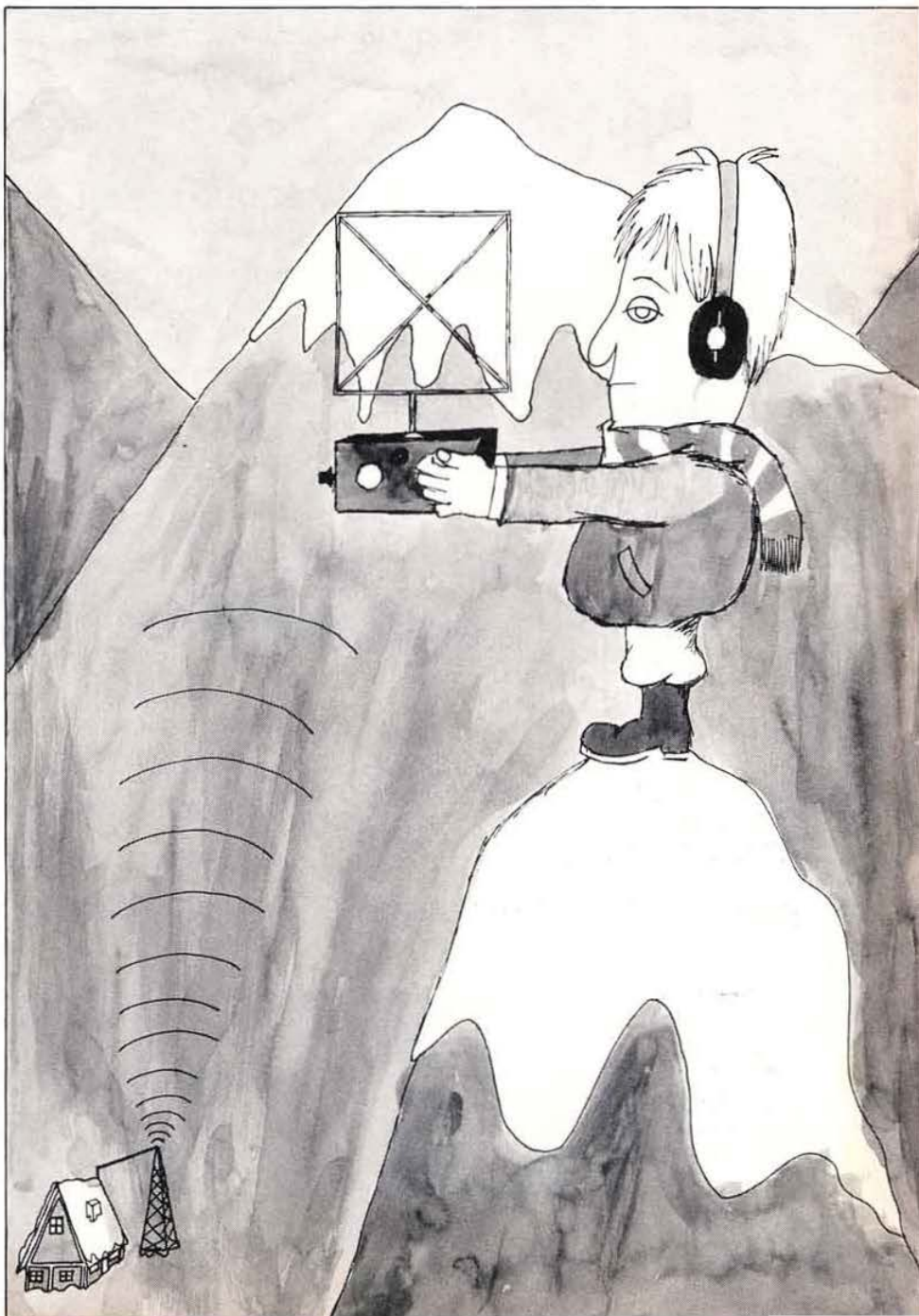
APRIL 1969

RADIO COMMUNICATION

DIRECTION FINDING AND D/F RECEIVERS

page 238



Journal of the Radio Society of Great Britain

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KW ELECTRONICS LIMITED

Write for illustrated detailed specifications on the KW 2000B; KW Atlanta; KW Vespa Mk 11; KW 201; KW 1000 and our list of KW Tested Trade-ins.

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RADIO COMMUNICATION

Incorporating RSGB Bulletin

233 CURRENT COMMENT—BRUSSELS 1969

235 JOHN CLARRICOATS, OBE, JP, G6CL
AN APPRECIATION

236 QTC

238 DIRECTION FINDING AND D/F RECEIVERS
Robin J. Pearce-Boby, Dipl. Arch.(Oxford), ARIBA, G3JLE

245 NEW PRODUCTS

246 REMOTE CONTROL FOR VHF APPLICATIONS
Robert K. MacDowell, W4VGS/G5AFL

250 EQUIPMENT REVIEW—KNIGHT KIT G-30 GDO AND KG 625 VALVE VOLTMETER
D. W. Robinson, G3FMT

252 QSL CORNER
A. O. Milne, G2MI

253 THE MOSVED AND THE DIRECT GENERATION OF SSB
Henry Gibson, K5MMW/6

254 TECHNICAL TOPICS
Pat Hawker, G3VA

259 THE INVESTIGATION BY THE POST OFFICE OF RADIO AND TELEVISION INTERFERENCE FROM AMATEUR TRANSMITTING STATIONS

260 MONTH ON THE AIR
John Allaway, G3FKM

262 PROPAGATION PREDICTIONS

266 FOUR METRES AND DOWN
Jack Hum, G5UM

272 SOCIETY AFFAIRS

273 ANNUAL GENERAL MEETING

274 OBITUARIES

275 RADIO AMATEUR EMERGENCY NETWORK
S. W. Law, G3PAZ

276 CONTEST NEWS

280 CLUB NEWS

284 LOOKING AHEAD, CONTEST DIARY AND MOBILE RALLIES

285 MEMBERS' ADS

295 INDEX TO ADVERTISERS

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5 MAY

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LOWE ELECTRONICS

50/52 WELLINGTON STREET, MATLOCK, DERBYSHIRE. DE4 3GS. Tel: Matlock 2817 (2430 evenings)

Let's fill a page with moans this month. I'm in a real old snarling mood. Mainly because some London spiv robbed me. Their advertising reads "all goods are new, first quality manufacture only and subject to makers full guarantee." Fair enough, I think, in my simplicity I order some OC171's. "Funny" I thought when I got them "OC171's should be chunky efforts with 4 bits of wire, whereas these are stamped OC171, sure enough, but only 3 wires and a TO5 case". VERY INTERESTING. New they may be, first quality manufacture they may be, subject to makers full guarantee they may be, but OC171s they most certainly are not! Ah, well, that's the last time I deal with that outfit, you can bet your sweet bippy. Unfortunately the laws of libel prevent me from warning you against a bunch of spivs publicly. In my case, it was O.K.—I only wanted them for a fool-around project. But think of the thousands of mugs who don't know enough to realize they've been done. Some poor lad who can't figure out why his transistor converter or something is dead. Ah, well, one lives and learns Let me just add that if you too have been caught—write to (*a*) Mullard, who are ready to take a swipe at the spivs, and (*b*) *Wireless World*, who, provided enough people shout, will stop their advertising. I can't understand the mentality of these crooks—it's just as easy to make a living honestly. As I said, I'm in a snarling mood, ready to take a swipe at anyone—particularly advertisers who claim perfection for things which are very, very far from perfect. It constantly amazes me that people can be fooled by such blah. What really riles me is that the advertiser is taking us for mugs. His opinion of us chaps who read this magazine is so low that he thinks we haven't the intelligence to see through it. And that gets me mad. Once again, the laws of libel stop me from blowing my stack, but honestly, lads, just look at the ads and the deliberate attempts to fool us. Here again, readers of this magazine should know something of spec sheets and how they can be distorted, but what about the poor chap who laps it up as gospel—he's done proper, as they say. Most of us know what constitutes a mechanical filter, we know the difference between a spec which claims 2·4 kc/s selectivity and one which says 2·4 kc/s at –6dB at 4·5 kc/s at –60dB. We know the difference between so many microvolt sensitivity for 10dB S/N ratio and *better* than so many microvolts for 10dB S/N ratio *across the entire tuning range*. We know the importance of image rejection, internally generated signals, stability etc. and do our best to find these things out. But what about the poor laddy who doesn't know. All he thinks is, it's widely advertised and everyone sells it, it *must* be good. Poor lad, he's a lot to learn. When something new comes on the market, I try it out. If the maker claims 2 kc/s selectivity and I *measure* it at 4 kc/s 6dB down (it sounds nice? Sure it sounds nice—with a filter as broad as a barn door it's bound to sound nice!) and if the maker claims 1 microvolt sensitivity and I measure it at more than this, and if it generates spurious signals then thank you very much, but I won't touch the damn thing with a barge pole. Regardless of the profit margin. I am (of course!) referring to the FE Super 600GT I had at the Show. The spec. sheet from Japan looked excellent, the design looked excellent, the price was attractive. BUT, it would not stand up to hard testing, so I don't flog it! If anyone wants a stinker, they can have it well below cost for £120. 0. 0! The joke is though that it has manufacturers specs that'll knock your eye out. Absolutely marvellous. Nevertheless, it's a stinker. I can tell you I've tested quite a few rigs and that's why I stick to Sommerkamp, Star and Inoue. Maybe I'm a chump—maybe I should sell what the other lads are selling, there's more money in it, but whenever I'm tempted to make a fast buck, I think of the businesses that have come and gone over the past years, No Sir, I'd like to be in business for many years yet, so I'll not sell anything questionable in any way. Altruistic? No, just plain common sense. However, all this grumbling and moaning won't flog anything, so lets get stuck in. Something new this month.

Low Pass Filters: Beautifully made and furthermore, something which really delights me, they're made in England. Insertion loss below 1dB, stop band attenuation around 80dB, capable of the full legal limit at 2 : 1 SWR or less. In short, a cracking good tool.

Prices:

50 or 75 ohm (state which, it's important!), with Belling Lee sockets, £4 10.0
50 ohms with SO239 sockets £5.0.0.

Another new job coming along—again made in England. A keyer with built-in monitor. CW men tell me it's a good 'un. I wouldn't know! I"m a PTT man from way back, but I take the word of an independent CW man. He says it's good, it's British made and the price is right! £10.0.0. But I haven't many! I have the well known and popular Katsumi EK9X keyer at £7.15.0. This doesn't have a built-in monitor, but I have also the Katsumi monitor. This is a rather superior effort with a quiet keying relay and spare contacts for break-in CW. £7.15.0.

Also in stock, the Katsumi speech compressor at £7 15.0. Again a popular tool.

In the big stuff, I have new and secondhand stocks of transmitters, receivers and transceivers to suit most tastes!

Sommerkamp of course. The FR-500 receiver (and mine actually have the crystals in that they're supposed to have!!) covering top band to 10m, 1 kc/s readout, AM/CW/SSB filters, notch filter. The lot, £130.0.0. Let's get this clear though. The FR-500 is not perfect, it is not the best Rx on the market. It drifts, it has images, it does not have a 1dB noise figure, it has birdies, it cross modulates. However, in spite of all this there is not a receiver anywhere near this price that will equal or better it. Come to think of it, the only Rx I know of that I'd rather have anywhere near the price is the Drake R4B (No, I don't sell them, but I don't mind giving credit where credit is due) Companion transmitter, FL-500 £145.0.0.

I also have the FT-150 in stock. At £215.0.0. complete with both mobile 12v and mains p.s.u.'s built in, it represents extremely good value. It's big brother the FT-500 with a 500W p.e.p. input costs £250.0.0 complete with built-in mains p.s.u.

For someone wanting something a little cheaper, take a close look at the Inoue. The receiver is all transistor using lots of FET's around a top quality 9 mc/s xtal filter. A very sensitive, quiet, birdie free Rx. 12v d.c. or 240v a.c. supplies built in. It's a little beauty and comparing it with other Rx's around the price, well worth £85.0.0. The companion Tx uses the Rx V.F.O. for transceive operation. Again transistor except V.F.O. mixer, driver and PA (2–6146B's). A nice sounding very clean Tx complete with psu £95.0.0 Where you'd get a better rig for £180.0.0 complete, I honestly know not. Here again, let's introduce some plain honesty. Is the Rx as good as the Sommerkamp FR-500 I'm always asked—of course it isn't. If it were, then I wouldn't sell a Sommerkamp. Certainly it is better in some respects, but it just hasn't the versatility of the FR-500. However, taking other transistor gear on the market at around the same price as the Rx, there just isn't any comparison.

The Star 700 series also represents excellent value for money. SR-700 Rx at £115.0.0. and ST-700 Tx at £135.0.0

Last good buy is the National 200 at £145.0.0 less p.s.u. I just can't sell these and I don't know why. It is one hell of a good rig for the money. It is not, of course, in the same class as the Sommerkamp transceivers—but it's nowhere near the price either. I just can't understand you chaps. The only thing I've got against it is that it uses the PA pi net as the Rx input stage. Now, the PA tubes' load impedance differs very considerably from the r.f. amp. input impedance, to say nothing of conflicting Q requirements so it isn't really very elegant design. However, Gentlemen, just take a look around and see all the other makes at much higher prices that do exactly the same thing! Also, by the way, look at Sommerkamp who DO NOT do it—they use proper r.f. antenna coils for the Rx side. Just one of those little things the spec. sheet never mentions! And of course, just one of those little reasons I flog Sommerkamp and not some other brand! However, in spite of this, the National 200 is value for money and that's my criterion. I honestly think that the above stuff is top value for money, but more than this, you get service second to none. Also of course, it is all ex stock at the time of writing.

Anyway, so much for the new expensive stuff. In the second hand line I have a very good selection of good quality stuff. The snag is that by the time this advertising appears in front of your bloodshot eyes, my current stock will have changed. I don't know what to do—I have some good stuff and if I include it in this guff it will likely be sold long before publication and I will be driven crazy by 'phone call after 'phone call for something sold 6 weeks ago. Best thing to do is just mention that if you are in the market for any gear send me a large s.a.e. and I'll tell you what I've got. This will be stuff that is in excellent condition and thoroughly recommended—I do not handle anything the least bit questionable. Many times I get a fond Daddy coming in wanting a rig for junior around £10.0.0. I advise him to get something better that won't frustrate the little monster—something he can use and enjoy using and hear some DX. He obviously thinks I'm making like a dealer, out to rob him, so he trots off somewhere else and buys a load of rubbish for £10.0.0. In one month or less it's in the garbage can. Well, I did try! I may be mad but it makes sense to me. Never mind, bash on! Just room to mention a few sundry bits. I've got a good 2 metre converter. 4 valves; twin triode r.f. 6BQ7A; 12AT7 xtal osc. 6RR5 mixer and 6AU6 I.F. amp. (28–30 mc/s). It requires 63v. a.c. and 150 to 200v d.c. It performs jolly well and is most attractively priced at £10.0.0. Lets be honest again (I must be mad!) It is not perfect. It has birdies. I doubt if the noise factor is anything like 1dB or less. I'm not a VHF man and thus dead ignorant, but someone may be able to enlighten me. Is there any piece of commercial equipment anywhere in the World outside a laboratory that has an overall N.F. of anything like 1dB? C.W. practice sets. These are a good buy for 15/-. consisting of a key and buzzer. We don't supply the 1½ volt battery though. Although the buzzer isn't what I'd call T9 (although I've heard a T9 report given to worse chowpi chowpi chow chowpi chow!) the key isn't bad. Well worth 15/- to anyone wishing to get CW up to snuff.

Well, I guess the above waffle will just about kill my sales stone dead this month. However, I console myself with the thought that somewhere amongst you is a man who pays no regard to advertising, a man who studies the circuit diagram and thinks about it, a man who can distinguish between good design and cheap design, a man who can evaluate the worth of a piece of gear. To you, sir, a hearty welcome. Come and delve, it is all ex stock.

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Plain morse keys, polished brass with ball bearing pivots	18 6
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S.W.R. Bridges, Hansen S.W.R. 3. 50 or 75 ohm	£3 10 0
Bug keys	£4 0 0
Katsumi C.W. Monitors, high speed relay, built-in with spare contacts for break in CW	£7 15 0
Headsets, low impedance, padded	£2 26
AR88D manual reprints	15 0
VHF/UHF 50 ohm dummy loads	£2 10 0
Collins 5 cycle VFO's, one left	£35 0 0

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6BH6-6BH6-QQV03-10-QQV30-10. 6 or 12 volt heaters. Inc. Valves AE relay 6 or 12 volt. Less Crystal 8 MHz. Modulator. PSU & Chassis. Delivery 7 days. Postage 3/6 **£4 17 6**

4 metre version. As above. Delivery 21 days.
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QQV03-10 modulator and audio amplifier dual purpose kit, relay switched. OC 200 mod. compressor, NKT223 emitter follower, NKT223a Tx mod. amp and Rx audio amp. NKT 223s emitter follower. NKT404 Tx and Rx driver. P.P. NKT 404 Mod. and Audio output. Complete with transformers. Pre-tested wired and dipped printed circuit board. Inc. tailored mike, press to talk. 300-3500 Hz. Less chassis. Postage 4/6 **£4 18 6**

Built with selected radiotelephone components. All kits include instructions & circuits. Negative or positive earth. Delivery ex stock unless otherwise stated.

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12v DC in. 390v DC 200ma out.: or 160v at 145 ma. Built on chassis 8 in. × 5 in. × 2½ in. with Toroidal transformer (2⅜ in. h. × 2½ in. w. × 2¼ in.) and large heat sink mounted on top of chassis. Postage 6/6 **£8 18 6**

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2 metre converter AFZ 12 1st RF amp. AFZ 12 2nd RF amp: AFZ 12 osc-multiplier GEX 66 mixer: or equivalent transistors of equal performance. Built on printed circuit. Will operate from 8 to 14 volt neg. or pos. earth. Space inside case (5 in. × 2 in. × 6 in.) to take battery for portable use. IF adjustable from 12 to 29 MHz. Crystal supplied is in this band, but cannot be specified at this price. Low noise figure. Guaranteed for 3 months. Delivery 14 days. Postage 3/6 **£8 17 6**

Garex ABP70. Transistorised 70cm converter. GM0290a grounded base RF amp. GM0290a mixer. Two trough line circuits at 432 Mc/s. (Cathodeon) VHF crystal 4½ db.noise figure. Built on copper clad fibre glass laminate and housed in 4½ in. × 3½ in. × 2 in. diecast box. IF 28-30 MHz ex stock; 12 volt DC operation. Post paid **£14 17 0**

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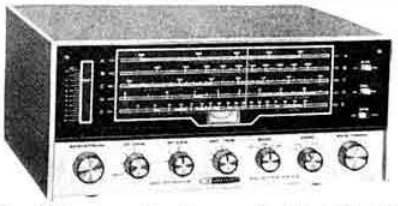
Kit K/SB-310 (less speaker) **£138.12.0** P.P. 9/-.
Optional CW and SSB filters available as extras.



GR-54 5 Band Shortwave Receiver . . . for AM, SSB, CW. Product det. for SSB . . . 3 shortwave bands cover 2 MHz to 30 MHz plus 550 kHz to 1550 kHz AM broadcast band and 180 kHz to 420 kHz aeronautical and radio navigation band. Built-in AM antenna.
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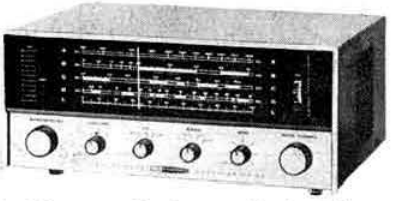
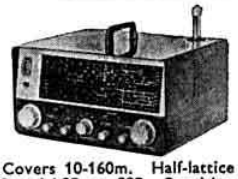


GR-64 4 Band Shortwave Receiver . . . 4 bands—3 shortwave bands cover 1 MHz to 30 MHz plus 550 kHz to 1620 kHz. AM broadcast band. Variable BFO control for code and SSB transmissions. Built-in AM antenna.
Kit K/GR-64 **£22.8.0** P.P. 9/-.



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Kit K/RA-1 £39 . 16 . 0. P.P. 9/-.

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B •

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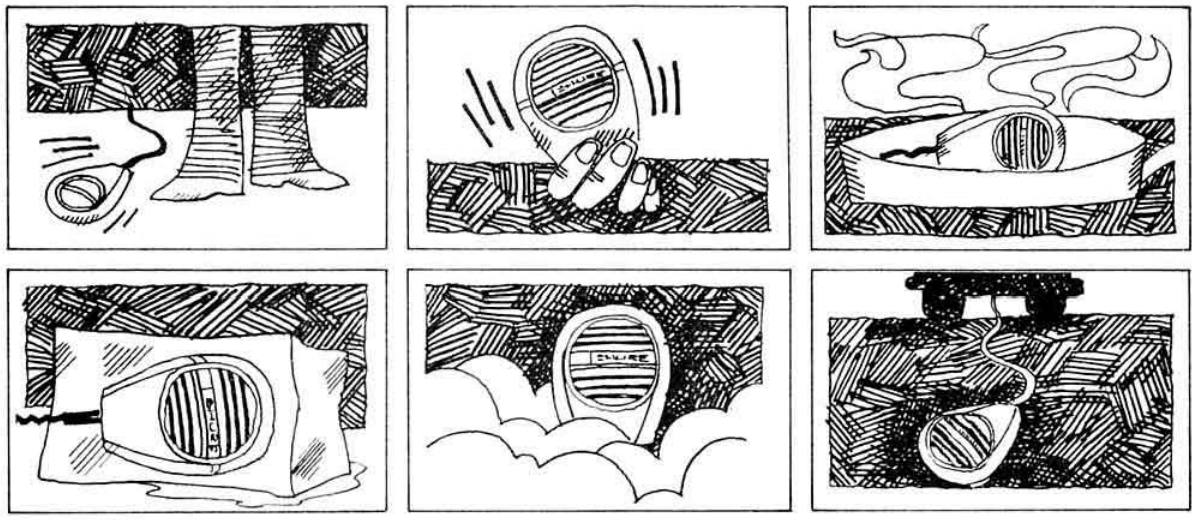
just to make sure that you never will



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We fry them. We freeze them.
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BRUSSELS 1969

TO the present generation of radio amateurs, particularly those who have qualified for a transmitting licence during the last ten years, the significance of the meeting to be held in Brussels next month has little meaning, yet for those who held a licence in the days prior to the 1939-45 war or obtained one shortly afterwards, the importance of the meeting will not be overlooked.

Nineteen years have elapsed since a proposal was put forward by representatives of the RSGB at the Silver Jubilee meeting of the International Amateur Radio Union, held in Paris, that Member Societies of the Union, located in Europe, should band together and establish an IARU Region I organization. The proposal met with the unanimous support of the 15 European societies represented at the meeting and the RSGB, having originated the idea, agreed to undertake financial responsibility for the first three years of the IARU Region I Bureau, as it was then called.

Why did the need arise for a Region I Bureau and why is this now a Region I Division? The answers are simple—a few months earlier—(during the long hot summer of 1947)—a World Radio Conference had taken place in Atlantic City, New Jersey, USA when, in the course of six months, the future of Amateur Radio was "in the melting pot." Not since pre-war days (Cairo 1938) had a World Radio Conference been held and during the nine years that had elapsed much had happened to cause the nations of the world to look for a reappraisal of the Cairo Conference decisions, especially those affecting frequency allocations. At the Atlantic City Conference two radio amateurs from England (the then President and Secretary of the RSGB) undertook the task of representing the European viewpoint at the Conference, surrounded by European government delegates who because of the war and because most European national Amateur Radio societies had had little time to get going once again knew—and cared—little about Amateur Radio or about the work done by radio amateurs.

On their return to England the RSGB representatives made it their business to emphasize to the Council of the Society. the dangers that had threatened the Amateur Radio movement, especially in Europe. In their reports both had pointed out the failure of many national societies to brief their government delegates on the meaning of Amateur Radio and on the requirements of their amateurs. The problem then was how to bring home to the amateurs on the mainland of Europe the need for a much closer liaison between all national Amateur Radio societies and Government departments responsible for the issue of amateur licences.

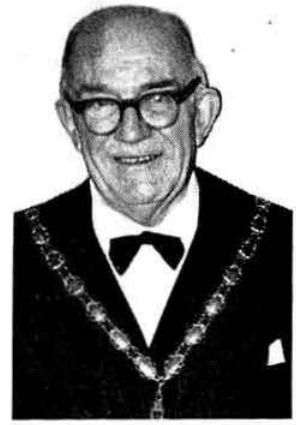
The decision to hold a meeting of IARU Member Societies in Paris during the spring of 1950 to mark the Twenty-fifth Anniversary of the formation of the International Amateur Radio Union in that city in 1925, provided the very opportunity the RSGB/IARU delegates to Atlantic City had been looking for. The Society's Journal, and other national Amateur Radio journals of the period, recorded the happenings at the Aero Club d'Paris during the period of the Conference when, among many other matters discussed, was the proposal to hold a formal meeting of European societies in Lausanne during 1953. The proposal was accepted and a Region I Bureau was established in London. At the Lausanne conference it was agreed to set up an international Committee and to introduce a simple method of financing the Division, primarily to provide funds which would enable the European (and later Region I as a whole) societies to pay for the cost of sending their *own* delegates to the next World Radio Conference. The decisions taken in Lausanne were strengthened three years later at a conference in Stresa, Italy, when rumours began to circulate that the "next " World Radio Conference was "round the corner". In fact the "next" Conference did not take place until 1959, in Geneva. Prior to that Conference a further meeting of Region I Division societies had taken place in Bad Godesberg, Germany, to nominate a team of observers to attend the Geneva Conference and to ensure that the appropriate Government departments in each country, where an IARU society existed, had full knowledge of the Amateur Radio movement, both nationally and internationally.

The Radio Regulations and the Frequency Allocation Table embodied in the Geneva Radio Conference of 1959, provides the basis on which Amateur Radio operates today. The efforts made by the team of IARU Region I observers during the six months' duration of that Conference were fully reported upon in every national Amateur Radio journal at that time.

Now, ten years later (with IARU Conferences in Folkestone, England, 1960; Malmo, Sweden, 1963; and Opatija, Yugoslavia, 1966 in between) another Region I Conference is almost here—Brussels 1969. Today with its 33 Subscribing Member Societies, Region I Division is well equipped to meet the challenge offered by all other users of the radio spectrum. The RSGB will again play a leading role in the work of the Conference, not only in the field of administration but also by making numerous contributions to the formidable array of Brussels Conference documents that are to be discussed by some 80 delegates from the 19 Member Societies who will be present. J. C.

(G6CL would have acted as Secretary of the Brussels Conference and this contribution was prepared during the week before his death).

John Clarricoats, OBE, JP, G6CL



AN APPRECIATION

By A. O. MILNE, G2MI, PAST PRESIDENT

To his vast array of friends, in many walks of life and with many differing interests, the knowledge that this human power-house has at last come to rest will be hard to realize.

The loss of a dear friend is always a shock, but we can all be thankful that he died in harness and was spared even a short period of lingering existence as an invalid, which he would have found intolerable.

What of the man himself? To say that he was no ordinary man is a trite understatement. He was one of those unique Originals—a Personality. How true is a remark made by one of our technical members when he said: " Clarry—he's just a one off!" There was no one like him. His gifts as a speaker and organizer were outstanding. He had a passion for accuracy and correct procedure with a sense of protocol which, sometimes, could infuriate those of us who dared to argue, yes, that is the word, because events would so often prove what we already knew in our hearts, that he would be right in the end.

Not only did he manage to accomplish the tasks of several ordinary men but he had a remarkable aptitude for conscripting assistance from others who would happily remain convinced that they were volunteers. He could lead, inspire and advise at the same time as he, himself laboured unceasingly.

It was in June 1926 that he became a member of RSGB and immediately things began to happen. He was co-opted on to the Council as Social Manager in July 1928—how times have changed!—and became Honorary Secretary in January 1930. In 1932, he became full-time Secretary, a courageous decision to take in those dark days of depression, and it was from this post that he retired in December 1963.

Up to the outbreak of war in 1939, it is doubtful if G6CL had a dozen weekends a year at home. Wherever there was a gathering of Radio Amateurs there would be Clarry and on the rare occasions when he was at home, 16 Ashridge Gardens became open house to Radio Amateurs from far and wide.

During a large part of the war years, the offices of the Society were located at his home and during this period, due to the combined efforts of G6CL, Mrs. Clarricoats, May Gadsden and the few members still available, the membership increased from 2500 to over 6000.

This was not all, for, during this time, he also held a commission in the Royal Air Force and was on special duties concerned with the training of personnel for radio communication.

His editorship of the pre-war "Guide to Amateur Radio " and the later Handbook and Supplement laid the foundations of the financial stability of the Society and, just as a side-line, he also produced several training manuals for service use.

It was while he was at the ITU Conference in Atlantic City in 1947 that he realized the paramount importance for improving the international image of Amateur Radio and it was his inspiration which brought into being the IARU Region I Division, which has played so great a part in the general acceptance of the Amateur Service and the esteem in which it is held in high places.

He made it his business to know everyone and to bring his persuasive powers to bear, to the advantage of Amateur Radio.

His work for the Region I Division alone would be a worthy memorial in itself but this is only one of the fields in which his influence was exerted to leave a permanent mark. That fascinating book "World At Their Fingertips " would have satisfied most of us as a bequest to posterity.

Apart from Amateur Radio, John Clarricoats had another and quite separate life in Local Government. In 1945 he became a Borough Councillor in his beloved Southgate; he was elevated to Alderman in 1954 and became Mayor in 1955-56.

To his hosts of friends, his admission to the Most Noble Order of the British Empire in January 1955 was a particular pleasure but, although he deeply appreciated this honour, there is little doubt if anything gave him greater personal happiness than his election as an Honorary Member of the Society, of which he was the architect, in December 1963.

This is the Society's highest honour and has been conferred only seventeen times. Of these, which include Sir Oliver Lodge and Senator Marconi, only seven are now living.

One of Clarry's great interests was in Freemasonry. He was a Past Master of Grovelands Lodge and Founder and First Master of Radio Fraternity Lodge No. 8040—a very significant combination to the Radio Amateur. He had recently received the honour of being made a Member of London Rank.

In May 1968 he was elected Mayor of the greatly expanded London Borough of Enfield which had encompassed Southgate and it was while preparing to discharge one of his civic duties that he collapsed and died only a few hours later.

His dedication, wise counsel and sheer hard work will be sadly missed by the IARU Region I Division who will be holding their triennial meeting in Brussels in May, the preparatory work for which had been exercising his attention for some time past.

Any tribute to this remarkable man is bound to be inadequate. We can but salute his memory, count ourselves privileged to have been numbered amongst his friends and be grateful for all that he did for us.

To his wife Cecilia, his son, Professor Peter Clarricoats and his two daughters, Joan and Pamela, we offer our heartfelt condolences.

R.I.P.

QTC

Investiture of HRH The Prince of Wales
Leon Deloy, F8AB
Amateur Gets Jail Sentence

Investiture of HRH The Prince of Wales

Amateur Radio participation in this historic event will include a Special Activity Station to be established on the outskirts of the Royal Borough of Caernarvon, scene of the Investiture on 1 July this year. The station has been specially authorized by the GPO with the callsign GB2HRH and operation will be from a fully-equipped caravan located in a beautiful rural setting overlooked by the mountains of Snowdonia, the rugged domain of former Princes of Wales.

Activity will commence on 28 June and the station will be open until 6 July. Operation will be on all the Amateur bands from 10 to 160 metres inclusive, propagation conditions permitting. The single sideband mode of communication will be employed for most of the contacts and more than one band will be in use, simultaneously, for much of the time. Requests for contacts will be welcomed and every effort will be made to meet the requirements of other stations, particularly those in member-countries of the Commonwealth.

The station will not be open to the general public as the site is private property. Operators will include GW2HFR, GW3IEQ, GW3NWV, GW3OXU, GW3VBX, GW5YB and G3WET, with assistance from members of Amateur Radio Clubs in the county. Welsh-speaking Amateur Radio operators, at home and abroad, are invited to write for pre-arranged schedules with GB2HRH so that opportunities may arise for contacts in the Welsh language. Contacts with the station will be confirmed by commemorative cards.

Further information is available from John Griffith Evans, G3WET, 22 Sherifoot Lane, Four Oaks, Sutton Coldfield, Warwickshire, who will be pleased to arrange contacts. Postal enquiries must be accompanied by stamped envelopes.

Who Wants to Know About Veroboard?

Vero Electronics Ltd., manufacturers of Veroboard have indirectly offered through the Crystal Palace Club to give talks on Veroboard to any interested Societies and Clubs. Veroboard is a novel kind of circuit construction board, incorporating conductors on the board. It is suggested that interested Clubs contact Vero's Sales Director, Mr J. A. Potter at Vero Electronics Ltd., Industrial Estate, Chandler's Ford, Eastleigh, Hants., to arrange for a local sales representative to see them.

The Wirral Six Ten NFD Transmitter

It is regretted that an error appeared in the circuit diagram, Fig. 1, of the Wirral NFD transmitter, published on page 99 of the February *Radio Communication*. The EF80 TR switch valve cathode bias network (220 ohm and 0·01 capacitor) are shown connected to terminal " C." This output should be connected directly to the variable 100K resistor via the diode shown, with the cathode bias network connected directly to the primary of the transformer.

RSGB Dinner Club

The next meeting of the Dinner Club will take place at the Kingsley Hotel, Bloomsbury Way, London, WC1 on Friday, 18 April at 7.30 for 8 pm. This is an informal function to which overseas visitors are particularly welcome. Bookings should be sent to Mrs Jardine at Society Headquarters. The cost of the dinner remains at 25/-.

Committees of Council

Mr A. D. Patterson, GI3KYP, has been invited to serve as a corresponding member on the VHF Committee. Mr E. G. Ingram, GM6IZ, is also a corresponding member of this committee and not a full member as published last month.

RSGB QSL Bureau

The QSL Bureau will be closed during the month of May. Please do not send any cards to G2MI during this period.

Radio Amateur's Examination 21 May 1969

The Centre organized by the Society will be at University College (London), Gower Street, London WC1. The entries total 74 and all candidates will shortly receive entry cards and information on how to reach the Centre.

John Clarricoats, G6CL

Mrs Cecilia Clarricoats and family wish to thank the many friends in the Radio Society of Great Britain who have so kindly sent letters of sympathy with them in their great loss.

What a Start!

The first contact that G3YEK made on receipt of his licence was with RSGB President John Swinnerton.

GB3GM Beacon

Despite our statement last month, it was not an argument with the Caithness breeze that removed the signal from GB3GM at Thurso. GM3SFH, who looks after the beacon, says that he has a relay in the mains line so that mains failure results in the beacon being shut off. Blizzards, impassable roads and the rest made sure that GB3GM remained inaccessible and it was consequently off the air for five days. It says much for the aerial system that all the huffing and puffing the frozen north could throw up had no effect whatsoever.

VHF Communications

The first issue of this new quarterly magazine published in West Germany by DJ3QC arrived in the UK at the beginning of March. In its 64 pages there are six technical articles each containing full circuitry and layouts for the equipment described. Of particular interest are a 144 MHz converter using FETs and a phase locked oscillator for receiver and transmitter use. An invaluable feature is the availability of printed circuit boards and essential components, such as coil formers, trimmers and transistors for the various designs. A yearly subscription to the magazine is the sterling equivalent (25s.) of three dollars and the UK representative is D. T. Hayter, G3JHM, of 4 Newling Way, Worthing, Sussex, to whom orders should be sent. A limited number of copies of the first issue are available to personal callers only at Headquarters.

G3HBW Dip Oscillator

This popular piece of test equipment is described in Chapter 19 of the *Radio Communication Handbook* commencing on page 19.18. Intending constructors should note that the two section variable capacitor C1-C2 (15 + 150 pF) may be obtained from Jackson Bros. The aluminium box may be obtained from H. L. Smith & Co., of Edgware Road, London, W2.

Leon Deloy, F8AB

It is with regret that the Society records the death, on 21 January, 1969, of Leon Deloy, one of the pioneers of Amateur Radio. It was F8AB who made the first trans-Atlantic QSO on 26 November, 1923 using a wavelength of 103 metres. With his co-operation it became possible for G2KF to contact U1MO during the early morning of 8 December, 1923 for the first UK—USA short wave contact. F8AB was the first French amateur to make contact with the UK over the Nice-Aberdeen path. During his lifetime he was honoured by government and scientific bodies for his work in connection with radio communication. The trans-Atlantic QSO of F8AB and U1MO and other references to Leon Deloy are recorded in *World At Their Fingertips* by the late John Clarricoats, G6CL.

