus-three permits that resulted from this extension of British vhf facilities. Class B operators are now so numerous that it is possible to get a contact on "Two" at times of the day when in the past the band has been a desert.

New licensees who went straight on to "Two" were joined by many who until then had been "70cm only" men but were seized with an urge to try out the lower frequency allocation (many, but by no means all). Result: some depletion of activity on "Seventy".

The trend is now in process of reversal. As yesterday's new found excitement of communicating on "Two" becomes the commonplace of today, people find themselves seized by another sort of urge, and that is to try something a little more challenging, "Seventy Cems" of course.

What this means in the practical terms of contacts made on the next band up is well expressed in a summary of the 432MHz activity over the last three years of South Londoner G8ARM. The table printed below takes in only those contacts from G8ARM which were generated from normal run of the mill activity—contests are specifically excluded. It shows plainly the marked decrease in contacts which happened when people were quitting 432MHz in the later months of 1968; equally evident is the steady build-up in the latter part of 1969 as operators returned to the band once more.

Contacts and year

Month	1967	1968	1969	1970
1	48	111	33†	50 Up to 22 Jan.
2	79	134	29†	
3	133	122	86	
4	133	146	83	
5	127	99	81	
6	159	97	80	
7	137	71	77	
8	142	53*	119	
9	110	62	125	
10	112	97	124	
11	136	75	80	
12	130	54	69	
Total	1444	1112	985	

* = On holiday. † = off air for one month rebuilding.
Total contacts on 432MHz 1967-69: 3541

New record for 3cm?

What is believed to be a new record for the 3cm (10,000 MHz) band was established on 8 February when G3EEZ/P worked G3BNL/P from Clee Hill in the Midlands to Cleeve Common in the Cotswolds. Signals were S9 both ways. The path distance was 45 miles. At the northern end G3EEZ used a pulsed klystron: at G3BNL/P the mode was fm.

Full story, complete with equipment details, next month.

If the table is atypical, in the sense that G8ARM is an outstandingly consistent and experienced operator on 432MHz, no matter; there must have been plenty of people around on the band to provide this profusion of contacts.

"How do I get going then?" Some recommendations on what to build for 70cm and where to unearth the references were given in *FMD* in the January issue. A re-read might prove to be the shortest cut there is to putting a new signal on "Seventy".

* * *

With 70cm still in mind, on next to a word or two about the Cumulatives. The first, in mid-January, seemed to be a bit on the quiet side, but the second on 29 January warmed up a cold and windy night with so much activity that 90 minutes seemed too short a time to work all who were available, and this with no lift at all. Reminder: the final leg is on 23 March.

The when, where and how of cw

Following up recent comments here about telegraphy on "Two", G3JKY of Beckenham has been doing a bit of thinking about the many variables ("... nothing to do with picofarads") which come into play when cw contacts are attempted.

One of them, he asserts, is being on at the right time "... otherwise there's no way of getting a message across, and certainly no way of getting an answer!" A remedy to this problem is suggested by G3JKY himself; put out CQs in the cw section for the first five minutes of each hour. It will not take long for other occupants of the cw area to come to realise that this is *the right time*.

Another point he puts forward relates to the use of BFOS: "... if nobody has them on there's no point in calling CQ on the key"—though it seems to us likely that those tuning the cw segment *would* have them switched in.

Allied to the foregoing is yet another variable, continues 'JKY: incompatible beam headings. If you are not pointing at the chap at *the right time* you won't hear him! But using bfo-in tuning techniques helps a lot by alerting operators to weak signals capable of being improved by adjusting aerial direction. Without the bfo on, their presence goes undetected. This may be stating the obvious to the mainly-cw generation nurtured in the art of tuning with bfo on, but to A3 adherents it may be something worth trying.

A fourth variable which G3JKY adds to *the right time*, *the right mode* and *the right beam heading* is *the right frequency*. He holds a lurking suspicion that "few people have the patience to tune back and forth for more than a few minutes", adding that a calling frequency would be as

successful on "Two" as it has proved to be at 70.26MHz on "Four". Try a spot frequency of 144.1MHz, he suggests.

It may be, of course, that he is underrating telegraphy men's willingness to tune the small areas of 2m and 4m where cw is used. Let us hope so. Anyway, what the 'JKY formula boils down to is: CQs for the first five minutes of the hour on or around 144.1MHz and tune with the bfo on. If it produces more cw activity than can be heard at present, then it is a formula with an end product. Let us give it a whirl.

How they band-plan in Germany

Just as in the UK, an increasing amount of ex-commercial business radio equipment is becoming available in Germany, and to make the best use of it our DJ/DL friends have drawn up a channelling system for 2m in which frequency modulation may be used. This news comes from Dave Pilley, well known as G3HLW and now in business in Germany (his indigenous call sign is DL0TU).

Faithfully observing IARU agreements, the German system is to limit F3 phone to 144.15 to 145.95MHz, avoiding the cw area at the low end and the beacon area at the high end. It recommends operators to fit two switchable crystals to adapted transmitters so that there may be operation on the locally agreed zone and on the international calling frequency of 145.00MHz—which is another very good reason why British stations should get increasingly into the habit of monitoring this mid-band spot frequency. German operators are encouraged also to have crystals to hand for local common frequency nets.

The sense of order which in Britain our own band-plan achieves is provided in Germany in a rather different manner: "... please put forward your frequency requirements to your vhf representative in your district", says the magazine *DL-QTC*.

Expeditionaries westwards

Within the next fortnight Cambridge University Wireless Society's expedition to the Isle of Man will be on its way. Anybody who has not yet requested a schedule during the 16-24 March period should drop a line without further delay to G3TPF, Steve Cripps, Jesus College, Cambridge, CB5 8BL. It is important to state if 23cm, 70cm and/or long haul ssb and telegraphy on "Two" are required. The call sign will be GD3TPF/P. Operating times: 7 to 9pm, 2m cw and ssb in appropriate zones; 9pm onwards, 432.075 cw and 433.19 a.m. telephony.

From G3BA come details of the return trip to Ireland which he and G3BHT will be making during the spring holiday week. Operation will be as follows: single sideband on 145.41MHz calling channel probably moving to 145.1MHz during the first 15 minutes of each hour; telegraphy on 145.5MHz from quarter past each hour until half past; A3 telephony on 145.5MHz from half past the hour until the hour.

All the above are between 1900 and 2300bst daily from 23 May to 30 May, but take special note—there will be breakfast sessions to the same pattern from 0700 to 0800bst, which is a sensible arrangement that takes into account the fact that "Two" is often more open in the early hours of the day than later on.

There will be an 80m talk-link in operation daily from 1830 to 1900bst.

BEACON STATIONS

Call-sign	Location	Nominal Frequency	Emis- sion	Aerial Direction
GB3ANG	Craigowl Hill, Dundee	145.950 MHz	A1	S
GB3CTC	Redruth, Cornwall	144.13 MHz	A1	NE
GB3GW	Swansea	144.250 MHz	A1	ENE
GB3GM	Thurso	70.305 MHz	A1	N/S
GB3GEC	W. London	434.000 MHz	F1	N/W
GB3SC	Sutton Coldfield*	433.50 MHz	A1	N/S
GB3SU	Sheffield (temporary location)	70.695 MHz	A1	Omni
GB3SX	Crowborough, Sussex	28.185 MHz	A1	E/Omni
GB3SX	Crowborough*	70.699 MHz	A1	Omni
GB3VHF	Wrotham, Kent	144.500 MHz	F1	North-West

* Not operational

To assist schedule-slotting, operators who wish to work EI during this expedition should write to Tom Douglas at 141, Russell Bank Road, Four Oaks, Sutton Coldfield. He says: "Every QSO will be QSLd, and an appropriate award will be given to the person whose skill and endeavour in contacting us merits some recognition."

... and northwards (transport wanted)

An invitation to go along with a metre-wave expedition to Scotland comes from Chris Tredwell, G8CHW, of 14 Brighton Grove, Rusholme, Manchester 14. If somebody (or bodies) will provide transport for an August journey to GM-land he will furnish high power equipment for 2m and 70cm, complete with aerials and 1kW petrol generator. And if Class A men wish to join the expedition he will see that the rigs are telegraphy-ready.

He does not have a vehicle himself, nor does he drive; hence this request for 50-50 co-operation on the part of those who do.

Projected dates are 7-24 August, travelling outwards up the east coast and back down the west coast. Expenses would be shared fairly among all who went. Letters direct to G8CHW as above.

Tech corner

From G6ADJ/T (Robert Skegg, London W3).

The following notes are for hopeful would-be viewers of amateur television on 440MHz and tell very roughly and briefly what to do to be able to receive in that frequency area.

First, get yourself a commercial television receiver in reasonable condition. You can make it fire on 625 lines by a little fiddling of the coarse line frequency control. To obtain negative modulation invert the video detector; the following circuit bias will usually be satisfactory.

Next, to tune to the 70cm amateur band get a uhf tuner, valve or transistor. Feed this directly into the television receiver i.f. (about 38MHz) after disconnecting the Band I-III vhf feed thereto. In doing this remember that the tv set chassis is live to mains: either employ an isolating transformer in the mains supply or put an isolated winding on the receiver first i.f.t. Keep input co-ax lead clear of the video detector or the i.f. strip will take off.

It should now be possible, in the London area at least, to receive 625-line BBC and ITA transmissions using a bit of wire for an aerial.

The next problem is to shift the uhf local oscillator lower in frequency to make the system cover the 70cm amateur band. Do this by adjusting the trimmers on the oscillator trough, which in most tuners is the one next to the i.f. output coil. At the same time keep the mixer input trough (the next one) tracked, otherwise the oscillator may stop. A small line in this trough couples power from the oscillator cathode/emitter back to the mixer. It is an advantage to replace this with one slightly longer at the looped (tuning gang) end. If all else fails, try putting a 2 to 4pF disc ceramic capacitor across the tuning gang in transistor tuners, or across the "other end" trimmers on all troughs in the case of valve tuners with half-wave lines. Keep troughs tracked for best sensitivity.

Do not use a 70cm transmitter as a signal source. Rather, run the transmitter oscillator only and use its harmonics.

When you are there on 70cm connect up your aerial, which should be an 8 over 8 slot or a Parabeam (but not a Skybeam—bandwidth too narrow) as high as possible, well clear of the roof and feeding a 70cm preamp if you have one.

Xtal Xchange

Albert Parker, G3KH, wants to obtain an FT243 crystal to put him in the new 2m Zone C and would like something around 8,061kHz. He offers an 8,066kHz FT243 in exchange. 133 Station Road, Cropston, Leicester.

Another Midland man, Stan Read, G2ATM, has the following to dispose of: 8,100kHz FT243, 8,007.27 on a 10XJ but pins as HC6U, 8,090 on an HC6U and 8,081.25 on an HC6U. He says, "I'd like to swap on a one-for-one basis for FT243 types of the 6MHz overtone pattern for Zone D, 145.5 to 145.95, and particularly for one on or near the new mobile calling frequency of 145.0MHz." 44 Birkland Avenue, Plains Road, Mapperley, Nottingham.

Here and there

"If I'm doing something simple on the bench I try a telegraphy CQ2 with one hand while sorting nuts and bolts with the other . . . and as for cw on 'Two', one sometimes has QSOs with local chaps for the sheer devilment of using the key!"—G3JKY.

The "Royal Boroughs and Burghs Award" is offered by the Echford Amateur Radio Society of Ashford in Middlesex. A new vhf class has just been added to it. Work a station in any one royal borough and two Scottish royal burghs and you can claim a parchment from Awards Manager G3TBS, R. Wilson, 52 Westmead, Windsor, Berks, if you send 5s. All profits go to the British Diabetic Research Fund, so it is in a good cause.

The new Multibeam and circularly polarized aerials for satellite reception will be the subject of a talk to be given by Vic Hartopp, G8COB, of J-Beam Engineering Ltd. to the 19 March meeting of the Leicestershire VHF/UHF Group. Starting time and place are 7.30pm and Leicester Polytechnic Room 45, as usual.

"If anyone wants to see television from G6ADJ/T, work fast! I'm going VE7 in the summer (for good?)"—G6ADJ/T of Acton in West London (and if you *do* want a video-sked

The metre-wave man's code

When operating his station the vhf and uhf metre-wave man:

1. Before transmitting, senses the band for conditions, level of activity and occupancy of his intended channel;
2. When sending CQ announces his location (if he is a newcomer his callsign may not be in the book, if he is an old hand he will not be egotistical enough to assume everyone knows where he is). He will also state beam-heading and intended direction of tuning for cw, using the accepted abbreviations (LH, ML, LF and so on);
3. When engaging in a QSO will give the other man's callsign first followed by his own; in net operation will call stations in "Callbook order";
4. Will keep within his geographic-frequency area unless calling a station on the latter's own frequency;
5. Remembers never to use phone in cw areas, though resorts to cw in any area when communication is difficult;
6. Observes gentlemanly microphone manners by avoiding irrelevant back-chat, refusing to allow "funny men" near the microphone (especially during contests), and abjuring all facetious callsign phonetics, having noted the recommendations written into the licence;
7. Avoids the pitfalls of duplex operation by announcing his and his correspondent's callsigns often, together with frequencies in use, not allowing the intimacy of the mode to tempt him to transgress 6 above;
8. At all times is considerate of others, especially the man in the next street or town, by avoiding over-modulation, key-clicks or single sideband overspill;
9. At the end of QSO always pronounces his callsign distinctly for the benefit of distant listeners; and
10. Takes a last look round before closing in case others are calling him. If they are and time is short he suggests times for subsequent meetings.

with him, as remarked here last month, contact him without delay at 18 Eastbourne Avenue, London W3.)

There is an M-S schedule every Thursday, 2100-2130gmt, at the cw end of "Two" between G3CCH and TF3EA to attempt further UK to Iceland contacts via meteor shower. Already 'CCH has been heard by 'EA. Why Thursdays? Because there is no TV in Iceland on that day!

The French have a word for it—*moustache*. The British call them whiskers. They stick out untidily from ill-modulated transmissions on 2m (Thank you, G3GXN).

A reminder, if you do not appear in the 1970 edition of RSGB *Amateur Radio Callbook*, to let others know where you are by frequently stating your QTH. Distant aeriels may then be appropriately aligned and more contacts result.

MONDAY NIGHT IS 70cm ACTIVITY NIGHT.

COME ON THE BAND BETWEEN 8 and 10pm.

John Warrington, G8AKE

"As father, as son . . ." How young Robert Barnes, G8CJQ, followed in the vhf footsteps of father G3AOS was told here last November. And with John Warrington of Melton Mowbray it was being brought up in a thoroughly "radio-active environment" that imbued him, too, with an interest in amateur radio communication at an early age. This environment was created by his father, G2FNW, also John Warrington, whose interest in what was then called the ultra short waves went back to before the war, and whose enthusiasm for this part of the spectrum made him a post-war "first" for many who were at that time coming on to the new 5m and 2m bands. Later, he was a pioneer of 70cm operation in the East Midlands.

Like his father, G8AKE has always had an urge to master higher and still higher—and more difficult—frequencies, undeterred by a QTH that on the face of it seems to hold little attraction as a uhf site. John with his wife, Sandra, and baby daughter occupy a house in a residential area to the north of Melton Mowbray. A built-up complex which rises to the north-west of them blanks off G8AKE signals in that direction, while on most other quadrants the take-off is moderately good but with no help at all from falling ground.

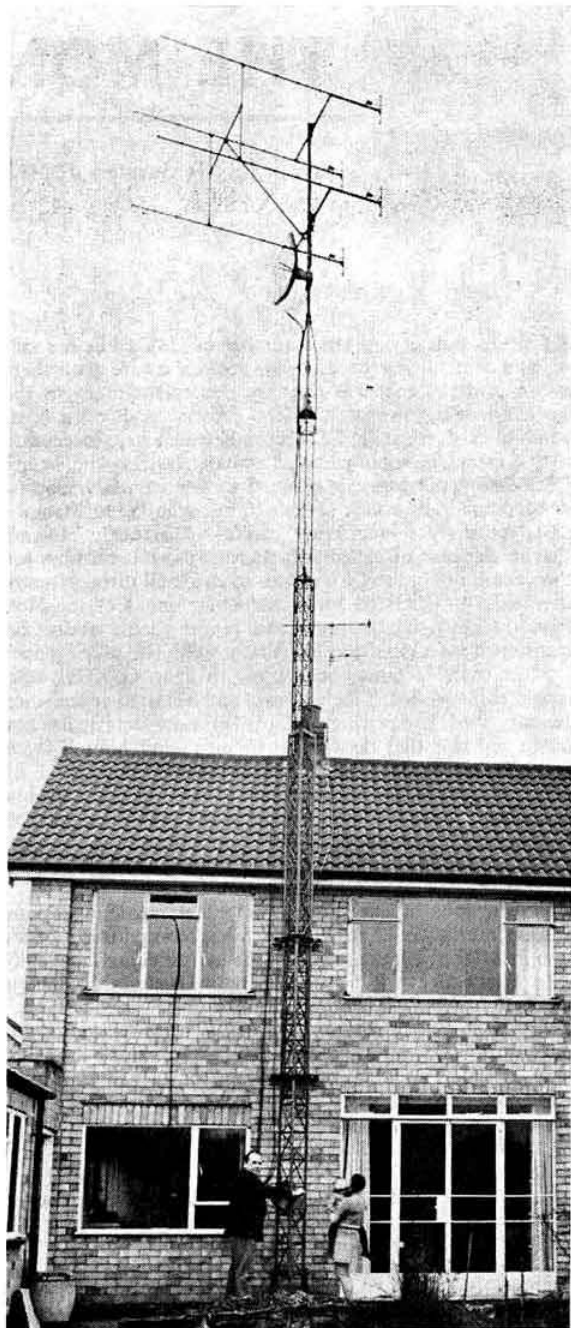
In spite of these geographical limitations the decision was taken when the licence arrived five years ago to see if 70cm could be made to sit up and beg. This would mean running the full legal 150W when finance and the gathering together of appropriate equipment allowed. It also meant using the gainiest aerial which local amenities would tolerate, or for that matter which would stand up to the North Sea gales which roar in across the fields from The Wash 50 miles to the east. A box arrangement of four 14-element Parabeams was particularly effective, though as G8AKE says, it was rather a big beast to have up in an urban location (picture at right, with G8AKE and family at ground level).

On the receive side there has been a continuing programme of work to evolve a converter with transistor rf stages (two BF180) giving the ultimate in signal-to-noise ratio.

A firm believer in the value of competitive events to exercise sites and equipments, G8AKE enthusiastically supports every RSGB contest in the 432MHz band—and wins most of them, as people who have studied the 70cm results tables over the last three or four years will know. And during the course of last year it gave him special pleasure to be able to join G3MCS in his lonely state in the table of holders of the senior award for 432MHz prowess (40 British counties and nine countries).

Another award which went to G8AKE during 1969 was a half share in the Thorogood Trophy, which is presented annually by the RSGB Council on the recommendation of the VHF Committee. This was in recognition of the work done by G8AKE and ON4HN in keeping a regular year-in-year-out schedule on 432MHz that rarely if ever failed in spite of everything that bad weather and bad conditions could throw at them. Fully documented in great barometric and electronic detail, this famous schedule shows that a proverbially line-of-sight band like 70cm can be persuaded to yield when superb equipment is allied to operator determination. And the other half share in the Thorogood Trophy? To ON4HN.

In the last year or so G8AKE has been firing up on "Twenty-three". The shape of things to come may be deduced



from the table of results of last October's 1296MHz Open Contest: first in Section A, for fixed stations, G8AKE.

"Like father, like son . . ." Neither of the two John Warringtons is professionally engaged in electronics. G2FNW is in mechanical engineering, while G8AKE is in electrical engineering.

THE MONTH ON THE AIR

A monthly feature by JOHN ALLAWAY, G3FKM*

IT seems that a very large number of QSL cards are still being sent out by people who are not aware that alterations invalidate them if they are needed for many of the world's leading awards. G3HCT reports receiving a large batch of cards from the USA recently which were inaccurate to the extent in some cases of actually bearing the wrong QSO date. Your scribe is tempted to wonder whether some who complain of a lack of success in obtaining satisfactory QSL returns are sufficiently careful—it is fairly obvious that in the case of expedition stations there is no time for the person doing the QSL chores to check all through many hundreds of QSOs to find a particular one. Correct date, time (in gmt), band, mode and report should always be mentioned, as should the fact that a QSO has taken place!

More cases of piracy have come to light. G3XGH, who is at present on board the ss *Axina* and has been at sea since January 1969, is receiving QSL cards for contacts he has not made. He says that he will not be on the air himself for a considerable time. G3VRV, who is likewise not on the hf bands at present, has also received a batch of QSLs mostly for alleged 20m contacts. He is only operational on vhf and is likely to remain so for the foreseeable future.

Would any reader knowing the present whereabouts of 5A1TA please inform G3FKM?

Photographs of expeditions and other amateur stations and operators would be very much appreciated for publication in *MOTA*. Black and white glossy prints are most suitable. Every effort will be made to return material submitted to the sender but no guarantee can be given.

In response to a number of requests there will, after all, be a 1970 Countries Table. This will be run along the same lines as the 1969 table, and the first scores will appear in April *MOTA*.