Amateur gets Jail Sentence

QST reports an event that should be a warning to any ill-inclined Radio Amateurs.

In November, in Bowling Green, Kentucky, K4KHE was convicted on seven separate counts of transmitting obscene, indecent and profane language on amateur frequencies. The case had been investigated by the FCC and the FBI. K4KHE was fined $100 on each of the seven charges, totalling $700. He was also sentenced to six months in jail on each count, each period to run concurrently.

Two other Kentucky amateurs, WB4AOE and W4EBG, were convicted for similar reasons. They received three months suspended sentence each, and they are on probation for two years. They were also fined $100 each.

QST also reports that ex-WN6PNZ, of Hollywood, California, has been denied an amateur licence due to consistent past violations of FCC rules.

ATC Break-in

It is sickening to have to report an act, or rather several acts of violence, that recently took place in Staffordshire.

During the week of 26–31 January, 1969 the headquarters of the 238 Squadron Air Training Corps at Hartshill near Stoke-on-Trent was twice broken into. This building was protected by all the usual security measures but these proved apparently quite useless. It is well known that protecting unoccupied buildings is a great problem but this should perhaps serve as a grisly reminder to Club officials to keep a very close eye on their property.

At this particular ATC HQ there is a seven foot high chain link fence, double locked doors, latched and screwed windows and a frequent random check is kept on the hut. None of this was much obstruction to a strong pair of wire cutters and a large jemmy.

Apart from amateur radio equipment, the first things the vandals smashed were the cadets' canoe, about 50 model aeroplanes and numerous electronic projects. However, it seems that the signals room was the main target. This was partially used for amateur radio and also for ATC/CCF signals communication. This room is equipped throughout with the personal property of V. J. Reynolds, F/O, RAFVR (T), G3COY, the signals and training officer of the group. Plain hammering has little effect on government surplus and army gear but subtler things such as spilled paint and dish-washer are difficult to resist. It's hard to move frequency with glue on your bandswitches. Doors don't look like much when they are smashed open and components tend to bypass tolerance values when trampled. On top of this disturbance the vandals amused themselves with smaller objects such as tools, headphones, odd souvenirs, canteen funds and much else. Fortunately the damage was "limited" because the electricity and water had been turned off at source.

On the first parade night after the break in, Group Captain A. Reece, RAF, DSO, OBE, DFC, AFC, ADC expressed his regret at the damage. His wish that the squadron should be restored to something like normal has already been partly accomplished. However, the squadron still needs some cw equipment for the 4·0 to 6·5 MHz range.

Needless to say, RSGB express their regrets on this occurrence. At the same time, we suggest that clubs look very carefully at the position of equipment in their own meeting places.

Can You Help?

C. J. Morris, G3ABG of 24 Walhouse Street, Cannock, Staffs who wishes to exchange ideas with anyone who has built the "Signal Souper" published in *CQ Magazine*, October 1968?

Silent Keys

We regret to have to record the passing of the following:

J. Croysdale, G5US, of Salisbury, Wiltshire.
Horace David Cullen, G5KH, of London, EC2.
H. Goldthorpe, G3BZF, of Manchester 16.
Norman Routledge, G3DDO, of South Poynton, Cheshire.
David Taylor, G3URH, of Rendal, Birmingham.
Greville Knights, G8APQ, of Tadworth, Surrey.
H. J. Platt, BRS25243, of London, SE22.
Anthony English, G3FPS, of East Molesey, Surrey.

Direction Finding and D/F Receivers

By ROBIN J. PEARCE-BOBY,
Dipl.Arch.(Oxford), ARIBA, G3JLE*

THIS article has been written to satisfy members' curiosity and help generate a greater interest in direction finding, and experience rather than theory has been drawn upon to help bring new recruits into these competitions reasonably painlessly. If a strong enough demand for the more theoretical and tactical aspects results, no doubt these could be covered in a further article.

General

A definition of Direction Finding or D/F as it is generally known could be: The sport of finding a hidden transmitter by cross bearings coupled with radio and physical searching at the transmitter locale.

This pastime has been followed by licensed and unlicensed Radio Amateurs since the late nineteen twenties. Very early D/F competitions were, I believe, staged in the Cheltenham and Gloucester areas; and no doubt earlier and other examples will come to light.

Most D/F competitions in this country now use the 160m band, although on the Continent and elsewhere 2 metres is favoured for " Foxhunts."

There is no " closed shop " in D/F. On the contrary Eric Mollart's lectures to interested clubs have been well received but little practical response has resulted. Car rally and insurance requirements have also deterred, but in practice are no problem. The existing competitors would welcome more participants in what in their experience is the most friendly of competitions even though no holds are barred in the actual contest!

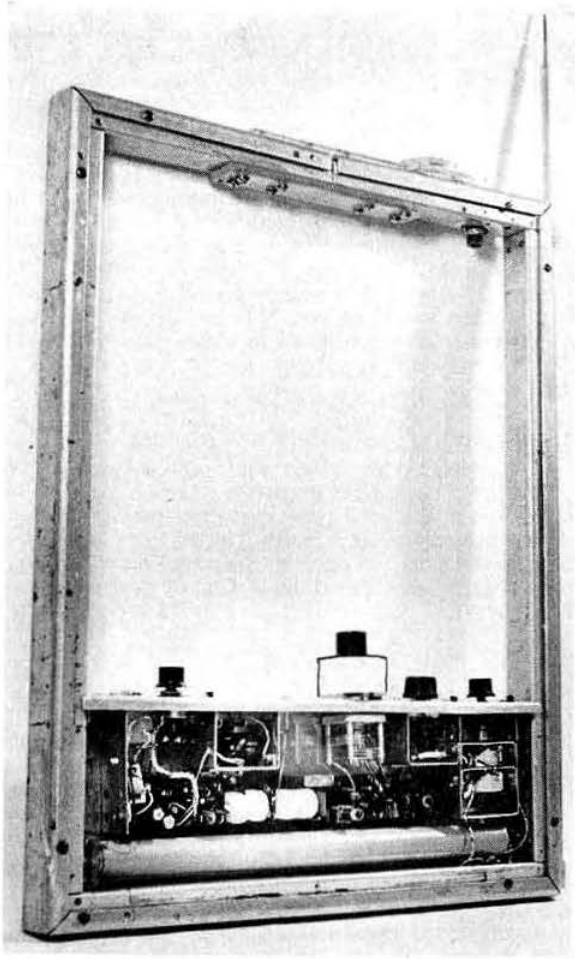
Several varieties of D/F events are organized by interested clubs in addition to major events under the auspices of the RSGB. Virtually all require a competitor actually to find a hidden transmitter with a demonstrably working receiver, the winner normally being the first to locate the transmitter(s).

Motorcars are used to get about the countryside although it would be quite possible to compete in many with a bicycle, or, in some cases by walking. Competitive driving is not necessary.

A brief description of the basic form RSGB events take will give a broad picture of the D/F world.

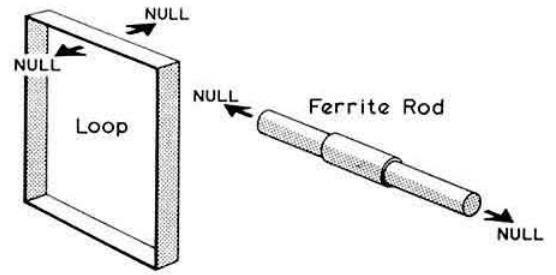
This particular competition comprises a series of qualifying rounds held around the country throughout the season, culminating in a Final. The qualifying rounds and final are run by local Radio Clubs on behalf of the RSGB. Competitors have two transmitters to locate and are given a form to be signed and timed by the transmitter crew. The winner being the competitor who finds *his second* transmitter before any other entrant.

To qualify for the Final a competitor must be one of the first three " home " who have not qualified in previous

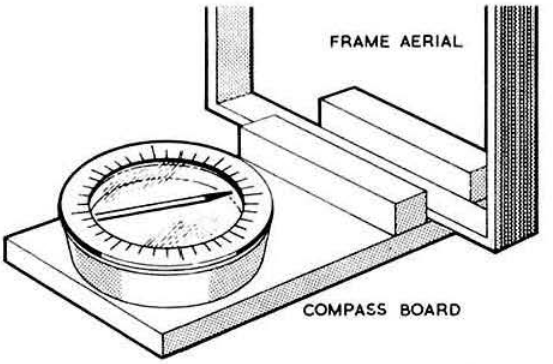


The FET receiver mounted in the frame containing the screened tuned loop. The gap is at the top of the frame with the sense aerial mounted on the upper right hand corner.
Photo by K. Figg.

* 63 Bartlemas Road, Oxford.



Showing the directions of maximum and minimum signal using frame and ferrite aerials.



The method of mounting a compass on a board with guides for the frame aerial.

rounds. The RSGB D/F Trophy is awarded to the winner of the RSGB Direction Finding National Final. Copies of the current rules of RSGB D/F events may be obtained from Headquarters.

Most of the other competitions in this country use only one transmitter although there are night events that employ two. Accuracy of bearings is used in one series of events to help determine the winner.

The majority of D/F competitions have several fixed time transmissions of a few minutes' duration. All other transmissions being " random " that is when the operator feels like it! These transmissions are normally of at least two minutes' duration with not more than fifteen minutes between them.

The transmitter(s) will be located on the same 1in Ordnance Survey map as the start, with a practical route to the transmitter shown on the map. No trespassing is necessary.

The receiver for D/F will of course cover Top Band! Bearings are obtained by the use of frame (loop) or ferrite rod aerials which have very sharp bi-directional " nulls " or minimum signal effects, approximately 180° apart. A magnetic compass attached to this aerial " reads " the bearing (maximum null). For " sensing " the true bearing from the reciprocal a separate signal from a vertical aerial is switched into the receiver input and compared with the directional aerial. With the directional aerial turned to *maximum signal* and the vertical aerial connected a strong or weak signal will be heard. If the directional aerial is rotated 180°, (its reciprocal), the signal should now be weak where it was strong or vice versa. By experimenting with known stations it will be possible to determine the true bearing from the reciprocal and the sensing will be constant for the receiver in question. It is not normally possible to take accurate bearings with the " sense " switched on. Unless a balanced to ground aerial is used always take a bearing with the same side facing the transmitter, e.g. take the " sense " first. A loop null is at right angles to the frame and the ferrite rod null is in line with the rod.

In an actual competition the bearing taken at the start is plotted on the map. Further bearings are taken at other locations, the theory being that they should all cross at the transmitter. This state of affairs does not occur very often, bent signals, inaccurate compass, human error and reversed senses are the more usual reasons. Experience, as is usual, plays an important part and is not easily taught.

The competitor having got as near as possible to the transmitter's apparent location leaves his transport and walks or runs according to his ability, inclination or the topography! Close to the transmitter the receiver will block, consequently attenuation must be provided or nulls will be unobtainable. The last few yards will probably be covered by physical searching if good camouflage is encountered.

The serious competitor will have a driver and navigator to look after that side leaving himself free to think tactics. However, it is possible to be highly placed in a competition when luck and experience are on your side and you have no " team ".

The writer's luck deserted him in this year's Final when the driver did not materialize and the navigator took to his sick-bed—at least that was the excuse!

The specification requirements for a D/F receiver are:

1. Cover 1·8 to 2·0 MHz.

Transmitters may be anywhere in the band—it depends on the crystals available! VFO transmitters can and have been knocked off the channel during a competition. Very few non-crystal controlled transmitters are now used, if at all.

2. Be reasonably selective.

Selectivity must be reasonably sharp. Listen around 1870 and 1925 kHz on a Sunday afternoon in the summer to find out why!

3. Easily tuned and clearly calibrated.

If there are two transmitters quick tuning onto them is required. If you knock the tuning off frequency you want to see at a glance what has happened—not have to refer to a chart to find the dial setting relative to a frequency type of thing!

4. Frame or ferrite rod main aerial.

The writer has found frame aerials more consistent and accurate compared to ferrite rods. This conclusion may be subjective, but results tell.

5. A separate sense aerial and amplifier screened from the remainder of the set.

It is possible to locate a transmitter without a sensing circuit; it is, however, much harder and will take longer to do so. The sense circuit must be screened to prevent pickup of the transmitted signals direct to later stages of the receiver. Reversed senses or none at all may result if this precaution is not taken.

6. BFO.

More accurate bearings can be obtained on the transmitter carrier than speech modulation. Two minutes of cw proceeds some phone transmissions and it may be possible to take a

bearing on the cw but not the am if the signal is weak. CW also enables the station to be easily identified. It is not possible to take useful bearings on ssb or series gate modulation. FM would also be difficult in this respect.

7. Headphone output.

Headphones prevent intrusion of outside noises when utmost concentration is required to hear the transmission or take a bearing. Meters and magic eye indicators are not practical propositions with the present band occupancy in addition to other disadvantages.

8. Good rf attenuation.

Close to a transmitter the receiver will " block " and no null will be obtainable, let alone a "sense". Some form of really effective rf attenuation or gain is essential. Even a low resistance across the aerial helps!

9. Audio gain control.

Possibly not required if exceptionally good rf control is available.

10. Strong.

Physically able to withstand heavy knocks and being dropped in the rush to the transmitter.

11. Reasonably waterproof.

It has been known to rain on D/F competition days.

12. As light and small as possible.

Running half a mile across a field and up a hill to the transmitter with a heavy receiver takes a lot of energy. There is one competitor of recent years who appeared to be carrying an AR88 about, he only rarely found one transmitter let alone two! Two or three pounds weight is quite enough. Physical size and shape must also be considered for ease of carrying, running with and when forcing a way through bushes.

13. Rapid access to "works".

Valves fail, batteries go flat, tuning drive comes adrift, a competition is in progress, time is valuable—enough said?

14. Complete screening of set.

Unless the receiver is completely screened signals can get into the set direct to the mixer as well as via the rf stage(s). This affects the null depth and sensing properties. Closer to the transmitter no nulls or senses will be obtainable at all.

15. Complete absence of ferrous metals.

A compass is used to take bearings, it is magnetic, iron attracts, therefore bearing will NOT be true.

16. Simple.

Simplicity means there is less to go wrong, easier construction and servicing.

Early Receivers

Early D/F receivers were 0-V-0 and 0-V-1 types. After the last war a simple superhet using 1T4 type valves was developed for D/F use. It has proved a very sound and reliable receiver and most are still in use with others being built. An extra rf stage is used for sensing amplification. By making the i.f. stage go regenerative a bfo effect can be induced. Don't try to line up the i.f. in this mode however! This set has the disadvantage of requiring a 1·5 volt filament battery, a 90 volt ht battery, and valves, which are fragile.

The circuit diagram of this set is shown together with component values. With a frame aerial of the size indicated the sense whip will need to be three to four feet long to obtain reasonable sense balance. A larger—and therefore more accurate—frame is more sensitive and will require a larger sense whip to balance. A tuned circuit at the base of the sense aerial does help the gain but has to be tracked across the band. If it is tuned higher than the signal frequency the sense will be reversed compared to when the sense aerial is tuned below the signal. Great confusion results. Simplicity will pay dividends here. You cannot push your way through bushes or over stiles with a whip up so it must be telescopic, extended only when a sense is required. The differential capacitor across the frame is not essential if the precautions discussed earlier are taken.

The arrival of rugged transistors at reasonable prices gave rise to great hope of really small and light D/F receivers. However, first attempts were not successful. The fundamental reason being breakdown of early stage transistors in the presence of strong rf signals. Back to back diodes across the input help to prevent this hazard. There are now several working transistor receivers, some without any rf protection.

With the advent of cheap FETs the risk of transistor breakdown is now a thing of the past and seem to be a must. The high impedance of the gate allows simple tuned circuits to be used.

The writer's valve D/F Receiver No 3 has a number of " non-standard " ideas built in which when working give superb results, but is generally a very unreliable set. Many lessons have been learnt from it and incorporated in Receiver No 4 Mk 1. This latest set was designed using some of the research material collected for a Field Day competition transceiver. Owing to this prior research the D/F set was designed and built in a month but did require a further month to develop to competition standard! The results so far have exceeded the wildest expectations and will be discussed later.

FET Receiver Description

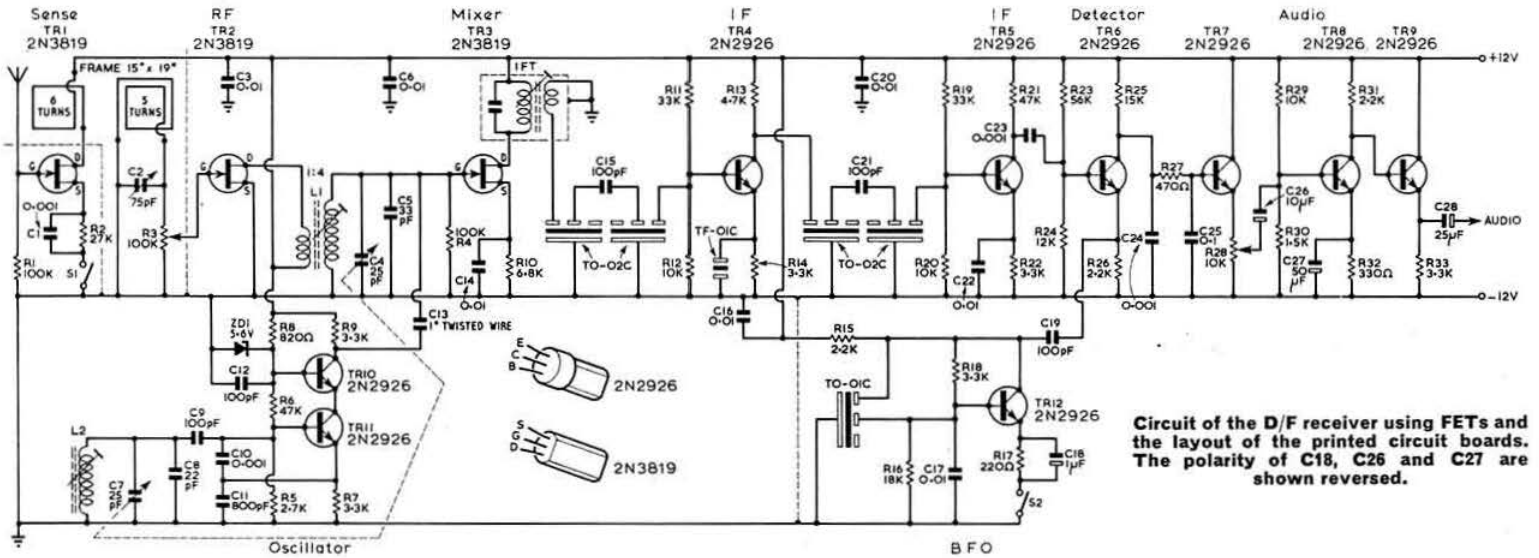
The basic design of the receiver is identical to the valve set with the addition of extra if stages and a bfo. Two transistor types are used, both cheap and readily obtainable. Simplicity and lightness are helped by the use of Brush Clevite if filters which take the place of if transformers and are fixed tuned.

The rf stage, sense amplifier and mixer use Texas 2N3819 NPN, FETs which are less than 10s each. The oscillator, if, bfo and audio stages use 2N2926 NPN yellow or orange transistors, which cost under 2s each.

The frame aerial may be of any suitable size. Comparison between the valve and the transistor set aerial sizes and turns give an indication of the variations possible. The sense coupling is optimum in the transistor set as built. The phase must, of course, be correct, e.g. the earthy ends must end—or start—in the same direction. The aerial may be screened if required and will give slightly more reliable bearings. The screening must have a break in it or it becomes a shorted turn.

The frame is tuned with a separate capacitor. The maximum value of this should be just enough to peak the aerial at the lowest frequency covered—1·8 MHz—to get the best possible Q value. Do not overwind the sense coupling wire or the Q will drop; wind the link beside the tuned winding. The screening, if it is used, should be at least one quarter of an inch away from the windings. The aerial tuning if correctly constructed will be very sharp. It may be possible to gang the aerial tuning with the main tuning. However, great care in screening and avoidance of possible lowering of the Q is essential for best results.

The rf stages are in common source which theoretically requires neutralization but in practice has not been found necessary. The rf input to the gate is via a 100 k ohm poten-



Circuit of the D/F receiver using FETs and the layout of the printed circuit boards. The polarity of C18, C26 and C27 are shown reversed.

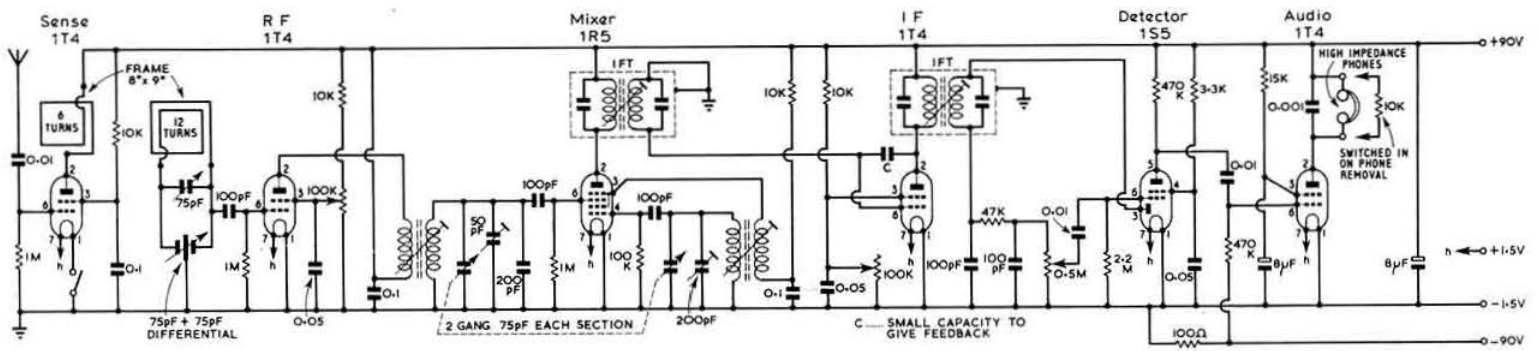
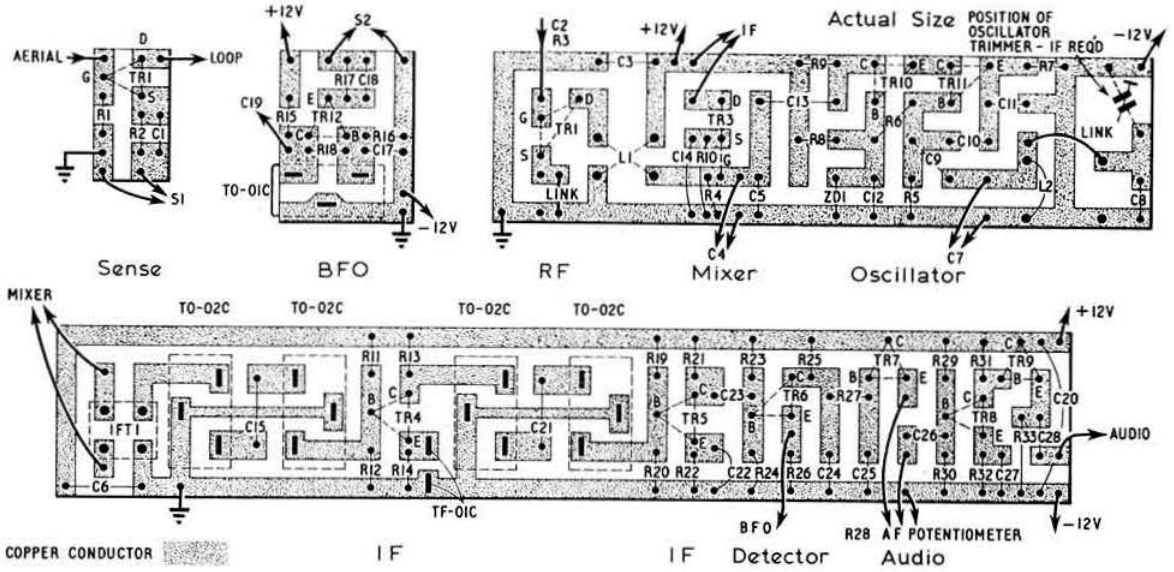


Fig. 3. Circuit of the valve D/F receiver.



Layout of the printed circuit boards.

tiometer and acts as an attenuator, consequently the 2N3819 is run at maximum gain. This mode omits a resistor—or variable control—and a bypass capacitor to the source. If blocking on strong signals occurs, use the attenuator.

The mixer has both the signal and local oscillator fed to the gate. Optimum gain was found with 6·8 k ohms in the source to ground with suitable by-passing. The oscillator coupling capacitor is about one inch of twisted insulated wire. Low coupling only is essential to avoid damping of the rf/mixer tuned circuit. A sub-miniature single tuned if transformer is used in the mixer drain and adds considerably to the stage gain.

The local oscillator is based on a circuit described by R. Gouldstone, G3TAG, in a letter to the RSGB BULLETIN, March 1967. The writer found the output of the G3TAG circuit much too low to be of use, and investigation showed that the voltage swing was being held very low by a 7·8 volt zener diode. Changing this diode to one of 5·6 volts rating and altering the relevant resistors solved this problem. The oscillator is exceptionally stable and kept its initial calibration throughout all the trials and tribulations of the set development and still has not been touched. A 3 : 1 epicyclic coupling is used for the main tuning drive.

The i.f. is at 500 kHz. The birdie from the bfo is then at 2·0 MHz, much better than having it in the band! The Brush Clevite trans-filters are in pairs back to back to improve the selectivity. There is also a trans-filter TF 01C replacing the by-pass condenser to the first if emitter, adding to the selectivity. If another is added to the second if emitter the stage will become unstable. Reduction of gain would probably alleviate this. The selectivity is quite satisfactory for D/F however. Owing to an oversight the last if stage output is untuned and capacity coupled to the detector. With the very satisfactory results so far no attempt has been made to rectify this.

The detector stage acts as a demodulator across the emitter base junction and audio amplifier at the collector. With the values used it is very efficient having equal gain characteristics, with and without the bfo switched on.

The audio stages are straight forward and give adequate output. The writer's set has a sub-miniature transformer added on to match high impedance headphones.

The bfo uses another Brush Clevite trans-filter as the frequency control. The circuit is developed from that shown in *Technical Topics* in the July 1965 issue of the *RSGB Bulletin*. Resistors R16 and R18 seem to be the influencing factor on the resultant frequency.

12 volt line decoupling capacitors are shown in the normal circuit positions. Feed through decoupling and standard types were used for this purpose as felt necessary to the physical layout of components. Other patterns of component positioning may well determine alternative decoupling requirements.

FET Receiver Construction

Construction of D/F sets like most home brews is very personal. The writer has not seen two alike, even Chinese copies are not the same.

The writer's latest receiver was designed to fit into an existing screened frame aerial, the whole arrangement being regarded as a prototype. Like temporary buildings, it is probably here to stay.

The photograph indicates the layout showing quite clearly the ample space left over. The double potentiometer formed part of the original attenuation circuit for rf and sense amplifier. Attenuation of the sensing circuit is not required and if incorporated will reduce the sensing ability in proportion to the attenuation. The screened box under the " front panel " is for the bfo. Four No. 8 batteries are in the long plastic tube at the bottom of the set. The oscillator used *may* possibly work at 9 volts but goes off well on 12 volts. When the batteries drop to 10 V a.m. detection ceases.

If another suitable local oscillator circuit had been used, 9 volts would have been adequate and alleviated the problem of finding a small 12 V battery. On/off switching is achieved by a ganged single pole switch on the audio potentiometer. The sense circuit is in the space between the screening to the double potentiometer and the frame aerial.

To help in development and possible change, the printed circuit is in four separate units. With the exception of the sense amplifier these could be on one sheet now the circuit is proved. The layout of the four circuit boards is shown. A 1/10 in two-way module is used in the design of the physical layout of the printed circuit. The basis being five horizontal bands extended up and down as required; this has been found a very versatile design technique. Cellulose paint was used as masking and applied with a fine paint brush. Remaining copper was etched away with a saturated solution of ferric chloride. After etching the cellulose paint was removed with a wetted household scouring powder and washed under a tap, a very quick and effective method. The copper exposed is bright and clean and should be tinned at once. The holes are made with a fine drill which must be sharp.

The oscillator and rf mixer coils were wound on miniature Osmor formers. The oscillator coil was wound with more turns than thought necessary to cover 2·3 to 2·5 MHz, and trimmed down until it did cover a 200 kHz frequency swing with the tuning capacitor chosen. Judicious use of the slug helps. The frequency swing was continuously checked with a gdo until approximately correct and finally adjusted with 22pF across the tuning condenser to cover from 2·290–2·510 MHz, this giving 10 kHz each side of the band edges.

The rf mixer coil was wound on the same principles and trimmed until it covered 1·790 to 2·010 MHz with the other half of the tuning capacitor. 33pF across the capacitor was required for resonance. The coupling coil from the rf FET drain was approximately a quarter of the turns of the tuned winding, pile wound at the earthy end. It is essential that this coil is coupled the right way round or the gain of the rf stages will be low. The wire used for the coils was very fine enamelled copper wire, about 40/44 swg. The oscillator coil required about $\frac{3}{8}$ in of winding and the rf mixer coil about $\frac{5}{8}$ in, with the drain coupling beyond it. Great care must be exercised in winding this gauge wire. It is most frustrating after ten minutes winding to snap the wire a few turns short of the number required. When the coils are in position and proved correct a coat of a suitable fixative should be applied to protect and prevent the coil from unwinding. Larger coil formers could of course be used together with a heavier gauge wire but were not felt appropriate in the author's set. Use of the relevant *Abac* will give the inductance values required to select suitable commercial coils if desired.

The tuning capacitor is of two sections each 25 pF, having a straight line capacity characteristic and calibration is almost linear. The bfo fourth harmonic on 2·0 MHz is within a few hundred hertz of a crystal calibrator harmonic and provides a very good band edge marker. It is at present too strong and tends to swamp signals within 5 or 6 kHz. Means of reducing the output are to be investigated in the near future.

The rf mixer coil was peaked on 1·9 MHz, no attempt being made to ensure tracking of this stage and the local oscillator, and this was not, in fact, found necessary. If tracking is required it only needs a small trimmer across both coils and reduction of the fixed capacitor values before standard tracking alignment can be carried out.

Bearing

Bearings are taken with magnetic compasses that are able to read to an accuracy of one degree. Quick and accurate bearings can only be read if the pointer is damped, or it will swing to and fro for quite a while. The pointer is usually suspended in a bowl of alcohol to provide damping. Good compasses are comparitively large and weighty, consequently are not permanently attached to the frame aerial. The usual method is to mount the compass on a board with guides for the frame aerial to locate in when bearings are being taken.

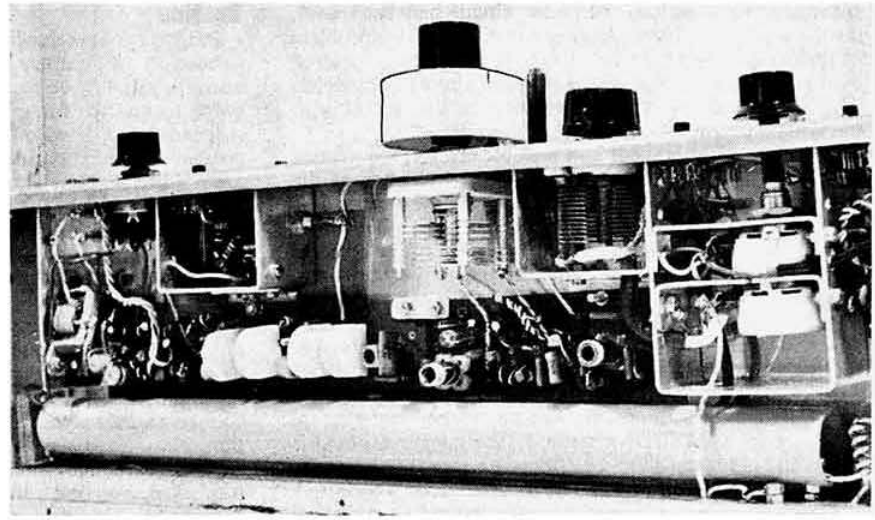
Surplus RAF and RN compasses are not now readily available. Equivalent new ones are available but expensive. Clear plastic compasses with damping can be obtained from Scout shops and instrument suppliers. These are reasonably priced and accurate but care must be taken in their use to avoid distortion from ferrous objects. They appear to be much more sensitive to this compared to the more expensive compasses. A watch, for example, can cause quite a deviation.

The most important component on the compass is a rotating degree bezel, but not all compasses have one. The rotating bezel is a device to read a bearing when the compass body is fixed in one position—to the compass board in D/F. In use, the bezel is rotated until it lines up with the compass needle. The bearing, in degrees, can then be read off adjacent to a marker on the compass body. Another type of compass used, but without a rotating bezel, the prismatic, beloved of the army, has a circular compass card with degrees marked on it. The card is attached to the magnet and the bearing can be read direct, usually via magnifying prism, not always an easy process for D/F purposes.

The method of setting up a compass on its board is quite simple, no thought need be given to magnetic deviation problems. You require a 1 in Ordnance Survey map, a 360° transparent protractor, straight edge and a pencil. Ideally arrange for a licensed amateur to put out a test transmission for you. Position the receiver and yourself some miles away in a large open space, free from overhead wires, underground metals—filled ground is hopeless—and well away from electricity grid lines.

Locate your position accurately on the map and draw a line from it through the transmitter. Place the protractor centre over your location on the map, line the protractor vertical and horizontal guides parallel to the map kilometre grid lines, north to the map top. The bearing can be read off the protractor as so many degrees clockwise from north.

With the frame aerial located to the compass board and the compass bezel set to read the transmitter bearing, turn the whole unit until the transmitted signal drops to the null position. This null can be very sharp; if it is not, interpolate the apparent null. The unfixed compass body is then rotated on the board until the needle lines up with the bezel guides. Check that the position of the compass is correct by repeating the null location and adjust as necessary. The compass body should now be fixed to the compass board and will always give bearings on transmitter nulls *relative* to the 1 in OS kilometre grid. It is wise to check on other transmitters, as well as from other locations. The averaged errors should then be used to correct the compass position on its board. Do not forget that the same side of the frame aerial must face the transmitter! Owing to the shifting of magnetic north the compass will gradually go out of true, and it will be a good idea to check and correct for this, say every five years or so.



Detailed view of the FET D/F receiver. Controls on the front panel are (from left to right): AF gain; tune; aerial tune and rf attenuator. The battery tube is at the base of the receiver case. *Photo by K. Figg.*

Conclusions

As far as the writer is concerned, the proof of the pudding is in the eating, and D/F set No 4 is a gourmet's choice.

Sensitivity is exceptionally good. With full attenuation across the frame and bfo off there is no noise whatsoever, even with full af gain, the set appears to be switched off. With no attenuation the ding-a-dong on 1900 kHz just blocks the front end in the day time. A little bit of attenuation and it is perfect. GM portables at S8 have been worked using this receiver in the shack without any coupling to the main aerial. OK stations have also been worked at S7/8 in the same manner.

Selectivity is such that literally a touch of the tuning knob distorts am signals, so is quite acceptable for D/F work. In addition it is reasonably satisfactory for cw working.

Sensing with a 6 foot long whip is excellent. So far it has been possible to obtain a sense within ten yards of a transmitter. Bearing nulls are generally good but do depend a lot on the receiver location, phenomena normal to all D/F receivers. The attenuated receiver has given a null right into the transmitter without difficulty.

The size and shape of the receiver have not so far been a problem. A smaller frame aerial will reduce the sensitivity a little, a marginal loss, but with the advantage of smaller size and handle-ability. The weight of the receiver is at least twice as heavy as need be at five pounds. This is the result of re-using $\frac{1}{8}$ in thick aluminium screening off an old frame aerial. 22 or 24 gauge aluminium screening should reduce the total weight to just over two pounds.

The first time the receiver was tested for " close to " nulls with the shack transmitter it was discovered that the transmitter power switch was on high power, 40 watts or so. The receiver was next to the transmitter and not attenuated and it just blocked without any damage at all. Needless to say low power was reverted to without delay. FETs are therefore " proved " for D/F work!

My gratitude to Brian Moss, G3NCM, for his much appreciated help in matters concerning the design and development of D/F set No 4 must not go unrecorded.

New Products

LSD Long Life Soldering Bits

Light Soldering Developments Ltd of Croydon have introduced a new range of Philips electrytically iron coated bits for their Litesold range of soldering instruments. These are long bits produced by the giant Philips organization of Europe and they represent an entirely new kind of coated bits. They are coated with iron to a radial thickness of up to 250 microns with a protective plating of nickel and chromium on top.

LSD claim a life span for the new bits of up to 75 times that of regular copper, with up to six months use on one bit reported. The coating does not impair heat transfer and it lasts the life of the bit preventing seizure.

The new bits will retail at something considerably above the normal price but if they work as stated then they look like being a saving for the constructor. They are available in single face chisel, screwdriver and conical shapes.

Nombrex Signal Generator

Nombrex introduce a new signal generator to their already popular line of test equipment. The model 29, available in two versions covers, from 150 KHz to 220 MHz in eight ranges on a slide rule dial, giving some 40 inches of scale length. It is completely solid state and runs off a small 9 volt battery.

The model 29 exhibits a maximum output of 100 millivolts across 600 ohms with provision for between 0 and 100 per cent external modulation. There is also an internal adjustable modulation tone. Other features include an attenuator, stabilized rf circuits and an unusual calibration device.

Construction is on printed circuit boards with a stove enamelled steel case measuring $7\frac{1}{2} \times 5\frac{3}{4} \times 3\frac{1}{4}$ inches. The finish is attractive and easy to handle.

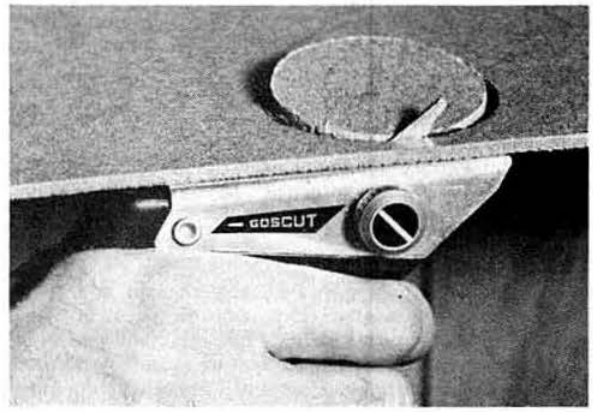
The basic model is designated the 29S but there is also a model 29X which has all the features of the 29S plus an integral crystal oscillator module providing harmonic calibration check points on all ranges to a check-point accurary of 0·02 per cent. The marker level is adjustable and it can also be used externally through the rf output socket.

Both models are available with optional rapid spin-wheel tuning at extra cost.

The cost of the Nombrex 29, which is available through retail outlets now, is £20 for the S model and £27 10s. for the X model. The spin wheel tuning costs another £1 on each.

Danavox Stetomike

A new microphone/headphone set from Denmark could find much favour in the amateur field. This is the Danavox Stetomike, comprising a high impedance boom-arm microphone and a miniature stethoscope headset (magnetic, not crystal) which can be had with varying impedances. The Stetomike is ultra-lightweight and is made of pale grey high tensile plastic. It will be priced at around £10 and it will be available through retail channels shortly.



Goscut Pistol-Grip Shear

What amounts to a new invention will be good news to the man who enjoys the plumbing side of home-construction. This is the Goscut Pistol-grip shear, manufactured by R. A. Stephens & Co Ltd of Mitcham, Surrey. It is a cutter designed for all kinds of sheet materials, including ferrous and non-ferrous metals, laminated plastics, hardboard, melamine, pvc sheet, floor tiles, guttering and other tough materials.

The shear uses three interchangeable blades. One is for the non-metallic substances mentioned above, up to $\frac{1}{8}$ in thick and the others are for metal (mild steel up to 19 swg, softer metals to 16 swg) and for cutting circles (up to 1 in. in plastic and board) and up to 4 in. in metal. Just about the only sheet substances which the Goscut will not handle are those that shatter such as glass and ceramic.

As can be seen from the picture, the tool provides its own mini-workbench to prevent distortions and cracking. There are fine adjustments for the three blades, all changeable in under a minute, and the cutting speed is about 30 seconds per foot. The total weight of the tool is half a pound. The Goscut will also cut through angled aluminium without bending the angle.

The Goscut is available from most d-i-y and const ruction shops, priced 37s. 6d.

Remote Control for VHF Applications

By ROBERT K. MACDOWELL, W4VGS/G5AFL*

THIS article presents experimental concepts being considered by the Author in connection with taking advantage of a remote and lofty aerial site for vastly improved VHF performance, while maintaining control of the remote equipment from the comfort of the home station. While there are many approaches available for complex and flexible systems, the Author's objectives are simplicity, reliability and modest cost.

The reader is reminded that the following are theoretical systems which should prove feasible with further planning and trials, and that this is not a "construction" article. It is expected that a number of enthusiasts will arrive at practical conclusions, that the results may be published in the near future and that the Author may have the pleasure of hearing from those who complete working systems.

Control Communications

Considering the stated objectives, control by radio or Laser must be rejected, in favour of direct wire connections. When the distance between the home station and the aerial site is considerable, the type of wire will be an important economic consideration. Prior to extensive design effort the type of wire must be established, and all of its important characteristics known. In the author's case, coaxial cable will be used, and rf, audio and dc signals will be transmitted via the single conductor to the aerial site. Received and converted signals will be returned to the home station by the same conductor.

Station Control System

In order to comply with FCC requirements and sound engineering practice, any remote control system involving transmitting equipment must be "fail-safe," and provisions for monitoring the transmitter output must be provided. Accordingly, the proposed system will de-energize the transmitter if a power failure occurs at either the aerial site or the home station, or if a short circuit or break should occur in the communications coax.

Fig 1 is a simplified diagram showing the major components in the home station system. Comments on the various elements follow.

Station Transmitter and Pad B This combination produces a 14 MHz ssb or cw signal for transmission to the aerial site. The pad attenuates the transmitter signal and matches the impedance of the communications coax, the final objective being approximately a 2V signal at the aerial site. While this approach is quite straightforward, the author would favour disabling the transmitter final and using the output of a low-level stage prior to the final to drive the coax, thus reducing both distortion, power consumption and the size of Pad B.

50 MHz Aerial, Pad A and Receiving Converter A simple aerial feeding a converter, via an adjustable pad. This subsystem produces a signal equivalent to the station receiver i.f. output for monitoring the transmitted signal. The receiving converter will probably not need an rf amplifier, thus eliminating another source of distortion, and Pad A should be adjusted to produce a signal from the converter output equivalent in amplitude to the average received signal present on the i.f. output of the station receiver.

Station Receiver and Panadaptor This, is, of course, normal station equipment, requiring no modification, other than addition of an i.f. output connection to the receiver if none is provided, The receiver may, obviously, be part of a transceiver, if this is the type of equipment is used.

Relay RL1. 120V dc coaxial relay with external contacts to serve as RL1B and RL1C. RL1 is activated by the transmit relay in the station transmitter, or transceiver.

C1 Low impedance to af and rf.

C2 Low impedance to rf, high impedance to af.

C3 Low impedance to rf.

L1 High impedance to af.

L2 High impedance to rf, low impedance to af.

R1 Termination to match characteristic coax impedance.

R2 Wire wound power resistor with sliding taps. Resistance and wattage determined by components to be used at aerial site.

D1 to D4 D1, for example, prevents the dc voltage imposed on the control buss by closure of D1C contacts being imposed on the section of R2 between the first tap and ground. 750 mA400 piv silicon diodes should serve this purpose admirably and are readily obtainable.

S1 Applies positive potential to control buss and activates remote site to receive/standby mode.

S2 Increases positive potential, activating "function x" at remote site. (Rotate Beam Anti-clockwise).

S3 Increases positive potential, activating "function y" at remote site. "Function y" may be designed to disable "function x" for example, using a normally closed relay contact on the relay RL5 to open the circuit to relay RL4. (Rotate Beam Clockwise).

* Bull Run Mountain Estates, Haymarket, Virginia 22069

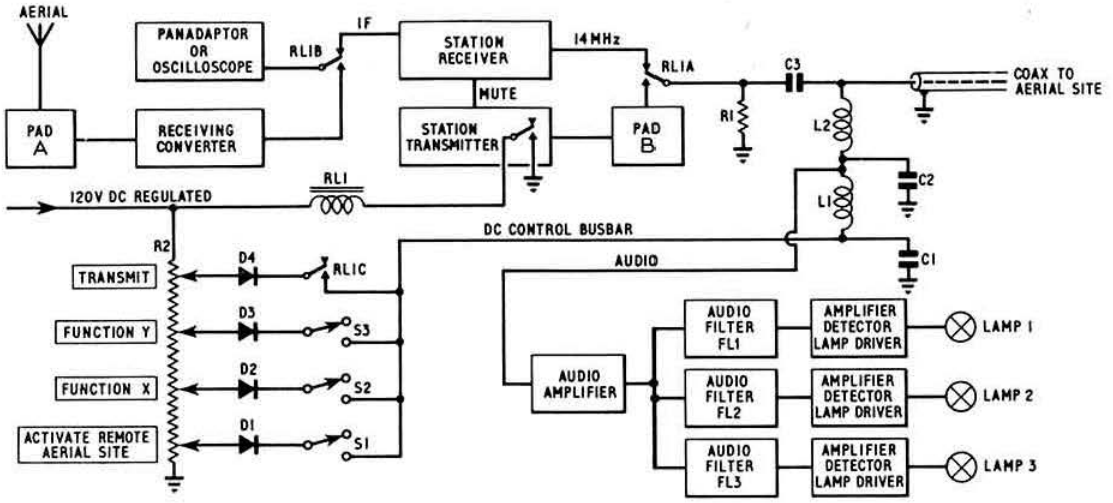


Fig. 1. Home Station Control System.

RL1-C Further increases positive potential on control buss, activating the remote transmitter and performing other transmit/receive functions. Transmit mode may be designed to cancel "function x, y," or both.

Audio Amplifier Amplifies audio signals returned from the antenna site and matches input impedances of FL1, FL2 and FL3.

FL1, FL2 and FL3 These audio filters isolate three individual tones generated at the antenna site.

Amplifier, Detector, Lamp Driver 1, 2 and 3 Here, the individual tones are amplified, detected by diode-capacitor networks and used to energize transistor switches which drive the associated lamps.

Decoding Assume the received audio signals correspond to beam antenna positions. The following table illustrates decoding which will indicate eight different positions, using only the three tones.

Table 1 Beam Heading Decoding

Lamp 1	2	3	Heading
Off	Off	Off	North
On	Off	Off	Northeast
Off	On	Off	East
On	On	Off	Southeast
Off	Off	On	South
On	Off	On	Southwest
Off	On	On	West
On	On	On	Northwest

Using this general approach, the builder might consider using a resonant reed relay, such as those used for remote control of models, to detect the audio tones and drive the lamps. This would require very stable audio sources, as these devices are very selective, and audio drift would not be tolerable. There is also some doubt as to whether the reed relay contacts would tolerate continuous lamp loads without eventually failing.

The Author's proposed system would be completely solid-state, frequency drift tolerant, and should be completely maintenance-free.

Aerial Site System

Before design and component selection for the remote equipment are begun, consider the fact that all equipment must be reliable and, to whatever degree possible, self-protecting. The installation should be planned bearing the above, plus safety to the public in mind. The installation should be tamper-proof, and a suitable notice of warning should be posted on the access door or fence gate. If commercial power is to be used, the utility company will require assurance that the equipment does not present a hazard to their equipment, or the public safety. If forced-air cooling is required for the final amplifier tube, you will have to provide a system which will sense the failure of the fan or blockage of the cooling system and disable the power supply to the filaments and B+. Compromise is most unwise. A professional approach to this system will pay dividends in operating pleasure, assist in getting FCC approval for remote control, and may avoid public embarrassment and the further propagation of the myth that Amateur Radio enthusiasts are generally untidy, disorganized and non-professional. Fig. 2 illustrates the basic approach which may be tried by the reader.

Network R3, C4, L3, C5, L4, C6 These components meet the same requirements as those shown in Fig 1, and serve to isolate the rf, audio and dc signals which are simultaneously transmitted from the home station.

RL2 Double pole, double throw coaxial, or pair of single pole double throw coaxial relays with coils in parallel, with one external spdt micro-switch to act as RL2c and select final bias.

RL7 Heavy-duty contactor, capable of handling the total system load, operated by RL3. Make certain that RL3 contacts can reliably cope with RL7's coil requirements.

CB1 Circuit breaker rated to carry total system ac current requirement.

Systems Power Supply In addition to providing the filament voltages, systems B+, final B+ and regulated bias supplies,

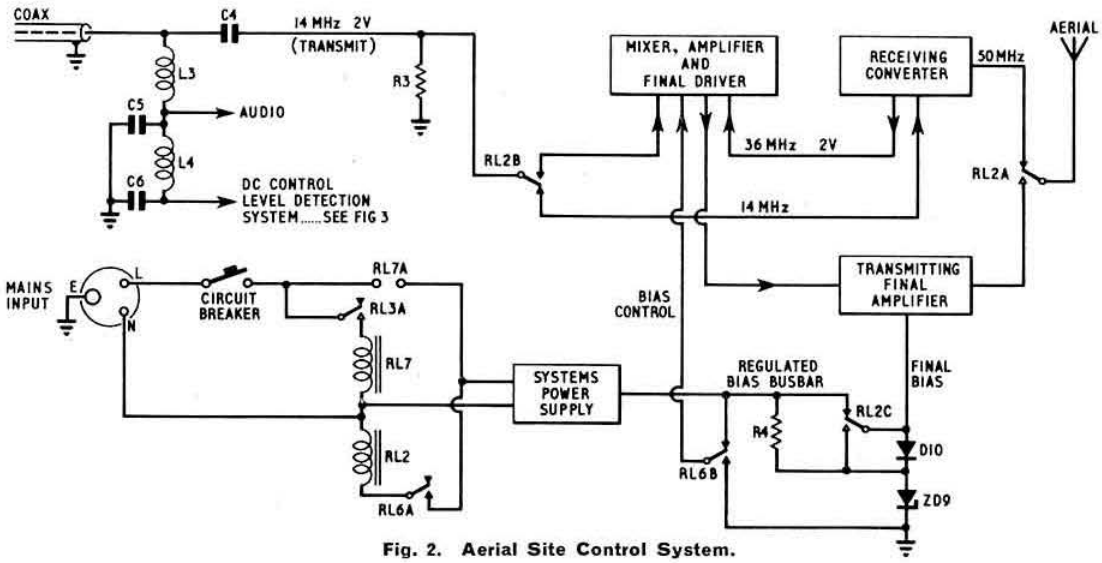


Fig. 2. Aerial Site Control System.

this power supply should be carefully fused and may contain other safety systems, such as the one required to disable the final amplifier filaments if the cooling system fails. Failure of a fuse, or operation of other safety systems could be conditions for bringing an audio oscillator into operation, the output of which could be returned to the home station via the communications coax. This unit could also contain audio sensing circuits for use in re-setting a failure condition on receipt of an audio signal from the home station.

Network R4, ZD9, D10, This is the final amplifier bias network. R4 supplies zener diode ZD9, which is selected to provide the correct bias for the final amplifier operational mode desired. The exact zener value may not be available, However, combinations of zener diodes in series should be, viable. D10 prevents the final bias line from ever becoming more positive than the value established by ZD9, thus avoiding the surge of final plate current which would occur when contacts RL2c are in the process of switching.

Receiving Converter Normal converter with one or more turns of wire wound on the coil form associated with the 36 MHz oscillator. This provides approximately a two volt signal at 36 MHz for use in the transmitting system.

Mixer, Amplifier and Final Driver When the bias control line switches from terminal bias to ground (RL6B) this sub-system mixes the 36 MHz signal from the converter with the 14 MHz ssb or cw signal from the home station, and provides a 50 MHz signal. This signal is amplified to the level necessary to drive the final amplifier. Incorporate sufficient tuned circuits to reject undesirable mixer products (e.g. 14, 22 and 36 MHz) and pay considerable attention to grounding, shielding and any other obvious potential cause of instability.

Transmitting Final Amplifier Use the best obtainable design here. Shielding and filtering of all power and controls leads mandatory. There must be no leakage of rf voltages which may be rectified by any of the diodes in the system. This amplifier must operate under conditions of changing aerial loading, and should be stable with the aerial disconnected the driving signal missing, or both. Final bias could fail, and you must protect against this possibility, either in the amplifier, or in the systems power supply.

DC Control Level Detection Fig 3 shows the method used to detect the various dc control voltages.

RL3 A 24 volt dc relay, 2500 ohm coil, drawing approximately 10 mA.

D6 Silicon diode, 750 mA, 400 piv. Suppresses RL3 coil inductive "kick-back," thus preventing damage to transistor TR1.

R5, D5 Generates positive bias of approximately 0·6 volts across D5. This back-biases the base-emitter junction of TR1 when no positive bias is applied to the base via R6, keeping TR1 switched off and relay RL3 deenergized.

TR1 Silicon NPN switching transistor, moderate gain minimum Vceo rating 40 volts, minimum Ic rating 20 mA.

R7 High relative resistance, around 10 K ohm. Keeps TR1 base at earth potential when no positive bias available via R6.

R6 Limits base drive current to TR1.

D7, 8 and 9 Series diodes, silicon, yielding a total positive bias of approximately 1·8 volts between TR1 emitter and junction of R6 and ZD10.

R8, ZD10 Zener diode selected to conduct when voltage on dc control buss reaches the positive value selected to activate RL3. R8 limits current applied to ZD10 and D7, 8, and 9 as the control buss voltage rises to select relays requiring more positive levels.

Additional relays It is feasible to operate quite a number of relays by duplicating the circuitry described above. The circuit for RL4 is shown in Fig 3 to illustrate the method used to prevent RL4 from operating when relays RL5 or RL6 are activated. Relay contacts RL5C and RL6C are in series with the TR2 forward bias network, thus preventing RL4 operation when either RL5 or RL6 are energized.

If, for example, RL5 is selected, it is obvious that RL4 will operate until RL5 armature moves contacts C to the open position. Thus, the function operated from RL4 will receive a very short command prior to the operation of RL5. If this is objectionable, the function selected by RL4 may be delayed by introduction of a thermal time delay relay or an R-C network having a delay of, perhaps, 200 milli-

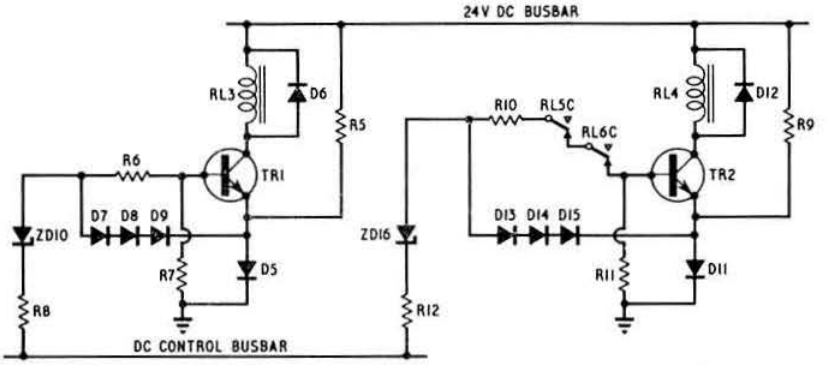


Fig. 3. DC Control Level Detection.

seconds. Similarly, the function selected by RL5 may be delayed to accommodate the reaction time of RL6. The author plans to use RL4 and RL5 for beam rotation control, and feels the short spurious commands will not materially change the beam heading, if at all.

Systems Tests For initial adjustment of the resistor taps at the home station the author suggests temporarily connecting one normally open relay contact set of each relay between the 24 volt buss and one of the seven inputs in to the diode matrix shown in Fig 4. This would result in a possible eight indications at the home station related to relay operation. The beam would be pointed North and the rotator switched off. Each resistor tap could then be adjusted to a point mid-way between operation of one relay and the next, providing the best possible margins under actual installed conditions.

Beam Heading Data Transmission Fig 4 shows an approach to making beam heading information available at the home station control position. Seven micro switches and a cam connected to the beam rotator or mast activate a diode matrix which codes the seven individual conditions into a three level code compatible with the code described in conjunction with Fig 1 and Table 1. The diode matrix drives combinations of audio oscillators, outputs of which are combined and returned to the home station for detection, decoding and display. This audio signal system could be expanded to a total capability of 16 different indications by addition of one more oscillator, home station detector, and modification of the diode matrix to include an additional code buss. Five oscillators and matching systems would yield 32 different functions, six oscillators would bring the capability up to 64 individual functions.

Micro switches are one approach to beam heading sensing. Reed switches and permanent magnets would be another. If one insists on sophistication, a code disk could be fabricated which would actually form the code generated by the diode matrix and thus eliminate the matrix.

Some form of rotation limiting must be incorporated to prevent the beam rotating continuously, or slip rings must be used to allow continuous rotation.

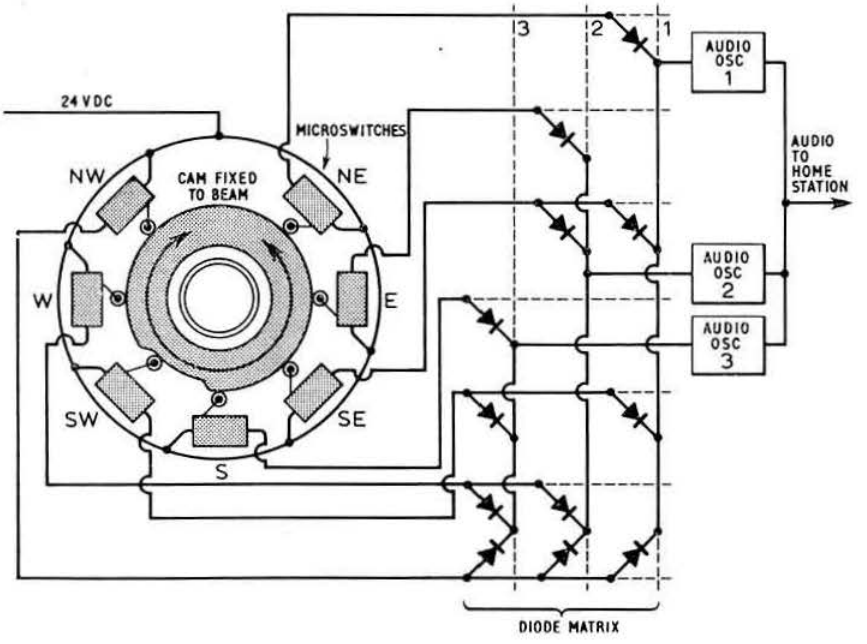


Fig. 4. Beam Heading Data Transmission.

EQUIPMENT REVIEW

KNIGHT KIT G-30 GRID DIP OSCILLATOR

By D. W. ROBINSON, G3FMT*

A FURTHER addition to the selection of grid dip meters now available on the market is the G-30 Knight-Kit Grid Dip meter. This model is available in kit form, manufactured by Allied Radio, Illinois, and is marketed in this country by Electroniques (STC) Ltd.

The uses to which a gdo can be put are so well known that it is not intended to enumerate them here and it is sufficient to say that this type of instrument is certainly the most useful and versatile piece of equipment any amateur station can possess.

The circuit consists of a series tuned Colpitts oscillator using a 6AF4A UHF valve. A closed circuit phone jack is wired in series with the 1 mA meter, for audio monitoring. Power is derived from a selenium rectifier across the secondary of the transformer and delivers about 120 V.

Six coils are provided to give a coverage from 1·5 MHz to 300 MHz with a slight overlap at the end of each range. The coils are colour coded for ease in identification and the coil socket is designed to take the 0·486 in. spaced pins of a crystal, when the instrument can then be used as a crystal oscillator. A headphone jack is connected to be used for either monitoring the station transmitter or for use in obtaining a beat note when the instrument is used as a wavemeter.

Assembly and Operation

The kit as delivered is well packed against damage in transit with all small components in sealed polythene bags, and the larger items double wrapped with corrugated paper or paper wadding.

Construction of the gdo is simple and the instruction manual is well produced with a step by step description of the assembly, which if followed should result in the instrument being completed within 1½ hours. Unfortunately a snag was encountered right at the start, caused by carelessness and lack of inspection at the factory. The tuning capacitor has a valve bracket already soldered in place along the base and a large run of solder had penetrated between the vanes, locking everything solid. Careful manipulation with a pair of watchmaker's tweezers removed the offending solder. Furthermore, the original mains transformer, which was only suitable for 110 Vac had been replaced by one of 240 V, but the holes in the fixing lugs of the transformer, when covered with the mounting clips, did not line up with the holes in the back cover of the gdo and needed bending slightly. When the instrument was completed, the Perspex cover to the 1 mA meter fell off and needed to be re-stuck with a cellulose adhesive.

The instrument suffers from the same defect as the majority of valve grid dip oscillators in that the grid current falls at the high frequency end of each range, although this was not so noticeable on the two low frequency ranges as on the higher frequencies. Although the coverage on the vhf range is 110 to 300 MHz, oscillation was erratic on the model under test and the instrument tended to be rather unreliable from about 175 MHz upwards.

The sensitivity is fairly good and only very loose coupling to the circuit under test is required, when the resultant "dip" in grid current is well marked. A control for varying the sensitivity is provided in the form of a potentiometer in the ht supply, which consequently varies the grid current.

The six scales are easily identified by the colour coded dial which corresponds to the colour of the coil being used.

The accuracy of the calibration varied slightly on each range, the worst being the two highest frequency ranges where the error was ± 2 per cent and 3 per cent respectively. This error can be compensated, however, by the use of a movable hairline cursor if a more accurate reading is required, and by checking any particular range against a frequency standard.

The size of the gdo is 6⅜ in × 3¼ in × 1⅝ in, and the weight 1 lb 3 oz. The power requirements are 220-250 volts a.c. and the consumption is less than 3 watts. The price is £14 12s. 10d.

* 25 Hamilton Avenue, Tolworth, Surbiton, Surrey.

Acknowledgement is made to Electroniques (STC) Ltd. who kindly made this kit available for a test report.

Manufacturer's Comments

We are obliged to the RSGB for reviewing one of our recently introduced range of Knight Kits. This review has been very exhaustive and we would make the following comments:

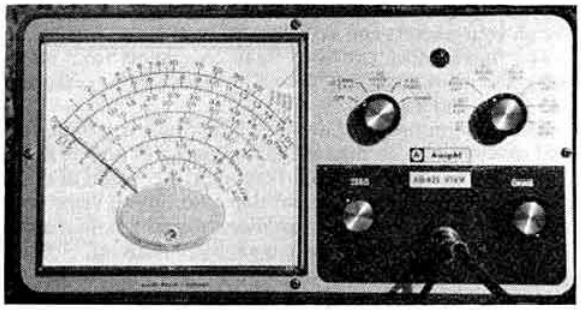
It is most unfortunate that the tuning capacitor supplied with this kit proved faulty; this should have been rejected on inspection. However, it is inevitable that a mistake will pass unnoticed from time to time and when this does happen we of course do all we can to put the matter right. A customer receiving a capacitor in this condition should not endeavour to repair it but return it to us for immediate replacement.

The perspex cover of the 1-mA meter can be forced off if the meter mounting is over-tightened from the rear of the front panel. We are grateful to the RSGB for pointing out this fact and our current kit instructions now include a warning.

We were surprised that the instrument proved unreliable over part of its range; this is of course covered by our guarantee and the unit should normally be returned for examination and any necessary rectification.

The accuracy of calibration is better than most ready-built units and as the review points out, the movable cursor enables this error to be compensated—a feature possessed by no other instrument that we know.

THE KNIGHT KIT KG 625 6 IN. VALVE VOLTMETER



By D. W. ROBINSON, G3FMT

A NEW valve voltmeter which has recently appeared on the market in this country is the Knight Kit KG 625 6 in. model marketed by Electroniques (STC) Ltd. This is slightly larger than most of the others currently available, the size being $7\frac{3}{4}$ in × 12 in × $5\frac{1}{2}$ in, but nevertheless it is a neat looking instrument.

In common with all Knight Kit productions, the KG 625 is well packed against damage in transit. If, however, any components should be faulty, Electroniques will immediately replace them.

Construction

Construction of the valve voltmeter is simple, with all the steps adequately described and pictorially shown in the excellent instruction manual. The main components are fitted on to a small inverted chassis and this simplifies the construction. The two range switches are both wired up separately with the small components wired in directly alongside the switch wafers. High grade components are used throughout the kit, with 1 per cent film type resistors for use as multipliers. A 6 in meter with a 200 microamp movement is supplied, giving a 100° meter arc. It has a large clear plastic face, backed by 10 separate colour correlated scales, with black for dc and red for ac.

The meter movement is shorted out in the "off" position to prevent damage.

The unit is housed in a charcoal grey steel case, suspended in a gimbal mounting bracket, enabling the dial to be viewed from any angle. The front panel is silver and black.

Construction took approximately four hours, no snags were encountered, and the meter worked perfectly the first time power was applied.

Calibration

The meter was switched on, and left for over two hours before any attempt was made to calibrate it. This was carried out according to the manufacturers' instructions and the instrument was then left for three weeks, being switched on occasionally and allowed to run for varying periods. At the end of this time, the calibration was checked and found to need only very minor adjustments. After a further two weeks, no additional adjustment was necessary and the accuracy was well within the limits given in the specification. This was probably assisted by the pre-aging of the 12AU7 double triode.

Manufacturer's Specification

Input impedance	11 megohms dc
Accuracy	Dc ± 3 per cent full scale Ac ± 5 per cent full scale
DC Ranges	0–0·5–1·5–5–15–50–150–500–1500 V (to 25,000 V with HV probe)
AC Ranges	RMS 0–1·5–5–15–50–150–500–1500 V P.P. 0–4·2–14–42–140–420–1400–4000 V (all full scale)
Frequency response	± 1dB 30 Hz to 3 MHz ± 3dB 30 Hz to 5 MHz (to 250 MHz with H.F. probe)
Resistance Ranges	0–1000–10,000–100,000 ohms 0–1–10–100–1000 megohms Centre Scale 10–100–1000–10,000–100,000 ohms and 1 and 10 megohms.

The circuit follows the conventional valve bridge configuration comprising a 12AU7 double triode, with the meter connected between the two anodes. When the balance between the double triode bridge is altered, so current will flow through one half of the valve, and the meter will indicate in terms of voltage the appropriate figure at the tip of the probe. When used to measure a.c. voltage, the input voltage is rectified by a 6AL5 double diode, which functions as a full wave peak to peak rectifier.

In order to measure resistance a 1·5V battery is connected through a series of low tolerance resistors and the unknown resistance. These form a voltage dividing network across the battery, with the result that the voltage is applied to the bridge circuit, the balance is therefore altered and the meter gives a value which is read from a directly calibrated scale.

Power is provided from the mains transformer through a silicon diode rectifier, giving 95V ht.

A slight modification is suggested although not essential. This is the substitution of a 57 k ohms or 69 k ohms resistor in series with the neon lamp across the input to the mains transformer. The original 33 k ohms was used on 110/130 V a.c. mains in the USA and therefore in order to give the neon a longer life, the series resistance should be increased.

Controls

Function Switch. This switches the meter on and selects one of four functions: (1) AC (RMS and PP); (2) −DC (for negative DC voltages); (3) + DC; (4) Ohms.

Range Switch. This is an eight position switch and selects the desired voltage range. The front panel is marked in black for dc. and red for ac.

Ohms Control. This is used to set the meter needle to full scale deflection before resistance measurements are made, an internal 1·5 V battery is then brought into circuit.

Zero Control. This is used to set the meter needle to zero at the left hand side of the scale, also for centre zero readings.

AC/Ohms—DC probe switch. A plastic probe is supplied with a switch. This inserts a 1 megohm resistor in series with the input on d.c. measurements only.

Service Controls. These controls are used for calibration only and are accessible through holes in the side of the cabinet.

An excellent comprehensive booklet on operating the equipment is provided and included in this are the calibration instructions and many helpful details on using the valve voltmeter.

With its lowest range of 0·5 V dc it is suitable for transistor equipment measurements, and with its high input resistance does not place an undue load on the circuit under test.

The price of the kit is £28 19s. 6d. It is rather on the high side, but then this is not a toy, but a precision instrument with a high degree of accuracy which, with reasonable care, should last a lifetime.

Acknowledgements are made to Electroniques (STC) Ltd., who very kindly made the kit available for review.

If for any reason a Knight Kit product does not work, it should be returned to Electroniques, who will examine and rectify any fault found, under their full guarantee.

QSL Corner

By A. O. MILNE, G2MI*

We thought it might be a good idea from time to time to have a little space devoted to some notes about the QSL Bureau. The intention is to give helpful information and, at the same time, help you to assist us.

Many members are heavily overstamping the packets they send to G2MI. Under the present postal rates, a 4d stamp covers 4oz continuing at 2d for each 2oz thereafter. Many parcels containing well under 4oz arrive bearing 6d and 8d and sometimes 10d stamps.

There is surely no point in sending packets by first class rate when they are destined to wait several days at the Bureau and be delayed, still further, going through the system. Weigh your packets and save your pockets.

The Bureau does not have many complaints from members. The main query is: "I sent X envelopes X weeks ago and I have had no cards."

Investigation proves that the sub-manager is holding the said envelopes which bear stamps valued 6d or above. Being a conscientious chap, he holds them until the weight of cards matches the postage on the envelope. So, if you want your cards at regular intervals, regardless, please put 4d stamps on and mark the envelope "wait 3," "wait 6," "Send monthly" or whatever.

Queries about envelopes, etc should be sent direct to your sub-manager. He has all the answers.

We are always most grateful to the many members who so kindly sort their packets into countries, the G's into sub-managers and the Americans into call areas. It saves us hours of time.

Once again, we ask you please do not send outgoing cards to RSGB Headquarters. They have enough to do anyway and it only causes delay. All cards to G2MI please. Please do not send messages to Headquarters written on QSL cards. Not all the staff are Radio Amateurs and your request for a Handbook or for an RSGB tie may be put in the tray and find its way to G2MI!

May I please make it quite clear that I am not QSL Manager to CT3AS, and I do not hold his logs.

Hal does his own QSLing as every good DXer should. He sends his cards out mostly through the CT Bureau and maintains a stock of envelopes with G2MI for his incoming cards.

Please note that G3KDE, the sub-manager for the new G3YAA series of calls has changed his address since the RSGB Call Book was published. The address shown on page 10 of the January *Radio Communication* is correct.

In closing, may I pay a tribute to the sterling work done by Charles Olley, G3AIZ over many years as sub-manager for G3AAA to BZZ. He has had to give up for business reasons. C. A. Bradbury BRS1066 who has handled G3CAA-DZZ has added this other section to his load and it could not be in more capable hands.

His address is 13 Salisbury Avenue, Cheltenham, Glos.

* 29 Kechill Gardens, Bromley, Kent.

The MOSVED and the Direct Generation of SSB

By Henry Gibson, K5MMW/6*

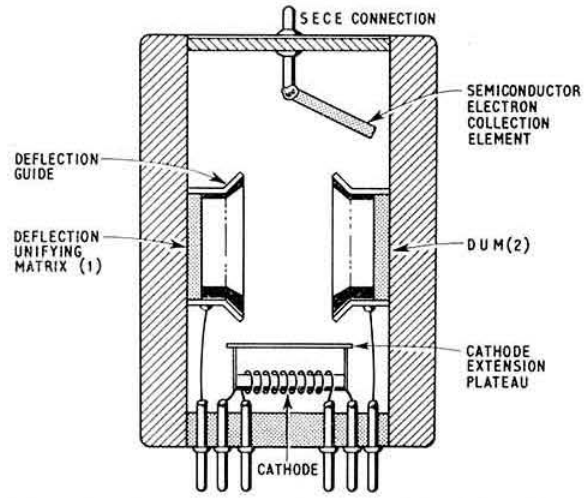


Fig 1. Basic breakdown of electrical construction of 5N100 MOSVED.

IT is often said that in the past, present and future, there is nothing new under the sun in electronics. While many consider this to be true, development of existing devices is continuing at a rapid rate. In the last few years, the valve has given way to the transistor which in turn has been superseded by the family of field effect transistors and integrated circuits. This article will describe a further stage in this evolution.

In 1966 a Polish engineer named Boris Piotr Chislenkjo working at the Warsaw Advanced Polytechnic Institute postulated a device which has since been named the Metal Oxide Semiconductor Vacuum Electron Device, or the MOSVED for short. After the Communists' fickle finger of fate marked Chislenkjo down he escaped to the USA and continued work on the MOSVED at the NBC experimental department in California.