News from overseas

John Packer, ex-ZD8JP/G3NRD, is now on the air from Tortola in the British Virgin Is with his VP2VAA callsign. He says that there are only six stations in the group, which consists of about 40 small islands of which 16 or so are inhabited. Tortola (literally "Turtle Dove" island) is the capital and some of the other islands have quaint names such as Virgin Gorda (the Fat Virgin) and Dead Man's Chest. John is usually on the air between 2100 and 2300 and may be found mostly between 14,130 and 14,190kHz on ssb; he is particularly interested in working back into the UK. At present operations take place from a flat with limited antenna space, but he hopes to be moving soon and portable operation from a 1,500ft hill-top on all bands (especially 80)

may be organized. The local post office is apparently not giving the full value in exchange for IRCs and it would be much appreciated if QSLs could be routed via VE3GMY. The other VP2V stations are VP2VI, VP2VJ and VP2VO, who are all on Tortola and who request QSLs via VE3ACD, VP2VL (who is none other than Bob Denniston, W0DX, President of ARRL), and VP2VV who is on Beef Island and asks for QSLs via Box 65 Tortola.

Louis Scherri, G3PWO, is now active from Algeria with his 7X0LOU call. He is mostly to be found on 14MHz ssb or cw during the evenings and says that he is particularly on the look-out for UK stations. Lou believes that he is the only 7X0 currently using ssb.

Don Welling, VE1ACU (formerly VO2AW/3B2AW), reports that QSL cards for JX2BH are still being held up by the fact that logs have not yet been received. Tor is leaving JX soon for another isolated post and it is expected that Don will continue to act as QSL manager. Andy, VE1ASJ, is presently on a world tour on the ship *Vema* using the HP9FC/MM call. He recently operated as HP9FC/VP9 and is awaiting permission to get on the air from TF, GM, LA, JA and other countries—all QSLs should be sent to VE1ACU. Other calls for whom VE1ACU acts as QSL manager are HR1KAS, HR2GK, HQ2GK, VP7NF, VP8JT, VE1ASJ and KG4DO. He does not act as manager for A2CAU.

G3VDO/MM is now licensed to operate from the mv *London Citizen* and is currently in the Pacific area. Ian uses an FT100 transceiver and a two-band vertical dipole mounted on the radar mast. He is particularly interested in UK contacts and welcomes calls from G.

The January issue of *NARS News* gives the news that the Nigerian society had 45 members in 1969 despite the difficult conditions in that country, and expresses the hope that new licences may begin to be issued soon. Sid, 5N2AAX, is now back in the USA as WA0IHL/4 and may be reached at PO Box 1206, Greensboro, NC, 27402.

The Ex-G Radio Club meets on the air each Sunday on 14,347kHz at 1900, except during June, July and August when official nets are held only on the first and third Sundays. UK stations are especially invited to participate. W3HQO has now moved from Philadelphia and is located at Apt M-12, Bristol Gardens Apts, 1405 New Rodgers Rd, Bristol, Pa, 19007, USA. Please note that in future only those holders of the Ex-G Certificate who ask to continue to receive the bulletin after the first year will do so. G8FG, G2FUX or any net control operator should be notified accordingly.

G3SXW will be spending the next few years in the Middle East and will be in Iran very soon where he hopes to obtain an EP call in spite of the current licence difficulties.

* 10 Knightlow Road, Birmingham 17.

ORS31427 reports that 9M2DQ is presently on leave in the UK and will not be returning to Malaysia until May. Two new stations in Kuala Lumpur are 9M2s AW and VI.

Jesus, CO2DC, is often to be found on 14,170kHz, and says that he will be on 21 and 28MHz ssb at 1200 frequently, especially looking for UK and other European contacts.

Denis Mather (G3KAM/9V1MS/9M8MS) is in Mauritius and hopes to be on the air soon with a VQ8 call.

VP2EQ has been temporarily away from Anguilla but has now returned. His QSL cards are on order from Canada and he hopes to be sending them out soon.

Fifth VERON Radio Camp 1970

This will be held at Vierhouten (10 miles north-west of Apeldoorn) from 15 to 18 May. This year's camp celebrates the 25th anniversary of VERON and overseas visitors will be particularly welcome. There will be a camp station with a special call sign—PA6AA. This will be on the air continuously, except during special events, and will cover 160 to 10m on cw, 80 to 10m on ssb, 80 and 20m on rtty, 2m rtty, and 2m and 70cms a.m. Special events will include dx contests and model control demonstrations. Those who book in advance may arrange for three meals and coffee for £15.90 daily—please contact PA0JAC, J. G. J. van Leeuwen, Sassenheimstraat 6/2, Amsterdam.

Top Band news

VP9GJ has returned to G3PQA and has sent a résumé of his activity during his five-month stay in Bermuda. Most of John's operating time was spent on 160 and 80m and he found that the best conditions between VP9 and Europe on 160m were between 2300 and 0330. There did not seem to be a dawn peak noticeable. DHJ was heard nearly every day and when its signals reached 579, contacts with Europe became possible. Thirteen different countries were worked and excellent signals received from DL9KRA, EI9J, G3s IGW, LIQ, MYI, OIT, OLI, OQT, RPB and RXH. John reports that there seems to be some deliberate interference being caused in the 1,825 to 1,830kHz section (the "DX Window") by certain USA phone stations, and also that Loran reaches down to 1,835kHz, but otherwise QRM is at a very low level.

G3TKC writes to point out that the "ZC4TK" being called by an OK station was either a pirate or a case of a misread call sign. Bob returned to the UK last June. ZC4AK, the club station at RAF Akrotiri, has excellent Top Band potential in the form of a half wave 160m dipole 90ft above ground and 300ft asl.

G3LQI will be visiting some rare counties during a short holiday in April. His schedule is as follows: 12 April—Selkirk, 13 April—Bute, 14 April—Wigtown, 15 April—Kirkcubright, 16 April—Dumfries and 17 April—Roxburgh. He will use 1,890kHz (+ or - 5) for phone and 1,834kHz (ditto) for cw. Main operating times will be 1900 to 2000 (cw) and 2000 to 2100 (phone).

Another counties expedition, this time by G3SVK as GM3SVK/P to a number of Scottish counties with operations mainly on 160m, but also some on 40 and 15m cw and ssb. His schedule is as follows: 18 April—E Lothian, 19—W Lothian, 20—Kincardine, 21—Moray, 22—rest day in Inverness, 23—Perth, 24—Argyll, 25/26—Bute, 27—Ayr, 28—Wigtown, 29—Dumfries, 30—Peebles, 1 May—Selkirk and 2 May—Berwick.

Eric Lomax, 5N2ABG, advises that 160m operating privileges have been restored to Nigerian amateurs. Conditions appear to be the same as those in the UK with a permitted 10W input power in the sector 1,800 to 2,000kHz.

The reports of UK contacts with HR2HH on 7 December mentioned in February *MOTA* were unfortunately not correct and were the result of a mis-read letter. Hal's first (and so far believed to be his only) QSO with Europe took place at 0533 on 28 December when he worked OK1ATP.

Contests

The CQ WW WPX SSB Contest

0000 11 April to 2400 12 April.

All bands 1-8 to 28MHz ssb only.

Exchange report plus serial number of QSO starting from 001. Contacts with stations in other continents count three points, with one's own continent one point, and with one's own country no points (however, these may be worked for multiplier credit). Contacts on 160, 80 and 40m count double these points. Final score is determined by multiplying total QSO points by the total of different prefixes worked. Note that a prefix only counts once however many bands it is worked on. There are single-operator (single or multi-band) and multi-operator (single or multi-transmitter) categories. Multi-transmitter stations may only radiate one signal at a time on one band. Single-operator entrants are only allowed to operate for 30 of the 48 hours and may take their 18-hour break in up to five periods which must be clearly indicated in their log. It should be noted that multi-transmitter stations should use separate serial numbers for each band and that a station may be worked on more than one band for QSO credit.

Certificates will be awarded to the highest scorer in each country and trophies to the top world single-operator in the single-band and the multi-band classes, and also to the leading multi-operator teams in both categories. Separate log sheets should be sent for each band and should follow the pattern of those used for the CQ WW DX Contests (40 QSOs per page) and may be home made. Summary sheets are available from G3FKM—there are no printed rule sheets. Entries should be posted before 15 May to: CQ WPX SSB Contest Committee, 14 Vandeventer Avenue, Port Washington, LI, NY, 11050, USA. Note that taking credit for more than three per cent of duplicate QSOs will result in disqualification.

* * *

The winners of the special **Lebanese DX Contest** which took place last October are as follows: World winner, HB9AKJ. Continental winners, ET3REL, WA2DIG, HK5AZA and VK2ASZ. GC5AGA and GM3PIP were listed among the country winners.

* * *

The SP DX Contest

1500 4 April to 2400 5 April

3-5 to 28MHz cw only.

Open to single operators (single or multi-band), multi-operator stations (multi-band only) and listeners. The object is to work as many Polish stations as possible, each QSO counting three points. Polish stations will send RST followed by two letters indicating their *powiat* (ie county), others

send RST plus QSO number (starting from 001). The multiplier is the total number of *powiats* worked—each one counts only once however many bands it is worked on. Separate logs should be submitted for each band and should be accompanied by a summary sheet listing all scoring information and a declaration that all contest rules and licence rules have been observed. A separate list of *powiats* worked would also be appreciated. Entries must be postmarked no later than 1 May and sent to: Contest Manager of PZK, PO Box 320, Warszawa 1, Poland. Contacts in this contest may be used when applying for the SPPA and Polska Awards. If 100 *powiats* are contacted the log will be considered as sufficient proof for the issue of the SPPA if the fee of seven IRCs is submitted with it.

The Second RTTY WAE DX Contest

0000 25 April to 2400 26 April.
All bands 3.5 to 28MHz. RTTY only.

Organized by the Contest Committee of the DARC DX Bureau, Uli Stolz, DJ9XB, In der Ostert 3, D-597 Plettenberg, W. Germany, from whom rule sheets may be obtained.

Top scores in the 1969 WPX SSB Contest have now been received from WIWY, who apologizes for the delay in sending out winners' certificates for the 1968/69 CQ WW contests. Top single operator all-band station was KV4FZ (2,312,848 points). In the single-band entries top world score on 7MHz was made by G3NLY with 47,880 points. On 3.5MHz GM3VTB (2,280 points) was world sixth. Detailed UK scores will be given at a later date when they are received.

A reminder that the Worked All Britain Contests take place on 15 and 29 March (see February MOTA). Logs should be sent to G3ABG, 24 Walhouse St, Cannock, Staffs, and not to G4CP.

Awards

The Worked All Malaysia Award

Issued by MARTS, PO Box 777, Kuala Lumpur, Malaysia.

Requires proof of ten VS1/9V1/9V0, ten VS2/9M2, one VS4/9M8, one VS5, and one ZC5/9M6 contacts (total 23). Log data certified by two club members as having checked QSL cards should be sent to the hon secretary at the above address together with a fee of ten IRCs or \$1.

The "25 Kosice" Award

Issued by Radioklub Kosice, Svermova 5/B, Czechoslovakia.

Twenty-five points must be obtained by contacting Kosice stations during the period 5 March to 5 April. QSOs with OK3s KAG, AL, CIR, HS and OK5VSZ count seven points, with all others two points. QSLs should be posted to the above address before 30 April together with one irc. Listeners may also apply. Other Kosice stations include OK3s KTP, KWM, AS, BR, DI, EK, IE, PQ, SP, UO, YP, CAJ, CBF, CDI, CEE, CEZ, CFE, CFQ, CFT,

Czechoslovakia call areas



The prefixes OK1, OK2 and OK3 are used by holders of full licences. The OL series are allocated to holders of Novice licences who operate on the 1.8 and 145MHz bands. Holders of reciprocal licences use the prefix OK8.

CHA, CHE, CHI, CHL, CHN, CHV, CIA, CIQ, CIR, VAX, VBI, ZAF, ZAG, ZAS, ZAX and ZAR.

The Okinawa Award

Okinawa ARC, APO, San Francisco, Cal, 96331, USA.

Available to amateurs/listeners who have confirmation of five KR8/KR6 contacts or reports. (Those in BV, CR9, DU, HL, JA, KG6, VS6 and W need ten QSOs). A log extract certified by two amateurs or an official of a recognized radio society who have seen the QSLs should be sent to the address above. There is no fee and the QSLs need not be submitted.

Those working for the new ARRL Five Band Worked All States Award may obtain a WAS outline map and *Operating Aid No. 8* which contains an alphabetical state listing to assist record keeping. A sae and irc should be sent with the request to ARRL, 225 Main St, Newington Conn, 06111, USA.

Readers who have recently applied for the Cornish Certificate will be sorry to learn that G2AYQ, who acts as custodian, is at present in hospital. He apologises for the delay in sending out certificates. Your scribe is sure that all readers will join him in wishing Ted a speedy recovery.

GB3TT

This station was put on the air by G3s AFK, RJK, RXC, XYB, and swl Mike Cuffe during the period 15 to 17 November 1969 from a site at Alum Bay, IOW, from which Marconi transmitted the information used in the first newspaper published at sea on 15-16 November 1899. A total of 343 contacts were made in spite of gales and torrential rain which at one time blew down the beam.

(The operators wish to thank A. N. Clark of Binstead and their sales manager, Mr J. Bloomfield, for the supply and erection of the lattice tower which supported the beam.) QSLs should be sent via G3RJK.

Dxpeditons

Gus Browning, W4BPD, is hoping to set off on his travels yet again within the next few months. The Indian Ocean seems to be a likely target and he may also go to the Himalayan area during a projected two-month operation. On this occasion Gus is being assisted by W2GHK and W2MZV.

The Spratley Is expedition, planned for late January, had to be abandoned due to troubles with the *Exodus* and the last minute inability of VS6AA to join the party which would have meant only two operators (one of whom would have been needed to stay on board the boat to guard it). There is a possibility that another attempt will be made within a few months with a larger boat.

The operators of OJ0MR succeeded in making 9,200 QSOs with 140 countries during their stay on Market Reef. Not much cw operation took place but this should be taken care of during a repeat performance scheduled for May or July.

A visit to East Pakistan by Rafiq, AP2MR, may take place at any time. All arrangements have been made and the trip will be made as soon as Rafiq is able to spare the time from his studies.

According to *DX'ers Magazine*, W4ZRZ and WB4MKU are visiting Anguilla and will arrive on 5 March. They intend to operate on all bands using ssb near the low edges, and hope to be there until 16 March.

West Coast DX Bulletin reports that DL7FT's proposed trip to Albania is now scheduled to take place during the period 15 to 22 May. Frank will be accompanied by Martin, DJ7VY, and all documents are in hand except the one which permits them to enter Albania via Yugoslavia. It is apparently not possible for them to enter via Italy, Greece or by sea. If it is not possible to carry out the trip in May an alternative date will be during the period 19 September to 4 October. The operation plans to use 14MHz ssb only—possibly transmitting on or near 14,195kHz and listening above 14,250kHz for replies. DL7FT (Frank Turek) points out the great cost of this exploit and those wishing to assist may reach him at I Berlin 47, Petunienweg 99, Germany.

W1BIH expects to be in Curacao for a couple of weeks starting around 1 March and hopes to be on the air with the callsign PJ9JT. He will be testing out a five-watt transceiver (made by K4FW) on 20 and 40m cw but says that he will be using some higher power equipment on the other bands. QSLs should be sent to W1BIH.

According to 9J2ED, a group of Central African amateurs will be making a trip to Botswana around Easter time. All band operation on cw and ssb is planned, static permitting, including 160m. The callsign A2DX or A2CDX has been applied for.

5Z4KL has a licence for Comoro Is operation (FH8) and hopes to go there in April or August. He is also trying to obtain a licence for Sudan (ST). TI8NAM has applied for a licence to operate from Annabon Is (EA0?) which he would like to visit this autumn.

QTH Corner

CR4BC	via WA4WTG, 445 NW 202nd Terrace, Miami, Fla, USA.
FG7TD	via WB8ABN, Box 62, Rochester, Mich, 48063, USA.
GB3TT	R. Kissick, May Cottage, Copse Lane, Freshwater, IoW.
H18XPM	via VE3DLG, 30 Zenith Drive, Scarborough, Ont, Canada.
HS4ABJ	via K4WHK, 1602 Stevens St, Richmond, Va, 23231, USA.
HS4ABV	via W5PJR, 2525 Driscoll, Houston, Texas, USA.
HS4ADJ	via WA2VTL, 434 S Livingston Av, Livingston, NJ, USA.
HS4ABD	via W6DQX, Box 5491, Los Angeles, Calif, 90055, USA.
SV0WI/JY	via WA3HUP, Mary Crider, 105 June Drive, Camp Hill, Pa, USA.
KC6EJ	via WA6AHF, 17494 Via Alamitos, San Lorenzo, Cal, 94580, USA.
KG4AS	c/o US Naval Stn, Box 25, FPO, New York, NY, 09593, USA.
KG6SM	via W2CTN, 159 Ketcham Avenue, Amityville, NY, USA.
KG6SY	Box 209L, Capital Hill, Saipan, Mariana Is.
W9FIU/K64	via W4VPD, 8254 SW 37th Street, Miami, Fla, USA.
PJ8AA	via W2BBK, 79 Glenwood Rd, Englewood, NJ, USA.
PJ8KH	via W2DV, 33 Laurel Place, Upper Montclair, NJ, USA.
PJ8PM	via W2IVP, 292 Van Nostrand Av, Englewood, NJ, 07631, USA.
PJ8JT	via W1BIH, PO Box 1, Torrington, Conn, USA.
VP2VI	via VE3ACD, 305 Rosemary Rd, Toronto 10, Ont, Canada.
VP2VJ	
VP2VO	
VP2VV	
VP2VAA	Box 65, Tortola, British Virgin Is.
VP5TH	via VE3GMY, E. P. Beaton, 63 Davis St, Lambeth, Ont, Canada.
VS6AM	via WA5GFS, 1404 S Cliff St, Decatur, Texas, USA.
WA1KYW	G3CUZ, N. Horrocks, 34 Sandbrook Rd, Ainsdale, Southport, Lancs.
ZB2BY	via G3YPK.
ZC4JW	GW3DIX, Bryn Hyfryd, Amlwch Port, Anglesey.
	(corrected QTH) John W. Stratton, CARS, PO Box 216, Famagusta, Cyprus.
ZK1AJ	via KH6GLU, Box 762, Kaunakakai, Molokai, Hawaii, 96748.
4S7NG	Noel Gunesekeera, Stratenwyk Estate, Jaala, Ceylon.
5T5BG	PO Box 538, Nouakchott, Mauritania.
7X0LOU	L. Scherri, CJB, 18 Boulevard des 3 Freres Bouadoud, Birmendreis, Alger, Algeria.

RSGB QSL Bureau, G2MI, Bromley, Kent.

DX news

Jacky, VQ8CFB, hopes that he will soon be able to be worked on 14,130, 14,230 and 14,330kHz ssb using crystals supplied by W1WDD and that he will continue to be on St Brandon until May. VQ8CD is reported to be in Chagos and awaiting the issue of a VQ9 call. He hopes to be able to get on 14MHz cw using a T.1154 transmitter which should enable his note to be instantly identified. Unofficial sources suggest that the procedure of denoting islands which are in the Mauritius dependencies by suffixes is about to be changed. Mauritius itself may become 3B8, Agalega 3B6, St Brandon 3B7, and Rodriguez 3B9.

The unofficial prefix FO8M which was used for an alleged operation from Maria Theresa Reef has been dropped from the ARRL DXCC list at the request of REF.

OK5FIS is the station of the Radio Club of Tatra which is operating from the Tatra Mountains during the period 1 December last until 30 April 1970 on the occasion of the World Skiing Championships. One kilowatt of am and cw is available on all bands 80 to 15m and QSLs should be sent via OK3BHU or the OK bureau.

ZK1AJ is now on from Cook Is with his HW100 and a dipole antenna. He will be there for two years or so and frequently checks into the Pacific dx net on Tuesdays and Fridays at 0600 on 14,265kHz. He will travel to Manihiki Is for a two-week stay sometime during the next few months and if he can obtain a dc power supply for his transmitter will operate from there. QSL via KH6GLU.

FR7ZP/E is awaiting delivery of his QSLs from France and asks for patience from those needing them. 9M8FMF and 9M8FME are K0FMF and his wife K0FME, respectively.

FO8CY is located in the Marquesas Is and it is reported that FO8AA and FO8BV will be on the islands during an expedition later in the year. Although the same as Tahiti for DXCC purposes, the Marquesas count separately for the DUF Award.

5T5AD and 5T5YL are often to be found from 0600 to 0800 on ssb between 14,240 and 14,260kHz. A new station, 5T5BG, who was formerly TN8BG (and before that F2DE, FQ8AE, FK8AO and 5R8CJ) has been worked on 14MHz cw.

Readers will be sorry to learn that BV2A's wife was killed in an accident last summer and that he has been inactive since then. However, he hopes to be on again soon on 14,027 kHz cw only—he has no ssb and does not use any other band. QSLs for contacts after 1 November 1968 should be sent via WB2UKP.

6W8XX will be leaving Senegal in April and returning to France where he will become F2XX.

ZK1MN is said to be a recently-licensed Manihiki islander who is currently crystal controlled on 3,800kHz. He hopes to have ssb equipment by April and KH6GLU may become his QSL manager.