What is the MOSVED?

The MOSVED is really a cross between a semiconductor and a valve. It exhibits first, second and third order electron cloud negative phase cancellation properties. This is a complicated way of saying that it is within itself able to phase out unwanted parts of an applied signal. It can be seen to be extremely useful for many applications, especially the direct generation of single sideband.

Structure

The MOSVED is contained in a vacuum enclosure. It has a conventional heater cathode mechanism with a special cathode extension which is more efficient than conventional types. The anode of the device, if it can be termed that, is formed from a miniscule slab of a silicon oxide semiconductor material with a beryllium depletion mount. This anode, known as a semiconductive electron collection element (SECE) has the property of conducting in one direction at one end and in the other direction at the other, with a linear reversal process along its length. The SECE is inclined eliptically to the focii of the electron generator at an angle of about 30 degrees for optimum transfer and repulsion characteristics. The SECE connection to the exterior is made from part of the SECE most distant from the cathode and it protrudes up through the centre of the vacuum enclosure surrounded by an anti-magnetic flange which is necessary for heat dissipation. In describing the device physically, a colleague once said: " It looks rather like a coaxial socket to me." In fact it closely resembles the nuvistor. Two other electrodes, called the Deflector Unifying Matrices (DUM), which are made of a composite goldy material, are positioned on either side of the envelope. They produce a variable force field to the electron cloud when suitable voltages are applied. This can be equated with a grid or gate. The MOSVED, owing to its small size, operates on very low voltages. (Fig. 1).

Possibilities

Commercial production of the MOSVED is still a way off but great interest is being shown in North American professional circles and manufacture should be commencing soon on a large scale. Initial devices will obviously be expensive but as with other new things the price will soon come down to a viable level. The MOSVED will be designated with a 5N number in line with North American semiconductor indexing. The MOSVEDs used in these experiments were 5N100s and slightly modified 5N100As.

On the Air

Our prototype ssb rig with the MOSVED exceeded all the expectations of a sceptical group of experimenters and engineers. Reports show that the signal produced sounds like clean amplitude modulation but with all the economies of ssb. The MOSVED could be revolutionizing downtown telephony communications by the end of the decade.

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REGULAR FEATURE

TECHNICAL TOPICS

By PAT HAWKER, G3VA

THERE are at least two ways of looking at the development of new amateur radio systems and gear: one approach aims at providing, at moderate cost, a simplified duplication of some of the advanced facilities found in the latest professional equipments; the other—at the risk of seeming starry-eyed—is to try and set the pace for the professionals to follow.

In the past, to the eternal credit of the amateurs, in a surprisingly large number of important areas, it has been the truly pioneering outlook that has made the most lasting impact: the original opening of hf; over-the-horizon vhf; crystal control and later the stable vfo; single-signal receivers; crystal filters; rotary hf beams; compact ssb transceivers . . . in these and many other developments the amateurs have either taken the plunge or been well up with the leaders.

Now we appear to be in an era where most of the current amateur techniques, particularly on hf, are paralleled by other commercial services who can usually afford to go one (or two) better, what with complex frequency synthesizers, large rotating log-periodics, transistorized 20-watt ssb packsets, high-stability receivers and microwave satellites for consistent long-distance circuits. Does this mean, as one sometimes hears murmured, that the pioneering role of the hf amateur has ended?

Certainly it is doubtful whether we shall ever again achieve anything comparable with the original breakthrough into hf in the 'twenties—but there can be little question that a lot of significant development, even on hf, is still possible. A prime example, conveniently to hand, is a cost-cutting approach that the professionals have not yet really latched on to. A method of reducing basic ssb/cw receiver costs by about an order of magnitude (the "in way" of saying dividing by ten), and in overcoming many of the problems which in recent years have delayed the general adoption by amateurs of all-semiconductor receivers.

Homodyne Basics

By now, you will have guessed that I am referring once again to the homodyne/synchrodyne/direct-conversion receiver/transceiver approach. For increasingly, it really looks as though in this technique we may have an answer to the problem of how to bring down again the cost of a complete amateur hf (and vhf?) station.

Admittedly there is a touch of nostalgia about encouraging the revival of this form of "straight" receiver: G3VA, like most of those who first came on the air as schoolboys in the 'thirties, made his early DX contacts with a battery 0-v-1 and a transmitter using a 350-volt power pack (in all honesty I cannot claim 10-watts since, in disregard of those pre-war licence conditions, the input sometimes crept up to a reckless 14 watts).

The crux of the matter is whether a simple, low-cost direct-conversion receiver can provide a practical means of winkling out and holding weak signals in crowded amateur bands. All the signs are that it can—and that, if associated with narrow-band cw filters, could give a performance at least comparable with high-grade receivers, provided that one accepts the implications of "audio image".

For instance, Fred Thompson, G5LH, who has been trying a valve version freely adapted from the original W2WBI design (see later), writes: "Results are so interesting that my two main receivers, a much modified HRO and a homebrew double conversion with Electroniques front-end and mechanical filter, have hardly been switched on for weeks. Given some means of getting rid of the audio image, I would abandon them in favour of the trf synchrodyne!"

While it would be possible, as Pete Martin, G3PDM points out, to eliminate the image by using two balanced detectors phased as in a phasing-type ssb generator so that all signals below the oscillator would be rejected and all above accepted, this would, as he says, be getting away from the point of the receiver which is simplicity. (Nevertheless the possibility of a really high-grade receiver on these lines might be interesting.)

But, from the evidence, here is an extremely flexible form of low cost receiver, valve or semiconductor, that can outperform on ssb/cw, even at the present stage of development, anything less than a very good single-signal superhet. And for cw, the audio image should often be tolerable: if one had two 100 Hz narrow passbands this would be considerably better than the one 2000-plus Hz filter often used for cw reception today.

And it might be relatively easy to incorporate in the homodyne oscillator a variable capacitance diode incremental tuning system to provide switchable upper/lower audio cw sideband to dodge QRM. Such detached tuning (see for example the F5AD switching technique of *TT*, February) could also overcome the problem for transceiver operation of the slight beat difference between transmit and receive frequencies.

A feature of this technique is that there is a wide range of fundamental circuit blocks that can be chosen to provide a whole series of "unique" or personal designs that nobody is likely to have tried previously, so that almost anyone building

one at the moment has the opportunity to break new ground. Fig. 1 shows the basic "blocks" and a look through *Amateur Radio Techniques* and other sources will indicate many ways of filling in the blocks with valves, bipolar or FET transistors, Schottky or conventional diodes. For instance, there is a little used balanced mixer using two rf pentodes (*ART*, page 85), and the equivalent in bipolars, neither of which calls for balanced oscillator drive. The number of possible stable oscillators is almost legion (and includes the VXO approach). Audio filters or selective amplifiers (see later) could be based on either inductors or active (feedback) techniques. High-gain, low-noise af amplifiers could make use of the af cascode (*ART*), starvation pentodes (*ART*) or SICs, or some of the new FETs capable of extremely low-noise af operation. To avoid band-switching, a transceiver might be made in modular form; for example plugging in a complete oscillator intended for one or at the most two bands. W7WKR has reported (*QST*, November 1968) using a compact 3·5 MHz, 100mW cw transceiver in a box 3 by 4 by 5 inches to make hundreds of contacts.

Many of these suggestions admittedly are based on surmises rather than solid bench work—but surely there is already sufficient evidence to show that such pipe-dreams could be turned into pratical equipments.

Selective Amplifier?

The vital need in the homodyne receiver is for very high gain low-noise af amplification, a subject to which relatively little attention has been given in amateur practice for many years (though it has received a lot of attention in such fields as medical electronics). If one decides that a sensible approach would be to develop an af amplifier suitable for cw *only* (a second amplifier for ssb might be included or "plugged-in") then several benefits could accrue.

For many years the approach to audio amplification has tended to be directed towards good bandpass performance over most of the af range. Yet, as we know from rf/if practice, this means that one has to be satisfied with relatively low gain per stage. It has been pointed out in *TT* in the past (*ART*, page 101) that the gain of a pentode is governed to a great extent by the value of the load into which it operates.

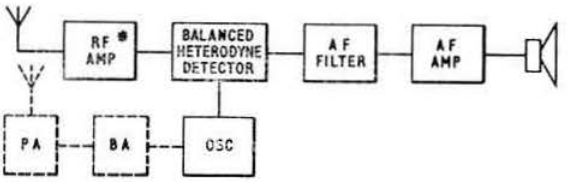


Fig 1. Basic circuit blocks of a homodyne/direct conversion receiver/transceiver. If either Schottky (hot carrier) diodes or a beam deflection balanced detector is used, it should not be necessary to use an rf amplifier. Prime considerations should be a well balanced linear detector, high-gain low noise af amplifier, very stable oscillator and effective audio filter.

With conventional *R-C* coupled stages there is a practical limit to the value of a load resistor, because the dc voltage drop brings the anode voltage well below the screen potential. One way of overcoming this problem is to operate a pentode under "starvation" conditions with extremely low screen voltages; permitting load resistors of the order of a megohm to be used.

Another system would be to increase the dynamic load by using a resonant load (as in rf/if practice). This point was well put in an article from the era of straight receivers: "Suggestions for improvements in cw reception" (*T & R Bulletin*, January, 1937) which showed that "enormous gain" without sacrificing stability is possible by using *tuned* af transformers. The authors pointed out that audio transformers (so popular in the 'twenties and 'thirties) had their natural resonances damped out to improve audio quality, but that if this damping were reduced, the secondaries could be tuned to the same frequency by means of 500pF capacitors, permitting much greater gain to be achieved per stage.

The actual technique, as described in 1937, was: "The transformers used can be of the ordinary af type, preferably shrouded; they should be opened up, and a saw-cut put through the laminations of each magnetic circuit. A cut of ½ to 1 mm is suitable. The ends of the laminations should be splayed in order to avoid short circuits produced by the burr from the cut. Care should be taken to see that the transfor-

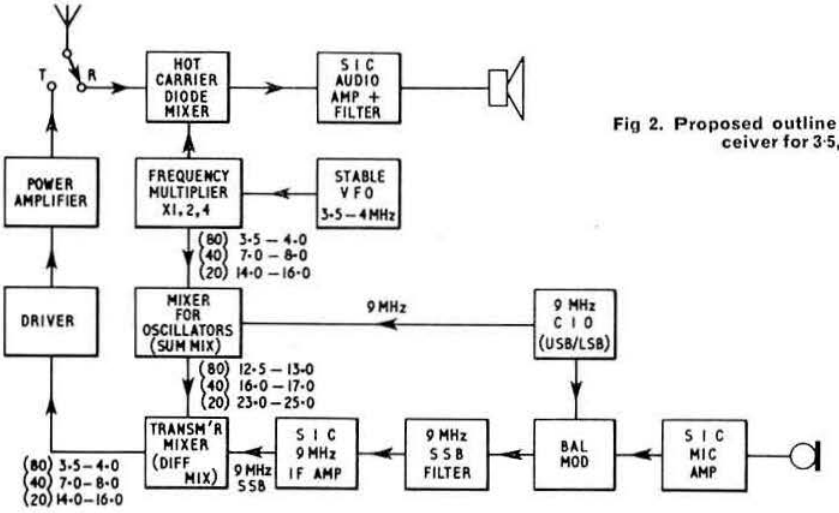


Fig 2. Proposed outline of a low-cost three-band ssb transceiver for 3·5, 7 and 14 MHz by G3PDM.

mers are all of the same type, and the cuts should be approximately the same thickness." The transformers had to be connected with primaries directly fed (i.e. not parallel fed since this would reduce the dynamic load); positive feed-back could, it was suggested, be used with advantage.

The article went on to point out that transformers especially intended for this purpose would provide greater efficiency, and mentioned the use of extra thin laminations and iron filing compounds. This was before the coming of ferrites and Vinkors and other components which greatly simplify the construction of tuned af circuits (see for example the 6Y5SR Vinkor circuits in the March *TT*). Provided that some form of filter is used immediately after a balanced linear detector to prevent cross-modulation in the early af stages, there might be some advantages to be obtained from using a selective amplifier rather than a block filter plus wideband af amplifier.

The G5LH Homodyne

To return to the valve model built recently by G5LH, based on the W2WBI design (*QST*, May 1961). This incorporates an active bandpass af filter (*ART*, page 54, Fig. 50 of which an FET version is given in *TT* February, 1968) between the pentode and triode sections of the ECF82, which follows a pair of 6SA7's as balanced detector. He also uses the *LC* audio filter suggested in the original W2WBI article between the output valve (an EC91) and headphones, with transformer coupling between the ECF82 triode and the EC91. He reports obtaining a very good null when the balanced detector was adjusted as described by W2WBI. As oscillator he used the K9BDO circuit (*ART*, page 78) the stability of which he considers to be a "revelation" and much better than the 500 Hz claimed for it. After an initial drift of 100 Hz he says it "stays put". Since publishing this circuit in *TT*, back in August 1960, this is the first comment received on it, so may be it is worth looking at again!

GT Electronics GT100 FET Receiver.

The GT100 Communications Receiver

To return to the world of multiple conversion. During recent years several all-semiconductor hf general purpose communications receivers using various forms of partial or full frequency synthesis have been noted in these columns. Most of these have been priced in the region of £650 to over £1200; but what is claimed as the first professional grade receiver of this type to break the £500 barrier (it carries a

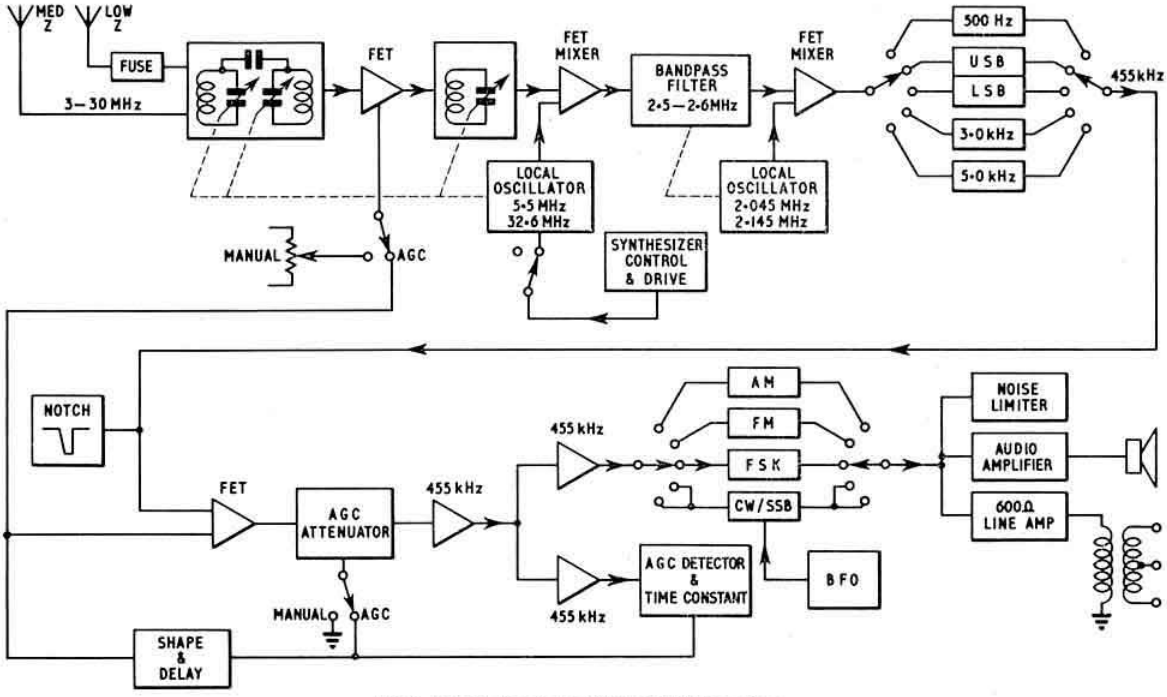


Fig 3. Block diagram of the GT100 Receiver.

£498 basic price tag) has been announced by a small, but apparently enterprising, firm called *GT Electronics (Essex) Ltd* of Kelvedon, Essex.

This uses FET devices, including dual-gate units, in the signal handling stages and exploits what is claimed as a new and unique method of frequency synthesis. Basically, it covers 3–30 MHz in six bands as a straight-forward double conversion receiver, having fine tuning by adjustment of the first intermediate frequency, using a top scale calibrated to cover 100 kHz. Where high stability is required, the pointer on the main scale is set half way between the desired 100 kHz segment, with the synthesizer phase locking the local oscillator to the crystal standard. The receiver then functions as a tunable if unit with crystal-controlled front-end, having the equivalent of some 270 high-stability crystals. A film scale on the 100 kHz tuning dial provides one inch per kHz resolution, and better than 100 Hz resolution is claimed.

The provisional data available at the moment does not provide much information on the important matter of dynamic range, but the parameters listed indicate that the receiver is designed for high performance (the image response for instance, is 70dB down at 30 MHz, spuriae is claimed as substantially less than 1 μV input at all frequencies, and agc less than 9dB variation in af output for 90dB variation of input). Stability is listed as substantially better than 50 Hz per hour. The block diagram of Fig. 3 unfortunately gives little indication of how the synthesizers function, but otherwise shows the main outline of an interesting receiver.

Poor Man's Synthesis

Pete Martin, G3PDM, mentions that he is currently working on "a poor man's frequency synthesizer" of the digital type which he believes can be made for around about £10, using low-cost digital SICs and providing discrete frequencies at 80 Hz intervals. In the system he proposes using, the frequency of the oscillator is counted for a precise interval of time and the "remainder" left in a divide-by-eight counter and compared with binary "four". If the count is low varactor diodes in the oscillator tune it slightly hf; if the count is high the oscillator is tuned lf. In an attempt to eliminate the need for a high stability crystal reference, 'PDM monitored the mains frequency to see if the 50 Hz *short-term* stability would be good enough for amateur purposes, but found frequent changes of the order of 1 in 10^4, or worse than many *LC* oscillators, so he feels that crystal standards for synthesizers are here to stay (any chance of using a signal derived from the high stability Droitwich 200 kHz carrier?).

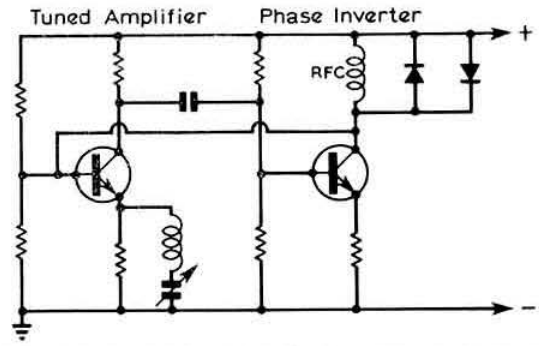


Fig 4. Basic two-transistor oscillator used in the BBC variable inductance frequency modulator.

'PDM believes that if a synthesizer were available in the amateur shack it could be coupled up to any other oscillator to make it equally stable. Obviously there are already some bright ideas being piped around up in Durham!

Transistor Oscillator

Sometime ago (*TT* March 1966, and *ART*) we noted a two-transistor "Wien Bridge" hf oscillator developed by ZL4LI who claimed good stability at around 3·5 MHz. Subsequently a reader (who is not unconnected with the BBC) queried whether this was one of those "April Fool" circuits since he found it far from stable. So it was interesting to find in the *BBC Engineering Division Monograph* No 76 (December 1968) a description of a "variable inductance frequency modulator" capable of full broadcast deviation of 75 kHz at the basic frequency of 2·6 MHz, and thus allowing fm broadcast transmission by heterodyning up to vhf. It is not intended here to describe this fm technique, though it might have some interest to vhf operators, but only to note that the basic oscillator used has several features in common with that suggested by ZL4LI, though with some important differences. Fig. 4 outlines the basic oscillator circuit—this operates at the resonant frequency of the series *L-C* circuit, at an amplitude governed by the limiter diodes.

FM for 144 MHz

Another fm technique, this time for narrow-band operation, is described by P. L. Lynch, ZL4TAJ in *Break-in* (December, 1968) and provides a further method of converting a 144 MHz transmitter for fm. The principle is to provide an add-on 8 MHz crystal oscillator plus diode

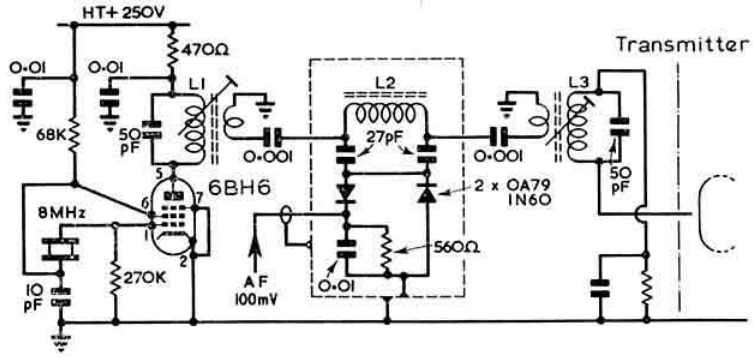


Fig 5. Phase modulation fm adaptor for 144 MHz transmitter described by ZL4TAJ. Typically L1 and L3 can be wound on ¼-in slugged formers consisting of about 50 turns of No 36 enamelled wire with 50 pF capacitor. L2 is 8 turns of No 20 on ¼-in former.

phase-modulator, with the output taken to the crystal socket of the existing transmitter: see Fig. 5. ZL4TAJ converted the original 8 MHz oscillator into a tripler to 24 MHz. The additional stage is useful in overcoming the loss involved in the phase modulator. The modulator components are mounted in a 1½ by 1⅜ in square coil can, together with L2.

Battery Voltage Stabilization

A need often arises with transistorized equipment for voltage stabilization able to cope with considerable changes in battery voltage. Dr. A. C. Carr, G3OSU points out that conventional stabilization using just zeners and resistors is of limited application since a large voltage drop across the resistor is essential, so that the stabilizer often consumes two or three times the current actually used.

He considers that a transistor used as a constant current device (Fig. 9a) provides excellent stabilization at little extra current, and with almost no loss of voltage when germanium transistors are used.

The particular arrangement was devised to feed a steady 20 mA into a transistor dc amplifier. Extra stages (Fig. 9b) would provide even better voltage stability or compensate for varying load current (Fig. 9c). Performance of the arrangement shown in Fig. 9a, using a surplus OC71 was as indicated below. Extra diodes can be added to obtain the exact voltage required. The zener was a surplus type selling at 3s 6d for 100!

The arrangement provides a stability some ten times better than with the diode alone, which would consume more than double the current.

Battery volts	Output volts at 20 mA	Total current
9·3 V	7.60 V	45 mA
9·0 V	7·60 V	38 mA
8·5 V	7·60 V	38 mA
8·0 V	7·57 V	32 mA
(7·5 V)	(73·3 V)	(24·5 mA)

Improved Super-Regen

A short item in *Ham Radio* (November, 1968) draws attention to a Bell Laboratories announcement of a "breakthrough" in simple super-regen receivers. This is the addition of a germanium diode which is claimed to overcome "hangover" (which results in spurious responses and blocking) and to reduce greatly the usually troublesome radiation with this type of detection. If this can all be done with the help

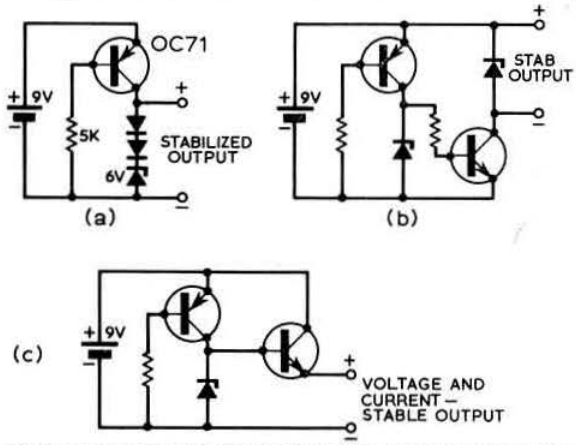


Fig 9. Use of transistor(s) to improve battery voltage stabilization and to reduce current wastage suggested by G3OSU.

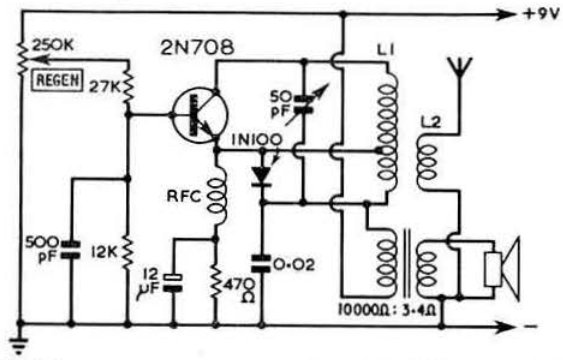


Fig 6. Improved super-regen receiver for 28 MHz suggested by Bell Laboratories, described by K2ZSQ in *Ham Radio*.

of a single diode then this is useful progress indeed—and there is usually a pretty firm basis to announcements made by Bell Labs. The diode shunt across part of the tank circuit dissipates undesired energy following the oscillation burst and is connected so as not to affect the necessary positive feedback: see Fig. 6. The damping action lowers the amplitude and shortens the duration of the radiated pulse, while the germanium barrier potential of about 0·2 volts prevents any change in sensitivity. Super-regens could, as we have suggested before in *TT*, yet have a role to play in low-cost equipment for 28 MHz and above.

The 6JH8 Beam Deflection Valve

The considerable value of beam deflection valves for use as linear mixers, product detectors, balanced modulators etc in both receivers and transmitters has been stressed in many a *TT* item. But, at least in recent years, this has usually been associated with the well-known type 7360.

Brian Booth, G3SYC, has found another available beam deflection valve that is also worthy of note (not least because the asking price may be only half that of a 7360). This is the 6JH8, which, like the 7360, is available in the UK through RCA who can supply a data sheet (unlike the 7360, basic characteristics of the 6JH8 are included in the current *RCA Receiving Tube Manual*). Prime function of this valve appears to be for colour demodulation and burst-gate circuits in American colour television receivers.

G3SYC lists a number of comparisons with the 7360 (it would be interesting to know also how its equivalent noise resistance compares): (*a*) good deal more linear transfer characteristic; (*b*) deflector plates operate at 0 V (i.e. unnecessary to bias to plus 25V as with 7360); (*c*) roughly similar gl-to-both-anodes transconductance (4400 µmhos compared with 5400 µmhos); (*d*) double the anode dissipation (3 watts); (*e*) and the substantial price advantage.

He has used the 6JH8 as a receiver mixer in a further development of his earlier front-end (*TT*, January, 1965), and also successfully as mixer in transmitter circuits.

Clarry

As Clarry's assistant at HQ back in 1947–51, I owe my introduction to editorial work to G6CL. I also came to realize how much, over so many years, the Society depended on his energy and his ability to keep many diverse activities progressing simultaneously. More than 40 years at the very centre of Amateur Radio—a not inconsiderable record for any man.

The Investigation by the Post Office of Radio and Television Interference from Amateur Transmitting Stations*

SINCE the circumstances in which interference may occur vary a great deal, it is impracticable to lay down hard and fast rules for dealing with it, but the following paragraphs summarize the general action taken by the Post Office when it receives a complaint that radio or television reception is suffering interference from an amateur's transmissions.

Initial action

Before the Post Office will accept a complaint of interference, it requires from the person complaining either evidence of the source of interference or a record of the times at which the interference occurs over a period of two weeks. Where amateur interference is occurring it may well be that the person complaining can identify the amateur by hearing his call-sign. The Post Office also expects the person complaining to have, or to equip himself with, a receiving installation of a reasonable technical standard. This normally means a receiver of ordinary commercial standard and an efficient aerial of a type needed to give adequate reception in the particular situation. The Post Office may tell the amateur at the outset, possibly by telephone, that a complaint has been received, in case he wishes to avoid neighbourly friction by ceasing to transmit on a certain band during, say, evening viewing hours.

Detailed Investigation

The aim is that a detailed investigation of the interference should be made as soon as possible after the complaint has been received. Since there are many different ways in which an amateur's transmissions may give rise to interference, tests have to be made to establish the mechanism by which the interference is occurring, the cure, and the responsibility for clearing the interference. This calls for the co-operation of the amateur and the people affected and the work has normally to be done in the evenings. This part of the investigation usually takes some time, bearing in mind the many calls upon the Post Office interference service and it may be hampered by the attitude of the parties to the case. Not infrequently, people complaining of amateur interference simply want the amateur closed down permanently and are most unwilling to accept that the trouble may lie in their own receiving installations. It is, unfortunately, Post Office experience that delay is sometimes caused by the failure of an amateur to deal promptly or effectively with trouble in his own equipment. If the investigation officer has reasonable grounds for thinking that an amateur's transmissions are causing interference, particularly where a number of people are affected, he may instruct the amateur to cease using specified amateur bands between certain hours pending detailed investigation. This is done by the most practicable means available. Usually it is during a visit to the amateur, but it may sometimes be done by letter or telephone. However, any oral instruction restricting the amateur's operations is confirmed in writing.

The investigation officer examines the transmitter and other equipment with the amateur to see if the interference is caused by such things as over-modulation or the generation of harmonics or spurious emissions, and, if so, whether the interfering signals are propagated by direct radiation or over the mains wiring. Assistance may be given in locating the stage in which unwanted signals are being generated and advice about dealing with the matter, but the responsibility for finding out what is wrong and what is the remedy lies with the amateur and modifications must be made by him. The investigation officer cannot normally spend more than a very limited amount of time on a case. The amateur is asked to let the investigation officer know when the modifications have been made, and is instructed, with confirmation in writing, not to use the transmitter in the meantime during sound broadcasting or television hours as the case may be. If tests with the investigation officer show that the modifications have been successful, the amateur is allowed, with confirmation in writing, to resume normal working.

When it has been checked that the interference is not being caused by the condition of the amateur transmitter or the way in which it is being used and the receiving installation affected is of a reasonable technical standard, investigation is made at the receiving installation. The interference may occur for a number of reasons; for example, blocking, cross-modulation, i.f. breakthrough or image effect. If reasonable remedial action, such as the fitting of a filter in the aerial lead, can be demonstrated by the investigation officer, then the responsibility for abating the interference lies with the set owner, who is advised in writing to obtain a similar filter from his radio dealer or from the manufacturer of his set. A calendar month is allowed for him to obtain a filter, during which the amateur is instructed, with confirmation in writing, not to use the frequency band(s) in question during sound broadcasting or television hours as the case may be. At the end of the calendar month the amateur is free, unless otherwise instructed, to resume transmissions whether or not a filter has been fitted to the receiver. It may sometimes be possible to leave a demonstration filter in position for a trial period during which the amateur transmits normally. If so, he is advised to this effect, with confirmation in writing. It has been found that the amateur himself sometimes provides a filter or other remedy to ensure an amicable settlement.

With superheterodyne broadcast receivers it may be possible to tune an amateur's transmissions in and out from one end of the receiver tuning scale to the other. Provided that reception of the local BBC stations is not affected, the case is not treated as one of interference.

Occasionally amateur transmissions are picked up by some electrical apparatus, such as a tape recorder or public address system, or by a wired television system. Provided tests show that the amateur is operating within the terms of his licence, the Post Office does not give protection to the apparatus in question, and action is normally limited to giving advice on means of reducing the susceptibility of the apparatus to interference.

Difficult Cases

It sometimes happens that reasonable remedial action such as the fitting of a filter has little or no effect on the interference. Such cases have to be dealt with on their merits, all the known circumstances of the case being taken into account. The Post Office has to recognize the existence of some television receivers that are rather susceptible to amateur interference and to give them reasonable protection for the time being. Public opinion would not support a policy of telling the owner of a television set of ordinary commercial standard that he must write it off because of amateur interference. The amateur can quite often avoid the interference by using other amateur bands. The Post Office has no control over the manufacture of television sets, but it has impressed on the radio industry the need to make receivers that are less liable to suffer interference by, for example, i.f. breakthrough or image effect.

* Communicated by the Radio and Broadcasting Dept. of the GPO.

THE MONTH ON THE AIR

By JOHN ALLAWAY, G3FKM*

NOW that the summer season is not far away the attention of would be DXpeditioners might well be drawn to the need to obtain evidence of their actual presence in the places from which they intend to operate. It seems that QSL's from at least one UK station who operated for a short spell from the Channel Islands last year (GC3SVK) are not being given credit by the ARRL for DXCC purposes because no written evidence has been supplied to that organization of Fred's actual presence on the islands. It seems a sad state of affairs when all members of the world's amateur population are assumed to be dishonest, and to be guilty of deceit unless they prove themselves to be otherwise! Since the " country " counting cult is only one aspect of amateur radio operations and no particular benefit accrues to those with the highest scores your scribe finds it difficult to see why dishonesty should be automatically assumed in anyone taking a portable transmitter and operating from a different location. In a letter to G3FKM W1WC (Assistant Communications Manager, ARRL) said that " simple written statements by persons having first-hand knowledge of the person's presence " are as acceptable as evidence of transportation and hotel bills. It should be noted that our own Society continues to assume that expeditioners are honest until proved otherwise.

Another point mentioned by Mr White concerned the new 5BDXCC. It is only necessary to submit 500 *confirmations* not 500 *cards* for the award—in other words if a station is worked on more than one band the QSO's may be recorded on a single QSL card.

A number of enquiries have been received concerning the 1969 *Countries Table*. Entrants for this table need only submit totals of countries worked/heard on each band since 1 January, 1969. No confirmations are needed, neither is a list of the countries concerned—in the event of dispute at the end of the year your scribe reserves the right to inspect evidence of the scores of the likely prizewinners! The table in last month's issue was headed " Final 1969 Countries Table "—this was of course not correct, the word " final " should have been omitted.

Top Band News

Readers contemplating expeditions to rare counties during the coming summer may be interested to know that in the survey carried out by your scribe the following twelve appeared most frequently amongst " want " lists: Aberdeen, Bute, Cumberland, Dumfries, East Lothian, Fermanagh, Hereford, Orkney, Selkirk, Tyrone, West Lothian, and Wigtown. Quite a few surprises appear in this list in view of the fact that some are not far off the beaten track.

Congratulations to Stew, W1BB, who achieved DXCC on 160m with a contact with the HK0TU, Malpelo Is. expedition on 23 February. This was Stew's 103rd all time country on the band and his performance is quite remarkable. The manner of this QSO is worth mentioning. It appears that when the contact was only half completed trouble developed in the 235 ft of coaxial cable between Stew's transmitter and aerial. In the darkness Stew grabbed a torch and climbed the tower to examine the three joins in the cable. Fortunately he soon found that the second joint was shorting and rejoined it, only to discover water dripping from the open end! A rapid journey home (1½ miles each way) to fetch some spare coax then took place. This was hastily tied in position and a further call raised the HK0 again for a solid contact. Quite a performance for a 65 year old!

G3XJP reports cross band QSO's between GM3VTB, GM3YCB, and himself (all on 1875 kHz) with OY9LV on 80m. These were on ssb and the UK stations were good signals in the Faeroes. Ole, OY9LV, is currently working on the possibility of obtaining permission to operate on 160m and feels optimistic about the prospects.

News From Overseas

Paul Barry, G3RJS is now operating /MM from the SS *Oronsay*. His licence came through on 9 December and arrived before the liner left for a cruise around the world via the Caribbean, the West coast of the USA, Hawaii, New Zealand, Australia, and South Africa. He is using an FT100B transceiver, and also has an FL100/FR, 100B combination available. Operation so far has been confined to 21 and 7 MHz using a 7 MHz dipole slung 100 feet above water level, this will be lengthened soon into a trap dipole suitable for all bands 3·5 to 28 MHz Paul wonders whether the 28,000 ton *Oronsay* is the only British liner with an /MM station aboard. Contacts with UK stations are particularly welcomed by G3RJS/MM, and he is usually to be found outside the US phone bands.

Les, VP8KO, appears to be putting in an excellent signal from the South Orkney Is. He is a meteorologist with the British Antarctic Survey and will be in VP8 another 18 months before he returns to his home in Newcastle-on-Tyne. At the moment his equipment consists of a Sommerkamp FTDX 500 which feeds a rhombic and a G5RV aerial. A three element quad is in course of construction and should be up by the time this is read. During the long Antarctic winter Les promises to be very active, particularly between 16.00 and 23.30 and between 08.00 and 11.30 on 14 MHz, and will be especially on the lookout for UK contacts. QSL's for the UK will be dealt with by BRS26222 (see January *QTH Corner*), all others by G3NMH (H. Perkins, 24 Hook Street, Hook, Nr Swindon, Wilts.)

* 10 Knightlow Road, Birmingham 17. Closing date for the May issue is 15 April, for the June issue 12 May and for the July issue 10 June.

There appears to be still no news of the restoration of 5B4 licences to Cypriot nationals. According to Flt. Lt. Gordon Moore, ZC4GM, there are many administrative difficulties to be overcome, and the event appears to be very much a thing of the future. The President of the Cyprus Amateur Radio Society (Mike Townley, ZC4MT) is working hard on the problem.

The Liberian Radio Amateur Association announces it's annual field " day," 12 April 00.00 to 13 April 24.00, and invites all amateurs to participate. The call 5L2VAT has been assigned by the Government of Liberia to be used during this jubilee year of President W. V. S. Tubman's 25th year in office. Field day headquarters will be at Bernard's Beach, Sinkor, Monrovia. The following frequencies will be used: 7000–7050 (cw), 14010–14040 (cw), 14150–14180 (Phone), 14200–14240 (Phone), 21000–21007 (cw), 21300–21350 (Phone), 28000–28005 (cw) and 28600–28650 (Phone). EL2S, Sewell Brewer, the club President, and Ben Walcott, EL2BA, are sure to be on hand for QSO's. QSL's will be handled by Dave Green EL2BJ, LRAAs address is PO Box 1477, Monrovia, Liberia.

Readers will be pleased to know that the twelve Angolan stations who were off the air because of difficulties with their local society have now received permission to resume activities. CR6GO now asks for QSL cards to be sent for him via G2MI.

John Hammond, formerly A5349, is now stationed on the island of Sharjah in the Arabian Gulf, and has the callsign MP4TCQ. He is mainly active on cw and is particularly looking for contacts with the UK. QSL's may be sent via the bureau, or to the address in *QTH Corner*. John promises 100 per cent QSL, and welcomes listener reports.

Contests

The **1st RTTY WAE Contest.**

00.00 26 April to 24.00 27 April.

All bands 3·5 to 28 MHz.

Single operator (maximum 36 hours operation, the 12 hours rest being taken in not more than 3 periods), and multi-operator single transmitter.

Exchanges consist of QSO number, RST, and time (GMT). QSOs with one's own continent count one point, with other continents three. Non-Europeans contacting Europeans earn five points, their European contacts three. Stations may be worked once per band. Multiplier is number of WAE and ARRL countries worked on each band. Call areas in JA, PY, VE, VO, VK, W/K, ZL, ZS, and UA9 and UA0 count as multipliers also. Extra points can be claimed for QTC Traffic. Fuller details are obtainable from the organizers: The Contest Committee of the DARC DX Bureau, In der Ostert 3, D-597 Plettenberg, W. Germany.

The USSR **"Peace to the World" Contest** this year has two sections:

09.00 12 April to 21.00 13 April (Telephony)

09.00 3 May to 21.00 4 May (CW).

All bands 3·5 to 28 MHz.

Exchanges consist of RS(T) plus serial number of QSO starting from 001. Russian stations will also give their Oblast number. Only 24 hours of the contest period may be used for scoring purposes. Each station may be worked on each band. QSO's between stations in the same continent count one point, in different continents three points. The multiplier is the total number of countries worked on each band (according to the " R-150-S " countries list). This list

Stefan, OK3CAC, Dambi, JT1AG, and Vlad, UA1CK/JT photographed in August 1967 during one of Vlad's visits to Mongolia.

varies very considerably from the other standard country lists and intending participants are advised to write to Box 88, Moscow, for a copy. The total score is the sum of countries worked × QSO points on each band totalled together. Logs should show date, band, time, callsign, number sent, number received, and points claimed, and should be sent to PO Box 88, Moscow, USSR before 1 June. Contacts during this contest may be used as credits for all the USSR awards.

The **Helvetia XXII Contest.**

15.00 19 April to 17.00 20 April.

All bands 1·8 to 28 MHz. Any mode, but not mixed mode QSO's.

Exchange RS(T) plus serial QSO number starting with 001. Swiss stations give a two letter code indicating their Canton. Stations may be worked on each band but only on phone or cw, not both. Contacts with Swiss stations count three points, and the multiplier is the number of Cantons worked per band. Separate log sheets should be kept for each band used and only written on one side of the paper. They must be submitted to: Marius Roschy, HB9SR, Chemin Grenadiers 8, 1700 Fribourg, Switzerland within 30 days of the contest. A declaration that contest rules have been followed closely must accompany them.

In the 1968 event overall winner was UA4KKC with 17,568 points. Top UK station was **G3IOR** (7722 points) followed by G3ESF (4284 points), GD3AIM (2706 points), GI3SSR (2280), and G3NSY (1944). This contest offers an opportunity to work stations for the very beautiful Helvetia XXII Award (see *Awards* section).

The **CARC 160m Telephony Contest 1969.**

09.00–11.00 27 April.

Telephony only.

One point for each CARC member worked. Logs should indicate QSO data plus serial number received and sent.

They should be sent to The Secretary, Chiltern ARC, 42 Cressex Road, High Wycombe, Bucks no later than 31 May. There is also a listener section—logs should record stations heard and report and serial number sent by them.

Awards

VERON (the Netherlands Society) have announced that due to a series of increases in postal and other rates they will in future require 7 IRC's from applicants for their awards, and 9 IRC's from those wishing for return of QSLs by registered mail. The mailing cost of the Code Proficiency Award is now 3 IRC's. Applications for stickers for any award will remain at 2 IRC's as before. The PACC Award was described on page 120 of February *Radio Communication*, other awards issued by VERON include:

The **Code Proficiency Award.**

This requires evidence of having copied PA0AA faultlessly for at least one minute at a given speed during one of the special transmissions put out for this purpose. These take place at 21.30 on the last Friday in each month on 3·6, 14·1, and 145·14 MHz. Code runs are sent at 15, 20, 25, 30, 35 and 40 wpm and the basic award is for copying 15 wpm. The original handwritten copy of PA0AA's transmission must be submitted, and no aids of any kind (including typewriters) are allowed. Stickers are available for each 5 wpm increase in speed.

The **LCC (Listener's Century Club).**

Issued to listeners who have written proof of hearing at least 100 Netherlands stations since 1 June, 1945.

The **HEC (Heard European Countries)**

Issued to listeners who have proof of hearing at least 15 European countries since 1 June, 1945.

Applications should be sent to: Traffic Bureau, VERON, c/o Mr G. Vollema, PA0LV, PO Box 9, Amsterdam, The Netherlands, and should include an alphabetical list of contacts, the QSLs, and fees as stated above.

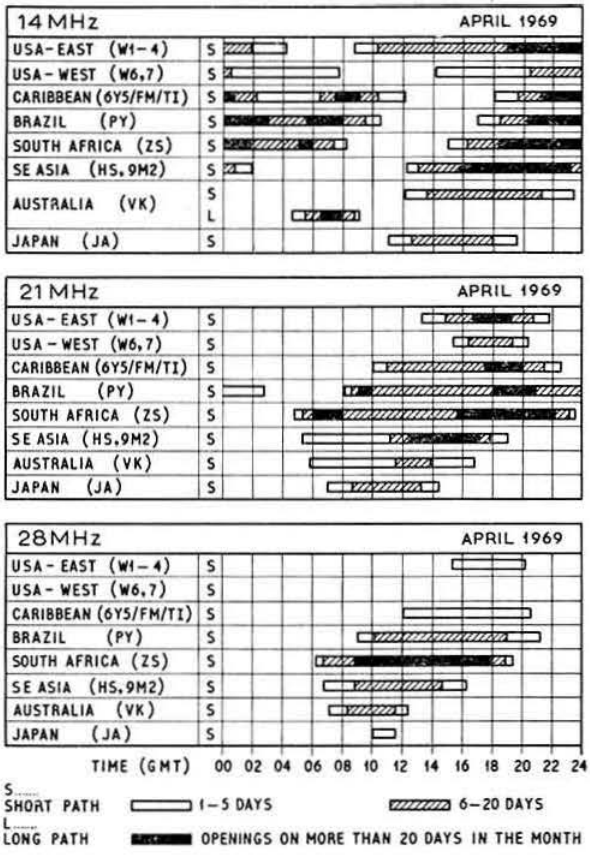
The National Amateur Radio Union of Greece (which is not the IARU National Society) awards the following diplomas:

The **Europe Phone Diploma** The **Europe SSB Diploma**
The **Europe CW Diploma** The **Europe SWL Diploma**

These are for producing QSL's from 20 European countries for contacts on the appropriate mode since 17 April 1968, Likewise the following require 100 QSL's from 100 countries since the same date:

The **World Phone Diploma** The **World SSB Diploma**
The **World CW Diploma** The **World SWL Diploma**

No mention of charges is made in the announcement of these awards, and intending applicants are advised to write to the NARU of Greece, PO Box 1442, Athens, for details before submitting cards.



PROPAGATION PREDICTIONS

The decrease of the F2 day muf's during March continues in April at a faster rate. At the same time the F2 night muf's will increase. For this reason the propagation predictions for the high frequency bands (especially 28 MHz) will become worse in the coming summer months (lowest about August), while on 14 MHz night traffic will continue to improve. On **28 MHz** traffic with Africa and South America will possibly be below average. The possibility of better traffic to North America and Japan on this band will not occur until the autumn (October/November).

21 MHz will also be adversely affected by the lowering of day time muf's. Traffic to Western North America, Australia and Japan will not be reliable towards the end of the month.

The shorter nights lead to improvements in the use of 14 MHz for night time DX. Towards the end of the month the band will remain open all night for traffic to South America and Africa. On the whole the most favourable time for DX on 14 MHz will be from the late afternoon until shortly after midnight as well as morning.

On **7** and **3·5 MHz** DX conditions will be markedly worse during the coming months as a result of the increase in static. There will be usable DX traffic on 7 MHz during the night and at sunrise and sunset. 3·5 MHz may also be usable for DX traffic. Local traffic will seldom be interrupted by the dead zone.

The provisional sunspot number for February 1969 was 120·9 with the period of greatest activity occurring during the last ten days of the month. The predicted smoothed sunspot numbers from the Swiss Federal Observatory for June, July and August are 92, 91 and 90 respectively. This is in accordance with the gradual decline to be expected after the peak of the current sunspot cycle.

The **Wirral DX Association Award.**

Applications to G3UFO, The Acres, Mill Hill Road, Irby, Heswall, Cheshire.

Stations outside Wirral peninsular need five QSOs with members, Wirral stations 10.

Certified check list of contacts plus 2s 6d or equivalent should be sent to G3UFO.

The **Helvetia XXII Award.**

Issued by USKA Award Manager, HB9RK, PO Box 384, 1701 Fribourg, Switzerland.

Requires proof of contact with each of the 22 Cantons since 15 April, 1948. Cantons are: Zurich (ZH), Berne (BE), Lucerne (LU), Uri (UR), Schwyz (SZ), Unterwald (NW), Glaris (GL), Zug (ZG), Fribourg (FR), Soleure (SO), Basel (BS), Schaffhouse (SH), Appenzell (AR), St Gall (SG), Grisons (GR), Argovie (AG), Thurgovie (TG), Tessin (TI), Vaud (VD), Valais (VS), Neuchatel (NE), and Geneve (GE). Some of these have no resident amateur population but nearly all are activated by mobile stations during the Helvetia XXII contest, QSL cards plus a check list and sufficient return postage should be sent to HB9RK (see above).

The **Lincoln Century Award.**

Issued by the Lincoln Short Wave Club.

Five classes: A500 points, B400 points, C300 points, D200 points, E100 points. Contacts with stations in any town called Lincoln count 20 points, with stations in Lincolnshire or any US Lincoln county count 10 points, with the Lincoln Short Wave Club station 30 points. QSO's on VHF or with CHC/FHC members count double. There is no date limit and endorsements are available for band/mode. The fee is 7s 6d, $1, or 10 IRC's, and should be sent with certified list showing exact QTH of all contacts to Stewart Foster, 68 Goldsmith Walk, Lincoln.

The " XL " Club

The Award Hunters Club (AHC), sponsors this fraternity which was first established three years ago. Membership is based on " long term service and excellent achievements in the field of amateur radio." The " XL " stands for 40, and 40 " points " are required for membership. They may be earned as follows: (1) five points for the first full 10 years the applicant has been licensed, plus three points for each succeeding full five years. (2) five points for the first 200 " countries " confirmed, plus three more for each additional 50 countries confirmed. (3) five points for each 100 DXCC countries confirmed on each of the 14, 21, and 28 MHz bands. (4) three points for each 50 DXCC countries confirmed on each of the 3·5 and 7 MHz bands. (5) 2 points for each 20 DXCC countries confirmed on 1·8 MHz or on VHF (all VHF bands count as one). ARRL DXCC rules apply for counting the countries but official DXCC credit is not required. Applicants should list their callsign, name and complete address, the date of issue of first transmitting licence, DXCC score confirmed, the number of countries claimed on each band (see above), and a declaration that the information is true. No other certification is required. There is no membership fee, but return postage would be appreciated, and the application should be sent to: Award Hunter's Club International, c/o OH2VY, John Velamo, Isokaari 4-B-30, Helsinki 20, Finland.

Flight Lieutenant Gordon Moore, ZC4GM/G3MCY, is very active from Episkopi, on the island of Cyprus. He runs a KW-2000A to a TA33 beam, with a 280 ft end-fed wire for the lf bands. He currently enjoys dealing with frequent " pile-ups," but prefers a " rag-chew " with UK when conditions are favourable. QSL *via* **W2CTN.**

Les, VP8KO, is with the British Antarctic Survey in the S Orkney Isles, and will be there for a further 18 months.

Expeditions

The annual tradition now held by Region 4 (Limerick Radio Club) of the Irish Radio Transmitter's Society for making an expedition during the summer months will be maintained in 1969. This time Sherlin Islands, six miles SE of Baltimore, Co. Cork, will be visited for the weekend of 31 May–2 June. Operation will be under the callsign EI0SI, and ssb, am, and cw will be used on all bands 1·8 to 28 MHz. A notable feature of this exercise will be some /MM operation by EI0SR during the same period on 7 to 28 MHz from the vessel " Shure Return."

The Imperial College Radio Society (G5YC) are visiting North Wales during the period 9 April to 16 April. Operation will be mostly on 160m and 2 metres, although other bands may also be used. Top band operation will be ssb and cw, and the 2m activity on am. The team will consist of G3SEP, G3WTS, G3XVM/VE3FUD, G8BAH, G8CGF, and A6366.

QTH Corner

AP5CP	Tiger ARC, Dacca Signals, Dacca 6, East Pakistan
EL8J	via LA60J, PO Box 6, Blomsterdalen, Norway.
FB8XX	(since 6/1/69) via F2MO, Michel Dort, Maison Helda, 64 St Pierre d'Irube, B.P. France.
FB8ZZ	(Op Gilbert) via F8US, 28 rue des Poilus, 78 Mesnil-le Toi, France.
FY7YR	via VE3BYN, J. K. Ritchie, 449 Dovewood Drive, Niagara Falls, Ont., Canada.
GD6UW	via DOTM,Box 7388, Newark, NJ, USA. 07107.
HU1P	via WB4BOJ, 1028 S. Court St., Montgomery, Ala, USA. 36104.
KC6BW	via WA3HUP, Mary Crider, 105 June Drive, Camp Hill, Pa, USA.
KC6JC	via W2RDD, James Cronn, 419 Maple St, West Hempstead, NY, USA.
MP4TCQ	J. Hammond, 5 Polbroc Place, Kirkconnel, Sanquhar, Dumfriesshire.
MP4TJK	via DL7JK, Klaus-D Schitthelm, Ampfingerstr. 35, 8 Muenchen 8, Germany.
TL8GL	via VE2DCY, Bernard Leblanc, 8900 Lacordaire, St. Leonard de Port Maurice, Que, Canada.
TT8AF	Jean Fremon, PO Box 444, Fort Lamy, Tchad.
VK0WR	via Operations Officer, USCG "South Wind," c/o FPO, NY, USA. 09501 or VK6RU.
VP2AW	via W9FIU, Roger Ries,1707 W Clark St., Champaign, Ill., USA.
VP2VY	Lester Scott, Box 2923, St. Thomas, US Virgin Is, 00801.
VQ8CCB **VQ8CCR**	Await cards via bureau for six months then via Stephen Gibbs,Box 14, Curepipe, Mauritius.
VQ9A/A	(See 6W/W4BPD).
VS5PH	via DL3RK, Walter Geyrhalter, PO Box 262, 895 Kaufbeuren, Germany.
YA2HWI	via W9FLJ, George Hammond, 627 E Main St, Barrington, Ill, USA.
YB0AR	PO Box 2761, Djarkata, Indonesia.
ZD3A	(See 6W/W4BPD).
ZS1ANT	G. H. Lunnon, c/o SABC, Church St, Riverdale, CP, Rep. of South Africa.
3V8AC	BP 323, Tunis, Tunisia.
5A1TA	via G3HCT, J. Bazley, "Brooklands," Ullenhall, Solihull, Warwicks.
5A3TX	via WA3HUP (see KC6BW).
5R8AO	R. P. Moore, 1 Club Rd, Ballykelly, Limavady, Co Derry, N. Ireland.
5R8CJ	via WA0RZB, 184 Arthur Av. SE. Minneapolis, Minn, USA.
6W/W4BPD	via W4ECI, 3101 Fourth Avenue South, Birmingham, Ala., USA. 35233.

RSGB QSL Bureau, G2MI, Bromley, Kent.

FINAL 1969 COUNTRIES TABLE

	1·8 MHz	3·5 MHz	7 MHz	14 MHz	21 MHz	28 MHz	Total
G3LNS	—	27	100	104	55	104	390
G3HDA	—	86	91	83	93	120	473
G3UML	—	63	22	101	23	18	227
G3HCT	—	76	70	41	60	111	358
G3VPS	3	15	11	43	19	14	105
G3TZU	1	13	17	35	57	118	241
G3KS	1	11	7	43	33	30	125
G3JVJ	12	43	9	41	12	2	119
G8VG	2	20	22	22	28	26	120
G3XBY	1	18	23	19	20	6	87
G3WPO	16	2	29	11	1	—	59
G3VUM	2	4	2	34	18	20	80
G3VLM	1	—	3	25	—	10	39
G3PEJ	—	1	8	16	26	19	70
G3VJG	—	—	9	—	4	29	42
A5390	9	23	43	105	94	13	357
BRS25429	4	39	39	79	48	30	239
A5154	2	35	14	96	63	42	252
A5662	18	25	24	69	66	44	246
A6148	4	33	20	64	11	39	171
BRS27806	2	34	19	51	48	37	195
A5466	3	17	19	33	13	9	94
BRS28198	2	27	32	1	—	20	82
BRS30694	6	14	11	17	24	12	84
A6498	4	14	1	16	1	9	45
A6201	—	29	10	2	—	—	41
A4253	1	2	2	10	4	3	22

This month's table is in order of 7 plus 14 MHz totals.

It is believed that a group of Hong Kong amateurs intend to operate from **Macao** (CR9) during the CQ SSB DX contest.

A visit to **Aves Is** by a group of Venezuelan amateurs should be in progress at the time this is being read. They were hoping to be on the air as YV0AA for about one week starting around 1 April. All band operation is hoped for and QSLs should be sent via RCV.

No definite information is available yet concerning the next move by the Calgary-Pacific Expedition. It will be recalled that permission has been given for operation to take place from **Tokelau Is.** (ZM7) from April onwards, and the suggestion that K7JCA and WA7FDF may join with VE6AJT on this venture has been heard. The same source mentions visits to ZK1 (**Manihiki Is**), ZK2 (**Niue**), and FO8M (**Maria Theresa Reef**).

The projected trip by CE3ZN to **St Felix Is** (CE0X) has had to be postponed on account of transport difficulties. It is not known when this is likely to be attempted again.

The operation from **Heard Is** had just commenced at the time this was being written. W7ZFY's Heath transmitter blew up while being tested and this left just one old Swan transceiver available. Fortunately this was before the ship left Freemantle and due to the kindness and generosity of Arie, VK2AVA, and W3RX, a brand new Swan transceiver complete with ac/dc power supply was supplied to the expedition. VK2AVA and W3RX intend to sell this equipment when the event is over in order to reimburse themselves. Those who are lucky enough to have a contact with VK0WR will know to whom they owe their indebtedness and it is hoped (by your scribe) that those who are able will show their appreciation by way of a small donation. VK2AVA's QTH is: Arie Bles, 33 Plateau Rd, Springwood, NSW, Australia.

DXpedition of the Month news is that Peter, 7Q7PBD, will be leaving Malawi shortly and becoming GD3PBD from the Isle of Man. All QSL's for PX1BW contacts have now been sent out and those who have not received theirs are invited to reapply. The contest logs from 4M5A have now been received, and cards are being sent out; likewise PJ0MM QSL'ing will start soon. It seems that CR5SP logs for the period 10 September to 15 December, 1967 have been mislaid, but otherwise logs up to September 8, 1968 have been received and are being dealt with.

As mentioned in January *MOTA* the Cambridge University Wireless Society were on the air from the Isle of Man between 17 and 24 March. QSL's for contacts with GD6UW should be sent via DOTM (see *QTH Corner*).

After a successful stay in Senegal as 6W/W4BPD (where over 5000 QSO's were made) Gus Browning moved on to the Gambia where he stayed for about a week using the callsign ZD3A. He departed from Bathurst on 11 March for Mauritius via Nairobi. The first Indian Ocean operation will take place from St Brandon and further movements as given in March *MOTA*.

DX News

There has been very little activity on ssb from **Taiwan** during the last year or so. This situation may be remedied soon as BV2A is said to be hoping to be on the air using that mode during the CQ SSB DX contest in April.

Those who missed making contact with the recent expedition to Chatham Is will be interested to know that ZL3ABJ/C is now active from there. Bruce works for the Posts and Tele-

graphs company and is expected to be on the island for six months or so. At the time of writing his signal had only been reported on 3·5 MHz but he should be on 14, 21, and 28 MHz soon.

3V8AC has appeared on the bands from **Tunisia.** He was formerly 9Q5CZ and runs 100 watts of A3j to a 14 MHz ground plane. Operation on 21 and 28 MHz is planned in the immediate future.

Les Hickinbottom, G3HZG, is now in **Fiji** and has been issued with the callsign VR2FT. He hopes to be active on all bands soon.

AP5CP is currently giving out contacts from **East Pakistan** and is running 35 watts to a dipole antenna. Mohd is usually to be found on 14 MHz cw around 16.00. QSL's should be sent to the address in *QTH Corner*.

HU1P is said to be a special callsign being used by a station in Salvador for use during contests. QSL's should be sent via WB4BOJ.

Hong Kong Firecraker Award hunters and anyone seeking a VS6 or Zone 24 contact will be interested to know that there will be a special 24 hour activity period by Hong Kong stations between 10.00 17 May and 10.00 18 May. On cw VS6's AA, AF, BA, DL, FV, and FX should be found at 25, 50 and 75 kHz above the lower limit of each of the hf bands. Ssb'ers VS6AL, BS, CO, DR, EF, and EK will be on the 170, 270, and 370 kHz points and also on 28,570 kHz. Suggestions for skeds outside this special activity day will be welcomed by HKARTS members at PO Box 541, Hong Kong. All the stations mentioned above guarantee 100 per cent QSL.

Band Reports

The period since the last *MOTA* was written appears to have been very good on most bands if the entries in the Countries Table are any indication. The list of DX reported on 3·5 and 7 MHz would have been considered good for 14 MHz only a few years ago, and this it should be noted is at the peak of a sunspot cycle. The HF bands have performed admirably and 14 MHz has been open throughout the night on a number of occasions. There has been a good opening via the short path to VK at 21.00 and later most nights. One unusual opening on 21 MHz has been reported, when, on the occasion of the second weekend of the ARRL DX contest (phone section), W5, 6, 7, ZL, and CX were all worked between 03.00 and 04.30. Signals appeared to be coming over the North Pole and over Central America. A large amount of activity on 28 MHz, no doubt partly due to five band DXCC hunters, has shown the potential in that band. An unusual happening was the appearance of FO8BS peaking S9 at around 11.30 on 23 February, in this case signals were found to be arriving via the South Pole.

Many thanks are extended to the following for supplying information and logs without which this section of *MOTA* could not be compiled: G2BOZ, G2BW, G2CDT, G2HKU, G3AAE, GW3AX, G3HB, G3HCT, G3HDA, G3JVJ, G3LNS, G3SUP, G3TZU, G3UAA, G3UML, G3VUM, G3WPO, G8JM, G8VG, G8VR, BRS28198, BRS30386, BRS30694, BRS31053, A5390, A5437, A5466, A5637, and A5812. (All calls are ssb except those in italics which are cw).

3·5 MHz: 00.00 FB8ZZ, PJ7JC, UF6FE, UH8AE, UH8LM. *9G1HM.* **01.00** YV's 1SA, 7AV. **03.00** OD5BA, 8P6AH. **04.00** VP7NH, 6Y5CC, 8R1J. **05.00** CO2DC, HK0TU, VE8RCS, YN4JG, YV5PBJ. **06.00** HP1JC, HC0BY/HR1, KC4ADD, KZ5WH, XE1KB, XE3EB, W6's GP, RR, UED, and W2RBT/6 (a most unusual opening) **07.00** *HK0TU*, KP4CL, TG9EP, TI2PAS, ZL2BCG, *6W/W4BPD.* **08.00** ZL3ABJ/C(Chatham Is). **18.00** 5A3TY. **20.00** ZS3AW, VK2AVA. **21.00** MP4TAF, ZD8Z. **22.00** HV3SJ, *UA9BG. UH8AE*, ZS3AW, 4X4's FA, TB, UF, etc., 5N2AAX, 9M2DW. **23.00** CR6AI, EL8's D, J, IS1GF, YA1HD. *9X5IP.*

7 MHz 00.00 ZD3A. **01.00** *TA2EM*, TG9FD. **02.00** *CO5EG*, 9Y4MM. **04.00** *8R1J.* **05.00** *VP8KF.* **06.00** *HK0TU, 6W/W4BPD.* **07.00** *CE0AE, FK8BG, HK0TU, PY0EP* (Trinidade Is.), VP7NH, ZL2ANX. **08.00** CO2DC, *VR2DK.* **17.00** KR6's FC, KN. VS6DR. **18.00** EP2BQ, *VS6AA, 9J2MX, 9V1BP.* **19.00** AP5HQ, EL8J, *UJ8AQ, 5Z4KL, 9K2BJ.* **20.00** CR6's GA, YL. *UJ8BE.* VK2BKM, ZS1JA, *5Z4KO, 9J2MX.* **21.00** *JA's 6AZK, 7ZB*, etc., *UD6BD, YA8MH, ZC4HS*, ZD8Z, ZS3AW, 5Z4's KL, *SS, 6W8XX, 9V1's PA, PB.* **22.00** 9K2BJ. **23.00** *CT2BO.*

14 MHz, 00.00 VP2AE, VP8JT, VK6RU. **01.00** *CP1GN*, FL8DJ, VR1G. **02.00** AP2AK, CE0AE, HU1P, PJ7JC. **03.00** YV7AV, 8R1C **07.00** *UA0KAE.* **08.00** FK8AZ, *KH6GRU*, G3ODO/KL7, HK0TU, VK9's BS, KS, VK0's IA, KJ. **10.00** *KL7CYH, XE1IIL.* **12.00** *JT1KAA.* **13.00** *KG6ARO.* **16.00** MP4MPJ. **17.00** *DU1OR*, FR7ZL/T, VK0WR (Heard Is.), YA1AZ, ZB2BC. **18.00** HK0TU, HV3SJ, OY7JD, ZD5V, 5R8AO, 7P8YL. **19.00** SV0WI, 4S7PB. **20.00** CR4BK, FP8CS, KL7ARG, VP8's HS, KO, 5U7AK. **21.00** *CP1BE, HL9TS*, JX4XM, *TA2FM*, TN8BK, VP8's FL, JJ (Antarctica), *UA0ZB* (Kamchatka), *4S7AB.* **22.00** *SU1IM.* **23.00** CE0AC. CP5AX, *FG7TG*, ZF1GC, 8P6AH.

21MHz 09.00 HL9UL, MP4TCE, *ZS3AW.* **10.00** 9G1KM, 9M2DQ. **11.00** HS3RF, JX3DH, VK9's RY, WD, XI. **12.00** FG7XX, K8SLB/KG6, VK2's FA, XT, etc., ZD8HL. **13.00** *CO2BM*, CR4BB, TU2AY, *VP7DX.* **14.00** DU1RZ, VS5PH. **15.00** JX3DH. **16.00** MP4TCG, *KL7MF*, TN8BK, XW8CD, *ZD5X*, 9L1KZ. **17.00** JX1OM, ZD5R. **18.00** TT8AF, VQ9GA, *YS10*, ZD9BE. **19.00** HK0AI, TG9RN, 6Y0A. **21.00** *VR6TC.* **22.00** *EA8FH*, JA7MA, *6W8BJ.* **23.00** WP4DEP.

28 MHz 08.00 KG6ALV, *HM5BZ*, TN8BK, *UA0TP, VR2DK.* **09.00** AP2MR, FH8CE, FY7YD, KR6TAB, etc., ZL4JI, 9G1FV, 9U5BB. **10.00** A2CAQ, *FL8MB, HL9KQ, KG6AQY*, MP4TAF, *TA1AV*, TR8AG, *VQ8CC, XW8BP, ZD5X*, 5V4EG, 9V1's PA, PB. **11.00** FR7ZR, HS3AL, *JW5BE* (Spitzbergen), MP4TJK, VU2GGB, 4S7PB, 7Z3AB. **12.00** CR8AI, FO8BS, *HM1DH*, VK9BB (TNG), VP2LX, *VP8HJ* (Falkland Is.), *ZL3GQ, 3V8VA.* **13.00** KG4DH, TJ1AU, *UG6AD*, VQ8CS, ZS3S. **14.00** HI8MJF, HU1P, *VE3BDS/VP9*, ZD8Z, *4S7DA.* **15.00** EL8J, *HH9DL*, VP7DX. **16.00** CE3ZL, *CE8AA*, VP2LK, *YS1RT.* **17.00** *EL2Y*, HK0TU, *HP1XYZ*, TG9AD, *VP8KL*, W6's and W7's many days, XE3EB, 7P8AR. **18.00** HB0LL, HK0TU, HR3AC, OA4ABO, OX3SA, PZ1DF, VP8KD, ZP9AC. **22.00** OD5LX.

Many thanks to all correspondents, and particularly to the following for permission to use material from their publications: **QUAX** (*SM4DXL*), the **DX'er** (*K6CQF*), **DX News Sheet** (*Geoff Watts*), the **Ex-G Radio Club Bulletin** (*W3HQO*), the **DX'ers Magazine** (*W4BPD*), the **Florida DX Report** (*W4BRS*), *CQ DX* (*ARI*), **NARS Newsletter** (*5N2AAF*), and **Long Skip** (*VE3HJ*).

Please send all correspondence **to reach G3FKM** no later than **15 April** for **May** issue, **12 May** for **June** issue, and **10 June** for **July** issue.

FOUR METRES AND DOWN

By JACK HUM, G5UM*

Three weeks come Saturday

With Convention only three weeks ahead come Saturday, tickets are now being sent out by Convention Sec Frank Green, G3GMY, to the first applicants. Those who haven't yet written in to him are advised not to delay lest the " House Full " situation should be reached at an even earlier stage than it was last year.

Every applicant will receive back not only his ticket(s) but also a three-page typescript detailing the programme for the day, from the opening at 11 am through the lecture sessions to the 1030 pm close-down after the banquet.

The first thing to do, then, is to send off to Frank Green, 48, Borough Way, Potters Bar, Herts, the sum appropriate to Convention-and-Dinner, 32s 6d, Dinner-only 27s 6d, or Day Session only 5s. Make cheques payable to F. E. A. Green, Convention Account.

Two Decker Lecture Session and . . .

This Fifteenth International VHF/UHF Convention is going to be a Convention-with-a-difference . . . well, all Conventions are, for that matter, and must be if they are not to die. What will be particularly different at Whitton on 26 April is the adoption of " two stream " lectures for the afternoon programme.

There has been in the past a tendency to slant lectures in the direction of an audience assumed to be well versed in metre wave matters. This year to cater for the enormously increased number of people coming on to 4m and down and perhaps in search of guidance, Lecture Stream " A " has been devised. Bert Allen, G2UJ, will chairman it, and its programme will be as follows.

1530–1615: " Quickstarting at VHF " by G5UM, a practical session intended to help members who wish to get going on the metre wavebands.

1620–1650: " Listening on VHF " by BRS15744—and none is better qualified than Ron Ham to give a talk for the benefit of the BRS and Associate listening members.

1655–1725: " Design and construction of 4m and 2m solid state converters using Dual Gate FET's " by T. L. Herdman, G6HD and C. W. Westwood, G3VFD.

1730–1800: " VHF Transistor Transmitters " by G3OOU: another practical session dispensing advice on the designing, building and adjusting of the " cold device " transmitters of the future.

Concurrently with the above, Lecture Stream " B " will be in session in an adjoining room, Chairman-ed by Peter Balestrini, G3BPT, and offering the following:

1530–1615: " VHF/SSB Phasing Transceivers " by G3HBW, who will describe their design and construction.

1620–1725: " A spurious-free vhf receiver " by G3MED, complete with design details followed by a demonstration.

1730–1800: " Measuring spurious radiation from SSB Transmitters down to minus 90dB " by G3FZL. This will be an important follow-up to the never to be forgotten " sideband at vhf " lecture at the IEE last November.

To help the Convention organisers to plan lecture accommodation, members are asked to indicate which of the above they wish to attend. This can be conveniently done on a blue form which G3GMY will send to all applicants. If you wish to take a rest from lecture listening, go out into the main hall, which will be the general-chat area.

Now, both lecture streams will commence *after* the tea break, which will be at 3 o'clock. Before that there will be a lecture in the main hall on " VFOs for VHF " by Tom Douglas, G3BA. The hour allotted to it will be just about enough—perhaps not enough—for what is a very current and controversial subject. This will begin immediately after VHF Manager Geoff Stone, G3FZL, has finished his opening address of welcome, which is billed for 2 pm promptly.

. . . A Triple Exhibition

The above mentioned blue form carries a line " I intend to bring some items for the bring and buy sale YES/NO." This is to help the organisers allocate space for members' unwanted equipment offered for sale. The " Bring and Buy " initiated last year was such an enormous success that its place in future VHF Conventions was assured. There's no doubt it will be an equally big attraction this year.

Members should label each item they put into the sale with the price wanted for it, making allowance for the fact that there will be a 10% deduction from it to go towards Convention funds.

The " Bring and Buy " will be one of three equipment exhibitions. Another will be the trade section, where several well known suppliers will show their products.

The third will be the area where constructors can show

HOW TO GET TO THE CONVENTION VENUE

The Winning Post Hotel is on the northern side of A316, the Chertsey Road, at Whitton, Twickenham, Middlesex. AA Members' Handbook 1968/9 Maps page 12, square TQ 1473.

A more precise reference is Ordnance Survey Map No 170, GR 140½ 703½.

As the A315 is a dual carriageway with few turning points you are advised to approach the main entrance of the Hotel from the West End of A316—it terminates at the junction of A316 and A305—or into the back entrance via a minor road which passes Whitton station.

The Hotel can also be reached from Waterloo Southern Region to Whitton station (approx 20 minutes) which is about 5 minutes' walk from the Hotel.

* Houghton-on-the-Hill, Leicester LE7 9JJ. Send reports for the May issue by 15 April and for the June issue by 14 May.

theirs. It is well not to be intimidated by the memory of some of the gorgeous items which have been displayed at past Convention constructors' shows: the individual, private-non-professional builder stands as good a chance as anyone to carry off that " 1962 VHF Committee " trophy if his (possibly quite simple) entry rates high enough marks for ingenuity.

And so to Dinner

The grand Convention dinner starts at 7.30 pm. For the first time at a VHF Convention we shall be able to welcome Colonel I.St.Q. Severin, of the Cabinet Office, as the principal guest. Col. Severin has been a well known figure at all post-war ITU Administrative Radio Conferences.

Other guests attending will be Dr J. A. Saxton, Director of the Radio and Space Research Station at Slough, Dr R. L. Smith-Rose, widely known at scientific radio conferences in many countries of the world, Fred Lambeth, G2AIW, secretary of the VHF Committee of the IARU Region 1, and Mike Dormer, G3DAH, conductor of *Short Wave Magazine*'s " VHF Bands."