According to *The DXers Magazine*, reciprocal licensing arrangements between Thailand and the USA are still not agreed. Americans are now operating through membership of the Thai ARC and call signs are being issued on a regular basis. Call areas have been changed and are now HS1—HS9, with HS0 being reserved for club stations.

VQ1ABM is reported heard on 21MHz asking for QSLs to Box 42, Kinan, Zanzibar. It is not known whether this station is genuine. A visit to Fatham Is (also VQ1) by 5H3KJ/A and 5H3LV/A was planned for the end of February.

There may be more AC3PT activity soon as a beam is on its way to Prince Mangyal. The SE Asia Net on 14,320kHz at 1200 seems to be a likely place to find him.

DXCC

December *QST* lists all those who have submitted cards for membership or endorsements during the period since October 1967. In the mixed modes category 66 UK calls are listed, 11 of whom are in the Honour Roll (including G8KS—320, G4MJ—319, G2BOZ, G3HCT, G3HDA and G13IVJ—all with 316, G2BVN and G5VT with 315, and G2PL and G3DO with 312 confirmed). There are 35 UK stations listed in the radiotelephone section, including five in the Honour Roll (G8KS and G3FKM with 317, G5VT and G13IVJ with 313, and G6TA with 312 confirmed).

International CHC—FHC Chapter 16

This has now been reactivated with a new HQ in England. G8TK and G3GJQ have been appointed as secretary/treasurer and awards manager respectively. The Chapter is open to amateurs who are both CHC and FHC and also to listeners with CHC-SWL and FHC qualifications. FHCers

who are non-CHC, but intend to seek CHC membership may join Chapter 16 in the interim. Details of an awards programme etc will be issued later. Note that with effect from 1 January 1970 FHC membership is widened to embrace all ground electronics communications and maintenance (aviation) personnel, including air-traffic control and radar operators. Details of CHC, FHC, or Chapter 16 may be obtained by sending an sae to G8TK, G5GH, G3GJQ, or G3VNX (QTHR).

Band reports

Good spells of conditions have been evident on both lf and hf bands, with openings into New Zealand and the western USA even on 28MHz. G3AAE reports working 47 states (and hearing the remaining one) on the latter band during the weekend of 7-8 February. The behaviour of some of the operators using ssb on the dx segment of 3-5MHz has now become so bad that your scribe feels that official monitoring of the band by the various European licensing authorities is imperative.

Many thanks to the following for supplying the information from which the following data was obtained: G2BW, G2FYT, G2HKU, G3AAE, GW3AX, G3FXB, G3HB, G3HCT, GM3UCI, G3YHB, GM4QK, G5JL, G8VG, BR52098, BR517567, BR519682, A6098, A6143, A6248 and A6658. Calls listed in italics were on cw, all others on ssb.

3-5MHz. 0000 *HS5ABD*, PY7AWD/0. 0100 KZ5AE, UH8CS, UL7GG, VP5TH, WB2LWH/VP9. 0500 HT1HF, 6Y5CC (QSL via VE3RX). 0600 CP1GN, HR1EMM, KP4CL, LU2ECO, OA4LA, VP2SY, VP2VI, 6Y5SR, 9Y4MM (QSL via VE3CBG). 0700 PY1BTX, VEs 4MP, 7ADY, 7SV, 8RX, VR6TC, W6s KG, UED, WB6PKA etc, W7SFA, W0JY, XE10OS, YV1AD, ZD3K, ZLs. 0800 AX2EO, HC2GG/1, ZLs. 1900 AX2EO, HL9UU. 2000 AX2KM, MP4BFO, VS6DO. 2100 CR4BB, EA9EJ, YT1GTU/SU. 2200 EL2BE, KV4FZ, OX3WQ, UW0BW, 5H3KJ, 5Z4s KL, LW, 9H1BE. 2300 FP8AP (Box 398, St Pierre.), UA0AG, VS6s DO, DR, XW8BP, ZB2BX, 9U5CR.

7MHz. 0000 6Y5SR. 0500 CO2DC, HK4KC, XE1OF, UW0AJ. 0600 PY2ELD, 0800 HT2DX, TI2USA. 2100 ZD9BM/MM.

14MHz. 0100 VR6TC. 0500 KJ6BZ, KC4s AAB, USG and ZS1ANT (all in Antarctica), 9Q5DG (QSL via W6KTE). 0700 KC4USE, KL7MCE. 0800 FK8s AH, AZ, JT1KAA, TA3MQ, ZL1AAT/K, ZM3PO/C, 5T5AD. 0900 KX6BU, PY7AWD/0. 1000 AX0LD. 1100 UA9VH/JT1. 1300 JT1AG. 1700 EA9AQ, FR7ZG, KH6GLY, SU1MA, VK0HM, VS9MB. 1800 HV3SJ, UA1KAE (Antarctica), 9G1s GD, GT. 1900 FP8AP, JX4GN, ZS2MI (Marion Is on a.m.), 7X0AP, 9L1RP. 2000 FL8DG (Box 538, Djibouti), VP2s GLE, SAB, 7Q7JG. 2100 OX5BL, VP2s DAJ, VV. 2200 FG7XL, WA2CKC/KC4, TR8MC, 8R1U. 2300 KV4AA.

21MHz. 0900 HL9UU, KR6HX, LU2DAW. 1000 SV0W/JY, XW8CT, 9N1RA. 1100 AP2MR, VS6FX, XW8CS. 1200 CP5DB, FG7TD, FL8RC, 9Y4TP. 1300 CR8AI, VP2GBL, VP5GM, YB1AN, YB0AAE (QSL via DJ1OJ). 1400 JX3EN, G3KHK/4X. 1500 KG4AN, OA4KF, TAZ2, 6W8GE. 1600 FR7ZW. 1700 EA9AQ, HK0AI, TG4SR, VQ8CW. 1800 VP7CG, ZS3D, SR8AS (QSL via W6FQ).

28MHz. 0700 UJ8AAC. 0900 5N2ABG. 1000 DU1FH, HS5ABD, TJ1AK, VQ9EP, 9L1RP. 1100 AX8HA, CE8AA, VS6DO, VS9MB, VU2BEO. 1200 HS1ABO (QSL via

Propagation Predictions

The seasonal fall of the F2 MUFs in the northern hemisphere starts slowly in March. This, together with the declining phase in the sunspot cycle, will lead to a worsening of conditions on 28MHz. Therefore, contacts with western North America or Japan will be rare. Only South America, Africa and South-East Asia will come through reliably.

On 21MHz the decline of the F2 MUFs will be noticed in a deterioration of dx conditions. However, the shorter nights will mean that this band as well as 14MHz will remain open longer in the late afternoon and evening. Traffic with Africa and South America should be better during the latter half of the night compared to the previous month, but this band will not become a real night-time dx band until the end of April or early May. Propagation conditions on 7 and 3.5MHz will only show slight changes from those of the previous month.

The provisional sunspot number for January 1970 was 115.4, with the second half of the month containing the greatest amount of solar activity. The predicted smoothed sunspot numbers from the Swiss Federal Observatory for May, June and July are 86, 84 and 82.

K5QHS), OA4ED, VE0MD (Canadian naval station), VP2LX, ZB2BO. 1400 HZ3TYQ, TA2E, VP2MT. 1500 VP2AA. 1600 HPIXHG, HRIEMM, HUIP, W6s and W7s. 1700 VQIABM. 1800 FY7YQ, VP8KD, 8RIJ. 2000 WA3CAL.

Many thanks to all correspondents, and especially to the following, for items obtained from their publications: the West Coast DX Bulletin (WA6AUD), DXpress (PA0TO), DX News Sheet (Geoff Watts), the DXers Magazine (W4BPD), the Florida DX Report (W4FRO), The DXer (K6YGS), NARS Newsletter (5N2AAF), Long Skip (VE3DLC) and On the Air (ON4AD).

Please send all items for April issue to reach G3FKM no later than 7 March, for May issue by 13 April, and for June issue by 11 May.

RSGB committees for 1970

The following committees were constituted at the January meeting of the RSGB Council:

Education Committee

Messrs L. E. Newnham, R. J. Hughes, J. W. Swinnerton, D. M. Pratt, R. Wallwork and G. L. Benbow.

Exhibition Committee

Messrs L. E. Newnham, E. W. Yeomanson, G. W. Norris, P. A. Thorogood, P. Balestrini, R. J. C. Broadbent, W. R. Andrews, M. G. Wallace, D. C. French and M. R. Elliott.

Finance and Staff Committee

Messrs N. Caws, L. E. Newnham, R. F. Stevens, H. E. McNally, B. Armstrong, W. A. Scarr, G. M. C. Stone, J. W. Swinnerton, A. C. Morris and J. O. Brown.

GPO Liaison and TVI Committee

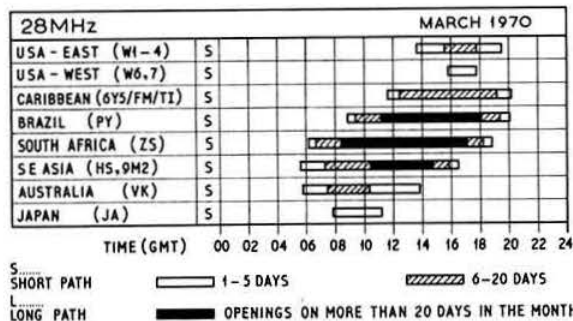
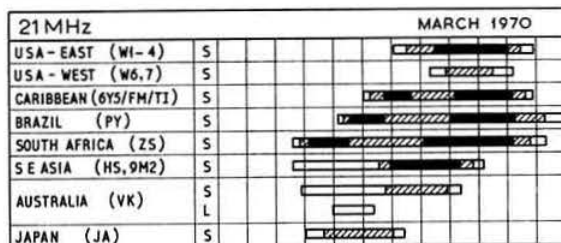
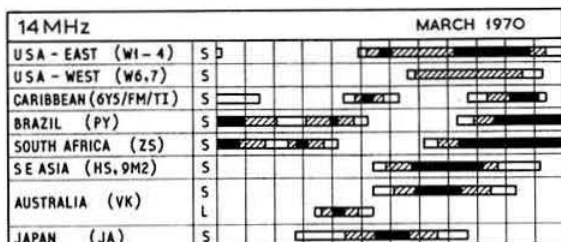
Messrs L. E. Newnham, R. F. Stevens, J. Etherington, E. J. Allaway, J. W. Swinnerton and R. J. Hughes. Mrs K. M. Priestley and Mr D. M. Thomas are corresponding members.

HF Contests Committee

Messrs E. J. Allaway, R. J. Hughes, M. Harrington, D. Thom, J. C. Graham, R. S. Biggs, R. L. Glaisher and R. Polley. Mr. G. T. Peck is a corresponding member.

IARU Working Group

Messrs N. Caws, E. G. Ingram, L. E. Newnham, R. F. Stevens, G. M. C. Stone, J. C. Graham and R. J. Hughes.



Membership and Representation Committee

Messrs N. Caws, J. R. Petty, H. E. McNally, F. Ward, A. F. Hunter, R. J. Hughes, W. A. Scarr and C. H. Parsons.

RAEN Committee

Messrs L. E. Newnham, E. W. Yeomanson, A. F. Hunter, P. Balestrini, E. R. L. Bassett, R. A. Ledgerton, S. W. Law, S. J. Scarborough, J. A. Rollason and Dr A. C. Gee. Mr R. Ferguson is a corresponding member.

Scientific Studies Committee

Messrs G. M. C. Stone, R. F. Stevens, R. G. Flavell, D. T. Hayter, G. Mills, C. E. Newton and A. Taylor. Prof Martin Harrison and Messrs A. J. Oliphant, A. Low and R. A. Ham are corresponding members.

Technical Committee

Messrs G. M. C. Stone, R. F. Stevens, B. Armstrong, G. R. Jessop, W. H. Allen, G. C. Fox, R. Baker, J. W. Matthews, R. J. Horwood, T. L. Herdman and A. W. Hutchinson (editor—Radio Communication). Messrs D. M. Thomas and D. N. Corfield are corresponding members.

VHF Committee

Messrs N. Caws, G. M. C. Stone, W. H. Allen, P. Balestrini, F. E. A. Green, F. A. Griffiths, J. H. Hum, A. L. Mynett, M. Wallace, D. T. Hayter. Messrs E. G. Ingram and A. F. Hunter are corresponding members.

VHF Contests Committee

Messrs B. Armstrong, G. M. C. Stone, A. J. Gould, C. Sharp, R. Whitbread, W. J. McClintock and J. Butcher. Mr R. Baker is a corresponding member.

SOCIETY AFFAIRS

A brief report of the Council meeting held at Society HQ on 15 January 1970

Present: Dr J. A. Saxton (President, in the Chair), Dr E. J. Allaway, Messrs B. Armstrong, R. J. Hughes, E. G. Ingram, G. R. Jessop, L. E. Newnham, J. R. Petty, W. A. Scarr, R. F. Stevens, G. M. C. Stone, J. W. Swinnerton, F. C. Ward, E. W. Yeomanson (members of Council), and R. G. B. Vaughan (general manager).

Apologies for absence were received from Messrs N. Caws, A. F. Hunter, H. E. McNally (Council members), and Mr A. W. Hutchinson (editor).

Prior to the formal proceedings Mr Swinnerton (immediate past-President), welcomed Dr Saxton to the presidential chair and presented him with his President's badge of office.

Welcome to new members of Council

Dr Saxton welcomed two new members of the Council, Dr E. J. Allaway and Mr W. A. Scarr, and presented each of them with a Council member's badge.

Appointment of executive vice-President

Mr B. Armstrong was elected executive vice-President.

Assistance during the hon treasurer's indisposition

Mr Swinnerton reported on recent offers of assistance during the indisposition of Mr Caws.

From among those who had offered their services, and following the recommendation of the Finance & Staff Committee, Messrs J. O. Brown, G3DVV, and A. C. Morris, G3SWT, had been invited to meet Mr Swinnerton and Mr Vaughan, and had agreed to assist the Society.

Membership records

The general manager reported that steady progress in overcoming the backlog was evident. However, a great deal of work remained to be done, and an additional member of staff had been engaged for the records department.

Membership and affiliation

It was resolved:

- to elect 149 corporate members and 68 associate members;
- to grant corporate membership to 14 associates;
- to waive the subscriptions of nine members due to blindness or other disability;
- to grant affiliation to the Border Amateur Radio Society; the Thornton Cleveleys Amateur Radio Society and the Worthing Schools Radio Society.

Constitution of committees for 1970

The constitution of committees for 1970 (published elsewhere in this issue) was agreed.

Following discussion, it was agreed that the general manager should be an ex-officio member of all committees, but that he would have no vote. He could attend committee meetings as he felt appropriate, or when requested by Council.

Mr Hughes asked that tribute be paid to the volume of work done by Mr Vaughan on committees in the past.

Mr Scarr asked that Council should regularize the position concerning the City & Guilds of London Examination Advisory Committee for the Radio Amateurs' Examination. Mr Scarr had been chairman of this committee for a number of years but Council had apparently omitted to formally appoint him as one of the Society's representatives.

Council agreed that the Society's representation on the Radio Amateurs' Examination Advisory Committee should be considered at the January meeting of Council in each year.

Following this discussion, it was agreed that Messrs Hughes, Newnham and Scarr should be the three Society representatives for 1970.

Appointments for 1970

Mr A. O. Milne, G2MI, was appointed QSL manager and recorded lecture library curator; Mr G. M. C. Stone, G3FZL, vhf manager; Mr C. R. Emary, G5GH, certificates manager; and Mr M. A. C. MacBrayne, G3KGU, slow Morse practice transmissions organizer.

After discussion, Council decided not to appoint a public relations Officer for 1970.

Accommodation for Maurice Child Collection

Mr Milne had drawn attention to the Maurice Child Collection of historic radio apparatus which was in store at Bromley, as he was concerned about the future of these items. Mr L. W. Jones, G5JO, was setting up a museum of historic apparatus at his home in Bottisham, Cambridgeshire, and Mr Milne proposed that the Maurice Child Collection should be loaned to Mr Jones for display.

After discussion, it was agreed that Mr Armstrong should visit Mr Jones to discuss this matter and report to the February meeting of the Council.

IARU Region 1

Mr Stevens reported that a meeting of the IARU Region 1 VHF Working Group would be held in Brussels on Saturday-Sunday 2-3 May 1970. The major item for discussion at this meeting would be the 1971 Space Communications Conference, and it was desirable that the Society's vhf manager should attend. Council agreed that Mr Stone should attend.

Co-option of a Council member in place of Mr D. M. Thomas, (Zone E)

Mr D. M. Thomas had written to the President, regretting that due to increasing business pressures he was unable to devote sufficient time to Society business and therefore wished to resign as a member of Council.

The President agreed to write to Mr Thomas and thank him for his efforts during his term of office.

Council agreed to invite Mr C. H. Parsons, GW8NP, to serve on Council as a co-opted member representing Zone E until 31 December 1970.

Area representative for Scarborough

Council confirmed the appointment of Mr P. B. Briscoe as area representative for Scarborough for a further term.

Council Meetings

The following dates were fixed for Council meetings during 1970:

Friday 20 February	Friday 7 August
Monday 16 March	Monday 7 September
Saturday 11 April	Monday 5 October
Friday 15 May	Friday 6 November
Monday 8 June	Thursday 3 December
Saturday 4 July	

Council noted that the 1970 annual general meeting was due to be held on Friday 4 December.

Mr Scarr asked whether the Society had abandoned the custom of a formal Presidential Address. After discussion it was agreed to consider this point again following election of the President for 1971.

Scottish VHF Convention

Mr A. W. Smith, Region 12 regional representative, had requested Council's authority to hold a Scottish VHF Convention on Sunday 11 October 1970. Council gave approval in principle to the date mentioned and authorized the vhf manager to attend. Mr Stone agreed to contact Mr Smith concerning this function.

Publications

Mr Stevens reported on several matters connected with Society publications. It had been necessary to arrange for a reprint of the *Amateur Radio Circuits Book*, and the new price would be 12s, or 60 new pence. A reprint of the *Guide to Amateur Radio* had been arranged, and this would have 100 pages with card covers, for which the price would be 8s, or 40 new pence.

A table version of the QRA Locator Map had been prepared and the selling price would be 1s 3d. A new publicity leaflet incorporating a membership application form had been produced at the request of the general manager.

20,000 copies of the *Radio Communications Handbook* had now been sold, and it was necessary to arrange for binding of the remaining 5,000 copies. Council agreed to the binding of two batches of 2,500 copies each of the handbook.

Council formally authorized a reprint of *Amateur Radio Techniques*. Mr Stone proposed a formal vote of thanks to Mr Stevens for his work in connection with publications, and this was approved unanimously by Council.

Mrs M. Jardine

Council noted with regret that Mrs M. Jardine had decided to terminate her services with the Society. It was felt that some suitable presentation should be made at the Presidential Installation in recognition of Mrs Jardine's services. Mr Swinnerton agreed to make the necessary arrangements.

Minutes of committee meetings

Council approved the minutes of the Education Committee (29.11.69), Education Committee (20.12.69), Exhibition Committee (28.11.69), GPO Liaison & TVI Committee (14.11.69), HF Contests Committee (11.12.69), Scientific Studies Committee (21.11.69 and 15.12.69), Technical Committee (19.11.69), VHF Committee (10.12.69) and Finance & Staff Committee (9.12.69).

VHF Contests Committee. Although no formal minutes were received for consideration, Mr Stone asked that Council examine the draft rules for vhf nfd. Mr Scarr enquired about Rule 12C which required a different form of location to be given on 1,296MHz from that given on 432MHz. Mr Stone explained that this rule was intended to prevent entrants guessing the location to be given on 1,296MHz.

Headquarters

The general manager reported that he was extremely concerned at the backlog of administrative work accumulating at headquarters due to staff shortage. He asked that Council members do everything possible to minimize the work load on headquarters until the position improved.

Representation on external bodies

Mr Stevens asked whether Council could regularize the position concerning representation on a number of external bodies, and the following appointments were confirmed:

CCIR UK General Purposes Committee	—Mr Stevens
BSI Tele 25/1 and 25/2	—Mr Stevens
Frequency Advisory Committee	—Mr Newnham
CCIR Study Group 5	—Mr Stone
CCIR Study Group 14	—No appointment

Council was in session for 4½ hours

Supplementary report of RSGB Council

The Council is pleased to submit the following brief report on Society activities since 1 July 1969. The period 1 July 1968 to 30 June 1969 was covered by the report published in the October 1969 issue of *Radio Communication*.

RSGB mobile rallies

The Woburn National Mobile Rally was held on Sunday 10 August. The usual large attendance was a testimony to the arrangements made by the Mobile Committee under its chairman, Mr N. Miller, G3MVF.

On 5 October, the Scottish Mobile Rally was held at the Beach Ballroom, Aberdeen. The arrangements for this occasion were in the hands of Mr A. W. Smith, the Society's regional representative for North-East Scotland, to whom Council offers congratulations on a really exceptional event.

Meetings

An official regional meeting was held at Belfast (Region 11) on 11 October, at which Council was represented by the President, Mr J. W. Swinnerton, G2YS, and Council member Mr H. E. McNally, G13SXG.

The Scottish VHF Convention was held on 26 October in Edinburgh. The Society's vhf manager, Mr G. M. C. Stone, G3FZL, attended on behalf of Council.

Regional representative conference

At the regional representatives' conference held in London on 13 October the question of improving the liaison between the members and the Society was discussed in considerable detail.

As a result it was unanimously agreed that the Society's Council members elected on a zonal basis should forthwith also become managers of their respective zones, and that the present regional representatives would operate as their assistants in the respective regions, while retaining their original title, status and responsibilities.

The organizational arrangements in each of the seven zones will, therefore, be the direct responsibility of the zonal Council member and his assistants, who will, with the members' approval, make local appointments so that there will exist an improved form of representative coverage throughout the zones.

While it is appreciated that different arrangements may be necessary in individual zones, it is anticipated that with the fullest co-operation of RSGB groups and affiliated societies, this type of administration should give a more streamlined, efficient and simplified means of direct communication between the ordinary member and Council.

Staff

Associate editor J. Adey emigrated to Australia during August. In September Mr A. W. Hutchinson was appointed editor of *Radio Communication*; Mr Hutchinson will eventually assume responsibility for many of the Society's publications in addition to *Radio Communication*.

Council decided to dispense with the services of Mr A. E. Dowdeswell with effect from the end of September.

Mr R. G. B. Vaughan, G3FRV, was appointed general manager with effect from 1 October.

Publications

Sales of the Society's publications continue at a high level. Council is pleased to report that sales to the American continent continue to increase with the *Radio Communication Handbook* and the *VHF-UHF Manual* competing very favourably with similar American publications. The 1970 edition of the *Amateur Radio Call Book* was published on 1 October.

RSGB International Radio Engineering and Communications Exhibition

The exhibition, held at the Royal Horticultural Society's New Hall from 1-4 October, was this year opened by Mr R. J. Halsey, a director of Cable and Wireless Ltd.

The financial outcome of this year's exhibition could not hope to equal the exceptional results for 1968, when the new handbook was published to coincide with the opening date. Nevertheless, the RSGB's stand takings exceeded £3,500, and Council wishes to thank the Society's Exhibition Committee, under its chairman, Mr E. W. Yeomanson, G3IIR, and the many volunteers who together helped to make the "RSGB Show" a success. As usual, the Society is indebted to Mr P. Thorogood, G4KD, for organizing the exhibition.

Radio Amateurs' Examination

The Society organized a centre for the December Radio Amateurs' Examination at the University of London. Although increased accommodation for 150 candidates was arranged, this was fully taken up prior to the closing date for entries.

Society headquarters

In the period under review the conduct of the Society's affairs has called for hard work and loyalty on the part of the permanent staff. Council wish to take this opportunity of thanking the staff and many voluntary helpers who have come to the Society's aid at this difficult time.

Obituaries

Squadron Leader Harold Goodwill, RAF, G3CCN

Harry died on 29 January 1970 at RAF Wroughton after a period of ill health and a major operation.

He joined the RAF as a boy entrant in 1934, and attained his sergeant's stripes in the trade of wireless electrical mechanic in 1942. He became a Warrant Officer in 1946, and in the same year he was allocated the callsign G3CCN. He was promoted to Squadron Leader in 1968. During the last three years he had acted for the Royal Air Force Amateur Radio Society as secretary, and lately as treasurer.

Harry was extremely active on ssb while in DL, VS1 and 9V1, and operated the RAFARS Headquarters Station, G8FC. He believed in home constructed gear, and was actually building a 2m transceiver just before he died.

Only those who have had personal contact with Harry can appreciate what a pleasant, happy and helpful chap he was at all times.

A memorial service was held in the Church of St George at RAF Locking, followed by cremation at the Weston-super-Mare Crematorium. The RSGB, the RAFARS and the W-S-MRS were represented at the service by many radio amateurs from near and far.

We extend our heartfelt sympathy to his widow, Muriel, and his daughters, Wendy and Gail.

J.T.

Mr A. L. Clare, G6AX

The death of Mr A. L. (Bert) Clare, G6AX, in his 72nd year, occurred in hospital on 15 January 1970. Mr Clare was licensed in 1928, and had been almost continually active, mostly on top band cw. He was a member of FOC.

Wounded in the first world war on his 19th birthday, he had been incapacitated ever since, and could only get about with extreme difficulty. His knowledge and his operating ability were put to good use throughout the second world war.

He was a true amateur in every sense, always ready to help to the limit of his capabilities.

He is survived by his widow, Edith, and daughter, Pamela, to whom sympathy is extended. His funeral was attended by G6QA, G6ZS (brother-in-law), G3JAG and G3BN.

A.E.S.

E. G. H. Brown, G5BJ

With the passing of George Brown at the age of 69, amateur and professional radio has lost one of its most able enthusiasts. In his time an outstanding dx operator whose call sign appears in log-books in most countries of the world, George was not only well known and respected throughout the amateur world but also the radio communications industry as a whole. He was a kindly man, always ready to help anyone with a radio problem and frequently in demand as a speaker on "Amateur Radio". He was a founder member of MARS, a member of the FOC and RAOTA, and a Freemason of the Lodge of Goodwill, No 3899.

He was a competent and practical technician who initially came into the industry through his association with New Era Wireless of Small Heath, Birmingham. Later he joined Stratton & Co Ltd and was one of the original Eddystone team who designed and engineered a wide variety of communications equipment for the amateur and professional markets at home and overseas. In the last war George advised and assisted the Birmingham City Police in implementing their wireless network.

Following his retirement George was able to devote more time to his hobby of amateur radio but, regrettably, his health was not of the best and in recent times his dx activities lessened, although he continued to maintain close personal contact with radio friends, many of whom attended the funeral service. These included G2AK, G2LB, G2RQ, G2CNW, G3AY, G3BA, G3DO, G3EKN, G3FPI, G3KCA, G3HBE, G3USA, G5FH, G5LJ, G5VM, G6KI and G8IK.

To his widow and family the radio fraternity extends its deepest sympathy.

A.C.E.

Mr C. Wrigley, G5WR

Mr Cecil Wrigley, G5WR, died on 2 January 1970 at his home, 5 Beech Ave, Urmston, Manchester.

He was first licensed in the 1920s and had been an RSGB member for many years.

He moved to New Zealand eight years ago, where he was ZL1VR, and returned to the UK in April 1969 when his health began to fail. Just prior to his death he was in the process of starting up on the air again.

T.C.

YOUR OPINION

The Editor

Radio Communication

Sir—I would like to comment on the RAEN frequency correspondence in your February issue. As the Society's vhf manager and a RAEN controller for the south-east London area, I can claim to have a foot in both camps, representing on the one hand vhf-band operators in general and on the other hand a typical local RAEN organization.

My suggestion for the 70MHz band is to have a common national channel to permit inter-group communications whenever required, together with special local group frequencies chosen on a minimum interference basis. I suggest a national channel as 70-350MHz, with local channels between that frequency and the top of the band.

(Allowing for conformance with the band plan by avoiding the beacon sub-band 70-675-70-7MHz). In south London we have chosen two "local frequencies", 70-47 and 70-65MHz; and we have observed that the top of the band has less usage anyway, whereas the 70-35-70-38MHz band is now overcrowded to saturation in south-east England.

Regarding the 144MHz band, again I urge conformance with the new band plan. This can be achieved by deciding a new national RAEN channel, for which I would welcome suggestions. This could be added to by zone RAEN channels (four zones) with local groups operating on frequencies in the zone band plan. Thus for any one group to be able to operate anywhere in the country two channels only would be essential, with three desirable. As the requirement for national mobility is unlikely in practice, two channels would suffice.

If members would contribute their views the VHF and RAEN committees can plan together for the maximum benefit of all 4m and 2m band operators—the object being the minimum mutual interference to all concerned.

Yours faithfully,

G. M. C. Stone, G3FZL

YOUR OPINION

The Editor

Radio Communication

Sir—Whilst in QSO with three white stick operators the other day I learned that while they were helped by the appropriate organization for blind operators with things like audible tuning units etc, they would like to have certain other items such as crystal controlled vfos made. As it is impossible for them to do the construction, themselves they would very much appreciate it if some sighted chaps could do this for them, for which they would supply the parts.

It occurred to me that a letter to your worthy magazine might bring forth some sort of response in the way of volunteers, possibly under the auspices of the RSGB. A stock of various audible aids could be made up and held in someone's care and they could then be made available to sightless amateurs on indefinite loan on application.

One or two lads on 80m have expressed their willingness to help in this matter. I would be pleased to hear from anyone interested in the idea.

Best wishes to your magazine and greetings to all my buddies on the bands.

Yours faithfully,

Allan Warburton, G3WPL

The Editor

Radio Communication

Sir—How I agree with N. H. Sedgwick, G8WV—February issue! I am afraid we are in the wilderness in this rude, permissive and technological age.

I started playing with amateur radio so many years ago that I shudder to think of it then and now. I started in the "crystal age" with 2LO, 5XX, Radio Paris etc, reaching the stage of the eight valve superheterodyne the size of the average kitchen table with hordes of Leclanche cells for the ht. I will even admit to having transmitted the most awful sparks without a licence to a waiting friend some few miles away. As our splatter was probably some metres wide the visitor from the GPO duly arrived—to tell me not to be a naughty boy and then spend some while viewing the equipment and talking radio. Any ideas of confiscation would have been very badly received by my mother—it would have left such nasty holes in the window and walls of my bedroom!

I left amateur radio, but still think of my greatest thrill. Living in Spain at the time, I had a QSL confirmed by 3LO Melbourne and heard the nightingales from the Oxted Woods near my home in the same evening—on a two valve TRF in which the League of Nations was deeply involved in the manufacture of the few components which were not home made.

My interest was aroused again some four years ago when I bought a family transistor set which happened to cover the 15m amateur band. Being completely out of touch I was intrigued with the Donald Ducks and could not understand that at all. This set me off converting a very old "4 + 1" to hf, followed by a receiver with bfo and then on to an AR88D.

It seems now that the achievement is not dx as such but to sort out the interesting from the ghastly racket of spurious emissions from the jammers all mixed up with some friends using amateur radio as a commercial channel with "phone patches" of 1kW or more. Regrettably I have now gone to a well-known Japanese general coverage set to keep the interest alive but have given up any idea of a transmitting licence. No doubt with expensive equipment one can achieve something, but how many times have I heard an interesting QSO destroyed by some ill-mannered individual persisting in calling one of the operating stations in full chat? I have an interesting amateur nearby who affords me great amusement at times with his old-style QSOs—NOT the dreadful contest type—but when he mentions his equipment the cost is quite frightening!

One must never become a "Wowser", but with the joys of amateur radio, motoring, and, it seems, inshore sailing almost swamped by sheer weight of numbers, I wonder what comes next for the amateur?

Yours faithfully,

C. F. Adam, BRS29680

The Editor

Radio Communication

Sir—I have been reading the articles on G3HVA's tvi-proof transmitter with great interest—he is to be congratulated on the dual achievement of making it and writing it up. However, in the February issue he says: "The . . . cable from the pa to the low pass filter should not be an exact multiple of $\lambda/4$ at the television frequency."

I believe that $\lambda/4$ is the best length, and $\lambda/2$ the worst, because at tv frequency a pi tank has a very low output impedance, and the cable will be very poorly matched. Low-pass filters always start with a shunt section (why?) which will give high attenuation when fed from a high impedance source, but little attenuation when fed from a low impedance. Consequently a quarter wave transformer is desirable to give the filter something to bite on.

I would like to add one item to G3HVA's list—eliminate all metal to metal joints in clothes lines near the aerial. Rust is a very good rectifier.

Yours faithfully,

R. C. Marshall, G3SBA.

The Editor

Radio Communication

Sir—As a keen radio listener I would be interested to know how a pirate radio station called Radio Britannia has maintained illegal transmissions regularly every Sunday since last May. I have seen many reports of pirates being caught, but none on this one.

This station has invariably broadcast half-hour programmes, and last Christmas Day remained on the air for an hour.

I have recorded the frequency many times, and at all times it has remained the same—1,183kHz, approx 254m.

The illegal operators cover a wide area; I personally have heard their transmissions in both Burgess Hill and Brixton, as well as at my home address.

How can a station with such power and cheek remain on the air regularly without being stopped. Is the Post Office less concerned about silencing medium-wave pirates?

Yours faithfully,

D. Mitchell

The Editor

Radio Communication

Sir—Page 91 of the February *Radio Communication* referred to carbon tetrachloride, which I regard as just as dangerous as the phosgene gas it can form.

As a Fellow of the Royal Society of Health, I would like to warn all prospective users of this liquid **not** to inhale the vapour. It can be a fatal poison; by destruction of the liver or disease of the kidney.

References: *Ohio State Med. Journal* 43 (1947). *Ind. Hyg. News* 9 (1949) 4.

The vapour can also cause blindness through atrophy of the optic nerve.

Ref: Smith, R. A. *Ibid.* 1 (1950) 90.

Yours faithfully,

C. F. Robjohns, G8CBZ

The Editor

Radio Communication

Sir—Mr Sedgwick's philosophy is pleasant (*Radio Communication* February 1970, p73) but to my mind his thinking is at fault. Can we finally dispel the idea that contests consistently annihilate our frequencies?

There are just seven weekends out of the year's 52 when contests severely affect the amateur bands. Four of these are the phone sections of the ARRL Competition, the CQ World Wide Contest and the CQ WPX contest. The other three are the cw sections of the ARRL and World Wide events. None of the other contests in the calendar have more than a trifling effect, being either limited frequency or area events.

It is quite noticeable that these seven weekends are the only times in the year when the sheer weight of amateur activity keeps our bands reasonably free of commercial interference. Surely that must make you happy, Mr Sedgwick?

Yours faithfully,

L. Margolis, G3UML

CONTEST NEWS

Rules for VHF NFD 1970

There have been several changes in the rules for this event. Rule 9, dealing with setting up time, has been clarified. The radial scoring system has been modified as in the general rules for other vhf contests and the band multipliers have been revised. Rule 12(c) has been introduced to make the exchange on 1,296MHz equal to that on the other bands. In the past the location given on 1,296MHz could be identical to that which had probably been given only minutes before on 432MHz.

The 2,300MHz and higher frequency bands have been omitted from the contest. It is hoped that uhf/shf enthusiasts will take part in the IARU Region 1 UHF/SHF Contest to be held on 3-4 October, rules for which will be published shortly.

Groups wishing to enter the IARU Region 1 VHF Contest, which co-incides with VHF/NFD should note Rule 19. Entries for Fixed Station sections of the IARU event should be sent to the address given in Rule 20.

1. Duration

From 1800gmt on 5 September to 1800gmt on 6 September.

2. Bands

The 70MHz, 144MHz, 432MHz and 1,296MHz bands only will be used.

3. Eligible entrants

Any RSGB member or group of members operating within the British Isles may take part.

4. Operators

(a) Operators of stations taking part in the contest must each hold a current British Isles amateur (sound) licence and must be fully paid up corporate members of the RSGB at the time of the contest.

(b) Points may not be claimed for contacts with stations operated by, or using the call signs of, operators of the competing station or group of stations.

5. Power supplies

Stations may not use public supply mains. Power for all equipment must be derived from an on-site portable generator or battery.

6. Stations

Each competing group will be permitted a maximum of three stations, each using a different call sign. Only one station may operate on a given band. There is no restriction on the way in which the bands are divided between the stations. (eg 70MHz and 432MHz on one station, 144MHz on another, to form a two station entry). Special event call signs (eg GB) may not be used.

7. Sites

All the stations forming one entry must operate from the same site. The field day site is defined as a circle of 1km radius centred on the operating position of any of the stations.

8. Groups

Any two groups may combine their score to form one entry, subject to the requirements of Rules 6 and 7.

9. Setting-up time

All equipment, including aerials, must be installed on the site (as defined in Rule 7) during the 12 hours preceding the contest or during the contest. The site may not be used for any transmitting activities by the group or member during the seven days before this time.

10. Power

The dc input power (as defined by the terms of the licence) shall not exceed 25W to any rf stage of the transmitter.

11. Scoring

(a) On the 70, 144 and 432MHz bands, contacts will be scored as follows:

km	Points	km	Points	km	Points
0-50	1	200-300	10	600-700	26
50-100	3	300-400	14	700-800	30
100-150	5	400-500	18	800-900	34
150-200	7	500-600	22	900-1,000	38
				over 1,000	50

(b) Band multipliers will be applied as follows:

70MHz-4, 144MHz-3, 432MHz-12.

(c) On 1,296MHz scoring will be at one point per kilometre plus 20 points per QSO.

12. Contest exchanges

(a) Contestants must exchange RS or RST reports followed by a serial number. Serial numbers start at 001 on each band and advance by one for each contact.

(b) Contestants must send and log both QTH and QRA Locator. The QTH must be a point which is identifiable on the Ordnance Survey Ten-mile Map, or a distance in kilometres and a bearing from such a point. The distance must not exceed 25 kilometres and should be given to the nearest kilometre. The QRA Locator is the standard location fixing system.

(c) The QTH given on 1,296MHz must differ in form from that given on the other bands, eg a location given as "10km north of Marlborough" on 432MHz could be given as "8km south-east of Swindon" on 1,296MHz.

13. Contacts

(a) Only one contact may be made with a given station. (ie call signs that are fixed, /P, /A or /M, or the same set of equipment used under a different call sign, all count as one station). If a station that has moved location is contacted a second time, only the higher scoring contact may be claimed.

(b) Repeat contacts must be clearly marked as such and the points column left blank.

14. Calling CQ

Contestants are asked to indicate on which band they are calling CQ and are strongly urged to state their tuning intentions, and to call CQ in the frequency zone as defined in the October 1969 *Radio Communication*.

15. CW segments

Any station operating on modes other than A1 or F1 in the segments 70-025-70.1, 144-144.15, 432-432.1 or 1296-1296.15MHz is liable to be disqualified.

16. Defective signals

Stations that persistently overmodulate, radiate key clicks or poor quality signals, or transmit excessive harmonics, are liable to disqualification or loss of points. Monitoring stations will be in operation.

17. Proof

Proof of contacts may be required.

18. Disputes

The decision of the Council of the RSGB is final in any case of dispute.

19. Logs

(a) Logs must be submitted on RSGB Contest Log Sheets. Separate logs must be submitted for each band. Groups wishing to have their logs forwarded to the IARU Region 1 VHF Contest should enter the distance in kilometres in the points column and the score as Rule 11 on the rear of the sheet.

(b) Entrants must keep their own log records in accordance with the licence requirements.

20. Entries

(a) Entries must be post-marked not later than 21 September 1970.

(b) Entries must be marked VHF NFD in the top left hand corner of the envelope and addressed to: The Secretary, VHF Contests Committee, 60 Merlin Grove, Beckenham, Kent BR3 3HU.

(c) A cover sheet (Form 427) must be made out for each band and must show the call signs of all operators.

(d) In addition to the Forms 427, a special summary sheet must be forwarded, even by single band entries. The declaration must be signed by one member of the group, who will be considered responsible for the entry.

21. Awards

At the discretion of Council, the Surrey Trophy will be awarded to the overall winners, and Certificates of Merit will be awarded to the overall runner-up, the leading entry from each country and the highest scoring station on each band.

28MHz Telephony Contest 1969

The 28MHz telephony contest held last October was won by Hal Perkins, G3NMH, for the second year running. Though his points total is lower on this occasion, the margin over second place is almost the same. Second position is a repeat performance also, by L. Margolis, G3UML, though his clearance over N. Cawthorne, G3TR, in third place is greater than last time.

Conditions on 11-12 October were mixed, being particularly poor on the first day. Apart from a few home stations in the south and south-east of the UK, no one made an overseas contact until 0945. This time became later the further north and west the QTH was situated. GW3NNF did not hear a thing for the first five hours. Even where early contacts were made, only three or four were managed until around 0945. For the rest of the first day, contacts made were limited in number, as Table 1 shows.

Practically all contacts made on Saturday were with African and Asian stations, with a few VK and VP8 stations added. Nothing

was heard of the USA, Canada or Central America. They came to light on Sunday, which showed an all round improvement.

The poor conditions on the first day possibly contributed to the lower number of entries from home and overseas operators. The receiving section maintained its popularity—the winner again being J. Skidmore, BRS26431, with a 90 point margin over P. N. Lewis, BRS30258. BRS26431 heard 233 contacts over the weekend, 173 being on the Sunday.

Despite having to rely on the rules passed over the air, D. R. Taylor, 9J2DT, took first place in the overseas section. His total of 2,342 points gave him a 600-point lead over UB5KIW operated by V. N. Olejnik. UB5KIW actually made all his contacts (211) on the second day.

Third in the overseas section, closely contesting the Ukrainian station, was N. Henwood, 5Z4LS, operating from Nyeri, Kenya.