After the toasts, the President of the RSGB, G2YS, will present " The 1962 VHF Committee Cup " to the winner of the competition for home constructed equipment, and also will award " The G5RV Trophy " to Ron Ham, BRS15744.

Convention Round-up

The holder of the lucky number dinner ticket will win an 18-element " Parabeam " for 70cm.

* * *

Look out on the RSGB Publications stand for a brand new VHF Handbook.

* * *

Talk-in will be G3VHF on 70·26 MHz, open from 1030 to 1400 hours.

* * *

Car parking? Plenty of it around the side and rear of the " Winning Post " hotel.

* * *

How to get there? Any reasonable map of Greater London will put you on the road to Whitton. Detailed instructions are in the panel herewith.

* * *

Raffle tickets will be on sale all day (see any VHF Committee man) for a comprehensive array of prizes (no junk). The draw will be at 6 o'clock.

* * *

Lunch is available in the hotel and should be ordered as early as possible in the morning.

* * *

And a final-final: the 1968 VHF/UHF Convention drew a record attendance. The 1969 event promises to outdo it. So a cheque ought to be got off quickly to G3GMY. See you there!

* * *

" Clarry "

Now, as we move towards another VHF Convention, the thoughts of many of us in the vhf world must inevitably turn towards the late John Clarricoats in recognition of the part he played in negotiating at national and international level many of the frequencies and privileges we hold today.

Without his tenacity at conference tables it could well be that the metre-wave spectrum would have become a poorer and more circumscribed place than how we see it in 1969. In such circumstances, that annual expression of the enthusiasm and confidence which characterize vhf and uhf in the United Kingdom—our annual Convention—might never have been born.

Although G6CL was not a vhf man, he was at one memorable Christmas-tide persuaded on to " Two " from the home of G5DJ, and exchanged greetings with a wide circle of surprised and delighted operators. A tape recording which was taken at the time will become to your conductor a specially treasured memento now that he has gone.

Midland Beacon on " 70 "

After a need has been established for a beacon to be provided on a certain band in a given district the approval of the licensing authority must be obtained before anything else can be done. After that equipment must be found and it must be capable of giving unbroken service 24 hours a day, which in turn means that local beacon-keepers must be enrolled to undertake the voluntary and often onerous task of seeing that " 24 hours a day " remains meaningful and not just a fond hope.

All this, too, at minimum possible cost to the Society. Much as metre wave men appreciate the value of their beacons it is well to remember that there are a few thousand other members of the Society who have never heard of them and cannot be expected to enthuse over more than a token expenditure on them.

In spite of all this plans are still going ahead to give the 70cm band a new beacon centrally situated—at the Sutton Coldfield television station, in fact, radiating from well up the 1000 foot mast there. Before anything can be finalized tests must be completed to ensure that no local interference to other services will be caused by it; these tests account for the signal coming out of the centre of England towards the top end of the communication part of the 70cm band.

Until the tests are satisfactorily completed it is unwise to

BEACON STATIONS

Call-sign	Location	Nominal Frequency	Emission	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	144·995 MHz	A1	N/S
GB3GM	Thurso*	70·305 MHz	A1	N/S
GB3GM	Thurso*	29·005 MHz	A1	Omni
GB3GEC	W. London	434·000 MHz	F1	N/W
GB3SX	Crowborough,Sussex*	28·185 MHz	A1	E/Omni
GB3VHF	Wrotham, Kent	144·500 MHz	F1	North-West

* Not operational

GB3VHF

The Society's vhf beacon transmitter frequency at Wrotham, Kent, measured by the BBC Frequency Checking Station (nominal frequency 144·50 MHz):

Date	Time	Error
20 February	0932	1300 Hz high
27 February	1350	5500 Hz high
5 March	0820	5500 Hz high

predict when the full service using the proposed callsign of GB3SC will be provided.

GIBnews 1: the beacon

Gibraltar's famous 70 MHz transmitter ZB2VHF has now come home to roost. Its place on The Rock will be taken by a new ZB2VHF using an all solid state beacon constructed by members of the South Coast VHF Group, and designed to deliver 5 watts of rf to the aerial on 6m, 4m and 2m, keyed simultaneously.

Each oscillator uses a Butler circuit employing a dual transistor in a TO64 can. The first to be finalized, that for 50 MHz, when given a heat run up to 75 degrees Centigrade shifted its frequency by only 200 Hz and its output by only half a decibel. At the other end of the double length of 6 by 4 in printed circuit board on which each beacon transmitter is built are the 2N3375 transistors delivering their 5 watts on 50·000, 70·295 and 145·13 MHz.

All three transmitters will be directly keyed by the transistorized rotating disc keyer which did such excellent service before at ZB2VHF. Their despatch to Gibraltar should occur any moment now.

The reliability of this triple-beacon is expected to be such that it will continue to chug away unattended and thus leave ZB2BO free to operate his own station. Which brings us to—

GIBnews 2: the DX watch

With the season for Sporadic E and Transequatorial propagation at vhf almost here, ZB2BO, ZB2BC and ZB2BL will monitor the UK calling frequency of 70·26 MHz regularly. If a signal is heard in the UK from the beacon a quick call on 70·26 might raise one or other—or all three—of the waiting Gib-men.

As for " Six " and its potential for TE, as early as mid-February ZE1AZC had been heard on several occasions in Gibraltar on 50·046 MHz at RST 559. The openings were

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VHF Personalities: No. 8

Arthur Russell, G8AWS

Most people's image of G8AWS is rather different from the cosy shack picture of Arthur Russell and his Ellesmere Port home station shown here. To 70cm operators all over the country these call letters have come to be associated with portable expeditions out to some remote mountain top in North Wales—and more especially (and appropriately) to Moel Arddur where Arthur has taken the rig on many 70cm Monday activity nights since these began. From that particular site in Flintshire more than 2000 feet up he sounds like a local in the Midlands 100 miles away, and frequently penetrates into the Home Counties at 200 miles.

It is the abiding enthusiasm which G8AWS holds for the 70cm band that persuades him to challenge quite arduous physical conditions when he goes out on his portable forays. " Right in the clouds . . . visibility now about twenty yards " or " Raining hard . . . half a gale blowing up here. . . . " These are typical situation reports logged in the course of contacts with GW8AWS/P. It is his enthusiasm, too, which has prompted him to enter numerous RSGB contests on the 432 MHz band, sometimes single handed, or, as in the case of the event of last May, in co-operation with G3VBC, when top place was secured in the portable section of the contest with a total of no less than 81 stations worked from high up on Merryton Low in North Staffordshire.

In the home-station picture herewith a recognisable piece of equipment which goes out on all the portable expeditions is the EC10 receiver. This is the if strip used to accept output from a high gain rf strip using a TIXM101, an AF239 and a TIS88A mixer, making a completely solid-state receiving system.

In the transmitter there are a few hot devices before the final well-filtered varactor is reached; but the whole design of the portable equipment is based on " minimum thirst " from the available power supply to obviate time wasted having to top up during a contest.

The varactor itself delivers 14 watts of rf on the usual frequency of 433·34 MHz, which is the spot to check any Monday nights from now on. With April here G8AWS/P or more likely GW8AWS/P will be in regular operation

once again. " Stroke P from Moel Famau 1820 ft asl every activity night . . . simply can't wait " Arthur Russell was saying back in February, rarin' to go even then. And it's not only " Monday activity Nights " he is around: it is worth checking his frequency on other evenings as well. He has often appeared on " Seventy " on Fridays in the knowledge that there are always numerous Midlands stations to be worked that night.

The portable equipment described has worked 41 counties and seven countries from various high-spot locations as well as from the low-down home site at Ellesmere Port near the Mersey in Cheshire. It will no doubt add to this tally when it gets going in Scotland next month (see separate item under " Expeditionaries.")

The home station is completely self contained and does not have to be torn apart when a portable expedition is mounted.

What will specially interest 23cm men is the G8AWS plan to take gear for this band on future Monday forays. He has a 2C39B pa, and a home built (not brewed!) converter using a TIXM106 preamp into a 1N21 mixer (the transistor has a rated noise factor of 4·5dB at 2·25 GHz).

Arthur Russell, who is 34, is by profession an electronics engineer. He joined the RSGB in April of 1967 shortly after getting the licence.

fleeting ones, believed via F2, and unlike the TE manifestations, which hold for longer periods.

South Africa's beacon ZS6VHF on 50·1 MHz has also been heard on ZB2, on one occasion so loudly that ZB2BC thought a neighbour was tuning up!

Comprehensive information on these phenomena is regularly fed by G3JVL and others to the RSGB Scientific Studies Committee—which is another good reason why scientifically inclined members should consider applying to the SSC to be enrolled as observers, and to receive the bulletins on propagation studies which the Committee issues.

Two Point Three Gigs

What follows answers in part last month's request by Bill Scarr for more news of activity on 13cm—though much more could be said on detailed points of equipment used for the latest successes were there the information forthcoming. We would like to have it.

There is now a regular link over a 40 mile path from G3MCS on his Chiltern eminence down to G3FP at Thornton Heath in Surrey. 13cm one way with 70cm as talkback. Each takes it turn and turn about as to who uses "Thirteen" On each band signals are S9 either way, with crystal controlled equipment in use, and something like 2 watts of rf coming out of the G3MCS final into a 30-in dish with waveguide feed. At G3FP a 36-in dish has the trapezoidal G3MTI-type feed.

Although initial tests between G3BNL in Gloucestershire and G3MCS were abortive this is the way it often is at uhf—even on 70cm, as most of us know! Intrigued by the potential of the Chiltern sites, G3BNL has plans to try a "Stroke P" set-up there with a view to linking with G3EEZ/P on Mow Cop.

So far as G3MCS is concerned, schedules on 2305 MHz will be welcomed at any time. He notes the following as being on the band or nearly ready: G2WS, 3FP, 3BNL, 3EEZ, 3MCS, 3OBD, 3RPE (recently moved QTH but not far from the previous one), 5FK, 8AGM, 8AGY (Abingdon), 8AJW, 8ANZ, 8AUE and F1RJ.

Crystal Control at SHF

Relevant to the above item about 13cm is the following. It was agreed at the Opatija IARU Conference in 1966 that for crystal controlled work on the super-high-frequencies operators be recommended to use the harmonically related parts of the uhf/shf bands thus:

Exciter on 1150–1158 MHz:
Times two 2300–2316 MHz
Times three 3450–3475 MHz
Times five 5750–5790 MHz
Times nine 10350–10425 MHz

Random Pulses

Perhaps not as much is published here about amateur television as should be, for there's plenty going on.

At Blackburn G3RFL also cruises under the colours of G6AEA/T. He can offer vision on 437 with sound on 433·5 MHz to 405 line characteristics. Although present rf output is 5 watts there is a 4X150 final on the way. Hills hemming him in have compelled the application of a 7 degree order of tilt to the array of four "Parabeams," as others have done in like adverse circumstances. Signals that were "bfo-only" whispers can be brought up to S8. John Hudson's new address is 68 Glebe Street, Great Harwood, Blackburn, Lancs, where applications for schedules, audio or video, may be sent.

Farther north, at Motherwell in Lanarkshire, GM3ULP is also GM6ADR/T. His video goes out on 437·26 and is to 625 line standards—so those Clyde Valley members who have BBC2 receivers might care to try test with him. At one end of the GM6ADR/T sending equipment is a vidicon camera, at the other an output stage delivering 5 watts of peak white to an 8-over-8 slot array.

One of several West Midlands television men is G6MXW/T of Birmingham. He will co-operate enthusiastically with any members seeking a picture on 70cm to push through wideband converters and into the domestic television set.

As always, the Fenland Net, centred round Ian Waters, G6KKD/T, continues to thrive. To show the lighter side of amateur television "KKD" tells "Four Metres and Down" how during a recent lift on 70cm he found himself without a serviceable talk-channel converter in the radio room while setting up a QSO with G6ADZ/T of Rainham in Kent. So as he couldn't *say* it he *wrote* it, and the two completed a novel contact by presenting handwritten messages to one another.

And on the more serious side, full marks to the BATC for drawing such widespread attention in the electronic press to the fact that there are large numbers of amateur video stations in regular operation in that portion of 70cm where predatory professional eyes have been cast.

OVER

PREPARING FOR THE MIDLANDS CONVENTION

Arrangements have reached an advanced stage for the Midlands VHF/UHF Convention to be held at Wolverhampton on 14 June.

There is to be one major lecture lasting an hour or more as the main attraction of the afternoon session. It will be given by none other than G3NNG, noted for his technical contributions to *Radio Communication* and for his prowess in metre wave contests, both home and portable. His subject will be "A new approach to vhf/uhf receiver design."

* * *

Everybody who has been to previous Midlands VHF/UHF Conventions or Dinners will automatically receive an invitation for 14 June, along with an application form for tickets and a copy of the programme. Those who haven't been before can obtain these papers by writing to Mr P. W. Wright, 20 James Road, Kidderminster, Worcestershire, enclosing a preferably-foolscap stamped addressed envelope.

The actual ticket applications should go to G8AEV, J. R. Hartley, 30A Salop Street, Bridgnorth, Shropshire, enclosing £2 for an all day ticket, 30s for a dinner-only ticket or 10s for the afternoon session alone.

Watch this space for full details next month.

Trekking Time

Here is news of some more expeditions to supplement that given here last month:

Right now (Easter weekend) five licensed members of the Imperial College Radio Society plus A6366 are setting up camp in North Wales to put GW5YC on the 2m air. They plan to be operational for the whole of the week 9–16 April with 30 watts of A3 to a ten-over-ten aerial, no less. Look for them in the appropriate zone.

* * *

During next month's 144 MHz Open Contest GM3OHC will be operating from that cold hot-spot Lawther Hill in Dumfries-shire, 2400 ft up. The operators going on trek will be G3NZS, G3OHC and G3TGL, all from the Greater Birmingham area. They will continue to man the station from the close of the contest until midnight on the Sunday night of 4 May and schedules during this period are invited. Send sae to G3OHC (QTHR). There will be cw on 144·02, and A3 on 145·93 MHz, with 60 watts and a 10-element.

* * *

Operating not far from GM3OHC will be GM8AWS/P on 70cm, GM3PZH/P on 2m and GM3OIW/P on 4m in a combined effort to put Wigtown and Kirkcudbright on all three bands. Transmissions will begin on 1 May and continue through the 2m contest on 3/4 May and beyond if activity warrants. Some good sites in both counties have been selected and QSLs printed well ahead. For many people this will be a fine opportunity to bag two new counties and one country towards the " Four Metres and Down " certificates, with QSLs guaranteed.

Tech Corner

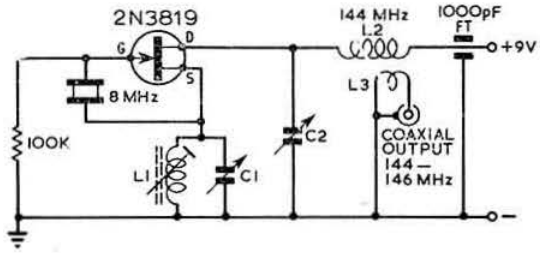
From G8ANQ (Bill Burton, now at 18 Newlands Avenue, Bishop Auckland, Co. Durham):

With reference to the anti-TVI tests described by G3COJ in " Tech Corner," March, I have found a quarter wave stub to be good in an area of high television signal. In the fringe area at Whitby where I formerly lived a halfwave shorted stub attached to the television set seemed to be more effective, the picture signal being attenuated less than when a quarter wave open circuit stub was used.

A point worth noting is that poor quality coaxial cable should give better results than good quality stock: its resultant " Q " is lower and the attenuation is greater over a broader band of frequencies than with semi-airspaced cable.

From G8BCO (Colin Boys, of Ashvale, Aldershot):

In " Technical Topics " last May a 144 MHz signal source using an FET and developed by F2RG was described. When this device was built up at G8BCO a number of variations of the F2RG theme were attempted and the modified version shown herewith emerged.



Comparison with the circuit diagram of last May shows that there are a number of detail differences, most noticeably in returning the crystal to the hot end of the inductor instead of down to earth, and the use of a simple single turn output loop at the earthy end of L2. The latter consists of 4 turns of 18 swg wire wound to ¼ inch diameter. It is tuned by the 2–12 pF capacitor C2 to the 2m band.

The other inductor, L1, resonates at the crystal frequency, 8 MHz, and consists of 28 turns of 28 swg wire close wound on a ¼ inch Aladdin former, and if it is slug tuned the capacitor C1 can conveniently be a 100 pF fixed ceramic.

It is desirable to wire the gate and source leads of the FET directly across the pins of the crystal socket.

To set up the calibrator connect a 0–10 mA meter in the +9 volt line and adjust the slug of L1 until the current reading drops from 3 mA to 2 mA. Insert a short length of wire into the co-axial socket, place the calibrator near the station 2m converter and tune C2 for maximum signal.

Although the layout of the oscillator is not critical it is desirable to enclose it in a screened case as recommended by F2RG to reduce harmonic radiation.

The uses to which this oscillator may be adapted are many. It has been applied as a first stage unit in a low power transmitter by extracting the third harmonic, 24 MHz, from L2, C2, the values of which are increased to 25 turns on a ¼ inch slug tuned former and 47 pF fixed ceramic.

Another application is to use it as a single stage local oscillator for a converter in a mobile rig, with a high-Q break interposed.

Almost any crystal seems to work satisfactorily in this circuit arrangement, *i.e.*, FT243 or 10X, including several which will not operate in the overtone mode (8 to 24 MHz) in the main transmitter.

Here and There

Never look directly at the sun in search of sunspots. GW3LJP projects its disc via a telescope on to a card. This method revealed an angry looking spot that presaged by two days the Aurora of 11 February. Many " A " signals were heard on 2m and GM3UAG, Banff, was worked. See the spots in safety and work the DX!

* * *

" To add insult to injury I was out on the Monday auroral night of 3 February. An unknown person telephoned, said he would ring back later but didn't. I'm convinced it was someone with a message to say things would be happening on ' Four.' "—GM3KSU.

* * *

" It is true uhf is used for the majority of the Apollo 8 traffic in the translunar and transearth parts of the mission; *but* the vhf frequency of 296·8 MHz is used as a backup and fairly extensively as a prime during the few hours following translunar injection. Apollo 10 is due to go 17 May! "—G3VUD (of the Dept of Electronics at University College, Bangor).

DX FLASH from VERON VHF Bulletin
4 March 1969, first EME QSO between Sweden and New Zealand.
A new world record was established when SM7BAE worked ZL1AZR on 144MHz at RST 559.

A big gap in amateur radio publishing is filled by a new book from *CQ Magazine*, the *Amateur Radio DX Handbook*, By Don Miller, W9WNV.

Everything DX-wise concerning the radio amateur or SWL is included in the DX Handbook. It runs to 200 pages of concise text plus a mass of drawings, tables, graphs and pictures. The amount of factual content is quite staggering.

W9WNV starts with an admirably straightforward survey of propagation, one of the best short treatments of the subject seen. He surveys the various bands from the DX point of view and then covers the many small factors that make for efficient operation. Following this are sensible suggestions for the station with the merits of various aerials thoroughly covered.

The best chapter in the book has the explanatory title of "Working DX from the Home Station." Especially useful here are language conversion tables for radio terms. Another chapter on contest working is one of the best analysis of contest work yet written while the piece on DX'ing from the rare location should be compulsory reading for all DX stations!

Sundry other topics such as award chasing and mobile DX'ing are adequately covered. There is even a section on vhf uhf DX!

SOCIETY AFFAIRS AND NEWS SUPPLEMENT

A brief report of the RSGB Council Meeting held on 17 February, 1969.

Present: The President Mr J. W. Swinnerton (in the chair); Messrs B. Armstrong, N. Caws, J. Etherington, J. C. Graham, R. J. Hughes, A. F. Hunter, E. G. Ingram, G. R. Jessop, H. E. McNally, L. E. Newnham, J. Petty, R. F. Stevens, G. M. C. Stone, G. Twist, F. C. Ward, E. W. Yeomanson (Members of Council); A. E. Dowdeswell, (General Manager), and J. Adey (Editorial Staff).

An apology for absence was received from Mr D. M. Thomas. The President welcomed Mr Etherington to Council.

Membership and Affiliation

It was resolved:

(i) To elect 186 Corporate Members and 84 Associate Members.
(ii) To grant Corporate Membership to 21 Associates.
(iii) To waive the subscription of five members due to blindness or other disability.

Membership and Representation Committee

In those cases where no nomination for Regional Representative had been received, Council decided to invite the previous holder of the office to serve again.

VHF Contests

It was decided that entry to RSGB, VHF and UHF Contests should be restricted to RSGB members.

Exhibition Committee

Mr R. J. C. Broadbent, G3AAJ, was appointed Stand Manager for the 1969 Exhibition.

Mr M. Elliot, G3VWS, was invited to take responsibility for the Home Constructed Equipment Exhibit and Mr French, G3HSE, was asked to assist Mr Norris and Mr Broadbent.

A reception for overseas amateurs at the 1969 Exhibition was approved in principle.

Regional Representatives Conference 1969

By agreement with RR's it was decided that this should be held in London on 18 October, 1969.

Regional Representative

The nomination of Mr Lewis, G8ML, as RR Region 16 was approved by Council.

Future AGM's Outside London

After discussion it was agreed that this matter should form an Agenda item for the RR's conference.

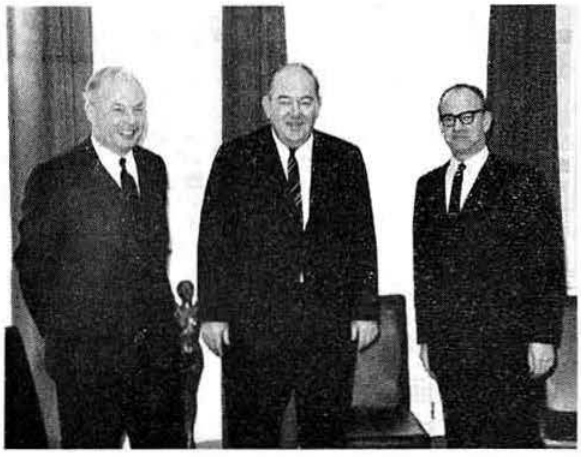
World Administrative Conference on Space Communication

This will be held in late 1970 or early 1971. Steps are being taken to ensure that any matters affecting the Amateur Service will be brought to the attention of Council.

Minutes of Committee Meetings

The following minutes of Meetings of Committees were approved by Council: RAEN Committee (9/11/68); Education Committee (28/12/68); IARU Working Group (13/1/69); HF Contests Committee (16/1/69); Finance & Staff Committee (17/1/69); Technical Committee (20/1/69); GPO Liaison & TVI Committee (21/1/69); Education Committee (25/1/69); VHF Committee (29/1/69); VHF Contests Committee (30/1/69); Exhibition Committee (31/1/69); Scientific Studies Committee (3/2/69); Finance & Staff Committee (10/2/69).

Council was in session for 4¾ hours.



A welcome visitor to RSGB on 14 March was ARRL Canadian Vice-Director, Colin Dumbrille, VE2BK seen here with RSGB Council Member, Roy Stevens, G2BVN and General Manager, Eric Dowdeswell, G4AR. Colin was travelling to Bermuda via the Continent.

The Late John Clarricoats, OBE, JP, G6CL

The Council of the Society has decided, in principle, to perpetuate the memory of the late General Secretary by a suitable memorial. The form of this has yet to be decided, but any donations that members care to send will be welcomed. Remittances should be clearly marked " G6CL Memorial."

Annual General Meeting

Minutes of the 42nd Annual General Meeting of the Radio Society of Great Britain held at the Royal Society of Arts, John Adam Street, Adelphi, London WC2, on Friday, 6 December, 1968 at 6.30 pm.

Present: The President (Mr J. C. Graham) in the Chair, the Immediate Past President (Mr A. D. Patterson, BASc.) The Hon. Treasurer (Mr N. Caws, FCA), Messrs B. Armstrong, R. J. Hughes, TD, DLC, A. H. Hunter E. G. Ingram, H. E. McNally, L. E. Newnham, BSc, R. F. Stevens, E. W. Yeomanson, (Members of the Council) Mr C. P. Pope (Secretary), Mr A. E. Dowdeswell (General Manager), Mr J. Adey (Associate Editor), Mr J. Clarricoats, OBE, (Honorary Member) and 73 Corporate Members.

Apologies for absence

Apologies for absence were received from Mr J. W. Swinnerton (Executive Vice President) and from Messrs G. M. C. Stone and D. M. Thomas (Members of the Council).

Notice Convening the Meeting

The Secretary read the notice convening the meeting.

Minutes

Mr A. D. Patterson moved and Mr R. Glaisher seconded and it was *resolved* that the Minutes of the 41st Annual General Meeting as published in the July 1968 issue of *Radio Communication* be taken as read.

Mr A. O. Milne moved, and Mr A. D. Patterson seconded and it was *resolved* that the Minutes of the 41st Annual General Meeting be confirmed and signed as a true record.

Annual Report

The President moved and, no questions being asked, it was *resolved* that the Annual Report of the Council as published in the November 1968 issue of *Radio Communication* be received and adopted.

Supplementary Report

The General Manager read a Supplementary Report of the Council covering the period from 1st July, 1968 to early December 1968.

Report of the Honorary Treasurer and Audited Accounts for the Year on 30 June, 1968

The Honorary Treasurer read the Report of the Auditors to the members and then thanked those members who had written to him with various queries and said that he would cover all the matters in his review of the Accounts and proceeded to go through the Income and Expenditure Account and Balance Sheet in detail.

He then proposed, and Mr A. D. Patterson seconded, that the Report of the Honorary Treasurer and the Audited Accounts of the Society for the year ended 30 June, 1968 he approved and adopted.

The President then asked for questions on the Accounts.

Mr Morris, G3SWT, said that he was very concerned at the deficit incurred during the last financial year and asked whether it was possible to estimate the current year's profit and deficit. Mr Caws replied that this was very difficult to estimate but the position would be known more precisely at 31 December, 1968. He hoped that the Income and Expenditure Account would show a surplus at the end of 30 June, 1969 as a result of the expected sales of the Handbook. So far 8000 copies had been sold (at a minimum profit of 10s per copy).

Mr Clarricoats commented on the change of name of the monthly journal from the *RSGB Bulletin* to *Radio Communication*. He said that he had raised this very point at the last year's Annual General Meeting and had been told that the change of name would encourage more firms to advertise in the Journal. The comparative figures for advertising revenue were 1967, *£4,968* and 1968, *£4,992*. Mr Caws commented that the budgets of companies for advertising had been drastically cut during the year. Mr Graham stated that Council was looking into this problem.

Mr A. H. Trigell thanked the Treasurer for answering the questions he had asked in his letter. He then went on to say the expenditure has risen drastically during the year and could the Society not save on certain items. Mr Caws replied by saying that Council was watching the situation very carefully but that rising prices had caused many increases.

Another member asked whether anything had been done to sell " Radio Communication " on the open market. Mr Stevens replied that this idea had been carefully considered by Council, but had been rejected as at the moment the Society has not sufficient staff to handle distribution and as the large distributing firms demanded such large discounts.

Mr J. Drudge-Coates asked whether the cost of the Council Meetings could be reduced. Mr Graham said the cost of the Meetings was high because certain Council Members representing zones had to travel a long distance and that it was Council's policy to have full representation.

Mr Milne then stated that he attended his first Annual General Meeting in 1927 and the Society was still going strong today. He said he had every confidence in the way Council was handling the affairs of the Society.

Mr Margolis asked how much the free advertising in *Radio Communication* was costing the Society. Mr Stevens said the net cost was about *£50* per month.

Mr F. Sharpe asked whether Council was considering an increase in Members' Subscriptions because of the current financial situation of the Society. Mr Caws said that at the present moment Council was not considering an increase in subscriptions.

The President then put the resolution to the meeting and it was carried unanimously.

Election of Council for 1969

The President announced that it gave him great pleasure to report in accordance with Article 10 of the Articles of Association, the Council had appointed Mr J. W. Swinnerton, G2YS, to the office of President for 1969.

The President then announced the result of the ballot to fill the two vacancies which would occur among the Ordinary Members of Council on 31 December, 1968. This was as follows:

Mr J. Etherington	G5UG	809
Mr G. R. Jessop	G6JP	880
Mr A. D. Patterson	GI3KYP	514
Mr G. M. C. Stone	G3FZL	1100
Mr R. G. B. Vaughan	G3FRV	615

He then formally declared Messrs Stone and Jessop elected.

The President then announced the result of the ballot for the vacancy which would occur on 31 December, 1968 for the Council Member elected on a Zonal basis for Zone " B " namely:

Dr E. J. Allaway	G3FKM	125
Mr R. W. Fisher	G3PWJ	64
Mr F. C. Ward	G2CVV	165

He then formally declared Mr F. C. Ward elected.

The President next announced that the ballot for Zone " C " was void as the nomination of Mr F. J. Barns had been declared invalid as not being in accordance with Article 27 of the Articles of Association. Mr R. J. Hughes, G3GVV, was thus elected unopposed.

The President thanked the unsuccessful candidates for taking part in the election and also the scrutineers, Messrs J. Clarricoats, G6CL, J. W. Bluff, G3SJE, A. W. Rix, G3RYF, R. J. Broadbent, G3AAJ, and W. Corsham, G2UV.

He stated that the following members of the 1968 Council were not required to stand for election in their respective offices:

Mr J. C. Graham	G3TR	Retiring President
Mr N. Caws	G3BVG	Honorary Treasurer

Members of Council: Mr B. Armstrong, G3EDD; Mr A. F. Hunter, GM3TLW; Mr E. G. Ingram, GM6IZ; Mr H. E. McNally, GI3SXG; Mr L. E. Newnham, G6NZ; Mr J. R. Petty, G4JW; Mr R. F. Stevens, G2BVN; Mr D. M. Thomas, GW3RWX; Mr G. Twist, G3LWH; Mr E. W. Yeomanson, G3IIR.

Auditors

Mr Caws proposed, and Mr R. J. Hughes, G3GVV, seconded, and it was *resolved* that Edward Moore & Sons be re-appointed Auditors for the year to 30 June, 1969 at a fee of £215.

Other Business

Panel of Scrutineers

The President announced that in accordance with Article 58, it was necessary to appoint a panel of 10 Corporate Members from whom three scrutineers for the 1969 Ballot for Council would be drawn. The following submitted their names: Messrs R. Broadbent, A. Milne, J. Clarricoats, W. Corsham, A. Gould, D. French, G. Preece, A. Taylor, A. H. Trigell and M. McBrayne.

This terminated the formal business of the Annual General Meeting at 7.45 p.m.

RSGB Film

The Society's new film "Radio News of 1968" produced and edited by Mr R. A. Cathles, G3NDF, who is the curator of the Society's Film Library was then shown for the first time.

After the showing all present paid tribute to Mr Cathles for his efforts in producing such a record of the Society's activities during 1968.

The President then opened the meeting for a informal discussion on any matters that members cared to bring up.

Mr Craig congratulated the Society on its prompt reply to the disgraceful report on radio amateurs contained in *The Times* recently.

Mr J. Morris asked when the revised edition of the Radio Amateurs Examination Manual could be expected. It was reported that this edition was well in hand but it would be another six to nine months before it finally appeared.

Mr P. Thorogood asked about the interference on the 70cm band. The President replied that Council knew about the interference and they are watching the situation carefully.

Mr A. Milne reported that he was now the custodian of the Tape Library and asked that if any clubs had some good lectures, they should record them and let him have the tapes. He said certain club secretaries were slow in returning tapes they had borrowed and he asked that in future they should return them more promptly.

Mr J. W. Bluff asked whether the name of the Exhibition could be changed. The President said the Exhibition Committee in conjunction with Mr Thorogood, the Exhibition Organizer, had considered the present title suitable.

Trophies

The Society's trophies were presented by the President to the winners.

NRSA Convention

The Northern Radio Societies Association is again holding its annual Convention and Exhibition at the Cumberland Suite, Belle Vue, Manchester on Sunday, 27 April, 1969.

Situated as it is, the Convention has become one of the major events in the Amateur Radio calendar, and is well served by road, rail, air (and even canal). This year's event promises to be bigger than ever.

Talk-in stations will be operating on both 160m and 2m for the benefit of visiting mobiles, using the call-sign GB2BVC. Adequate parking facilities are available.

A special demonstration station will be operating, on the hf bands, using the call-sign GB2BVC, located just off the main Exhibition Hall. Fully equipped with all the latest equipment it is intended to give the lay public an insight into the "working" of an Amateur Radio Station. Among the many attractions are: displays by the 11 member societies, many representatives from the trade a static and active display of model boats—the active display being on the boating lake and a Grand Draw. The programme of events is as follows:

11 am. Exhibition open to the public.
11 am to 1 pm. Display of model boats on boating lake.
2 pm. Official opening by Brian Trueman, well known TV personality.
4.30 pm. Grand Draw and Brochure prize Draw.
6 pm. Exhibition closes.

Sutton and Cheam Dinner and Festival

The Sutton and Cheam Radio Society announce their 21st Annual Dinner and Ladies Festival to be held at the Crown Inn, Morden, Surrey (just by Morden Station at end of the Northern Line tube) on Saturday, 12 April, 1969, The reception is at 6.30 pm.

RSGB President, John Swinnerton, G2YS, has accepted an invitation to be Guest of Honour and it is expected that a number of other well-known personalities in the field of Amateur Radio will be attending.

A really first-class evening, including cabaret, is planned and a heavy demand for tickets is anticipated. Please contact Roy Scott, G2CZH, 140 Seymour Ave., Morden, Surrey as soon as possible for bookings, at 35/- per person and further information.

Newark and Nottingham Agricultural Show

The Magnus Radio Society of Newark will be running a special exhibition station at the Newark and Nottinghamshire Agricultural Show on Friday and Saturday, 2 and 3 May. They are hoping to use the call GB3NS and to operate on all the hf bands from 160 to 10 metres. The station is being run on the Nottingham County Education Committee Stand.

Beaconsfield Charter Fair

A special station will be operating to celebrate the 700th anniversary of the Beaconsfield Charter Fair. The callsign will be GB3BEK and the station, organized by a group of local amateurs, will be using ssb on 10 to 160 metres and am on all bands up to four metres. Further details can be obtained from D. C. Chapman, G3NGK, 64 Heath Road, Holtspur, Beaconsfield, Bucks. The operation will be over the period 3 and 4 May.

Obituaries

Norman Routledge, G3DDO

It is with deep regret that we report the very sudden death of Norman Routledge, G3DDO, at his home in Poynton, on January 28, from a heart attack.

Although not very active in recent years, he always maintained a great interest in amateur radio and was particularly keen on having everything exactly right and working to its maximum efficiency. He spent more time to these ends than on the air.

He first became interested in radio soon after leaving school, over 40 years ago. He gave valuable service to the country during the war by working for RSS. He will be sadly missed by all his many friends, both radio and otherwise. We extend our deepest sympathy to his widow.

C. L.

James Croysdale, G5US

We deeply regret to announce the death, after a long illness, of James Croysdale, B.Sc., G5US, on Thursday, 20 February, 1969 at the age of 67.

Licensed in 1922, he was an early member of the T & R Section and did a lot of work on the revolutionary Armstrong superegenerative receiver. From early 1939 till he retired to Redlynch near Salisbury in 1964 he was employed on radar and aircraft radio work at the RAE, Farnborough.

He leaves a widow and three sons to whom we extend our deepest sympathy.

E. S.

Greville Knights, G8APQ

It is with great sorrow that we must report the death of Greville Knights, G8APQ, on 10 February, 1969, at the age of 24 years.

Greville was an enthusiastic vhf/uhf operator and a regular participator in the seventy centimetre activity nights. He entered nearly every 70 cm contest after he was licensed and we are sure that many readers will remember him.

We extend our sympathy to his family, including his older brother, G3TQY.

M. T. K.

RADIO AMATEUR EMERGENCY NETWORK

By S. W. LAW, G3PAZ*

Truth has many facets and we can always penetrate a little deeper into the apparently clear depths. Even in our most controversial moods there penetrates a thought that the other fellow may have a point (to the fury of our delicate ego!). Take the case of the chap who has never come across a Moebius band; he *knows* that it has two sides—it would be ridiculous to think otherwise! Yet a line drawn round the wretched thing apparently proves that it can only have *one* side. To cap it all, if it is cut in half it still remains whole! Doubters, look up the art of Topology. Why this erudite waffle? Well, it's not a bad simile for the spirit of a good RAEN Group. Whatever the sides taken by the almost inevitable factions within any Group there remains only the one side when the test line is drawn—get out there and get on with it! And if the numbers are decimated (or to be more correct, halved) then the band still remains whole. It *is* that way with your Group, isn't it?