Comments from competitors are mainly concerning the conditions, and one or two regarding the scoring, though from several receiving stations there is a possibly justifiable complaint. This concerns

TABLE 1

Callsign	Time of first contact	Number made before 0940	Number made on Saturday	Number made on Sunday	Bonus contacts	Aerial	County
G3NMH	0942	—	79	327	73	4-ele quad at 74ft	WE
G3UML	0700	5	76	224	73	Hy-gain TH-4	EX
G3TR	0724	6	63	244	67	T.A33 Junior at 40ft	SY
G3WBN	0707	4	64	254	60	Mosley Elan at 72ft	SX
G3SME	0702	4	60	177	67	3 Ele quad	SY
G3WNNF	0706	4	53	192	61	3 Ele quad	HN
	1201	—	21	139	48	2 Ele quad at 37ft	AG

UK TRANSMITTING

Posn.	Callsign	Points	Posn.	Callsign	Points
1	G3NMH	5647†*	20	G3ILO	3070
2	G3UML	5024*	21	G3XYP	3025
3	G3TR	4817*	22	GW3NWW	2885
4	G3WBN	4549	23	G2NH	2430
5	G3SME	4532	24	G3KSH	2190
6	G2QT	4280	25	G3KWH	2030
7	GW3AHN	4195	26	G3NEO	1945
8	G3OZF	4145	27	G5DZ	1755
9	G3TZU	4135	28	G3NVL	1687
10	G3NAS	3775	29	GC3XOJ	1530
11	G3UQR	3765	30	G13VAW	1495
12	GC5AGA	3730	31	G3YFZ	1242
13	G3WTV	3685	32	G2AJB	1110
14	G3HCU	3485	33	G3UKH	940
15	G3WJN	3390	34	G3XAP	905
16	GW3NNF	3297	35	G3UMV	810
17	G3VU	3200	36	G2FNK	580
18	G3KMA	3109	37	G8KU	350
19		3105			

UK RECEIVING

Posn.	Identification	Points	Posn.	Identification	Points
1	BRS26431	4101†*	20	BRS26003	2105
2	BRS30258	4010*	21	A5466	2005
3	BRS21008	3797*	22	A5877	1975
4	BRS24957	3445	23	BRS31341	1870
5	A6148	3280	24	BRS25207	1735
6	BRS29720	3005	25	BRS28005	1730
7	BRS25429	2940	26	BRS31270	1700
8	A6003	2935	27	A6593	1625
9	A5032	2835	28	BRS27806	1530
10	BRS29473	2810	29	A6023	1470
11	BRS26407	2740	30	G-6903	1370
12	A5904	2615	31	A6495	1275
13	BRS25605	2580	32	A6152	1270
14	A5643	2530	33	A6491	1155
15	BRS30577	2455	34	BRS28201	1085
16	BRS29812	2410	35	BRS29592	885
17	BRS30628	2370	36	A6345	770
18	BRS26234	2310	37	A6466	615
19	A6274	2145			

the bad habit of not using phonetics or not repeating the callsign of the station contacted, especially European or other foreign stations. B, D, E etc can sound remarkably alike when said quickly in the rush of contest contacts. This is borne out in the number of points lost through one digit being wrong in the operators' logs.

The HF Contests Committee wishes to record its thanks to the following for their always acceptable check logs: A6411, CR7FR, G3FVA/A, G3NXT, HC2LF, UA3BB, UW4NH, YV5BPG.

OVERSEAS TRANSMITTING

Posn.	Callsign	Points	Posn.	Callsign	Points
1	9J2DT	2342*	27	UI8LJ	730
2	UB5KIW	1748*	28	OD5BA	729
3	5Z4LS	1729*	29	KP4CL	695
4	ZS6ACK	1600	30	UY5HI	675
5	ET3REL	1590	31	CX2CN	655
6	OD5BZ	1535	32	ZS5PG	635
7	5N2AAF	1485	33	9M2DQ	595
8	5B4ES	1367	34	KP4DCR	560
9	UT5AM	1240	35	UW3DH	545
10	UA3NUE	1225	36	CR6LV	475
11	VP8KD	1115	37	UA4RL	450
12	UA4CO	1097	38	PY4KL	387
13	ZC4GM	1020	39	HP1JC	357
14	UW6LC	1015	40	W0MGI	337
15	UA6JWW	947	41	KZ5II	335
16	UW4CF	935	42	W5OJZ	327
17	UW6FB	905	43	VK6KK	320
18	UA4CD	900	44	WA5TYF	285
19	UA6BL	900	45	UV3MM	280
20	VP8JT	880	46	CR6LX	275
21	K4TWK	874	47	PY1BAR	270
22	VK6CT	865	48	UB5EM	260
23	UW3IN	860	49	UV6AD	260
24	WC4GSC	825	50	CR7IZ	200
25	VE3BMB	810	51	SM0AJU	120
26	UJ8AAC	795			

OVERSEAS RECEIVING

Posn.	Identification	Points
1	UB5-073-389	925*
2	UA-409-476	735*
3	UP2-038-83	425

† Trophy winner

* Certificate winner

High Power Field Day 1970

This field day is still being organized on an experimental basis, and its future will largely depend upon the amount of support which this year's event receives.

1. **The General Rules for RSGB HF Contests**, published in the January 1970 issue of *Radio Communication* will apply.

2. **When**—From 1700gmt on Saturday 11 July to 1700gmt on Sunday 12 July 1970.

3. **Eligible entrants**—Any group of RSGB members resident in the British Isles, or any affiliated society either in the British Isles or overseas.

4. **Stations**—Each group may operate one portable station on any, or all, of the 3.5, 7, 14, 21 and 28MHz bands.

5. **Power**—The dc power input to the final stage of the transmitter must not exceed 150W.

6. **Contacts**—CW (A1) only.

7. **Scoring**—Three points for each contact with a fixed station, and six points for each contact with a portable station.

8. **Entries**—Must be addressed to HF Contests Committee, c/o R. Biggs, G2FLG, 29 Lord Avenue, Clayhall, Ilford, Essex.

May 1970 144 MHz Portable Contest

This contest has been divided into two sections, one to coincide with contests being held in other parts of IARU Region 1, and the other restricting operation to the Sunday. It is hoped that this arrangement will satisfy the die-hard portable operators and also those with less time to spare for these events.

Section 1 1800gmt on 2 May to 1800gmt on 3 May

Section 2 1000 to 1800gmt on 3 May

All entries and checklogs must be sent to the adjudicator, addressed to: VHF Contests Committee, c/o G2DQ, Tudor House, Renny Royal Road, Danbury Common, Chelmsford, Essex.

Contests calendar

7-8 March—ARRL Phone Contest (second part)

7-8 March—BERU

7-8 March*—144MHz Open

21-22 March—ARRL CW Contest (second part)

23 March—432MHz Cumulative Fifth and Final Round

28 March-19 April—IARC Propagation Research Contest (Phone)

5 April—Low Power 80m

11-12 April—70MHz Open

26 April—DF Qualifying Event, Derby

2-3 May*—144MHz Portable Long Section

3 May—144MHz Portable Short Section

17 May—DF Qualifying Event, Grimsby

30-31 May—432MHz Open

6-7 June—HF NFD

14 June—Microwave Contest (1,296MHz and up)

14 June—DF Qualifying Event, Salisbury

21 June—70MHz Portable

28 June—DF Qualifying Event, High Wycombe

4-5 July—Summer 1.8MHz

4-5 July*—144MHz Open

11-12 July—High Power HF Field Day

19 July—DF Qualifying Event, Stratford

26 July—432MHz Open

9 August—DF Qualifying Event, Chelmsford

10 August—144MHz SSB

15-16 August—70MHz CW

5-6 September*—VHF NFD and IARU Region 1 VHF Contest

13 September—80m Field Day

20 September—DF National Final, Slade

3-4 October*—IARU Region 1 UHF/SHF Contest

10-11 October—28MHz

24-25 October—7MHz CW

7-8 November—7MHz Phone

7-8 November—144MHz CW

14-15 November—Second 1.8MHz

6 December—144MHz Fixed Station

* To coincide with IARU Contests

RADIO AMATEUR EMERGENCY NETWORK

By S. W. LAW, G3PAZ*

Human nature being what it is, we are inured to the layman who eagerly enquires as to our contacts with distant lands—and turns away disgusted when we admit to an occasional natter with a friend 20 miles away. Similarly, note the quickened breath, the wetted lip and the gleaming optic when RAEN is mentioned—and the even more disgusted air when no blood and thunder deeds of daring are forthcoming!

The passing of messages over an 11-mile path from an unsafe block of flats in Kidderminster to the reception centre in Droitwich sounds small beer to the sensation seekers, but we say "Good show, chaps" to the Mid-Severn Valley Group for their call-out by the Mercia Police on 15 January. The band was 2m; 4el and 8el Yagis at about 20ft were used, and the local VCAS gave support over the ten-hour period.

Hidden hazards

The example above gives one to think of the potential of our service in spheres not always self-evident. Not all people are aware of the constant stand-by of the WRVS in parts of London at times of threatened high tide on the Thames. Elderly and infirm folk have to be moved to places of safety in case floods should occur; then moved back when the danger has passed. No use waiting until the water floods over. A moment's thought will show the use of communications here and the need for a great deal of work at high level to legitimately broaden our scope.

RAEN Committee

At the meeting held on 31 January the hon chairman and hon secretary were re-elected unanimously, and the committee reconstituted as before. The appointment of Mrs Balestrini as hon registrations secretary was confirmed. Apologies for absence were read from GM3LTW, G6NZ and G2ABC (whose optical troubles are slowly being overcome). The subjects covered included new registrations, new groups, non-registered members (even the odd controller! Sent your card in yet?), licensing, message procedure and the availability of equipment. Despite the wide range of business things moved along and the session closed after four-and-a-half hours.

Armbands

A new supply of armbands has now become available, but the price has unavoidably risen to 3s. Still a bargain we think but please try to include a suitable sum for postage when applying to the hon registrations secretary.

Meetings

For those interested in voluntary civil aid, a meeting and conference on "Civil Disaster" is to be held at Billings Aquadrome, Northampton, on Sunday 17 May. In Kent a meeting being held at the "Y" Sports Centre in Maidstone on 3 March will include a run-down on the winter exercise on 22 February, which we understand had an interesting narrative. Incidentally, rumour has it that the Manchester Group caravan may be present at the VCAS show at Northampton.

Hi?

How high is line-of-sight? Greetings to new member A. G. Scott at the peak of his career—the *Sark Lighthouse*!

Honorary Registrations Secretary:

Mrs. Jane Balestrini, "Merrivale", Willow Walk, Culverstone, Gravesend, Kent.

Honorary Secretary, RAEN Committee:

Mr. E. R. L. Bassett, 57 Upper St. Helens Road, Hedge End, Southampton, SO4 4LG.

* 130 Alexandra Road, Croydon, Surrey, CRO 6EW.

RSGB SLOW MORSE PRACTICE TRANSMISSIONS

These slow Morse practice transmissions are sponsored by the RSGB. Alterations and additions to this list should be sent to the honorary organizer, M. MacBrayne, G3KGU, 25 Purlieu Way, Theydon Bois, Essex.

Clock Time	Call-sign	MHz	Town
Sundays			
09.30	G3TNF	1-920	Gateshead
09.30	† G3KZZ	1-920	South Shields, Co. Durham
10.00	† G3WNR	1-920	
09.30	G3HZL	1-940	Isleworth, Middlesex
09.45	G3USK	1-975	Mablethorpe, Lincs.
10.00	G2FXA	437-000	Stockton-on-Tees
		to North	
10.15	G3CGD	1-875	Cheltenham
10.30	G2FXA	437-000	Stockton-on-Tees
		to South	
10.30	G3NPB	1-875	St. Ives, Cornwall
11.00	G2FXA	1-900	Stockton-on-Tees
11.00	GW3UMB	1-880	Colwyn Bay
11.30	G3KKU	1-940	Liverpool
11.30	GW3VPL	1-918	Porthcawl, Glam.
12.00	G3HVI	1-890	Stoke-on-Trent
12.00	G3GNS	1-910	Weston-super-Mare
13.30	G3FWW	1-880	Burnham-on-Sea, Soms.
13.30	G3XDV	1-910	Canterbury, Yorks.
14.00	G3XGJ	1-830	Huddersfield, Yorks.
17.30	G3TN	1-920	Gateshead
19.30	G3YFO	144-19	Burnham, Bucks.
	† Alternately	to South	
Mondays			
17.30	G3TNF	1-920	Gateshead
18.00	G3SWR	1-980	Birmingham
18.30	G3NCZ	1-920	Blackburn, Lancs.
18.30	G3RXH	1-910	Skipton, Yorks.
19.00	G3WGU	1-880	Blispham, Lancs.
19.00	† G4LI	3-600	Jersey, C.I.
	† G2FMV		
19.00	G3YJA	1-920	Coventry, Warks.
20.00	G3KAN	1-990	Northampton
20.00	G3IBJ	1-910	Southampton, Hants.
20.00	† G3WDW	1-915	Leeds, Yorks.
	† G3VTY		
20.00	G3JEX	1-855	Belfast
20.15	G3YMH	1-845	Wraybury, Middlesex
20.30	G3YEB	1-915	Harlow, Essex
20.30	G3JHM	70-050	Worthing, Sussex
	† Alternately		
Tuesdays			
17.30	G3TNF	1-920	Gateshead
18.00	G3XDV	1-910	Canterbury, Kent
19.00	† G3UFO	1-980	Wirral, Cheshire
	† G3XAM		
19.30	G3SWP	1-850	Doncaster, Yorks.
19.30	G3WGU	433-500	Blispham, Lancs.
		to South-East	
20.00	G3UPA	1-850	Meriden, Warks.
20.00	† G3FAU	1-980	Stevenage, Herts.
	† G3KSS		
	† G3QVT		
20.00	G3FWW	1-880	Burnham-on-Sea, Soms.
20.00	GM3UWX	144-045	Blispham, Renfrewshire
20.00	G3WGD	1-860	Leicester
20.00	GM3PIP	3-590	Mintlaw, Aberdeen
20.30	G3HZL	1-845	Isleworth, Middx.
20.30	G3PRN	1-915	Harlow, Essex
21.00	G4RS	1-865	Blandford, Dorset
22.00	G3HJM	1-925	Manchester
	† Alternately		

Wednesdays			
17.30	G3TNF	1-920	Gateshead
18.30	G2FXA	1-900	Stockton-on-Tees
19.30	G3WGU	433-500	Blispham, Lancs.
		to South-East	
19.30	G3YFO	144-19	Burnham, Bucks.
		to North	
19.30	G3UJD	1-825	Farnborough, Hants.
20.00	G8QU	1-970	London, N22
20.00	G3JHM	70-050	Worthing, Sussex
20.15	G3UNV	1-845	Ashford, Middx.
20.30	G3KGU	1-915	Theydon Bois, Essex
21.00	G3HVI	1-890	Stoke-on-Trent
21.00	G3XUS	1-970	Newhaven
	† Alternately		
Thursdays			
17.30	G3TNF	1-920	Gateshead
18.00	G3SWR	1-980	Birmingham
18.30	GW3VBP	3-590	Barry, Glam.
18.30	GW3UMB	1-880	Colwyn Bay
18.30	G3NC	1-968	Swindon, Wilts.
19.00	G3WGU	1-880	Blispham, Lancs.
19.30	G3GNS	1-910	Weston-super-Mare
20.00	G3JEX	3-590	Belfast
20.30	† G3SJE	1-875	Harrow, Middx.
	† G3GC		
	† G3ROE	1-915	Harlow, Essex
20.30	† G3RSF		
	† G3YMJ		
	† G3YFC		
21.00	G4RS	1-865	Blandford, Dorset
21.00	GW3XNI	1-930	Crosskeys, Mon.
	† Alternately		
Fridays			
17.30	G3TNF	1-920	Gateshead
18.00	G3XDV	1-910	Canterbury, Kent
18.30	G3NCZ	1-920	Blackburn, Lancs.
19.00	G3WRO	1-915	Romford, Essex
19.00	G3NPB	1-875	St. Ives, Cornwall
19.30	G3PQF	1-825	Farnborough, Hants.
20.00	G3EEL	1-980	Peterborough
20.00	G3WGD	1-860	Leicester
20.00	† G3KEP	1-910	Bingley, Yorks.
	† G3UCZ		Pudsey, Yorks.
	† G3WTF		Bradford, Yorks.
20.15	G3SAZ	1-845	Ashford, Middlesex
20.30	G3JHM	70-050	Worthing, Sussex
	† Alternately		
Saturdays			
09.30	G3UNV	1-835	Ashford, Middlesex
10.00	G3PLE	1-820	Stourbridge, Worcs.
13.00	G2FXA	1-900	Stockton-on-Tees
14.00	† G4LI	3-600	Jersey, C.I.
	† G2FMV		
17.30	G3TNF	1-920	Gateshead
19.30	G3EFS	1-913	Bromley, Kent
20.00	G3KPO	1-980	Peterborough
	† Alternately		

Members might like to be reminded that the Royal Naval Amateur Radio Society using their call-sign G3BZU, transmits cw as a proficiency test at 1900 gmt on the first Tuesday of each month. Frequencies used are 1-875MHz for practice only, and 3-520 MHz for speed proficiency tests. Certificates are issued against correct copy submitted to: The Royal Naval Amateur Radio Society, HMS Mercury, Leydene, Hants. A small charge is made to cover costs.

G2ABC, Woodford, Essex, is now making a series of test transmissions of slow Morse practice each Sunday at 1100BST on 29-00MHz to assess the service possibilities to listeners on a quiet band. Reports are requested from listeners, and solely on their response rests the continuance of these transmissions.

CLUB NEWS

Items for inclusion in this section should be sent to regional representatives on the first of each month for inclusion in the following month's issue. They should not be sent direct to the editor.

The date of publication of the following month's issue, first

Tuesday in the month, should be borne in mind so that events are not, in fact, history when the details are published. While regional representatives are pleased to receive clubs' events calendars for several months ahead, they still require monthly events lists so that entries can be confirmed or amended.

Region 1 RR B. O'Brien, G2AMV

Merseyside Luncheon Club—First Monday in every month, 12.30 for 12.45, HMS Landfall. Please advise G3VQT or G2AMV of attendance.

Ainsdale (ARC)—4 March (to be announced), 18 March ("Aerials", by G2DQX, 1 April (Quiz by G3VNO), 8pm, The Morris Dancers, Scarisbrick.

Allerton (Liverpool) Scout Amateur Radio Society, North West Region—First and third Thursdays each month, 8pm, Liverpool County Scout Headquarters, Richmond Street, Liverpool.

Blackburn (ELARC)—5 March (Film show: Shell Mex & BP, "The Titans" and "A light in nature"), 2 April ("Printed circuits", with demonstration, by A. E. Critchley, G3SXC), 7.30pm, Edinburgh House, Shearbank Road, Blackburn. Further details from G4JS.

Blackpool (F & FARS)—Mondays, 8pm, Pontins Holiday Camp, Squires Gate. Morse tuition at 7.30pm.

Bury (B & RRS)—Second Tuesday in each month with an informal meeting on the fourth Tuesday, 8pm, The George Hotel, Private Room, Market Street, Bury. Club Secretary G3VVQ, 411 Holcombe Road, Greenmount, Bury.

Cheshire (Mid Cheshire ARC)—Every Wednesday, 7-8pm (RAE course by Ken Starnes, G3JWK, Alan Rigby, G3FGI, and Brian Moore, G8CFY), 4 March ("The Oscilloscope", by Brian Moore, G8CFY), 11 March ("Aerial systems and tuning units", by Alan Rigby, G3FGI), 18 March ("Conversion of receivers for D/F contest", by George Baines, G3MNM), Sunday 22 March (D/F contest), 25 March ("2m receivers and converters", by George Baines, G3MNM). Technical Activities Centre, Winsford Verdin Grammar School, Grange Lane, Winsford.

Chester (C & DARS)—Every Tuesday except the first in the month which is net night on 160m and 2m. 10 March ("Short-wave listening", by G3OWY), 17 March ("Back to Square One", by G3ATZ), 24 March ("Intruder watch and monitoring", by G3EWZ), 2 April (Club dinner at Queen Hotel, Chester). 8pm, YMCA, Chester. Further details from G8AYW.

Douglas (D & DARS)—Second and fourth Wednesdays each month, 7pm, 19 Rosemount, Douglas. Further information from W. T. McEvoy at the same address. Telephone Douglas 6146.

Eccles (E & DRC)—Tuesdays, 8pm, Bridgewater School, Worsley, Lancs. Thursday—Club top band net, 2030gmt.

Leyland Hundred Amateur Radio Group—Thursday night net at 2000gmt on 1-915MHz.

Liverpool (L & DARS)—Tuesdays, 8pm, Conservative Association Rooms, Church Road, Wavertree. 3 March (Business meeting), 10 March (Project Night). Secretary: H. James, G3MCN, 448 East Prescott Road, Knotty Ash, Liverpool 14.

Liverpool (NLRC)—13, 27 March, 8pm, Labour Party Headquarters, 13 Crosby Road South, Liverpool 22. Secretary: Peter Jeffs, 38 College Road North, Liverpool 23. Telephone 051-924 3020.

Macclesfield (M & DRS)—10, 24 March, 7 April, 8pm, The George Hotel, Jordansgate.

Manchester (M & DARC)—Wednesdays, 7.30pm, 203 Droylesden Road, Newton Heath, Manchester 10. At the AGM on 7 January a new committee was elected headed by Steve Fisher as Chairman. Barrie Langfield, G3IOA takes up the reins of secretaryship after absence of some years. Tom Cook continues as treasurer. It is proposed to arrange a series of mini-lectures on basic subjects in the near future.

Manchester (SMRC)—Fridays, 8pm, Conservative Association Divisional Office, 449 Palatine Road, Northenden, Manchester.

North West VHF Group—Mondays, 8pm, in the Club Caravan, Greeba, Shady Lane, Manchester 23.

Preston (PARS)—5, 19 March, 2 April, 7.30pm, (Private room)

"Windsor Castle", St Paul's Square. Secretary: George Windsor, 26 St Gregory's Road, Preston.