To The Right—In Tens

It won't be long now before you measure your car's speed in kph. Do you do your RAEN exercises in kilometres? You should, because the National Grid Maps are all marked that way; and if you don't have a set of NG maps for your area you can't give a National Grid Reference or go to it if asked. We hope we are speaking to the (by now indignant) converted, but if you are still not clued-up, why? While we are about it, may we repeat the tip we gave on this page some time ago. Have a chat to a Car Rally enthusiast and ask about those little measuring scales which make tenths of a kilometre easy to measure. The Rally types can work to the nearest lamp post with ease!

Those Manuals

As a voluntary organisation we have problems that could never arise in commerce. Hence, the disastrous chain of mishaps which overtook the printing effort has still not cleared up. Spare a thought for the work involved and the time (and money!) expended by those who produced the first issue. Now, a few copies have been produced and are with our Registrations Secretary. These are available as far as they will stretch, but we regret that we must charge 3s. 6d. to cover the cost of printing and postage. Orders will be dealt with by G2ABC in strict rotation, so send off right away.

Like An Ever-Rolling Stream

The Bearer of the Scythe is no respecter of age nor of youth. We mourn the passing of John Clarricoats, G6CL whose hand has been seen in so many branches of our hobby for so many years. No need to enlarge on his unstinting work on behalf of us all. He passed on as he would have wished, still in the service of us, his friends. At the other end of the age scale our sympathy is with the Surrey Group, who have lost a keen young member, Greville Knights, G8APQ who died suddenly and unexpectedly in February. There is little to say; we can only turn to our innermost thoughts for a few moments to salute these two.

Still Trying

Surprising how things keep getting overlooked. We had occasion to check the registration lists recently and found that a certain Group (who shall be nameless) claimed a membership of over 40, yet only about half of the names appear on the list as being Registered Members of RAEN! In another case, the figures showed that a certain much larger Group could rate over the three figures if its un-registered members got an up-to-date card—over 40 of them. Are you *sure* that your card is stamped currently? Or must we keep on with a monthly reminder?

Flexibility

The present tendency seems to be to concentrate activity on to 4m and 2m for RAEN traffic. With the availability of gear coupled with the obvious advantages of crystal control this is understandable. Nevertheless there is something to be said for having another band to turn to if traffic should require it. Certainly it has been rather an embarrassment during the sunspot cycle to have a 10m crystal-controlled walkie-talkie channel blotted out by high-power DX (as the Cornwall boys found out during the oil-slick troubles!). This won't last much longer though, so it might be a good idea to have a look round for any of the rigs that may still be about. True, the HF bands can be very noisy at night but not all emergencies occur during darkness and the usefulness of another channel is obvious. So don't get so dependent on VHF that you would be stumped if things got really hectic.

Snappy—But No Smoke

The overs during RAEN operation are rarely of any great length but our relays must always work impeccably even if a car battery is getting a little run down after a long stint of static or /P work. A trick we have seen used professionally is to use a relay of a lower voltage than the supply for snappy operation which is held on by the immediate introduction of a heavy-duty resistor to limit the hold-on current. In these days of solid-state devices this is not such an awkward problem as it might at first appear. The circuit shown in Fig. 1 gives the values for a 12V relay operating from a 24V supply, but it is only necessary to make the appropriate changes to the resistors for other values of supply. We can assure you that the relay gives a very positive action on twice the rated voltage, even when the volts are down. Examination of the circuit will show that the wire-wound resistor in series with the relay coil is normally short-circuited by the transistor. When power is applied, the relay coil receives the full voltage until the bias builds up to the transistor base. The transistor then provides an open-circuit across the limiting resistor which only passes sufficient current to hold on the relay without the risk of overheating. (It's the resistor that's going to get hot, so don't confine it; give it air!)

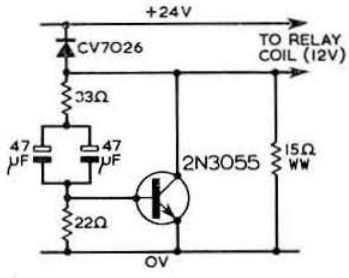


Fig. 1.

* 11 Chisholm Road, Croydon, Surrey, CRO 6UQ.

Honorary Registrations Secretary: **Mr R. A. Ledgerton, G2ABC, 1 Latchingdon Gardens, Woodford Bridge, Essex.**

Honorary Secretary, RAEN Committee: **Mr E. R. L. Bassett, BRS16075, 57 Upper St. Helens Road, Hedge End, Southampton, SO3 4LG.**

CONTEST NEWS

Rules for VHF NFD 1969

Several changes have been made in the rules, the most important being in Rules 5, 6, 12 and 19. The scoring has been altered to be consistent with other RSGB VHF Contests. One new rule (Rule 17) has been introduced. Intending entrants are urged to obtain the necessary Cover and Summary sheets well before the event.

1. Duration
From 1800 GMT, 6 September to 1600 GMT, 7 September 1969.

2. Eligible Entrants
Any RSGB member or group of members operating within the British Isles.

3. Operators
(a) Operators of portable stations competing 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 callsigns of, operators of the competing station or group of stations.

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

5. Stations
Each competing group will be permitted a maximum of four stations, each using a different callsign. Only one station may operated on a given band, with the exception that a station operating on the 1296 MHz or higher frequency bands may use any other band to make initial contact. There is no restriction on the way in which the bands are divided between the stations. (e.g. 70 MHz and 432 MHz on one station, 144 MHz on the other to form a two station entry).

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

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

8. Transmitters
Only one transmitter may be used on any one band at one time, for scoring contacts.

9. Setting up Time
All equipment including aerials must be installed on the site (as defined in Rule 6) within the 12 hours preceding the contest or during the contest. This does not apply to the storage of equipment.

10. Power and Modes
(a) On the 70 MHz, 144 MHz, 432 MHz and 1296 MHz bands the dc input power (as defined by the terms of the licence) shall not exceed 25 watts to any rf stage of the transmitter. All modes may be used with the exception of A2 (MCW).
(b) On the 2300 MHz and higher frequency bands any power or mode may be used, within the limitations of the licence.

11. Scoring
(a) On the 70 MHz, 144 MHz, and 432 MHz bands contacts will be scored on distance as follows:

km	Points	km	Points
0–50	1	500–600	22
50–100	3	600–700	26
100–200	6	700–800	30
200–300	10	800–900	34
300–400	14	900–1000	38
400–500	18	Over 1000	50

(b) Band multipliers will be applied as follows:
70 MHz–six, 144 MHz–three, 432 MHz–20.
(c) On 1296 MHz and higher frequency bands, contacts will be read at one point per kilometre, with no multiplier.

12. Contest Exchanges
(a) RST or RS 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 their QTH and QRA Locator. The QTH must be a town which can be found on the Ordnance Survey "Ten-mile Map" or a distance in kilometres and bearing from such a town. The QRA Locator is the standard five symbol location fixing system.

13. It is the responsibility of the receiving operator to obtain the location information he requires for scoring.

14. Logs *must* be submitted on RSGB Contest Log Sheets. Columns 5, 6 and 7 are to be used to enter the location of the station worked. Separate logs must be submitted for each band.

15. Contacts
(a) Only one scoring contact may be made with a given station, (i.e. callsigns that are fixed, /P, /A or /M all count as one station). If a station that has moved location is contacted for a second time, only the higher scoring contact may be claimed.
(b) Crossband contacts will not count for points but may be used to "set up" a single band contact.
(c) Contacts made with a 1296 MHz or higher frequency station operating on 70 MHz, 144 MHz, or 432 MHz will not count for points unless that station also represents its group's entry on the band in question.
(d) Repeat and crossband contacts must be clearly marked as such and the points column left blank.

16. Calling CQ
Contestants are asked to indicate on which band they are calling CQ and are strongly urged to state their tuning intentions. Operators of stations prepared to attempt contacts on 1296 MHz or higher frequencies should call accordingly (e.g. "CQ 70 or 23"). Operators of stations entering *only* on 1296 MHz or higher frequency bands *must* indicate this. (e.g. "CQ for 23 only").

17. CW Segments
Any station operating on modes other than A1 or F1 in the segments 70·025-70·1, 144-144·1 and 432-432·1 MHz is liable to disqualification.

18. Proof
Proof of contacts may be required.

19. Entries
(a) Entries must be postmarked not later than 22 September 1969.
(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) Special Summary sheets are available for this contest and *must* be used, even by single station entries.
(d) A Cover Sheet (Form 427) *must* be made out for each band and must show the callsigns of all operators.
(e) The Summary sheet must be completed and signed by one member of the group, who will be considered responsible for the entry.

20. Awards
Awards will be made to the overall winner and runner-up, the leading entry from each country and the highest scoring station on each band.

Fourth 144 MHz (Portable) Contest 1969

1. Date and Time : 4 May from 09.00 to 17.00 GMT.

2. All **entries** and check logs must be sent to the adjudicator at: VHF Contests Committee, 32 Harbour Avenue, Comberton, Cambridge.

In addition, the following General Rules as published in the January issue of *Radio Communication* will apply: 3b, 4a, 5a, 6a, 7c, 8a, 9a, 10a, 11–19 and 25–28.

144 MHz (CW) Contest 26 January, 1969

Comments on conditions ranged from above average to below average depending on how well each operator considered he was doing. Activity was fair and produced 26 entries. By observation and comment almost all QSO's took place in the bottom 100 kHz of the band. Some operators found this not to their liking—" 100 kHz of QRM and 1900 kHz of QRV " said GW3NUE/P. VFO's were in use in plenty as evidenced by certain T8 (and worse) notes and drift.

The best DX was worked by G3DAH assisted by G3BA who worked into Southern Germany for 650 km.

Entrants Comments:

" 'Phone stations continue to use the cw band, local QRM dreadful" —G3GZJ. " More beams this way please "—GC2FZC. " This year the contest must have demonstrated—to many who choose to ignore it—that there really is a band plan "—G2WS. " Two stations were heard operating outside the low end of the band "—G3DAH. " Lone trips began at 0600, arrived back home 0020—t'was a long day "—G3NUE. " Apologies to all stations who may have called us in vain due to receiver trouble " sic—G3XAC.

Subject to Council approval, certificates of merit will be awarded to the leading station in each group and the runner up in Section A.

G3WSN was disqualified under Rule 11.

SECTION A

Posn	Call	Score	QSOs	Co. code	Power	Aerial
1	G3GZJ	364	32	CL	150	6/6
2	G3NEO	305	40	YS	150	5/5
3	G3LAS	258	50	HF	100	10
4	G3IMV	218	45	BS	75	8/8
5	GW3FSP	203	28	GN	150	10
6	G3GJY	182	22	YS	20	8
7	G2XV	154	31	CE	100	3 elquad
8	GC2FZC	146	15	GY	60	8/8
9	PA0KWY	136	12		150	8/8 long
10	G2WS	135	25	ST	75	5
11	G3WDG	93	23	HE	25	6
12	G3BPM	77	23	MX	20	5
13	G3FIH	74	15	GR	80	4/4
14	G3RSD	66	12	LN	14	8
15	G3VXK	9	4	LE	50	8

SECTION B

1	G3OXD/A	289	48	WR	25	6/6
2	G3NNG	262	53	BF	30	6/6
3	G3DAH	249	53	KT	150	10
4	G3WSC	205	46	SX	75	10
5	G3KMI	96	20	HE	40	6
6	G3OLB/A	50	16	GR	15	5

SECTION C

1	GW3NUE/P	415	62	BR	100/50	10 plus halo
2	G3XAC/P	88	19	YS	20	4/4
3	G5HZ/P	77	18	BE	15	halo
4	G3PEJ/P	71	12	YS	10	4/4

First 70 MHz Fixed Station Contest 1969

Conditions were generally agreed to have been poor for this contest, which was the first of its type to be held. Nevertheless, there were 36 entries, and check logs were received from G2WS, G3KPJ, G3SLJ/P, G3SZT/P, G3TAA, G3TDM, GI3UPG/P, G3VFD/P and BRS28005. The North was particularly well represented with eight entries from Lancashire and five from Yorkshire compared with one from London and two from Surrey.

Top scorer was Willy McClintock, G3VPK, of Chelmsford. Although his score undoubtedly benefited from many Home Counties stations being worth three points, his log included six QSOs at over 200 km and one (G3GZJ) at over 400 km. In second place is Don Hayter G3JHM of Worthing. 'JHM has certified on his entry that his "/A " location is included on his licence (as required by Rule 20). This is mentioned to avoid any misunderstanding arising from his signing "/A ." Subject to Council approval, Certificates of Merit will be awarded to G3VPK and G3JHM.

GI3TLT deserves special mention for his log which included three GMs and G3EPK, while GI3UPG who made four G QSOs from a portable site 920 ft asl mentions having worked 45 " G " stations on a previous visit to the same spot and wonders where they were this time! Another station well removed from centres of high activity is G3GZJ in Cornwall, where 82 of his 95 points came from five cw contacts made during the last two hours of the contest. The absence of contacts in the six and 10 point zones, owing no doubt to TVI problems, prevented 'GZJ from making a higher score. On the subject of TVI, G2WS suggests that better support for 70 MHz contests would be forthcoming from the South and West if at least part of the duration of the events were in the late evening or early morning, outside TV hours.

Most of the transmitters in use finished up with QQVO-you-name-its in their PA stages but there were a few 832s, 829s and an RK34 still going strong. G3GVM of Fareham, Hants, used ssb for most of his contacts, taking the 28 MHz output from a modified Sommerkamp FL200B to drive a homebrew mixer-amplifier line-up. With his log, G3GVM sent in a list of stations called but not raised which includes G3GZJ, G3RIK, G3TTG and G3VJR.

The standard of logkeeping was generally good but two stations have been penalized for giving their locations in as many as three different forms and not noting the fact on their cover sheet. This only makes things difficult when it comes to checking contest exchanges.

Competitors Comments:—" Usual grouse ' Tuning 70·1 up ' and never reaching 70·4 "—(G3OCC).

" Things somewhat different from operating at G3OXD/A . . . think there is definitely a place for this type of contest " (G3OHC).

" In my only clear take-off direction the bulk of the population is composed of sheep! " (G3VVT).

" Lack of portable stations made things rather dead " (G3UUT).

And finally, from G2AMV, " Very enjoyable, another one please."

Call Sign	Posn	Score	QSOs	County Code	Best QSO km	RF Stage	Ft.asl
G3VPK	1	203	56	EX	445	6CW4	320
G3JHM	2	176	62	SX	210	TIS 88	500
G3LAS	3	168	68	HF	400	6CW4	300
G3TDH	4	164	67	BD	132	BF180	520
G5NU	5	157	40	BE	330	6CW4	205
G3NEO	6	137	29	YS	435	6CW4	380
G2AMV	7	132	55	LE	270	6CW4	170
G3RLE	8	120	39	YS	330	E88CC	500
G3MOT	9	119	62	BS	355	E88CC	325
G6HD	10	97	56	KT	235	3N140	67
G3GZJ	11	91	14	CL	450	6CW4	800
G3VJR	12	86	31	YS	230	6CW4	150
G3EKP	13	85	36	LE	265	—	800
G3RIK	14	73	30	LE	280	E88CC	500
G5HZ	15	72	35	OX	160	6CW4	300
G3GVM	16	70	22	HE	325	MPF107	24
G3AEZ	16	70	48	SY	85	6CW4	400
G3PMJ	18	68	38	LE	73	E88CC	250
G3SNA	19	67	36	LE	280	2N3819	550
G3HBG	20	66	42	SY	75	2N3819	400
G3DAH	21	63	14	KT	320	6CW4	100
G3UUT	22	56	17	YS	296	E88CC	70
G3WMR	22	56	44	LD	65	EC91	200
G3OCC	24	55	36	KT	150	Cascode	—
G3WQP	25	51	31	LE	82	6CW4	8
G3WYV	26	41	23	LE	125	—	650
G3OHC	27	39	10	WK	186	6DS4	520
G3GOX	28	38	35	MX	60	EF95	70
G3UNV	28	38	36	MX	57	6AK5	zero
GI3TLT	30	37	29	DW	230	6CW4	—
G3UOV	31	36	19	SX	85	6CW4	230
G5UM	32	35	11	LR	133	E88CC	560
G3ABM	33	32	23	CH	102	—	110
G3VVT	34	17	13	LE	73	AFZ12	575
G3WRA	35	16	6	HD	85	—	280
G3XOL	36	8	6	YS	55	—	—

Affiliated Societies Contest

It is a matter for regret that this year's Contest attracted ten fewer entries than last year. In fact, one group (South Manchester) were moved to comment " who would have thought there was a Contest on the Saturday evening? " At least 19 other Clubs were known to have been active, but no entries were submitted.

The lower entry was reflected in the lower checked scores; but Maidstone YMCA (G3TRF) keyed 1656 points to (once again) take the first place. In second position, with 1633 points, were GCHQ (G3SSO) who moved up from last year's joint fifth. The third position went to Surrey RCC with a checked score of 1572 points.

Comments Outgoing

To the London Group who claimed 1839 points—sorry lads, get another abacus. 31 × 15 = 465, not 750!

To the entrants who sent their logs to RSGB HQ—please *read the rules.*

To those entrants who still do not use RSGB log forms—would *you* like to check a contest where about five per cent of the entrants use non-standard formats? Please chaps, the log sheets are free!

Comments incoming

" Enjoyable contest but hard going in later hours due to lack of AFS stations"—Leyland Hundred.

" We can imagine, one day, all AFS entrants being Southerners only! "—South Manchester.

" It was a pleasure to note that the obvious topscorers found time to pass GL greetings, etc."—39th (City of London) Sigs. AVR.

RESULTS TABLE

Posn	Club	Call-sign	Points
1	Maidstone YMCA ARS	G3TRF	1656
2	GCHQ ARS	G3SSO	1633
3	Surrey RCC	G3SRC	1572
4	Verulam ARC " A "	G3VER	1562
5	Crawley ARC " B "	G3TR	1550
	Salisbury SWC	G3FKF	1550
7	Silverthorn RC	G3SRA	1544
8	Moray Firth ARS	GM3TKV/A	1514
9	Purley & District " A "	G3TWJ	1496
10	Coventry ARS	G2ASF	1481
	Crawley ARC " A "	G3WSC	1481
12	Thames Valley ATS	G3TVS	1477
13	Leyland Hundred ARG	G3GGS	1472
14	Crawley ARC " C "	G3TNO	1463
15	South Manchester RC	G3FVA	1462
16	Crawley ARC" D "	G3XNS/A	1457
17	Nuneaton ARC	G3XIU/A	1434
18	Fareham DRC	G3VEF	1429
19	Mid-Sussex ARS	G3WPO	1409
20	West Kent ARS	G3WKS/A	1407
21	Verulam ARC " B "	G2AIA/A	1399
22	Staffs College Tech. ARS	G3VZI	1380
23	Royal Sigs. ARS	G4RS	1356
24	Vange ARS	G3RNL	1351
25	University of Bristol ARS	G3KAC	1328
26	Royal Naval ARS	G3BZU	1295
27	Ashford	G3UES/A	1279
28	Southgate RC	G3SFG	1249
29	Wirral ARS	G3NWR	1221
30	Edgware DRS	G3ASR/A	1201
31	Chippenham DARC	G3VRE	1169
32	Purley DRC " B "	G3WRR/A	1161
33	BOAC Speedbird RC	G3NAF/A	1144
34	Grimsby	G3VEV	1117
35	Shefford DARC	G3VMI	1053
36	39 Sig Regt ARC	G3SIG	1041
37	Isle of Wight RS	G3SKY	1029
38	Clifton ARS	G3GHN	1027
39	Cray Valley RS	G3RCV	1004
40	Mid-Herts ARS	G3WGC	951
41	Acton Brentford Chiswick RC	G3IIU	874
42	Bromsgrove DARC	G3VGG	791
43	South Shields DARC	G3DDI	271

The following entries were disallowed for the reasons stated: The Rule numbers refer to " General Rules for HF Contests " Royal Air Force ARS (G3IRS)—No declaration or entry particulars—Rule 8d and no operators callsigns—Rule 4b(ii). Cheltenham ARS (G3BK)—Late entry—Rule 8f.

The Seventh 7 MHz Contest

The CW Section 26-27 October, 1968

This was quite well supported with some 400 stations providing contest points for the 112 entrants. The overall winner is G. W. Spray, G3FXA, who made 303 contacts for a score of 3425. In second place is R. Edwards, GW3BQY, with 3325 points from 275 QSO's. G5PQ is third with 2795 points from 250 contacts, and the leading overseas entrant is VK3MR with a score of 1800.

In the receiving sub-section, only 11 entries were submitted and 10 of these were from overseas with eight from the USSR. The only British entrant, A. A. Goacher, A3942, is the clear winner with an outstanding score of 1995 points. Second is UA1-143-1 with 735 points, and third is UL7-021-14 with a score of 730. As the Committee have come to expect Eric Trebilcock, BCRS195, sent in a useful log reporting on long path conditions.

The Thomas (G6QB) Memorial Trophy will be awarded to G3FXA, and certificates of merit to those as shown in the results table.

The Phone Section 9-10 November, 1968

There was less support for this section, and the Committee were disappointed that only 21 stations, of the several hundred that participated, took the trouble to send in logs. The winner, George Beasley, G3LNS, scored 1970 from 186 contacts. The runner-up is Hal Perkins, G3NMH with 125 contacts and a score of 1910. In third place, and the leading overseas entrant, is EP2BQ, with 1750 points.

In the receiving sub-section, Joe Skidmore, BRS26431, managed to log more than sufficient overseas contestants to give him first place with a score of 1855. It seems to have been quite a contest for A. A. Goacher, A3942, as not only did he come first in the cw listeners sub-section, but he is also the runner-up in the phone sub-section with a score of 1540. In third place is Derek Robinson, A6003, with 1370 points. There were a total of 19 entrants, with 17 of these from the UK.

Equipment Used

The leading station, G3FXA operated from the QTH of the Government Communications Radio Club, with a KWM-2 and 51S-1 combination, two verticals and a two-wavelength horizontal aerial. GW3BQY used a LG300 transmitter and a HQ170A receiver, working into either a half-wave vertical or a dipole. G3LNS and G3NMH both used Heathkit equipment and vertical aerials. On the receiving side, A3942 worked with an AR88D and a half-wave end fed aerial, while BRS 26431 used a Star SR 550 and 100ft end fed wire

Conditions

A predominance of short-skip was prevalent during both sections of the contest. Analysis of the logs during checking, shows that nearly 90 per cent of all contacts made were inter-European. Apart from a few short openings to VK and North America, the only noteworthy contacts were made with EP2BQ in the phone section. Several entrants have commented on the lack of openings to Africa and Asia and have suggested that it would be preferable if the contest dates could be moved to December or January. While the Committee will take note of these suggestions, it is unlikely that any change will be possible, bearing in mind the very crowded International Contest Calendar.

Comments

Apart from the suggested date change, most entrants seem satisfied with the rules. A number of contestants commented about conditions, however several pointed out that 1968 is at the peak of the sunspot maxima and were thankful that things were not worse.

As usual, there were complaints from UK competitors about the presence of broadcast stations on the low end during the cw contest. According to several entrants, Radio Peking had a transmitter fault which effectively blotted out the first 35 kHz of the band for several hours on the Saturday evening.

A few logs had to be rescored, but the number was far less than in previous contests. Some entrants were kind enough to send in summary sheets and prefix check lists with their logs. This is a most helpful timesaver for the Committee and is much appreciated.

Finally the Committee would like to thank all those who sent in check logs for this contest. These include: G3MWZ, G6LX, SM2ALU, SM5TU, UJ8KAA, SWL Davis (VK), PA-L890 and SWL Richardson.

CW Section

Position	Call-sign	Points
1	G3FXA/A*	3425
2	GW3BQY*	3225
3	G5PQ	2795
4	G5RP	2700
5	GW3LEW	2675
6	G2DC	2320
7	G3PDL	2290
8	G3RWL	2200
9	G3ESF	2120
10	G3KZC	2055
11	G3KLH	2000
12	VK3MR*	1800
13	G3APN	1740
14	G3MGL	1730
15	GM3CFS*	1700
16	W2LXK*	1590
17	G3RZI	1535
18	W3FU*	1500
19	G3LQI	1475
20	GW3CW	1460
21	GI3JXS*	1360
22	WIHL	1305
23	G3UFW	1265
24	G2GM	1200
25	G3JFF	1165
26	GW3WVG	1160
27	G3TBK	1070
28	G3ICH	1030
29	W3NB	1000
30	G3UKV	930
31	OK1AOR	915
32	W1ARR	895
33	VE2LY	890
34	DL7HT	855
35	W1WMH	850
36	G8KU	840
37	SM3EWB	835
38	SM6CUK	805
39	SP5ATO	780
40	W2MT	775
41	UT5EH	745
42	UQ2PZ	740
43	UR2QI	735
44	VE1AUE	730
45	G2FYT	710
46	UA9WS	705
47	UQ2KCR	700
48	SP8CGN	685
	UP2AW	685
50	SP3AIJ	675
51	SP2AVE	670
52	SM3DNI	665
53	SP9ABE	660
	UB5GY	660
55	SP7CKF	650
56	YU1SF	645
57	SP9AWV	640
58	UQ2PZ	635
59	UA1MV	625
	OH7NF	625
	UP2OE	625
62	OH9NV	620
	UA1DX	620
	PA0AAC	620
65	YU3EYZ	610
	SM0CCE	610
67	UV3XZ	605
	OK2BPE	605
	UQ2PM	605
70	UB5MZ	600
	F8TM	600
72	OK1MSS	575
	UR2BV	575
74	UT5KCW	565
	SM4DF	565
76	G8CO	560
77	SP9BQX	540
	UW6NG	540
	OK2BIP	540
80	OM2BNZ	535
	UY5RV	535
	UI8AI	535
83	SP9RP	530
84	SM4AZD	515
85	SM5TU	505
86	YO9APJ	500
	UA3KWI	500
88	SP1CTN	490
89	OH2JM	480
90	SP8AJJ	475
91	UA4IM	470
92	UT5FA	460
93	HB9CV	450
94	UA4NE	420
95	SP8CCC	415
96	UQ2PG	410
97	OM2QX	405
98	UA2KBP	390
	UT5LB	390
100	UY5CW	385
101	UA3GO	380
102	F6ACD	375
103	UC2CX	370
104	SP6BCA	365
105	HA3GJ	340
106	HA6NC	310
107	UQ2MU	300
108	UT5FE	290
109	YO2BP	230
	SM0BDS	230
111	UW6CW	135
112	SP2LV	115

* Certificate winners

Phone Section

Position	Call-sign	Points
1	G3LNS*	1970
2	G3NMH*	1890
3	EP2BQ*	1750
4	UV9PP*	1645
5	G3KMA	1425
6	G3SME	1420
7	DJ8JS*	830
8	DJ2YE	800
9	G3PQF	735
10	F5OJ	730
11	GM3RFR*	725
12	DJ3CN	680
13	I1KBT	650
14	I1KDB	605
15	GI3SSR*	555
16	HB9DX	500
17	SM5CMP	410
18	OZ7DX	405
19	UF6CR	365
20	DM2BTO	310
21	SM4DPB	210

Receiving Contest

CW Section

Position	Call-sign	Points
1	A3942*	1955
2	UA1-143-1*	735
3	UL7-021-14*	710
4	UA4-13321*	570
5	UO5-039211	410
6	UQ2-037-10	400
7	BCRS 195	300
8	UA4-1522	295
9	VU-0016	165
10	UQ2-03756	125
11	UA0-010-111	100

Phone Section

Position	Call-sign	Points
1	BRS 26431*	1855
2	A3942*	1540
3	A6003	1365
4	BRS 28198	1180
5	BRS 26003	1175
6	A5489	1060
7	BRS 26189	1045
8	BRS 30258	865
9	A5154	845
10	BRS 28201	805
11	EI-221*	715
12	BRS 30628	610
13	UB5-07325	600
14	A5821	550
15	A5379	545
16	A6044	540
17	A5953	485
18	SWL Wooton	445
19	A6098	375

Direction Finding Events 1969

The following Direction Finding events have been arranged during 1969.

27 April—D/F Qualifying Event—Stratford on Avon
18 May—D/F Qualifying Event—Grimsby
15 June—D/F Qualifying Event—To be arranged
29 June—D/F Qualifying Event—Oxford
20 July—D/F Qualifying Event—Salisbury
3 August—D/F Qualifying Event—High Wycombe
21 September—D/F National Final—Rugby.

Stratford on Avon D/F Qualifying Event

Date: Sunday 27 April, 1969.
Map: Ordnance Survey sheet 144 Cheltenham and Evesham.
Assembly: 1300 BST for first transmission at 1320 BST.
Location: Broadway Hill NGR116364.
Organizer: I. A. Cobbold, G3RPJ, 5 Avenue Road, Stratford-on-Avon. 0789-2167.
Frequencies and Callsigns: To be announced at the start.
Entries and tea: Intending competitors are asked to notify the organizer by 20 April of the numbers in their party requiring tea.

D/F Qualifying Event—Grimsby

Date: 18 May, 1969.
Map: OS Sheet 105 (Grimsby).
Assembly: 1300 BST for start at 1320 BST.
Location: Waltham Aerodrome (on A16) NGR 284018. Frequencies and callsigns will be announced at the start.

This event is being organized by Grimsby ARS; and intending competitors are asked to notify John Reynolds (G3RSD) of the numbers in their parties requiring tea. His address is: 91 Davenport Drive, Cleethorpes, Lincs.

Please advise G3RSD as soon as possible, and in any case not later than 1 May.

CLUB NEWS

Please send all information direct to Regional Representatives, giving full details of future meetings, and any snippets of activities which would be interesting in print. When listing meetings, please be sure to include the date and time, the meeting place, the lecturer's full name and the call-sign to whom prospective members can refer. The last day on which Regional Representatives can accept letters for inclusion is the first of the previous month.

REGION 1

Merseyside Luncheon Club—meets on the first Monday in every month. April, however, in view of the Easter weekend will be an exception. For this month only the lunch will be on Monday 14 April —HMS *Landfall*, 12.30 for 12.45 meal. If you wish to attend please advise G3VQT or G2AMV beforehand.

Ainsdale (ARC)—9 and 23 April, 8 pm, "Morris Dancers," Scarisbrick.

Allerton (Liverpool)—The organization previously reporting under the title "Scout Radio Hobbies Society" has changed its name to "Scout Amateur Radio Society, NorthWest Region." Allerton will now be only a branch with meetings on the first and third Thursdays of each month at 8 pm, Liverpool County Scout Headquarters, Richmond Street, Liverpool. It is hoped that other meetings will shortly be arranged for Warrington, Wavertree and Barnston.

Ashton Under Lyne (AUL & DARS)—Fridays, 7.30 pm, 6 Stamford Street, Stalybridge.

Blackburn (ELARC)—10 April ("Raynet" by S. J. Scarborough, G3MBQ). 1 May (Quiz: East Lancs ARC v Preston ARS), 7.30 pm, Edinburgh House, Shearbank Road, Blackburn. Please note new address—further details from G4JS.

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

Bury (B & RRS)—8 April, 13 May 8 pm, George Hotel (Private Room), Market Street, Bury. Club secretary G3VVQ, 411 Holcombe Road, Greenmount, Bury.

Cheshire (Mid Cheshire ARC)—Club meets every Wednesday, 7 pm to 9.30 pm. Instruction nights every Thursday 7 pm to 9 pm. The latter includes theoretical work for the RAE exam, practical construction and morse practise. Further details from G3JWK, Technical Activities Centre, Winsford Verdin Grammar School, Winsford, Cheshire.

Chester (C & DARS)—Tuesdays 8 pm, YMCA.

Crewe & District—No meetings will be held for the time being as no accommodation is available. However, the Area Representative Mr R. Owen of 10 Circle Avenue, Willaston, Nantwich, will welcome visitors at his home.

Douglas (D & DARS)—2nd and 4th Wednesday each month 7 pm, 19 Rosemount, Douglas. 9 April (Constructional Evening) 23 April (Film Show). Further information from W. T. McEvoy, 19 Rosemount, Douglas. Tel Douglas 6146.

Eccles (E & DRC)—Tuesdays 8 pm. Please note new address which is Bridgewater School, Worsley, Lancs. Every Thursday Club Top Band net 20.30 hours.

Leyland Hundred Amateur Radio Group—The Thursday night net at 20.00 hours GMT on 1·915 MHz.

Liverpool (L & DARS)—Tuesdays 8 pm, Conservative Association Rooms, Church Road, Wavertree. Club Secretary Philip Storey, 29 Chalfont Road, Liverpool 18.

Liverpool (NLRC)—11 and 25 April, 9 May 8 pm, Landsbury House, 13 Crosby Road South, Liverpool 22. Secretary R. Simmons, G3PNS, 62 Daneville Road, Liverpool L4 2RG.

Macclesfield (M & DRS)—8 and 22 April 8 pm, The George Hotel, Jordangate.

Manchester (M & DARS)—Wednesdays 7.30 pm, 203 Droylsden Road, Newton Heath, Manchester 10. Hon Secretary, G. Tillson G3TJX, 95 Kelverlow Street, Oldham, Lancs.

Manchester (SMRC)—Fridays 8 pm, Conservative Association Divisional Office, 449 Palatine Road, Northenden, Manchester 22.

North West VHF Group—Due to the move into new Headquarters being delayed by structural alterations members should keep in touch with the Club Secretary, G3FNM, 141 Norris Road, Sale. Tel 061-973 1472.

Preston (PARS)—3 and 17 April, 1 May 7.30 pm, (Private Room) "Windsor Castle," St Paul's Square.

St Helens (SES)—Meetings temporarily discontinued. Local enthusiasts should keep in touch with B. Hardy, 198 Knowsley Road, St Helens, Lancs.

Salford (Dial House Radio Society)—This new group are in the course of applying for affiliation having been in existence for 2½ years—the small membership are all GPO engineers. An expedition is planned leaving Manchester on 3 April for Scotland. The party will consist of G3WFW, G8AMO, G8CDM and three shortwave listeners, G. Dunn, R. Charnley and M. Gregory. Two Land-Rovers will transport a petrol generator, two tents, two HW17 transceivers, homemade top band receiver and ssb transmitter. They will also be armed with a six over six 2m aerial together with a kite aerial and 350 ft of wire. It is hoped to make as many contacts as possible before they return on the 13th. The schedule is as follows: Wigtownshire 3, 4 and 5 April, Buteshire 6, 7 and 8 April, Inverness-shire 9 and 10 April and Perthshire 11 and 12 April. The call-sign will be GB2GM operating on 2m during the day and early evening (145·8 MHz and 145·08 MHz), operators being G8AMO and G8CDM. G3WFW will operate 1·9 MHz (1875–1888 kHz) from dusk until it becomes necessary to get some sleep. There may also be operation on 3·7 MHz during the day.

Skeds may be arranged in advance and anyone wishing to do so should contact the Club Secretary, Dial House Radio Society, 1st Floor, Dial House, Chapel Street, Salford 3.

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

Southport (73 SSB Society)—Thursdays at 8 pm, (all commencing with a talk on part of RAE Syllabus), 73 Avondale Road North, Southport.

Stockport (SRS)—2 April ("Quartz Crystal" by Terry McKnight of Crystal Electronics Ltd.), 16 April ("Radio Communication" by Martin Clark, Marconi), April 30 (Surplus Gear Sale) 8 pm, Brookfield Hall, Wellington Road South, Stockport. *G3LSL*.

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

Westmorland—Fridays, 7.30 pm, 24 Park Road, Milnthorpe. Additionally there is an RAE class on Mondays and Thursdays at the same time.

Wirral (WARS)—1st and 3rd Wednesdays each month 8 pm, Former Civil Defence Headquarters, Upton Road, Bidston, Birkenhead. Coming events—2 April (Sale of Surplus Equipment), 16 April ("Crystal Etching" by G3NPJ), 7 May ("Radio Mathematics" by G3EGX). Recent events have included a Quiz covering all aspects of Amateur Radio. Teams were picked by G2FOS and G2AMV and the result—almost a dead heat. On 17 February Cine Films of Club activities were shown. They recalled happy memories for many of those present.

Region 1 Field Day will be on 11 May. Rules will be circulated to Representatives and Affiliated Societies in due course.

REGION 2

Barnsley (B & DARC)—11 April ("4m portable TX/RX" by G3LRP), 26 April (RSGB Tape Lecture), 7.30 pm, King George Hotel, Peel Street, Barnsley. *G3LRP*.