Salford (Dial House Radio Society)—A society formed by GPO Engineers meets Wednesdays, 6pm, 8th Floor, River end of Dial House. Any GPO Engineer who is interested should contact the secretary at Dial House, Chapel Street, Salford 3.

Southport (SRS)—Wednesdays, 8pm; Sundays, 2.30pm, The Esplanade. Secretary: S. Miller, 72 Station Road, Banks, Southport.

Southport (73 SSB Society)—Thursdays at 8pm. All meetings start with a talk on part of the RAE syllabus and are at 73 Avondale Road, Southport.

Stockport (SRS)—4, 18 March, 1 April, 8pm, Brookfield Hotel, Wellington Road, South Stockport. New members welcome. Secretary: D. I. Lunn, G3LSL, 4 Farnham Avenue, Macclesfield (Tel 7903).

Warrington, Culcheth (CARC)—Fridays, 7.30pm, Chat Moss Hotel, Glazebury. All visitors welcome. Secretary: K. Bulgess, 32 Hendon Street, Leigh.

Westmorland—Fridays, 7.30pm, 24 Park Road, Milnthorpe. The AGM of the Westmorland Radio Society will be held at the Coach & Horses, Coach Lane, Milnthorpe, on Friday 20 March at 7.30pm. Refreshments will be available at reasonable prices. Secretary: Jim Forrester, 44 New Street, Carnforth.

Wirral (WARS)—First and third Wednesday each month, Former Civil Defence Headquarters, Upton Road, Bidston, Birkenhead, at 7.30pm. 4 March ("Fifty years of Powered Flight"—Shell Mex film), 18 March ("Digital Techniques", by G3VYB). Secretary: Alf Fisher, G3WSD, 34 Glenmore Road, Oxton, Birkenhead.

Wirral (Wirral DX Association)—Meets on the last Wednesday in each month at members' houses. March; at G3VVA who will talk and show slides on his visit to British Columbia (VE7). At the AGM the retiring officers were re-elected en bloc. The association's recent phone contest was won by G3OKA followed by G3YFZ and G3UFO. The highest non-member entry came from G3YBH who was fourth. Secretary: G3OKA.

Region 2 RR K. Sketheway, BRS20185

Barnsley (B & DARC)—13 March ("2 metres" by K. Robinson, G8CMB), 27 March (no meeting), 7.30pm, King George Hotel, Peel Street, Barnsley. G3LRP.

Bradford (BRS)—24 March (AGM), 7.30pm, 10 Southbrook Terrace, Great Horton Road, Bradford.

Durham (DCARS)—12 March (The G3PDM Receiver), 7pm, Durham University's Elvet Riverside Arts Block, New Elvet, Durham.

Halifax (NHARS)—11 March ("RTTY" by D. Pratt, G3EP), 25 March ("Anodic treatment of aluminium", by K. Walton, G3IKS), 8 April (AGM), 7.45pm, Peat Pitts Inn, Ogden, Nr Halifax.

Hartlepool (HARC)—Meetings every Monday at 7.30pm. Mid February was a visit to the local ITA tx site. Due to increase in membership larger premises are being sought. G3NWU.

Hull (H & DARS)—13 March ("Building a linear from the junk box" by G3MVO), 20 March (Df event local, G3PQY), 27 March (Good Friday—No meeting). 7.45pm, The Clubroom, 592 Hessle Rd, Hull. All visitors most welcome.

North East Amateur Radio Group—The first meeting of the NEARG will take place in Durham City on Friday, 20 March. It will take the form of a lecture by G5RI entitled "Aerials", with practical demonstration. The Group is a Federation of many NE clubs but all in the North East are welcome as members. Further details, contact J. Melvin, G3LIV, 5 Lancashire Drive, Belmont, Co Durham, enclosing sae please.

North Riding (NRARG)—The group has just celebrated its first year of existence. The AGM was held in the Ship Inn, Scarborough, on 15 January with 16 licensed members attending. Officers elected were: Secretary, J. S. Jones, G3VLM; RAEN Organizer and VHF Contests Manager, E. Agar, G8AZA; HF Contests Manager, M. O'Rourke, G3WTV. Meetings are held in The Ship Inn, Falsgrave, Scarborough, every fortnight, alternately Tuesdays and Thursdays. G3VLM.

Northumberland (NRC)—The Northumberland Radio Club has been formed and its first meeting was held on 12 February in Ashington & District Club. The next meeting possibly held in Morpeth. Further details from the Secretary, J. E. Temple, G3XAI, 4 Coquetdale Place, Bedlington.

Scarborough (SARS)—Thursdays, 7.30pm, c/o RAF Association, Fulbeck House, 3 Westover Road, Scarborough.

Sheffield (SARC)—24 March (Discussion, NFD 1970), 28 April (AGM), please pay outstanding subs by 24 March! Our thanks to G3MDW and W1BB for very interesting tape lecture at the January meeting. G8NN.

South Shields (SS & DARC)—Meetings every Friday, 8pm, Trinity House Social Centre, Laygate, South Shields. The annual dinner was held on Saturday 24 January, and the judging of the constructional competition will be held in March, the actual date not yet decided.

Spenn Valley (SVARS)—5 March ("LF Amplifiers", by J. E. Sugden Ltd), 12 March ("Transistors at RF", by A. B. Yarker, G3TAY), 19 March (Visit to Beacon Glass Works, Morley), 26 March ("What's new?", by S. Matsden, West Riding Electronics Ltd), 7.30pm, The Grammar School, High Street, Heckmondwike.

Sunderland (SARS)—Meetings on first and third Tuesdays of each month at Sunderland Technical College, 7pm. G3XID.

York (YARS)—Thursdays, 7.30pm, in the British Legion, 61 Micklegate, York. The annual general meeting was held on 21 January and was well attended. K. Cass, G3WVO, was elected Chairman, W. H. Hodgson, G3WWH, Secretary, and J. Rainbow of 14 Temple Road, Bishopthorpe, Vice-Chairman.

Region 3 RR R. W. Fisher, G3PWJ

North Midlands Mobile Rally, organized jointly by Midlands Amateur Radio Society and Stoke on Trent Amateur Radio Society, 19 April 1970, Drayton Manor Park, Nr Tamworth, Staffs. G8ASW. Upton Mobile Rally, organized by Worcester and District Amateur Radio Club. G3VJN.

Club secretaries for further publicity of your programme, do not forget GB2RS on Sunday morning.

Birmingham (MARS)—10 March ("Vhf weather and propagation", by R. Rew), 7.45pm, Midland Institute, Margaret Street, Birmingham 3.

Bromsgrove (B & DARC)—Second Friday of each month, The Royal Oak, Barley Mow Lane, Catshill, Bromsgrove.

Coventry (CARS)—6 March (Night on the air), 13 March (Lecture on colour tv), 20 March (Night on the air, Morse practice), 27 March (Junk sale, bring and buy), Scout HQ, St Nicholas Rd, Radford, Coventry.

Dudley (DARC)—10 March (Visit to BBC, Sutton Coldfield), 24 March, 8pm, Central Library St James' Rd, Dudley, Club Station, Old Windmill, Vale St, Upper Gornal, Dudley, Worcs. G3PWJ.

Hereford (HARS)—6 March (Quiz night), 20 March ("Raynet", by G. Tibbetts, G3NUE), Civil Defence HQ, Goal St, Hereford. G3RJB.

Leamington (MWAE & RS)—2 March (Open meeting), 9 March ("Winding transformers"), 16 March (Open meeting), 23 March ("Digital speed measuring"), 8pm, 28 Hamilton Terrace, Leamington Spa.

Lichfield (LARS)—First and Third Friday of each month, The Swan Hotel, Lichfield. G3NAS.

Redditch (EWARG)—12 March ("Mid Severn Valley Raynet", by G. Tibbetts, G3NUE), 8pm, Old People's Centre, Park Rd, Redditch. G3EVT.

Solihull (SARS)—17 March ("Project 66", by G3RGD), 8pm, The Manor House, High Street, Solihull, G3YOY.

Shrewsbury (SARS)—5 March, 12 March ("Transistorized 2m ssb rig", by G4LU, 19 March (Club station), 26 March ("Amateur tv", by G6KQJ/T, G8ACB), 7.30pm, Shrewsbury School Signals Hut, G3UDA.

Stoke on Trent (NSARS)—Every Monday evening, 7.30 pm, at the new venue Harold Clowes Community Association Centre, Bentilee, Stoke-on-Trent.

Stourbridge (STARS)—3 March (Annual general meeting), 7.45pm, Longlands School, Stourbridge. G8CVK.

Stratford (SoA & DRC)—6 March ("Ssb explained for junior ops", by G3RPJ), 20 March (Boasters evening), 3 April ("RSGB matters", by G3PWJ, Region 3 Rep), 7.30pm, Halls Croft, Old Town, Stratford. G3RPJ.

Sutton Coldfield (SCRS)—Second and fourth Monday of each month, Club House, Sutton Town Football Club. At the AGM held 12 January, the following committee was elected: Chairman, R. Lawton, G3XZR; Treasurer, K. Cox; Hon Secretary, R. Smith, G3XXJ, G3XXJ.

Wolverhampton (WARS)—2 March ("Video", by G6KQJ/T, G8ACB), 9 March (Natterite), 16 March (Tvi forum, 23 March (Committee meeting), 8pm, Neachells Cottage, Stockwell Rd, Tettenhall, Wolverhampton. G3UBX.

Worcester (W & DARC)—Every Wednesday and Saturday evening 7.30pm, Perdiswell Park, Droitwich Rd. G3VJN.

Region 4 RR T. Darn, G3FGY

Heanor (SEDRS)—Meeting held every Tuesday, 3 March ("Forum"—members questions and answers), 10 March ("The S3A portable"), 17 March (Recorded slide lecture—"Colour television", No 1, the shadowmask tube), 24 March (Sale of members surplus equipment), 31 March ("The dynamic microphone"). At the recent AGM the following were elected: Chairman, G. Housley; Secretary, T. W. Clarke; Treasurer, W. Hickinbottom. 7.30pm, College of Further Education, Ilkeston Road, Heanor, Derbys. Visitors are always welcome. W. T. Clarke.

Derby (NHCAARG)—Meetings are held every Friday, 6 March ("Film show", by G3ALA), 13 March (Night on the air with the group's rig), 20 March ("Problems in radio and television interference", an illustrated lecture by F. C. Ward, G2CVV), 27 March (Open evening). The group has recently acquired the new call G3ZBI. 7.30pm, Room 7, Nunsfield House Community Centre, Boulton Lane, Alvaston, Derby. Visitors are welcome to attend. G3WFL.

Chesterfield (CADRS)—Meetings are held every second and fourth Wednesday of the month, 11 March (Talk on colour television). On the first and third Wednesdays of each month, Morse instruction and practical work is carried out. The callsign G3VKK is held by the club and it is hoped to construct a club station in the near future. 7pm, Adult Education Centre, Derby Road, Chesterfield.

Grimby (GARS)—5 March (Modifications to Pye equipment for 2m), 19 March (Sale of books and periodicals), 2 April (Tape lecture, the subject of which is to be decided), 8pm, The North Lincs Photographic Society's Clubrooms, 50 Wellhome Road, Grimby. G3XDY.

Nottingham (TARCON)—Meetings are held on Thursdays, 7.30pm, at the Sherwood Community Centre, Woodthorpe House, Mansfield Road, Nottingham. Visitors are always welcome.

Melton Mowbray (MMARS)—20 March (Visit to shack of D. W. Lilley, G3FDF). Meetings are held at the St John's Ambulance Hall, Holwell Works, Ashfordby Hill, Melton Mowbray. G3NVK.

Lincoln (LSWC)—The club meets every Tuesday, 7.30pm, at No 2 Guardroom, Sabraon Barracks, Burton Road, Lincoln.

Derby (DADARS)—4 March (Surplus sale), 11 March ("Transistorized transmitters", general discussion), 18 March (open evening for the swl), 25 March ("Diamond jubilee exhibition 1971", a general discussion of ideas and proposals). At the annual general meeting held on 4 February, Tom Darn, G3FGY, was re-elected chairman, and Fred Ward, G2CVV, was re-elected secretary for his 22nd year. The fully-paid up membership for 1969 was 235 of which 115 were licensed. The club recently acquired the callsign G8DBY to enable its Class B licensees to take part in vhf contests. We hope this call will become as famous as the other two club calls, G3ERD and G2DJ. Preparations are well advanced for the 13th Derby Mobile Radio Rally, to be held on Sunday 16 August 1970. The club has also obtained facilities to use the clubroom at 119 Green Lane, Derby, on six days a week. This will entail increasing the club's subs to 10s per annum, as from 1 January 1971. It is interesting to note that the yearly subscription has been 5s for 59 years. In 1969 we had over 100 visitors to our club nights. Visitors to Derby from home or overseas are always welcome. Meetings are held on Wednesdays at 7.30pm, in the society's clubroom, 119 Green Lane, Derby. G3FGY.

Region 5 RR S. J. Cranfield, G5BQ

Bedford (B & DARC)—Thursdays, 5 March ("Demonstration of the Sommerkamp line and 'scope monitor", by G3FWA), 12 March

(Members' equipment. Please bring an item of gear for a five minute talk and demonstration), 19 March (Visiting lecturer—to be confirmed), 26 March (Informal evening by the work bench), 31 March (Easter Sunday net on 3-690kHz at 10.30am), 8pm, Dolphin Inn, Broadway, Bedford.

Bishop's Stortford (BS & DARC)—Meetings 1st monthly at the British Legion Club, Windhill, Bishop's Stortford. Full particulars from G3RGA, Henham, Herts.

Cambridge (C & DARC)—Club meets on Fridays, 13 March (AGM) 7.30pm. RAE classes on Wednesdays. Club Headquarters, Corporation Yard, Victoria Road, Cambridge.

Dunstable Downs (DDRC)—Meetings on Friday evenings, at Chews House, High Street, Dunstable. Particulars from G8BWZ, 51 Manor Park, Houghton Regis, Bedfordshire.

Police (M & DRAS)—Club meets on Tuesday evenings, at Old Police Headquarters, High Street, March, Isle of Ely.

Shefford (S & DARC)—Thursdays, 8pm, Church Hall, Shefford, Bedfordshire. Particulars from C. W. Stedman, G3XWS, 10 Wychwood Avenue, Luton, Bedfordshire.

Region 6 RR L. W. Lewis, G8ML

Cheltenham (RSGB Group)—First Thursday, 8pm, Great Western Hotel, Clarence Street, Cheltenham.

Chiltern Amateur Radio Club—Last Thursday each month, 8pm, at the Desborough Arms, Desborough Road, High Wycombe. G3IQF.

Gloucester (GRS)—Meetings on second and fourth Thursday, 7.30pm, RAFA Club, 6 Spa Road, Gloucester.

Oxford University (OURS)—Every Wednesday, 8.15pm, Metallurgy Laboratory, Parks Road. G3OUR is active from the Combined Outdoor Sports Club, 4 Keble Road.

South Bucks VHF Club—3 March ("VHF Antennae", by V. R. Hartopp), 8pm, Bassetbury Manor, High Wycombe.

Region 7 RR P. A. Thorogood, G4KD

1970 sees in region 7 15 new licensed members and 23 BRS and associate members; total for January, 38. What can you do to beat this in your area. Details will be separated from the rest of the UK and overseas and then duplicated for you.

Acton, Brentford & Chiswick (ABCRC)—17 March (KW2000B by G5ZA). The following club officers were elected at the January agm: chairman, G3QJX; vice-chairman, G5ZA; secretary, treasurer and press agent, G3GEH; auditors, G2FRI and G3PZK; committee members, G3IGM, G5ZA, G3PZK and G2FRI. Meetings as usual at 7.30 pm, Chiswick Trades & Social Club, 66 High Road, Chiswick.

Addiscombe (AARC)—Second and fourth Tuesdays, 7.30 pm, Tote Hall, 158 Lower Addiscombe Road.

Ashford, Echford (ARS)—Last Thursday of month, 16 March ("Antennas and propagation", by ex-LA4QE of Collins Radio), 26 March (AGM), 7.30 pm, St Martin's Court, Kingston Crescent, Ashford, Middlesex. For further details contact G3UNV.

Barking (B & DREC)—Tuesdays and Thursdays, 7.30 pm, Gascoigne Recreation Centre, Gascoigne School, Morley Rd, Barking.

Bexleyheath (NKRS)—Second and fourth Thursdays, 12 March (Junk sale), 26 March (Talk by C. H. Jones on modern transistors), Thirty-six attended the last meeting to hear a talk by A. E. King of Evershed & Signals Ltd on earthing and earth testing. At the end of the talk one was left in no doubt that although everything may be tied down to a piece of wire going to ground, it was not necessarily a good earth. Six-page Newsletter from G3BPE, 7.30 pm, Congregational Church Hall, Chapel Rd, Bexleyheath.

Cheshunt (CDRC)—First Friday of month, 7.30 pm, Methodist Church Hall, opp Theobalds Station, Cheshunt.

Chingford (RSGB Group)—Fridays, Telephone 01-524 0308 for further information.

Chingford (SRC)—Fridays, 8pm, Friday Hill House, Simmons Lane, Chingford, E4.

Civil Service (CSRS)—First and third Tuesdays, 3 March (Demonstration of amateur radio operating), members meet in the snack bar prior to going down to the shack, 17 March (Lecture on colour television), 6.30 pm, Civil Service Recreation Centre, Monck Street, Westminster.

Croydon (SRCC)—Third Tuesdays, 17 March (KW Electronics' Sales Manager will talk on their products), 7.30 pm, Swan & Sugarloaf, South Croydon. A constructional contest will again be held at

the May meeting, so bring along any pieces of equipment or assembled kits you have made. Do not forget "Contact of the Year" contest—show QSL card duplicate sent. Newsletter by G8TB.

Crystal Palace (CP & DRC)—21 March ("A visit to Bermuda", by G2MI), 8 pm, Emmanuel Church Hall, Barry Rd, SE22. Last meeting's junk sale was the best ever and everything was sold. Newsletter by G3FZL.

Dorking (DR & DRS)—Second and fourth Tuesdays, both at the Wheatshaft.

Ealing (E & DARS)—Tuesdays, 7.30 pm, Northfields Community Centre, Northcroft Road, W13.

East London—15 March (Talk of the year, '70', Contact, G3RYF), 2.30 for 3 pm, Wanstead House, The Green, Wanstead E11.

Edgware & Hendon (E & DRS)—First and third Mondays, St George's Hall, 51 Flower Lane, Mill Hill, NW7.

Farnham, Bucks (Burnham Beeches RC)—Fortnightly on Mondays, Farnham Common, Village Hall, Victoria Road.

Gravesend (GRS)—Wednesdays, 8 pm, Community Centre, Cedar Avenue, Kings Farm Estate, Gravesend.

Guildford (G & DRS)—Second and fourth Fridays, 13 March (Technical talk by Vero Electronics), 27 March (No meeting—Easter), 10 April (AGM), All meetings at Stoke Park.

Hampton Court (TVARTS)—First Wednesday of each month, 7.30 pm, The Three Pigeons, Portsmouth Road, Surbiton.

Harlow (DRS)—Tuesdays (General), Thursdays (Cw practice), Fridays (Junior), 7.30 pm, Mark Hall Barn, First Avenue.

Harrow (RSH)—Every Friday, 8 pm, Roxeth Manor School, Eastcote Lane, Harrow.

Haslemere (H & DARC)—Fortnightly, 8pm, British Legion House, Western Road, Romford.

Hemel Hempstead (HH & DARS)—First and third Fridays, 7.30 pm, "Addmult" Sports Club, Hemel Hempstead.

Holloway (GRS)—Mondays (Rae), 7 pm, Wednesdays (Morse), 7.30 pm, Fridays (Club), 7.30 pm, Monton School, Hornsey Road.

Ilford—Every Thursday, 8 pm, 50 Mortlake Road (off Ilford Lane), Ilford.

Kingston (K & DARS)—Second Wednesday of each month, 11 March (Radio and tv servicing—ways of rapid fault finding, by Mr Leo Simpson), 8 April (Provisional—"Construction of df receivers", by D. Beakhurst, G3OSQ). The meeting will be a prelude to radio activity in the field at a df hunt, 8 pm, Penguin Lounge, 37 Brighton Road, Surbiton.

Leyton & Walthamstow—Tuesdays, 7.30 pm, Leyton Senior Institute, Essex Road, E10.

London (UHF Group)—First Thursday of each month. Who has the best 70cm converter? Telephone G4KD for information, 636 1403, 7.30 pm, Whitehall Hotel, Bloomsbury Sq, Holborn, WC1.

Loughton—Fortnightly on Fridays, Loughton Hall, Rectory Lane (nr Deben Station).

Maidenhead (M & DARC)—Third Tuesday of month, 7.30 pm, Victoria Hall, Cox Green, Maidenhead.

New Cross—Wednesday and Fridays, 8 pm, 225 New Cross Road, SE14.

Paddington (P & DARS)—Thursdays, 7.30 pm, Beauchamp Lodge, 2 Warwick Crescent, W2.

Purley (P & DRS)—First and third Fridays, 8 pm, Railwaymans Hall, Side Entrance, 58 Whytecliffe Rd, Purley.

Reigate (RATS)—First Wednesday, 4 March (Mystery night). Annual dinner now to be in April, either 10 or 11, 1 April (AGM), 7.45 pm, George and Dragon, Cromwell Road, Redhill, Lyell Herdman, G6HD, was the speaker at the last meeting. The subject was a.m. modulation and he cleared up a number of misconceptions, and as a result top band is a little cleaner. Newsletter from G3NKS.

Romford (R & DRS)—Tuesdays, 8.15 pm, RAFA House, 18 Carlton Road.

Scots (ARS)—Third Thursday of month, 9 March ("Aerials", by John Carter, G3KYH), 16 April (AGM), 7.30 pm, Baden Powell House, Queensgate, South Kensington, SW7.

Sidcup (CVRS)—First and third Thursdays, Congregational Church Hall, Court Road, Eltham, SE9.

Slough (SDR Group)—First Wednesday of month, 7.30 pm, United Services Club, Wellington Street.

Southgate (SRC)—Second Thursday of month, 7.30 pm, Civil Defence Hut, Bowes Road, N11.

St Albans (Verulam ARC)—18 March (J. W. Swinnerton, G2YS, will be talking on "Stateside trip 2"), 7.30 for 8 pm, Town Hall, St Peter's Street, St Albans. All visitors are welcome. Congratulations on late arrival of new junior op to G3LXP, it appears there was a delay on the feeder!

Sutton & Cheam (SCRS)—Third Tuesday of month, 17 March ("Equipment for beginners", by T. Hughes, G3GVV), 17 April (AGM), 8 pm, The Harrow Inn, High Street, Cheam. The twenty-

second annual dinner of the society is to be held on 14 March at the Crown Inn, London Road, Morden. Tickets are 35s each, juniors 20s each.

Welwyn (Mid-Herts ARS)—Second Thursday of month, 8pm, Welwyn Civic Centre, Welwyn.

Wembley (GECARS)—Thursdays, 7pm, Sports Club, St Augustin Avenue, North Wembley. (This club is open to non-GEC employees by invitation. Telephone ARN 1232 for details).

Wimbledon (W & DRS)—Second and last Fridays, 8pm, St John Hall, 124 Kingston Road, South Wimbledon, SW19. Request by hon secretary that members must be early, especially when guest speakers are appearing. Previously they have been kept waiting while the hall fills up. A number of new talks are being arranged. G3XQX.

Region 8 RR D. N. T. Williams, G3MDO

Brighton (BTCARC)—5 March ("Transistors", by F. R. Canning, G6YJ), 19 March (Informal in club shack). Meetings held at 7.30pm.

Canterbury (EKRS)—Details of future meetings from G3MDO.

Dover (S-EK YMCA ARC)—Meetings held Thursdays 7.30pm at YMCA, Leybourne Road, Dover.

Eastbourne (SARS)—Meetings held at 8pm, in the Victoria Hotel, Latimer Road, Eastbourne.

Mid-Sussex (M-SARS)—Meetings held at Marle Place, Leylands Road, Burgess Hill. Details for March meetings to be finalised.

Thanet (TRS)—13 March (Talk by G3DAH), 20 March (T & R Contest results and constructional contest).

Tunbridge-Wells (WKARS)—6 March ("Colour transistorized television"), 20 March ("Let's design", a series of discussions to determine the best of amateur radio equipments), 10 April (AGM). All meetings held at the "Adult Education Centre", Monson Road, Tunbridge Wells.

Worthing (W & DARC)—Meetings held every Tuesday, 8pm, at the Clubroom "Rose Wilmot Youth Centre", Littlehampton Road, Worthing.

Region 9 RR J. Thorn, G3PQE

Barnstaple & District Radio Club—A new club in the process of formation, with officers and committee still to be elected. Meets on second and fourth Wednesdays in each month from 7.30pm. Morse practice starts at 6.45pm. 11 and 25 March, "Grinnis", High Wall, Old Sticklepath Hill, Barnstaple. G4CG.

Bristol City & County (BARC)—Every Tuesday and Thursday, 7.30pm. Note, the club has changed its club night from Monday to Tuesday. 10 March ("Tvi and its cures", by G3OUK), 25 March (Meets Swindon club for skittles, at the Pheasant, Bath Road, Chippenham), 2 April ("Contest operating", by G3SWH). G6SXY.

Bristol (RSGB Group)—23 March ("What's what with weather satellites", by G3JMY). 7.30pm, Becket Hall, St Thomas Street, off Victoria Street, Bristol 1. G3ULJ.

Shirehampton Radio Club (SRC)—Every Friday, 7.30pm, Twyford House, Shirehampton. G3YIQ.

University of Bristol (ARC)—Meetings on Saturdays, 2.30pm, Dept of Physics, Royal Fort, Woodland Road, Bristol. G8ADP.

Burnham on Sea (BOSARS)—Contact G3GIW.

Cornish (CRAC)—5 March (A talk on using ex-service receivers, eg the AR88 and HRO, for amateur use, by G3POB, also a potted talk on "antennascopes", by G3OFN), 7.30pm, The SWEB Clubroom, Poole, Camborne. G3UCQ.

Falmouth Group—3 and 17 March, Laburnham Drive Mission Hall. G3OJN.

Newquay Group—4 March (2m and 4m transistor converters, practical demonstration), 18 March (Transistor theory, part 2, G3VWK). Morse class 7 to 7.30pm, Treviglas School. G3THT.

Exeter (EARS)—3 March, YMCA, St David's Hill, Exeter. G3HMY.

Plymouth (PRC)—3 March at the club HQ, G3PRC, Virginia House, Bretonside. G3YDU.

Saltash (S & DARC)—5 March ("More on transistors", by G3VVP), 20 March (Talk on radioactivity), 7.30pm, Burraton Toc H Hall, Warraton Road, Saltash. The new Chairman is Ken Price, G3WYJ, not G3WJ as published in the January issue. G3XWA.

South Dorset (SDARS)—6 March Room E2, South Dorset Technical College, Newstead Road, Weymouth. G3RZG.

Taunton (T & DARS)—Every Friday from 7.30pm. Film or talk on the first Friday, SEVO talk on the third Friday, RAE classes every Tuesday, all at SEVO HQ, Taunton Barracks, The Mount. G3WPJ.

Torbay (TARS)—Every Tuesday and Friday, 14 March (Annual dinner), 28 March (Junk sale). The club meets at its HQ, G3NJA, Bath Lane, rear 94 Belgrave Road, Torquay. G3NQD.

Wells (WARS)—Contact G3MYA.

Weston-Super-Mare (WSMRS)—3 April ("Those were the days", by E. Gaukrodger, G6GU, assisted by K. Harvey, G5KT—general talk on early days of radio communications), 7.30pm, Westhaven School, Ellesmere Road, Uphill, WSM. Ted Halliday gave an interesting talk on ssb principles last month and respects were paid to the memory of Harry Goodwill, G3CCN, who passed away recently. G3GNS.

Yeovil (YARS)—Wednesdays, The Park Lodge, The Park, Yeovil. G3NOF.

Nottingham (ARCON)—5 March (Committee meeting and natter night), 12 March (Film show, "IBM computers"), 19 March (Talk by T. Kirk, G3OMK), 25 March (Open evening).

Region 10 RR C. H. Parsons, GW8NP

Blackwood (ARC)—Fridays, 7pm, Blanche Cottage, off High St, Blackwood, Mon. G6BK.

Barry College of Further Education (ARS)—Thursdays, 7pm, College of Further Education, Calcot Road, Barry, Glam.

Cardiff (RSGB Group)—Monday 9 March, 7.30pm, TA Centre, Park St, Cardiff. GW3GHC.

East Glamorgan Raynet Group—First Tuesday in each month, 7.30pm, Cardiff Emergency Services HQ, Womanby St, Cardiff. GW3VNO.

Hoover (ARC)—Mondays, 7.30pm, Hoover Social Club, Hoover Works, near Merthyr. Secretary: Mr Tribe, c/o Hoover Social Club.

Port Talbot (ARC)—Second Tuesday of each month, 7.30pm, Trefelin Club and Institute, Port Talbot. GW5VX.

Pontypool (ARC)—Tuesdays, 7.30pm, during school terms, at the Educational Settlement, Rockhill Road, Pontypool, Mon. GW3JBH.

Pembroke (ARC)—Last Friday of each month, 7.30pm, Defensible Barracks, Pembroke Dock. GW3LXI.

Rhondda (ARS)—Meets at Rhondda Transport Employees Club and Institute, Porth Rhondda, Glam. Full details of meeting dates and times available from the Secretary, GW3PHH.

Sully and District Short Wave Club—Tuesdays, 7pm, at the Annexe, Sully Bowls and Social Club, 59 South Road, Sully, Glam. GW3SLA.

Swansea Telephone Area (ARS)—Fridays, 7.30pm, at the Telephone Engineering Centre, Gors Road, Townhill, swansea, Glam. Activities include Morse practice, RAE preparation work, and constructional projects. Secretary: M. D. E. Connor, 54 Talley Road, Penlan, Swansea, Glam.

University College, Cardiff (ARS)—Meetings in Geology Dept, Main College on Tuesdays at 8pm. Shack located behind Computer Centre, Park Place, Cardiff. Secretary: c/o Students Union, Dumbries Place, Cardiff.

University College, Swansea (ARS)—4 March ("Power earthing and amateur radio", GW3MOP), 7.30pm, 7 March (144MHz expedition to the Brecon Beacons), 18 March (Open night at the society's station GW3UWS). Meetings in the Applied Science Building. Further details from Philip Regan, Union House, University College of Swansea, Singleton Park, Swansea SA2 8PS.

Region 11 RR M. Williams, GW3LCQ

Cader Idris Radio Society (CIRS)—The meeting at which this new society was formed was held in Dolgellau on 20 January, the acting Hon Sec being M. D. Fowler, GW3GKZ, of Ty Gwyn, Abergwynant, Dolgellau, Merioneth. Meetings will be on the second and fourth Fridays in each month and visitors are asked to contact the Hon Sec first.

Conway Valley Amateur Radio Club—The next meeting will be held on 19 March at the Parade Hotel, Llandudno, where the speaker will be Brian Clark, GW3HGL, who will give a talk and demonstration on the EA12 receiver, and a general talk on NFDs. The open forum at the last meeting was an unqualified success and was again supported by the University of North Wales ARC. The Conway Valley ARC would like to take the opportunity of saying how much their attendance was appreciated by their members.

Rhyl & District Amateur Radio Club—The next meeting will be on Tuesday, 10 March at the usual QTH, Mona Hotel, Market St, Rhyl. The speaker will be R. Little and his subject will be industrial

electronics generally. The Club would more than appreciate support from the other Clubs in N Wales as sickness has somewhat depleted their own attendance. The Secretary and treasurer Alan Cobb, GW3YIH, although still in the War Memorial Hospital, Rhyl, hopes to return home during the next few weeks. At the last meeting of the Club F. Pardy gave a most interesting talk on aerials in general—his talk was much appreciated.

Region 12 RR A. W. Smith, GM3AEL

Aberdeen (ARS)—Fridays, 7.45pm, at 6 Blenheim Lane, Aberdeen. GM3HGA, telephone Aberdeen 33838.

Lhanbryde (MFARS)—Mondays, 7.30pm, at St Andrews School, Lhanbryde, by Elgin, Morayshire. GM3UKG, telephone Clochan 225.

Lothians Radio Society—12 April, 26 April (Quiz, GM3OWU), at 7.30pm, Board Room, YMCA St Andrew Street, Edinburgh. GM8BPL.

Dundee (RSGB Group)—Thursdays, 8pm, at 3 Magdalen Place (off Roseangle), Dundee. GM3KYI.

Lerwick Radio Club (Shetland)—Tuesdays and Thursdays, 8pm, at Annsbrae House, Lerwick. GM3XPQ, telephone Bixter 249.

Region 14 RR N. G. Cox, GM3MUY

Ayrshire (Ardeer Recreation Club ARC)—3, 5, 10, 12, 17, 19, 24, 26, 31 March, 7.30pm, Ardeer Recreation Club, Amateur Radio Section, Stevenston, Ayrshire. Details J. F. McCreight, GM3DJS, 10 Auchenhavie Road, Saltcoats, Ayrshire.

Ayrshire (AARG)—8, 22 March, 7.30pm, ATC HQ, Kilmarnock. **Glasgow University (GURC)**—13 March 7.30pm, ("Simple test equipment", P. Bower, GM3OFT), George Service House, University Gardens. No meeting on 27 March.

Greenock (G & DARC)—6, 13, 20, 27 March, 7.30pm. Please send all communications to Club Rooms, Watt Library, Union Street, Greenock. The Secretary is now J. F. Gray, GM3LRG.

Mid-Lanark (RSGB Group)—20 March, 7.30pm, YMCA, Brandon Street, Motherwell.

Region 15 RR J. Thompson, G3ILV

City of Belfast YMCA Radio Club—Mondays (Morse practice class and operating procedure), Wednesdays and Saturdays (Club night), Fridays (Audio and tape recording night), all at 8pm, City YMCA (3rd floor), 12 Wellington Place, Belfast, BT1 6GE. Information from YMCA General Office.

Region 16 RR W. J. Green, G3FBA

Basildon (VARS)—Vange ARS meetings every Thursday, 7.30pm, at the Scout Hall, Fairview Road, Vange, Basildon. G3VOP.

Chelmsford (CARS)—First Tuesday in each month, 7.30pm, Marconi College, Arbour Lane, Chelmsford. G3OZF.

Colchester (CARS)—Every Wednesday, 7pm, Room 41, NE Essex Technical College, Colchester. Details from R. C. Greenleaf, 27 Ernest Road, Wivenhoe, Essex.

Gt Yarmouth (GYRC)—Last Friday in each month, 7.30pm, 98 South Market Road, Gt Yarmouth. G3HPR.

Ipswich (IRC)—25 March ("Lash-ups" by J. Rhind, G3UJR, 7.30pm, Red Cross HQ, Gippeswyk Avenue, Ipswich. G3UJR.

Maldon, Essex (MYGRG)—Every Thursday, 7.30pm, The Friary, Chequers Lane, Maldon, Essex.

Norwich (NARC)—2 March (Members' travelogue—including films), 9 March (Informal meeting), 16 March (Vhf single sideband by R. Baker, G3USB), 23 March (Chitty chitty bang bang, or your car problems, by J. Hanks), 30 March ("My Panadaptor", by P. Lefevre, G8AWZ), 7.30pm, Brickmakers Arms, Sprowston Road, Norwich. G3PTB.

Southend (SDRS)—13 March (Cup competition), 8pm, The Canteen, Ekco Electronics, Southend. G8BSB.

Region 17 RR C. Sharpe, G2HIF

Note to Club Secretaries: If your Club would like to take part in a regular exchange of newsletters with other groups in Region 17, please let me know and I will endeavour to make the necessary arrangements. G2HIF.

Chippenham (CDARC)—31 March ("A Layman's guide to computers", by G3UHO), 7.30pm, Boys High School, Hardenhuish Lane, Chippenham. G3UTO.

Fareham (FDARC)—1 March ("Fings ain't wot they used to be", by G2QK), 8 March (Txers' turn), 15 March (Quiz night), 22 March (Listeners' ladder—Round 3, and committee meeting), 7.30pm, Porchester Community Centre, Porchester, Fareham, Hants. At the AGM held on 19 January the following were elected to the committee: President, D. Briggs, G2QK; Vice-President, F. Lee, G3VLY; Chairman, G3LFM; Secretary, G3XIV; Assistant Secretary, G3VXM; Treasurer, G8BLQ, also G3HQT, G3XUF, G8CBT and SWLs Hern and Gamble.

Maidenhead (MDARC)—2 March (AGM), 17 March (Informal, club station on the air), 7.30pm, Victory Hall, Cox Green Lane, Maidenhead. G3VMR.

N Berks (AERE, Harwell, ARC)—Meetings on third Tuesday of each month, 17 March ("More about the chuff-chuff problem", by G3BGL), 7.30pm, AERE Social Club, AERE, Harwell. G2HIF.

Portsmouth (PDARC)—Meetings every Wednesday, 7.30pm, Twyford Community Centre, Portsmouth. All welcome. G3CNO.

Salisbury & District Short Wave Club—Club meetings every Tuesday, 7.45pm, in the Clubrooms, at the Sawmills, Wilton. Secretary: R. E. Gregory, G3XHE.

Southampton (So'ton Group)—Meetings each Wednesday and Friday at the Clubroom, 14 Nightingale Grove, Southampton. G3GOY.

Looking ahead

25 April—VHF Convention, Whitton, Twickenham, Mdx.

20 May—Lecture at the IEE by Dr J. A. Saxton, President RSGB.

25-26 July—British Amateur Television Club Convention, Cambridge.

19-22 August—RSGB Exhibition. New Horticultural Hall, London.

Mobile rallies calendar

19 April—North Midlands Mobile Rally.

10 May—Ealing and District Amateur Radio Society Rally, Hanwell Community Centre, Westcott Crescent, Hanwell, London W7.

17 May—Northern Mobile Rally. Organized by the Northern Amateur Radio Mobile Society.

14 June—1st Elvaston Castle Mobile Rally, Elvaston, Derby. Organized by the Nunsfield House Community Association Amateur Radio Group, G3EEO. Further information from P. Neal, G3WFW, QTHR.

20-21 June—Anglian Mobile Radio Rally, Suffolk Showground, Ipswich. Further information from D. W. N. Thomas, G8BYE, QTHR.

21 June—University College of Swansea Amateur Radio Society's annual Rally, Singleton Park, Swansea.

28 June—Longleat Safari Mobile Rally, Longleat House, Near Warminster. Organized by the City & County of Bristol RSGB Group.

5 July—1970 South Shields Mobile Rally.

5 July—Cornish Radio Amateur Club Rally. Further information from J. Farrar, G3UCQ, QTHR.

12 July—Worcester and District Amateur Radio Club Rally.

19 July—Scarborough Amateur Radio Society Rally, Burniston Road Barracks, Scarborough.

26 July—White Rose Mobile Rally, Allerton High School, King Lane, Leeds 17. Organized by the Pudsey & District Radio Club. Further information from K. Wells, G3WIX, QTHR.

9 August—Woburn Abbey Mobile Rally.

members' ADS

These advertisements are accepted free of charge as a service to members of RSGB. They must be submitted on the Members' Ads order form printed on the penultimate page of each issue of *Radio Communication*, or on a post-card similarly laid out. Each must be accompanied by a recent *Radio Communication* wrapper addressed to the advertiser, as proof of membership.

Trade or business advertisements, even from members, will not be accepted for Members' Ads but should be submitted as classified or display advertisements in the usual way. The RSGB reserves

the right to refuse advertisements, and accepts no responsibility for errors or omissions or for the quality of equipment offered for sale.

Members are advised to enclose a stamped addressed envelope when replying to advertisements.

The closing date for each issue is the 7th of the preceding month, but no guarantee of inclusion in a specific issue can be given. No correspondence concerning this free service can be entered into. See the current order form for further details.

FOR SALE

Lafayette HA700, mint cond, £30 ono. Heathkit RG1, fully tested, perf, £29 10s ono. Codar PR30 pre-amp, RQ10X Q mult, £11 ono. All little used and only few months old. W. Jones, 113 Bentley Road, Bramley, Rotherham, Yorkshire.

Leak trough line stereo tuner, £30. BC221 and mains psu, £22. KW power meter and 2-tone osc, £11. New trnsfmr, 10V 10A, £4. H/b Elect keyer, no paddle, £4. G3UYK, QTHR.

HRO with psu, ldsprk, 9 gc coils in rack, £20. TCS12 rx, built-in Q mult, sep psu, ldsprk, £12 10. Buyer coll. A. Harwood, 21 Butts Hill Road, Woodley, Bucks. Tel Sonning 2378.

Vintage wireless parts, 1913 year book Wireless Telegraphy, Marconi variable condensers 0.003mf 0.0008mf, polished boxes, 0.95 jars, glass cover unit No. 4 Morse key, plug in coils, swivel holder, folding frame aerial etc. Sae pse. G3ICT, 45 Sandhurst Road, Ponders End, London N9.

Codar T28 160-80m rx, 12V, rc, £10. G3VWH, QTHR. Tel 0743 54683. Scope CRTs: Cossor 89D, 4in double beam, ex wkg Cossor 1035, £3. Mullard DP7-6, 2.75in, new in orig carton with data, £1. Mullard DP4-2, 1.75in, 10s. All post free. G8ABR, 45 School Lane, Milton, Cambs, CB4 4BS.

J-Beam 2m Skybeam, 10 ele, £3. G3OHC, 50 Essex Road, Sutton Coldfield, Warks. Tel 021-308 2512.

Avo model 7 Mk 2, £10. G8ANU, QTHR. Tel. Stafford 62533.

CR100 8, mods: 6BA6 rf, S meter, noise limiter, mute, Q mult connection, rf cont. Vgc, £18. G3USZ, QTHR. Tel Upminster 23699.

HA14 1in, new 572Bs, will demonstrate, £45. G3GYE, QTHR.

BCC69E, with hndbk and mic, £5. Some mods to rx front end. G3JKS, QTHR. Tel Stainforth 786.

KW Electronics lpf, 75Ω, chan 2, hardly used, rated to 1KW, £3, post paid. (Belling Lee sockets), G3RNX, QTHR. Tel Clay Cross 863326.

HE80 rx, £22. LM14, vgc + charts and psu, £18 10s. Two 4 × 150 bases + two valves, one pte chimney, £5 10s GW3UYH, QTHR Tel Llanon 436.

KW dc psu, 12V positive earth for 2000A or Atlanta etc. Unused, £25. Handbook type Q Mult with high Q coils, 465kHz i.f., £3. G3XZB, QTHR. Tel Southampton 74352.

Panda PR120V, 150W cw, 120V am, vgc + filters and atu, £30. Class D No 2 Wavemeter, 230V ac, as new, £8. Both with hndbks and recently overhauled. Prefer buyer coll. G3RKF, 10 Northcourt, Leighton Buzzard, Beds. Tel L.B. 4953.

Heavy duty Avometer, £11 10s. Avo Multimeter Mk 4, £7 10s. Fi-Cord 101 personal tape recorder, (orig £63), £18. Philips stereo mic, £6. H. Thornton, 26 Stagbury Avenue, Coulsdon, Surrey. CR3 3PD.

CR100 in ex elec & mech cond. Re-valved, factory re-aligned & re-sprayed light Admity Grey. Reason for displ-emigrating. £20 or swap gd Mohican or RA1. G2ANX, QTHR. Tel 01-979 3701.

Sommerkamp FL200B tx, vgc, £90 ono. Heathkit HX20 ssb/cw tx, vgc, £75. KW77 rx, vgc, £65 ono. Cannon ball 160m ssb tx, £20 with ac psu. G3SUK, QTHR. Tel Rattlesden (Suffolk) 352.

Smith's micro relays, £1. G3WXS, QTHR.

HRO MX + hndbk, psu, spkr, 7 coils (10m bandsprd), atu, xtal calib, spares. Offers to C. Lamb, 70 Dudsbury Road, Ferndown, Dorset.

New xtals: HC-6/U, 7007, 7012, 7025, 7060kHz, 12/6 each. Trio spkr SP-5D, 55/-. Dow-Key coax relay DK-60G, 110V ac, 30/-. Tetsco DM 50T mic, 35/-. GM2HFV, QTHR.

HRO, unmod Coils 50kHz-30MHz + all bndsprd, psu incorp spkr, £30 buyer coll or carr extra. 3 Eddystone plug in coils, 2in dia 5 in long, with base, 42/6. Pair 5B254M, 12/6. R. Hughes, G3GVV, 10 Farm Lane, Tonbridge, Kent. Tel 3360.

AR88D comp with hndbk, spkr and spare valves. Cab a little shabby but in gd working order. £35, pref buyer inspects and coll. J. Martin, 3 Albion Road, Fairmile, Christchurch, Hants. BH23 2JG.

Swan 350 + ac psu xtal calib, new pa valves, £190 ovno. G3UWG QTHR.

R209 Mk2 rx, 12V, hdpns, leads, spare valves, vibrator, hndbk, buyer coll, £20 ono. G3VFM, QTHR.

Hallcrafters SX122, few months old, comp with calib and auto trnsfmr, as new, £120. Eddystone EB35 am/fm rx, batt and mains psu, little used, £45. G3ACB, QTHR. Tel Cuffley 3695.

E88CC, ECC84, 6CB6, EF91, OA2, OB2, 6AK5, 6BA6, 6BJ6, 5763, ECF80, 2s each. QQV03/10, 5s. FT243 xtals: 7950, 8175, 8525, 8625, 10500, 14333kHz 2m. 2000, 7200, 9100, 9357, 10559, 11797, 12975, 15000kHz, 5s each. G3URX, QTHR. Tel Tiptree 6533.

Large computer PEBs containing silicon epitaxial transistors, Lcs, dual comparitors, diodes, resistors, capacitors, ferrite cored inductors, various types available from 5/6 post paid. Sae for full details. G. Baraclough, 2 High View, Higham, Rochester, Kent. Tel Shorene 2297.

Ferroxcube pot cores, not new but comp: LA 1, 2, 3, 7/6; LA7, 12/6; LA11, 15s. New: LA6, 17/6; LA11, £1. 1mA 3in meters, exc cond, £1. Resistors 1%, h.s., 1W, 10-3MΩ, 1s each. W. Kilner-Smith, 101 Oxford Rd, Marlow, Bucks.

Yaseu Musen line: FRDX400 de luxe rx, 160-2m, fm/ssb/am/cw, all filts and extras fitted. FLDX400 tx 80-10m am/cw/ssb. FL2000 lin. Spare valves, etc. As new cond, prefer buyer coll. £250 or offers. K. Young, 56 Old Road, Bishops Itchington, Nr Leamington Spa, Warks. Tel Harbury Wells 273.

DX100U tx, exc cond, factory tested, £55. Will deliver 40 mile radius of Bedford. RAE correspondence course, £4. D. Onione 61 Maulden Rd, Flitwick, Bedford. Tel Bedford 50292 (8am to 5pm).

KW E Z Match atu, new cond, £6 plus post. G2GM, QTHR.

Trio TS500, very little use, £160 ono. R. Limehouse, G3WTN, 5 Argyle Rd, Whitby, Yorkshire.

Brand new PYE Vanguard transcvr type AM25B(2m) comp with handset control box, all cables, but without xtals, £9. G6TA, QTHR. Tel 01-769 1038.

2 Mullard 5-10 amps with stereo preamp, £15. BSR UA12 record deck. BSR monarbeck tape deck. Electronics coils—HSO 1-6 & QL2 transfmr DIF/1/85 series 1 or 2. G3RHR, QTHR. Tel Oglethorpe 262.

KW top band tx Mk2, unmarked, exc cond, £16. Advance static stabilizer, 240V, offers. Delivery by arrangement. E. Taylor, 4 Brownsea Ave, Corfe Mullen, Nr Wimborne, Dorset. Tel Broadstone 2631.

PYE PTC703 15W 4M tx/rx base station, hb, £15. Delivered 50 miles or coll. Projection galvo in teak box, $\pm 1\frac{1}{2}$ A, £2. 1 1/2 in crt's, 20s. TG-10 US Sigs Morse tape keyer, £5. A. Cockle, 14 Leewood Way Effingham, Surrey. Tel Bookham 5439.

S640 rx, requires slight attention, built-in S meter, offers to G. O'Connor, 61 Steep Hill, Lincoln. Tel 24113.

RA1 with xtal cal, £30. R206 rx with range extender, 75kHz-30MHz, £25. DX40U external mod unit, Geloso vfo, will split, £25. Partly built am tx, £15. 19 set psu. Buyer collects. G. Mills, G3TWY, 7 Frobisher Rd, Bilton, Rugby, Warks.

A510 transcvr, 160, 80 and 40m, + xtals, aerials, mic, phones, key, batts, £15. Xtal calib, £4. Two rotary convtrs, £1 each. Buyer coll. G3SDK, QTHR. Tel OLU 55001.

4m xtals, 1003, 1875, 1981, 3645, 7090kHz and 30 other xtal freqs. Wearite 'P' coils. Xtal controlled RF24 10, 15 & 20m convtr. Headphones etc, see for list. M. Powell, G3NNO, QTHR.

R208, £5. 10-60MHz, 3 band, 8V s/het, spares, manual etc. Deliver reasonable distance. See further details. G3NAQ, QTHR.

Acos mic 45, 16s. 813, 21s. Viceroy meter, 45s. 5R4GY rectifiers at 2/6. All new. Brand new HRO man, original. Offers. G2UZ, 2 Cliff Road Gardens, Leeds. LS6 2EY.

Fully stab psu's 11 to 15V, 1.5A, overcurrent & overvoltage protection, 40s. 1/50hp motor, centrifugal fans, 25s. 1/20hp capacitor start motor, 30s. 250V ac, all unused, post extra. M. Taylor, "Edgeley", Six Hills, Stevenage, Herts. Tel Stevenage 3261.

ZC1 Mk2 tx/rx, 1.8-8MHz, mains or 12V dc psu, £15 ono. New valves: 6J7, TZ40, 807, 813, PT15, EL32, KT8c, TT11, NT35, 808, 6B8. Price see or tel. G8CER, QTHR. Tel Oadby 5603.

Rtty: Creed auto tx 6S5, £20; 6S6, £25. 230V ac, G8BMQ, 2A Convent Hill, Upper Norwood, London SE19. Tel 01-653 8489.

Valves, ex-equipment: 4CX250B, 17/6; 2C39A, 12/6; 4-65A, 7/6; 5B/252M, 5s. Please add postage. G3OBD, QTHR. Tel Bournemouth 511267.

KW Vanguard Mk 2, 80-10m, mint, £30 ono, carr by arrgt. Gearbox, ideal for beam, ratio 1425-1 new, £2 10s plus carr. G3ESB, QTHR. Tel Brunwood 536.

Eagle Minilab testmeter, £5. New Mullard tape pre-amp, made by Stern's, £4. P. Elms, 110 Arundel Rd, Walton, Peterborough.

813, 21s. 5B/251M's and 5B/252M's (min 807), new, 20s each. G8BGQ, 25 Church Lane, Sarratt, Rickmansworth, Herts.

Codar AT5 tx and psu exc cond, £15 plus carr. G3BRF, Hetherington, Leven, Fife. Tel Leven 2136.

National SW54 rx, 540kHz-30MHz in 4 bands, 110V, with transfmr unit for 240V operation, FB cond, £15. G3UQP, QTHR. Tel St Neots 2236.

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HRO, Hallicrafter SX24, MC8 Minimitter all band converter, offers. Home brew Z match, dummy load, atu etc, £4. 813's, £1 each. G3FSJ, St Aubins, Woodbury, Devon. Tel Woodbury 637.

Heathkit SB-301E rx, little used, £120. KW Viceroy Mk2, as new, £65. Heathkit 10W mono amp MA-12 + control unit UMC-1, £15. G3HJT, QTHR. Tel 01-890 6487.

Eagle comm rx. 500kHz-30MHz in 5 bands, inc bndsprd, bfo, spkr, hdpne jack, S meter, ferrite ant. Gd cond, £15 ono. J. O'Connor, 20 Chevallier St, Ipswich, Suffolk.

KW Valiant, 160-10m, matching psu, £20. V-4-6 traps and base, only £5. G3III, 11 Station Road, Shipston on Stour, Warks. Tel S.o.S. 8482.

PYE Ranger, hi band comp with mic, i.f. xtal and transistor psu, £8. 2m mains pwrd convtr, 4-6MHz, i.f., £5. G8CSD, 43 Pine Hill, Epsom, Surrey. Tel Epsom 24814.

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Beme Loop RDF, £25. CR300 man, £1 5s. PO 3000 relays, 6 c/o 50001 in screening cans, 2/6, each. B. Makowski, 66 Manor Ave, London SE4.

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Collard tape deck, 3 speeds, mech perfect, £3. Amplion 3 speed disc recorder, £3. Sobell tv for 2m rx, £2. Dictionary of radio and tv by Pannett, half price, new. G3MIS, QTHR. Tel Marnehill 209.

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RSGB Bulletin 1934/5/6, SWM 1985/6/7, £1 per year, post paid. J. Baldwinson, 33 Cherry Close, Tulse Hill Estate, London SW2.

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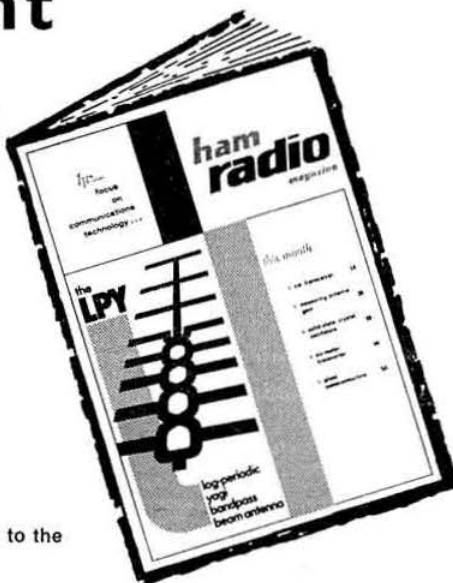
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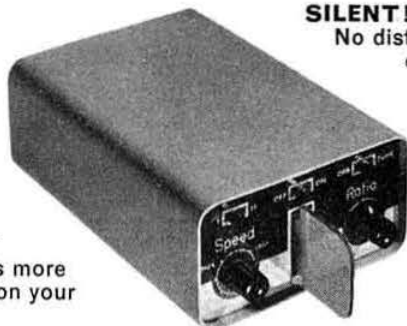
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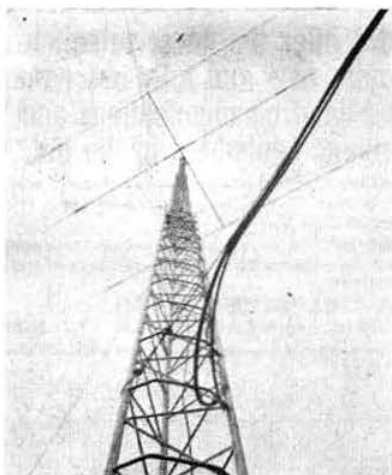
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March is traditionally the month for high winds and therefore the time to go out and check your guys are secure and tight. I hope your rotator will survive the tempest but if it fails remember we can repair or replace from our CDR stock.

News this month is that the KW Atlanta went into confinement recently and now emerges with its newborn—a Remote VFO Unit.

Looking just like her mum this little dolly retails at £34 and really makes the powerful Atlanta a versatile job.

While she has been away the Atlanta has had a few other internal ops. too and is very much improved as a result. I took her home for a few days to try her out. My goodness! what a smashing rig she is. I've always thought I'd never chop my faithful old 2000A in for an Atlanta although she's getting a bit long in the tooth. But, I was so impressed with the improved performance plus the split-band facility of the new VFO that I'm haggling with myself for a good trade-in deal!

I've never had such good sig. reports and praise for such excellent audio quality. Not only did I make a lot of noise in ZL, VP8 and KR6 etc, but the natives could understand what I was saying too! No increase in price, by the way. She's still £250 complete. 73 till April, de Mike.

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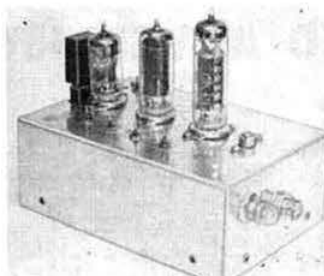
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INDEX TO ADVERTISERS

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EMSAC

CN1 Low noise 2 Metre converter with IF (output) of 28-30MHz for 144-146MHz input. Two 6CW4 Nuvistors in a cascade circuit provide the RF amplification. 12AT7 triode mixer and cathode follower for low impedance output. 12AT7 crystal oscillator/Multiplier. Measured noise factor better than 3dB. Band width minus 4dB or better over band. The Converter is complete with crystal (38-66MHz) and all plugs and sockets. The overall dimensions 6" x 4" x 4". 170/- P. & P. 4/6

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I.F.	XTAL
4-6MHz	70MHz
9-11MHz	45MHz
12-14MHz	44MHz
24-26MHz	40MHz

Crystals may be purchased separately price 30/- post free.

Other I.F.s are available outside this list for which the crystals have to be specially ground. These cost 25/- extra on the price of any converter and the delivery time is usually between 2 and 4 weeks.

XL3866 2 metre converter crystal as used in the EMSAC converter. These are brand new and especially made for us by Cathodeon. Type MMW, wire ends, spacing .192". Plenty in stock. 30/- Post free

6CW4 RCA Nuvistor. 10/6 plus 1/6 P. & P. any quantity

TU2 The TU2 is designed with the short wave listener especially in mind. Its useful range is from 1-5MHz to 30MHz continuous, including six amateur radio bands and all short wave broadcast bands. The improvement in performance will depend on how well your existing antenna matches your receiver.

The TU2 controls consist of 2 tuning capacitors, a switched inductor and a system switch. The system has positions giving a straight through position (so that you can instantaneously switch the thing in and out), a calibrate position (in this position the receiver input is earthed so that you can hear

Also in stock TAVASU mobile antennas. The TTC standing wave indication previously advertised are also available from—
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G3IAR **ELECTRONIC & MECHANICAL SUB-ASSEMBLY CO. LTD.**
Highfield House, West Kingsdown, Kent. Telephone: West Kingsdown 2344

your crystal calibrator pips or zero your "S" meter) and an "in circuit" position. The circuit is a pi-network. 90/- P. & P. 4/6

EMSAC 4 Metre Converter

CN3 Low noise 4 metre converter with two 6CW4 Nuvistors in the front end. 12AT7 triode mixer and cathode follower for low impedance output. 6AK5 crystal oscillator uses 42MHz crystal. The I.F. (output) is 28-100 to 28-700MHz to tune between 70-1 and 70-7MHz. Complete with crystal and valves. Overall dimensions 6" x 4" x 4". 170/-

CN4 4 metre converter as above in an attractive case with built in power supply, overall dimensions 8 1/2" wide, 7" deep, 4 1/2" high. 260/-
Input and output connections on EMSAC converters are being standardised to BL types. SO239 will be available to special order only.

EMSAC Basic Antenna Systems

GV1 All band Vertical.
The GV1 is a general purpose vertical antenna, which when properly excited, will cover frequencies from 1-8MHz to 28MHz. It is constructed of aluminium alloy tube sections nesting one inside the other, providing continuous adjustment from 7' to 23'. Apart from its role as a multi-band vertical it may be adjusted to a single band quarter-wave vertical for either 14MHz, 21MHz, or 28MHz. For portability, when dismantled, no individual element is greater than 6' 6". The antenna is mounted on two glass-fibre insulators (SO1), which may be screwed to a suitable piece of timber or mast. No guying is provided or required.

Optimum multi-band performance will usually be obtained by mounting the GV1 as high as possible driven by a single wire feeder. A tuning unit (transmatch) is required to match the feeder to the transmitter. A suitable circuit is given in the comprehensive instructions which accompany each antenna. Alternatively, the EMSAC TU4 may be used.

Optimum mono-band performance (14, 21 or 28MHz) using the GV1 will be obtained by using it as a ground plane antenna, in which case coaxial cable feed should be employed. The EMSAC tuning unit TU1 provides a perfect match to 50 ohms or 72 ohms coaxial cable. Alternatively, details of a suitable matching unit will be found in the instructions. 92/- P. & P. 7/6

GD1 Multi-band Dipole.
Multi-band dipole, 5RV type. 102 feet horizontal length of 18 swg Polyanite covered copper wire, 30 feet 300 ohm ribbon matching section and 80 feet twin 75 ohm feeder. Glass-fibre mouldings used for all joints. Ready to go! 80/- P. & P. 4/6

GD2 Multi-band Dipole
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AGENTS:

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G3MME Southwick: 4887
Sim: 19 Ellismuir Road,
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Send me a large s.a.e. and I'll fill it with all sorts of lists of new stuff, bits and bats, etc. The larger the envelope, the more guff you'll get.

H.P. on any equipment over £38. Got gear to flog? If it's good I'll either buy it from you or flog it for you on commission (5%).

73 de Bill VE8DP/G3UBO

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Matlock 2817, 2430 after 6 p.m.
Bill G3UBO

It's a funny thing, but if I don't keep pretty pictures of Sommerkamp gear in front of your eager, shiny faces, sales start to drop off, people ask me if there's anything wrong, rumours on 80 have it that Yaeu are coming out with a new all band vest pocket 2 Kw job for £10, etc. etc. Man, I tell ya, it bugs me not a little, so I reckon the full page spread elsewhere in this august journal will settle things and fill my till. As our hippie friends would say—"real heavy man, out of sight." However, I do flog things other than Sommerkamp—what about Inoue for size? Marvellous value. Other new bits and pieces are:

Morse buzzers 7/6; Morse keys with ball bearing pivots 18/6; Keysers Katsumi EK-9X £7.15.0; Speech compressors Katsumi £7.15.0; Headsets low impedance padded £2.2.6; Tavasu and G-Whips mobile antenna; Medco 50 ohm LP filters £5; 75 ohm £4.10.0; H.P. Filter 27/6; Small components in general; Filters Kokusai and KVG.

RECEIVERS: EA12 £130; HRO BS Coils £20; EC10 £38; BRT 400 £60; Collins 75 SI £175; KW201 £80; FR100B £85; SR600 £40; HA350 £50; T28 £8; PR30X £4.

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INCORPORATED 1926

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35 DOUGHTY STREET,
LONDON, WC1.
01-837 8688

* I hereby apply for election as a Corporate Member of the Society and enclose a remittance for £2/10/- being the amount of my first annual subscription.

* Being under 21 years of age and not holding a current Amateur Radio Transmitting Licence I hereby apply for election as a Non-Corporate (Associate) Member of the Society and enclose herewith a remittance of £1/5/- being the amount of my first annual subscription.

I, the undersigned, agree that in the event of my election to Membership of the Radio Society of Great Britain, I will be governed by the Memorandum and Articles of Association of the Society and the rules and regulations thereof as they now are or as they may hereafter be altered; and that I will advance the objects of the Society as far as may be in my power; providing that whenever I shall signify in writing to the Society addressed to the Secretary that I am desirous of withdrawing from the Society I shall at the end of one year thereafter after the payment of any arrears which may be due by me at that period be free from my undertaking to contribute to the assets of the Society in accordance with Clause 8 of the Memorandum of Association of the Society.

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† If the applicant is not acquainted with a Corporate Member willing to propose him for election he may submit a suitable reference in writing as to his interest in Amateur Radio.

The first subscription of 50/- or 25/- should be enclosed with this application to avoid delay.

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