Bradford (BRS)—15 April (National Field Day Arrangements), 7.30 pm, Bradford Technical College, Great Horton Road, Bradford. There has been a change of Secretary, P. Dewhirst, G3VFR having taken over the position from Bill Scarlett, G3RXS having retired as Honorary Secretary owing to pressure of business. However, G3RXS will be staying on the Committee, and the Bradford Society wish to record their appreciation of his efforts on their behalf and are pleased that they will not be losing his services altogether. In January R. J. Cockerhan had " A look at VHF " and there was a display of members gear. In February there was the " W1BB Tape/Slide Lecture " and in March a visit to a Computer Centre and AGM. *G3HJP.*

Leeds (LRS)—16 April (Grand Opening Night), Swarthmore Education Centre, Woodhouse Square, Leeds 3. A new programme is being arranged to include a series of lectures for the beginner and the RAE. It is hoped that interested people in the area will attend now that the club is alive again. *G4AD.*

Middlesbrough (TARS)—First and third Fridays each month, 8 pm, Settlement House, 132 Newport Road, Middlesbrough. *G3JMO.*

Northern Heights—9 April (AGM & NFD arrangements), 23 April (" Colour Anodizing of Aluminium " by K. Walton, G3IKS), 7.45 pm, Sportsman Inn, Ogden, Near Halifax. *G3MDW.*

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

South Shields (SS & DARC)—Meetings Fridays, 8 pm, Trinity House Social Centre, Laygate, South Shields. *G3SFL.*

Spen Valley (SVARS)—10 April (Visit to Leeds/Bradford Airport to inspect Radio Installation and Control Tower), 17 April (" What's New? " by S. Marsden, West Riding Electronics). 24 April (" The Esro II Satellite " by Dr P. L. Marsden, Leeds University), 1 May (Judging for the Swindon Cup), 7.30 pm, The Grammar School, Heckmondwike. *G8BSC.*

REGION 3

Birmingham (MARS)—15 April (" Amateur Television Demonstration," by G6MXW/T), 20 April (North Midlands Mobile Rally, Drayton Manor), 7.45, Midland Institute, Margaret Street, B'ham 3.

(South)—2 April ("Talk and Demonstration," by Messrs Amateur Radio), 7.30 pm, The Scout Hut, Pershore Road, Selly Oak, Birmingham 29. *G3JFL.*

Bromsgrove (B & DARC)—11 April (NFD Plans), 8 pm, Co-op Hall.

Coventry (CARS)—4 April (Night on the Air—Club KW2000), 11 April (Lecture " Radio Navigation,"), 18 April (Night on the Air), 25 April (Veroboard Lecture by A. Woodhouse), 7.30 pm, Scout HQ, 121 St Nicholas Road, Radford, Coventry.

Dudley (DARC)—22 April (Talk and Demonstration by Trio Equipment), 8 pm, Central Library, St James's Road. *G3PWJ.*

Hereford (HARS)—11 April (" How to get the most from your AR88," by G3HVX), 18 April (" Emergency Communication," by Wing Cmdr. Wilson), 7.30 pm, The CAVS Centre, Goal St, Hereford. We have now moved to new permanent HQ's, also our own Club call sign is G3YDD Yankee Doodle Dandy. *G3RJB.*

Leamington Spa (MWARS)—14 April (Open), 21 April (Demonstration), 28 April (Sale of Surplus Equipment), 8 pm, 28 Hamilton Terrace, Leamington Spa.

Redditch (EWARG)—10 April (" High to Eternity " Colour Film, First American Manned Flight into Space, Talk, Mr Scrivener), 8 pm, Old People's Centre, Park Road. At the AGM held 13 February, the following officers were elected, Chairman J. Bazley (G3HCT); Treasurer R. Bantock, G3WNT and Secretary R. Mutton, G3EVT.

Shrewsbury (SARS)—10 April (Junk Sale), 24 April (Construction Competition), 7.30 pm, The Signals Hut, Shrewsbury School.

Solihull (SARS)—15 April (" Amateur Radio in the United States," by G5AER/W2IRS), 7.30 pm, The Old Manor House, 126 High Street. Visitors always welcome. At the February meeting a talk and film show was given by G3PYR on Industrial Gases with some very awe-inspiring experiments using liquid oxygen. *G3VXV.*

Stourbridge (STARS)— 6 May (NFD Preliminary Arrangements), 8 pm, Longlands School, Stourbridge. *G3HGI.*

Wolverhampton (WARS)—14 April (Natternite), 21 April (Talk by Mr B. Sturmey, G8KL/W6), 8 pm, Neachells Cottage, Stockwell Road, Tettenhall. *G3UBX.*

Worcester (W & DARC)—Wednesday and Saturday, 7.45 pm. 35 Perdiswell Park, Droitwich Road, Worcester. *G3TQD.*

REGION 4

Burton upon Trent (B-O-T ARS)—Wednesdays, 7.30 pm, Club Rooms, Stapenhill Institute, Burton on Trent. *G3ACR.*

Derby (D & DARS)—2 April (Surplus Sale), 9 April (From the Archives—R1084 Receiver), 16 April (DF Practice), 23 April (Club Room—Open Evening), 30 April (to be announced), 7.30 pm, Room No 4, 119 Green Lane, Derby. *G2CVV.*

Derby (NHCAARG)—Fridays 7.30 pm, Club Room, Nunsfield House, Boulton Lane, Alvaston, Derby. *G3LCV.*

Grimsby (GARS)—Thursdays, 8 pm, North Lincs Photographic Society's Rooms, back of 50 Welholme Road, Grimsby. *G3RSD.*

Heanor (TSEDRS)—15 April (High Quality Sound Reproduction), 22 April (Member's Forum), 29 April (Tape Recording for the beginner), 7.30 pm, The South East Derbyshire College of Further Education, Ilkeston Road, Heanor, Derbys. *G3LGX.*

Leicester (LRS)—Mondays 7.30 pm, Sundays 10.30 am, Club Room, Gilroes Estate Dottage, Groby Road, Leicester. *G3UQK.*

Loughborough (LARC)—4 April (AGM), 7.30 pm, Club Room, Old Bleach Yard, Wards End, Loughborough. *G3RAL.*

Lincoln (LSWC)—Tuesdays 7.30 pm, No. 2 Guardroom, Sobroan Barracks, Breedon Drive, Lincoln. *G8BSS.*

Mansfield (MARS)—First Friday in each month, 7.45 pm, New Inn, Westgate, Mansfield. *G8HX.*

Newark (NSWC)—Mondays, Thursdays, 7.30 pm, Guildhall, Guildhall Street, Newark. *G3TWV.*

Nottingham (ARCN)—Tuesdays, Thursdays, 7.30 pm, Room No 3, Sherwood Community Centre, Mansfield Road, Sherwood, Nottingham. *G3SRX.*

Worksop (NNARS)—Tuesdays, Thursdays, 7.30 pm, Club Room, 13 Gateford Road, Worksop, Notts. *G8ON.*

REGION 5

Bedford (B & DARC)—Club meets on Thursdays at the Dolphin Inn, Broadway, Bedford at 8 pm (Morse Class at 7.30 pm).

Bishop's Stortford (BS & DARC)—Meetings on third Monday of each month at 8 pm, British Legion Club, Windhill, Bishop's Stortford, Hertfordshire. 21 April (W1BB Tape Lecture).

Cambridge (C & DARC)—Meetings on Fridays at 7.30 pm, Club Headquarters, Corporation Yard, Victoria Road, Cambridge. (Club closed on Good Friday, 4 April.)

Cambridge University (CUWS)—There will be no meetings this term owing to the Tripos exams. Activities last term included visits to Pye Telecommunications to see manufacturing processes. Lecturers came from Marconi, J-Beam Engineering, and English Electric Valve Company.

Dunstable Downs (DDRC)—Fridays at Chew's House, High Street South (Opposite Police Station), Dunstable, Bedfordshire. Officers elected for 1969/70 are: President, G3HEO; Chairman, G3WBC; Secretary, G8BWZ; Treasurer Dave Robinson; Liaison Len Bates; Committee Members G3NMZ, G8ADC.

Luton (L & DARS)—The club has now been reformed, and has its own HQ at Putteridge Estate, Luton. Meetings on the first Thursday in the month at 8 pm. For further particulars contact D. B. Fanning, G8CDL, at 30 Surrey Street, Luton, Bedfordshire.

Peterborough (P & DARS)—First Friday in each month, Lecture or Demonstration in the Electronics Section at Peterborough Technical College, Eastfield Road, 7.30 pm, other Fridays meet at Club HQ in The Old Windmill, behind The Peacock Inn, London Road, 8 pm onwards. *G3KPO.*

Shefford (S & DARC)—Meetings on Thursdays, 8 pm, Church Hall, High Street, Shefford, Bedfordshire.

Stevenage (S & DARS)—Meetings on first and third Tuesdays, 8 pm, Hawker-Siddeley Dynamics Ltd, Gunnels Wood Road, Stevenage, Hertfordshire.

RSGB Film Library

Film No 11. **Radio News of 1968.** 16mm sound, 29 minutes. Hire: 25s. per day; additional days at half-rate.

" *We enjoyed the film immensely. Congratulations on a fine production.*" Lothians Radio Society.

" *FB Film. Many thanks.*" Fareham & District Radio Society. " Radio News of 1968 " is available to all Members, Affiliated Societies and Groups. Circulars have been sent to all Societies. Further copies of Film Library circulars can be obtained from the Librarian—sae please. (G3NDF)

REGION 6

Cheltenham (RSGB Group)—First Thursday, 8 pm, Great Western Hotel, Clarence St, Cheltenham.
Gloucester (GRC)—Second and fourth Thursdays, 7.30 pm, Lamb Inn, Market Parade, Gloucester.
South Bucks (VHF Club)—A South Bucks VHF Club has been formed in the High Wycombe District. Meetings will be held on the first Tuesday in the month at Bassetsbury Manor, Bassetsbury Lane, High Wycombe, Bucks. All interested should contact the Honorary Secretary, R. Barton, G3PQH, 25 Hillside Road, Marlow, Bucks.

REGION 7

Acton, Brentford & Chiswick (ABCRC)—15 April ("Veroboard" by Vero Electronics), 7.30 pm, Chiswick Trades and Social Club, 66 High Road, Chiswick.
Addiscombe (AARC)—Second and fourth Tuesdays, 7.30 pm, 158 Lower Addiscombe Road, (Toc H Hall).
Ashford, Echelford (ARS)—24 April, 7.30 pm, St Martins Court, Kingston Crescent, Ashford, Middlexsex.
Barking (B & DREC)—Tuesdays and Thursdays, 7.30 pm, Gascoigne Recreation Centre, Gascoigne School, Morley Road, Barking.
Bexleyheath (NKRS)—10 April (Club VHF Activity), 24 April (Brains Trust—Your Questions Answered!), 7.30 pm. Over 46 RSGB members and visitors were present at the Junk Sale. Lots of gear changed hands at knock-down prices. Congregational Church Hall, Chapel Road, Bexleyheath.
Chingford (RSGB Group)—Fridays. Tel 01-524 0308.
Cheshunt (CDRC)—1 April, Methodist Church Hall, Crossbrook St, Cheshunt.
Chingford (SRC)—Fridays, 8 pm, Friday Hill House, Simmons Lane, Chingford, E4.
Civil Service (CSRS)—15 April (Film Show), Civil Service Recreation Centre, Monck Street, Westminster.
Croydon (SRCC)—15 April, 8 pm, Swan and Sugarloaf, South Croydon.
Crystal Palace (CP & DRC)—19 April (RAEN Organization and Activities—G3FZL and G3BPT), Emmanuel Church Hall, Barry Road, SE22.
Dorking (DR & DRS)—8 April (Informal Meeting), Wheatsheaf, 22 April (Integrated Circuits) Surrey Yeoman, 8 pm.
Ealing (E & DARS)—Tuesdays, 7.30 pm, Northfields Community Centre, Northcroft Road, W13.
East London—20 April (Eddystone Radio), 2.30 pm, Wanstead House, The Green, E11.
Edgware & Hendon (E & DRS)—14 April (VHF by G3OUO/T), 28 April (Informal), 8 pm. New Committee: Chairman G3SJE; Treasurer Arthur Medway; Secretary G3GC; St Georges School, 51 Flower Lane, Mill Hill, NW7.
Gravesend (GRS)—Third Wednesday, 8 pm, RAFTA Club, Overcliff Road.
Guildford (G & DRS)—11 April (AGM) 8 pm, 29 April (2 metre portable discussion organized by G8AND at Surrey University), Guildford Engineering Society, Stoke Park.
Hampton Court (TVARTS)—First Wednesday, 7.30 pm. "Cardinal Wolsey," Hampton Court.
Harlow (DRS)—Tuesdays, 8 pm, Mark Hall Barn, First Avenue.
Harlow (RSH)—11 April (Lecture on RTTY), 18 April (Practical), 25 April (Junk Sale), 2 May (Practical), Roxeth Manor School, Eastcote Lane, Harrow.
Havering (H & DARC)—9 and 23 April, 8 pm, British Legion House, Western Road, Romford.
Hemel Hempstead (HH & DARS)—First and third Friday, 8 pm, Rucklers Lane Hall, Kings Langley.
Holloway (GRS)—Mondays (RAE), 7 pm, Wednesdays (Morse), 7.30 pm, Fridays (Club), 7.30 pm, Monten School, Hornsey Road.
Ilford—Thursdays, 8 pm, G3PCA, 50 Mortlake Road (off Ilford Lane) Ilford.
Kingston (K & DARS)—Second Wednesday, 8 pm, 9 April (First of three talks on receivers commencing with "Receiver Goodies", dealing with addition of an S meter, Q multiplier etc. to a receiver.) Penguin Lounge, 37 Brighton Road, Surbiton.
Leyton & Walthamstow—Tuesdays, 7.30 pm, Leyton Senior Institute, Essex Road, E10.
London (UHF Group)—First Thursday, 7.30 pm, Whitehall Hotel, Bloomsbury Square, Holborn, WC1.
Loughton—11 and 25 April, Loughton Hall, (near Debden Station).
Maidenhead (N & DARC)—Third Tuesday, 8 pm. Victoria Hall, Cox Green, Maidenhead.
New Cross—Wednesdays 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 Road, Purley.
Reigate (RATS)—First Wednesday, 7.45 pm, George and Dragon, Cromwell Road, Redhill.
Romford (R & DRS)—Tuesdays, 8.15 pm, RAFTA House, 18 Carlton Road.
Scouts (ARS)—17 April (AGM), Baden Powell House, Queensgate South Kensington, SW7.
Sidcup (CVRS)—17 April (Natter Night), 1 May ("Veroboard" at Congregational Church Hall, Eltham), 8 pm, All Saints Church Hall, Bercta Road, New Eltham.
Slough (SDR Group)—First Wednesday, 7.30 pm, United Services Club, Wellington Street.
Southgate (SRC)—Civil Defence Hut, Bowes Road, N11.
St Albans (Verulam ARC)—2 April ("What not to Twiddle," talk on receiver alignment by Bob Ewens, G2HAR), 16 April ("TVI and SSB Measurements," by GPO), 7.30 pm, Cavalier Hall, Watford Road, St Albans.
Sutton & Cheam (SCRS)—15 April, 8 pm, The Harrow Inn, High Street, Cheam.
Welwyn (Mid Herts ARS)—10 April, 8 pm, Welwyn Civic Centre, Welwyn.
Wimbledon (W & DRS)—11 and 25 April, St John Hall, 124 Kingston Road, South Wimbledon, SW19.
Wembley (GECARS)—Thursdays, 7 pm, Sports Club, St Augustin Avenue, North Wembley. This Club is open to non GEC employees by invitation. Telephone ARN 1262 for details.

REGION 8

Canterbury (EKRS)—Details from Hon Sec. G3MDO QTHR.
Eastbourne (SARS)—14 April ("VHF Propogation" by Don Haytor AMIEE G3JHM), 7 pm, Meetings held in the Victoria Hotel, Latimer Road, Eastbourne.
Maidstone (MYMCA ARS)—4, 5, 6 April (Practical Tests for NFD) 11 April (AGM) 7.30 pm. Meetings are now held on Tuesdays and Fridays at 8 pm, "Y" Sports Centre, Melrose Close, Loose, Maidstone.
Mid Sussex (MASRS)—10 April (Talk by G3WPO on 160m operating, aerials and DX), 24 April (Sale of Surplus Equipment), 7.45 pm, Marle Place Further Education Centre, Leylands Road, Burgess Hill. *G3RXJ.*
Tunbridge Wells (WKARS)—18 April (Club AGM) all meetings are held at the Adult Education Centre, Monson Road, Tunbridge Wells. 7.30 pm.
Worthing (W & DARC)—Meetings held every Tuesday, 8 pm, Rose Wilmot Youth Centre, Littlehampton Road, Worthing.

REGION 9

Bristol (BARC)—Every Monday and Thursday, 3 April, ("Two Metres" by G2UJ, Tape Lecture.) 7 April (Easter Social), 24 April ("The World at your fingertips," Tape Lecture), 7.30 pm, Club HQ (G3TAD), University Settlement, 41 Ducie Road, Barton Hill, Bristol 5. *G3WLZ.*

(RSGB Group)—28 April ("Principles of Single Sideband" by G3JMY) 7.30 pm, Becket Hall, St Thomas Street, Bristol 1. The February meeting beat all records, nearly 140 Callsigns and SWLs were present to hear two old timers, Ken Harvey, G5KT and Eric Gaukrodger, G6GU give a very detailed history of the early days of Radio in the South West of England. It took them two years to compile the data and they are still at it, any help from Amateurs further afield would be appreciated, there are still a few gaps. Maroni was very active from this area, and a spark Tx was on show with other vintage gear as well. First log books were displayed and some entries brought laughter, such as a contact across 6 feet, the dining room table, and 12 miles Dx from Bristol to Bath. Three letter calls brought a touch of nostalgia to the old timers present who included many early calls. Events were discussed in such detail that the time quickly passed, and events to 1924 only were discussed, a further meeting being held to continue from there. The meeting was tape recorded, and also video recorded so keeping records for the future generations. *G3ULJ.*
Burnham-on-Sea (BOS ARS)—Meet second Tuesday in each month at the Crown Hotel, Burnham-on-Sea, Somerset. *G3GIW.*
Cornish (CRAC)—3 April (AGM and RSGB Newsfilm) South Western Electricity Board Social Centre, Pool, Camborne.

(VHF Group)—Third Thursday in each month, 7.30 pm, The Peoples Palace, Pyder Street, Truro. *G3XC.*
Falmouth Group meet fortnightly on Tuesdays, Laburham Drive Mission Hall. *G3OJN.*

Newquay Group meet fortnightly on Wednesdays, Treviglas School. *G3THT*.
Plymouth (PRC)—First and third Tuesday in each month, 7.30 pm, Virginia House, Bretonside, Plymouth. *G3SCW*.
Saltash (S & D ARC)—Alternative Fridays, Burraton Toc H Hall, Warraton Road, Saltash. No Mobile Rally will be held this year. *G3UBY*.
South Dorset (SD ARS)—First Friday in each month, 7.30 pm, Labour Rooms, West Walk, Dorchester. *G3BKV*.
Taunton (TARS)—Every Friday, 7.30 pm, SEVO HQ, Taunton Barracks, The Mount. On the left as one enters barracks. RAE classes are also being held here on Thursday, Theory and Morse. *G3DTB*.
Torquay (TARS)—Every Tuesday and Friday Club nights. 26 April Surprise Night, an event not to be missed by any member. 7.30 pm, Club HQ (G3NJA), Rear of 94, Belgrave Road, Torquay, entrance in Bath Lane. *G3VNG*.
Wells (WARS)—Mondays, EMIE Social Club, Chamberlain Street, Wells. *G3MQQ*.
Weston-super-Mare (WSM ARS)—Good Friday first Friday, so 2nd this month, 11 April 7.30 pm, Westhaven School, Ellesmere Road, Uphill, WSM. *G3GNS*.
Yeovil (YARS)—Wednesdays, 7.30 pm, Park Lodge, The Park, Yeovil. *G3NOF*.

REGION 10
Blackwood (ARC)—Fridays, 7.30 pm, Blanche Cottage, off High Street, Blackwood, Mon. *G6BK*.
Barry College of Further Education (ARS)—Thursdays, 7 pm, College of Further Education Colcot Road, Barry, Glam. It is hoped that this Society will shortly have available its own accommodation for meetings, shack and workshop, which will enable meetings to be held outside normal College hours.
Cardiff (RSGB Group)—14 April, 7.30 pm, TA Centre, Park Street, Cardiff. *GW3GHC*.
Port Talbot (ARC)—The annual Social, to which all local Clubs and Societies are invited, will take place on April 29th at 7.30 pm, at the Trevelin Club and Institute, Port Talbot. Will all Secretaries please notify well in advance the number of members who will attend. *GW3RVG*.
Pontypool (ARC)—Tuesdays, 7 pm, Educational Settlement, Rockhill Road, Pontypool, Glam. *GW3JBH*.
Pembroke (ARC)—Last Friday in each month, 7.30 pm, at the Defensible Barracks, Pembroke Dock. *GW3LXI*.
Rhondda (ARS)—Pengelli Hotel, Treorchy, Rhondda, Glam. Further details available from the Secretary. *GW3PHH*.
University College, Cardiff (ARS)—This Society is now in possession of a centrally located shack, with access to a good aerial system, and has a KW2000A. Four members recently passed RAE and are well advanced in morse training. Further details available from the Secretary, G3XSQ, c/o Students' Union, Dumfries Place, Cardiff.
University College, Swansea (ARS) (Coleg Y Prifygol Cymru, Abertawe: Cymdeithas Radio)—The society meets fortnightly in the Laboratory Technicians Common Room, (Near the Bar), College House. On Tuesday, 29 April, the Society is sponsoring a demonstration and talk on various aspects of Stereophony and Hi-Fi Audio Systems. This will be the event of the year in Swansea and it will take place at Lecture Theatre A, Faculty of Applied Sciences. The meeting will be open to the general public. Early arrival is advised and car parking facilities will be available. On 22 June the University will be holding their annual D/F hunt in the beautiful Gower National Park. Further details from the Secretary, D. West, GW3TYI, Neuadd Gilbertson, Clyne, Abertawe, Sir Forgannwg.

REGION 11
Rhyl (R & DARS)—On 13 February the Society heard a talk by GW3UMB on operational procedure. He gave lots of useful hints and narrated some interesting anecdotes.
Llandudno (CVARC)—17 April (Quiz relating to RAE standard questions with GW3GRY as quizmaster), Parade Hotel, Llandudno. At the March meeting an excellent talk was given by E. Doylrush, FRAS, on " Sunspots at HF and Auroral Reflection at VHF."

REGION 12
Aberdeen (AARS)—Fridays, 7.45 pm, 6 Blenheim Lane, Aberdeen. *GM3HGA*.
Lhanbryde (MFARS)—Mondays, 7.30 pm, St Andrews Church Hall, Lhanbryde, by Elgin. *GM3UKG*.

REGION 13
Edinburgh (LRS)—10 April (Facsimile by GM3TFY), 24 April (Talk by Mr Powell of Vero Electronics Ltd.), 7.30 pm, YMCA, 14 St Andrew St, Edinburgh. *GM3VBB*.

REGION 14
Ayrshire (Ardeer Recreation Club ARC)—Tuesdays and Thursday, 7.15 pm, Ardeer Recreation Club, Amateur Radio Section, Stevenston, Ayrshire. Details, J. F. McCreight, GM3DJS, 40 Auchenharvie Road, Saltcoats, Ayrshire.
Ayrshire (AARG)—6, 20 April, 7.30 pm, ATC HQ, Kilmarnock. *GM3THI*.
Mid Lanark (RSGB Group)—The new secretary of the Mid Lanark RSGB Group is G. Hunter, GM3ULP/GM6ADR/T of " The Bungalow," Broomside Braes, Camp Road, Motherwell, Lanarks.
Glasgow University (GURC)—11 April 7.30 pm, Engineering South Building, University of Glasgow.
Greenock (G & DARC)—11 April, 7.30 pm, Arts Guild, Campbell Street, Greenock.
Mid Lanark RSGB Group—18 April, 7.30 pm, YMCA Brandon Street, Motherwell.

REGION 15
Ballymena (BRC)—Tuesdays, 8 pm, morse and theory classes in progress, Club Rooms, 46A Bridge St, Ballymena. *GI3XDX*.
Belfast (B & D RSGB Group)—Wednesdays, War Memorial Building, Waring St, Belfast. *GI2DZG*.

REGION 16
Great Yarmouth (GYRC)—Fridays, 7.30 pm, 98 South Market Road, Gt. Yarmouth.
Ipswich (IRC)—Last Wednesday in month, 7.30 pm, British Red Cross HQ Gippeswyk Ave, Ipswich. *G3UJR*.
Norwich (NARC)—April 14, (Ragchew Night) 21 April (RTTY), 28 April (Stability, Arnold Tomalin, G3PTB).

REGION 17
Basingstoke (BARC)—First Saturday in each month (Beginner's Construction Project and CW Practice Night), 19 April (" Propagation " by Trevor Clarke, G3UYD), 7.30 pm, Clubroom, Chineham House, Popley, Basingstoke. *G8CIY*.
Chippenham (C & DARC)—8 April (Fortnightly series, " Fault Finding and Alignment" by G. W. Spray, G3FXA), 15 April (D/F Hunt), 29 April (AGM), Meetings each Tuesday, 7.30 pm, Clubroom, Chippenham High School for Boys, Hardenhuish Lane, Chippenham. *G3PQG*.
N Berks (AERE (Harwell) ARC)—Third Tuesday in each month, 7.30 pm, Social Club, AERE. *G2HIF*.
R.A.E. and Morse Classes each Wednesday, 7.30 pm, Post Graduate Education Centre, AERE. *G3NNG*.
St Helier, Jersey (JARS)—11 April (" Workshop Practice " by G. Arthur), 25 April (Bring and Buy Sale), 7.30 pm, *GC2LU*.
The JARS Clubroom is open Mondays, Wednesdays and Fridays, 7.30 pm to 10 am and Sundays, 11 am to 12.30 pm. Visitors are welcome. The March meeting included " Tx Construction " by GC3PRA and " First Aid in the Shack " by SJAB. The Club is to be congratulated on publishing the first issue of their Newsletter, copies of which may be obtained from the Secretary, A. Morrissey, " Darlinghurst " Bagshot Rd, St. Saviour, Jersey.
Swindon (S & DARC)—Alternate Wednesdays, 7.30 pm, Penhill Junior School, Swindon. The S & DARC will be exhibiting at the Swindon Further Education Exhibition at the Town Hall, 30 April to 3 May. *G3JAP*.

RAIBC—The five new SWL's introduced this month include another husband and wife joint membership (both invalided) and a partially sighted invalid at Cambridge for whom we would welcome local aid. Annual donations are received with thanks from Lichfield ARS and the Radio Society of Harrow. The death of Eddie Snell, G3BSS on 21 February at Redruth, Cornwall, after a long illness is reported. Supporter G5UP of Ingleton also died on 19 February.

LOOKING AHEAD

13–19 April—Meet the President Week. All bands 1·8–28 MHz, cw and ssb.

18 April—RSGB Dinner Club.

26 April—VHF//UHF Convention, The Winning Post Hotel, Witton, near Twickenham.

27 April—Bellevue Convention, Manchester.

5–10 May—IARU Region 1 Conference, Brussels.

10–11 May—Radio Amateur Convention, Knokke, Belgium.

21 May—Summer RAE Examination.

13–14 September—IARC Convention, Geneva.

1–4 October—RSGB International Radio Engineering and Communications Exhibition Royal Horticultural Society's New Hall, Greycoat Street, Westminster, SW1. 10 am to 9 pm.

CONTESTS

5 April—432 MHz Cumulative Activity Contest (January 1969)

13 April—Second 70 MHz (Open) contest (March, page 132).

3–4 May—Fourth 144 MHz (Portable) Contest.

24–25 May—First 432 MHz (Open) Contest.

24–25 May—First 1296 MHz Contest.

7–8 June—National Field Day (February, page 131).

22 June—Third 70 MHz (Portable) Contest.

5–6 July—Summer 1·8 MHz Contest.

5–6 July—Fifth 144 MHz (Open) Contest.

12–13 March—High Power Field Day (March, page 203).

20 July—Second 432 MHz (Portable) Contest.

4 August—Sixth 144 MHz (SSB) Contest.

10 August—Third 432 MHz (Open) Contest.

17 August—Fourth 70 MHz (CW) Contest.

6–7 September—VHF National Field Day.

14 September—3·5 MHz Field Day.

21 September—Seventh 144 MHz (CW) Contest.

5 October—Second 1296 MHz (Open) Contest.

11–12 October—28 MHz Telephony Contest.

25–26 October—7 MHz Contest (CW).

3 November—Eight 144 MHz (SSB) Contest.

8–9 November—7 MHz Contest (Phone).

15–16 November—Second 1·8 MHz Contest.

6–7 December—Tops CW Club 80m contest.

7 December—Fifth 70 MHz (CW) Contest.

General Rules for RSGB HF and VHF Contests appeared in the January 1969 issue.

MOBILE RALLIES

6 April—ARMS mobile meeting, Lydd Airport, Kent.

20 April—North Midlands Mobile Rally, Drayton Manor Park, near Tamworth, Staffs.

11 May—Scunthorpe ARS mobile Rally, Grange Farm Hobbies Centre, Franklin Crescent. Open at 11 am. Talk-in on 160 metres.

18 May—Northern Mobile Rally, Moore Grange, County School, Parkstone Avenue, Leeds.

1 June—ARMS Rally at the home of the Shuttleworth Aircraft Museum, Old Warden Aerodrome, Biggleswade, Beds.

1 June—Maidstone YMCA ARS Rally.

29 June—Longleat Mobile Rally, Longleat Park, near Warminster, Wilts. Organized by the Bristol RSGB Group, assisted by the Bristol ARC.

6 July—South Shields Mobile Rally.

13 July—Worcester Mobile Rally.

27 July—Cornish Radio Amateur Club, Provisional location Truro.

27 July—The White Rose Mobile Rally, Allerton High School, Leeds

10 August—RSGB National Mobile Rally, Woburn Abbey.

17 August—Derby and District Mobile Rally.

24 August—Torbay ARS Mobile Rally.

24 August—ARMS/RSARS Rally, Blandford Camp, Dorset. ARMS/RSARS members only.

24 August—Swindon Mobile Rally organized by the Swindon and District ARS.

31 August—Bromsgrove & District ARC Mobile picnic. Call G3GGV

31 August—Preston ARS at Kimberley Barracks, Deepdale Road, Preston.

22 September—RSGB Scottish Mobile Rally, Cartland Bridge Hotel Lanark.

29 September—Harlow Mobile Rally, Magdalen Laver Village Hall, near Harlow, east of the A11. Open from 10 am. Talk-in station on 160, 4 and 2m. Details from R. A. Sinclair, G3VAD, 244 Stanstead Road, Hoddesdon, Herts. Tel: Hoddesdon 66806.

MEMBERS' ADS

These advertisements are free to members and limited to 32 words, discounting the name, address and telephone number. Ads must be typed or printed on the form, or on a post card similarly laid out. They should be accompanied by a recent Radio Communication wrapper. No trade advertisements can be accepted in this section, although these and others requiring immediate inclusion should be sent to our classified advertisements department.

Entry period for May .. 4 April to 11 April
Entry period for June .. 5 May to 12 May

Entry period for July .. 4 June to 10 June
Entry period for August .. 9 July to 15 July

Rf ammeters 2 in round 350mA brand new in makers (Metro-Vik) sealed cartons. Six only 11/6 each pp. W. Stratton, G3XJJ, 14 Kingsthorpe Grove, Northampton. Tel Northampton 39196.

Marconi 52 set in exc cnd with hb. Buyer insp and col, £7 10. R. Chamberlain, G3VYU, 40 Elmfield Road, Peterborough.

19 set, tx removed. Converted for 160 and 6·3 V heaters. Transistorized bfo and extra 2 valve output stage £4 ono. Deliver in Birmingham area. J. Viney, 1254 Yardley Wood Rd, Shirley, Solihull, Warks. Tel 021-474-4636.

JXK 70cm conv 2 GM290A rf, 24–26 MHz if, 9V pos earth supply, fb cnd £8 ono. C. Howard, G8ANU, 60 Brocton Rd, Milford, Stafford. Tel Stafford 62533.

Mosley TA33Jr. Insp. offers and take away, cannot put up here. W. Alcock, G2CAT, Orchard Hill, Kingston, Corfe Castle, Wareham Dorset. Tel Corfe Castle 514.

4m Pye base station tx and rx xtal controlled with independent mains psu's. Squelch on rx. Both units in 19in rack housing. Sorry, buyer collect, £12 ono. P. Woode, Pinfold, Gt. Eccleston, Preston, Lancs. Tel Gt. Eccleston 412.

RSGB Bulletins complete volumes sae. Loudspeaker cords 54in various colours with 3 spade terminals each end 1/- pp. Microswitches with 3 contacts 1 in × ¾ in. Other components sae. J. Harvey, 22 Elm Grove, Bromsgrove, Worcs.

BC221 orig charts and hb, spare xtal, built in psu £15. Mobile tx 80–10m (5B/257M) with transistor modulator and 12V power units £12. D. Johnson, G3HLG, The Laurels, High St, Collingham, Newark, Notts. Tel Collingham 384.

21 ft steel mast in 3ft sections with guys etc £2 10s ono. Wanted 2m conv with if between 1·8 and 11 MHz. Also 6 or 8 el 2m beam. P. Duvoison, G8CBM, 16 Holt Dr, Wickham Bishops Witham, Essex. Tel Wickam Bishops 784.

2N706 npn transistors 2/- each or £1 per doz. Silicon rectifiers 1000 piv 200mA 2/- each. All new and tested. T. Boucher, G3OLB, 598 Long Cross, Lawrence Weston, Bristol BS11 OTT .

Rx1949 am/fm 27–146 MHz with sep ac mains psu/ls g cnd £25. Wanted mint 770U uhf rx. E. Page, 16 Abbey St, Crewkerne, Somerset. Tel Crewkerne 2662.

Several mint 1W transistor amplifiers on printed board complete with circuit, six components which need soldering £1. Air-spaced miniature trimmers 0–15 pF 2/- each or six for 7/6. M. Bonner, G8ALB 90 Aveling Park Rd, London, E17. Tel MOU 0259.

Selling up. 358 with all coils, RF27, 1132, components, valves, SX28, SB10, many items, sae for list. O. Kennedy, G3OCS, 77 Seaview Rd, Brightlingsea, Colchester, Essex.

KW1000 linear 1 yr old £100. KW Vespa 11, modified to IIA, psu £100. Collins 75A4 rx with auto tran and hb £150. M. Lee, G3VYF, 11 Sturrocks, Vange, Basildon, Essex. Tel Chelmsford 53281, etc 467 (office hours).

Joystick vfa and atu. Woden UM2 trans 475-0-475 140mA, 350-0-350 150 mA, 3 6·3V windings. 300-0-300 120mA. 2 6·3V windings. Offers D. Jones, GI3KVD, 6 Mullagh Place, Limavady, Co. Derry, Northern Ireland. Tel Limavady 2075.

KW Vanguard tx 80–10m. Heathkit RA-1 rx £30 each ono. The Treasurer, G3UNU, Nottingham University Radio Society, NG7 2RO.

R1155, 19 sets, psu's, many components, good pickings for swl . Phone then call and col. B. Dunkley, 15 Shakespare Rd, London NW7. Tel 01-959-5813.

Newnes TV and radio servicing books from no 1 to 1968. 18 books in good order £40 ono. Buyer col please. E. Munt, 9 Heath Rd, St Albans, Herts (sae please). Tel St Albans 57833.

Telequipment scope S31R £15 buyer col. Labgear speech compressor unused £2. Radio and television Servicing vols 1–5 and 1960/61 £2 10s each. T. Edgar, G3BZZ, 8 Derwentwater Gdns, Whickham, Newcastle-on-Tyne. Tel 887098.

Surplus top quality polypropylene non-rot rope ¼ in dia 1300 lbs, $\frac{3}{16}$ in 1480 lbs, ⅜ in 3100 lbs. Brand new, sae sample. N. Powell, GW3HUM, 21 Tanybryn Estate, Valley, Anglesey.

R107 with manual £7 10s buyer col. W. James, G3SKK, 36 Poplar Rd, Rayleigh, Essex. Tel Rayleigh 4385.

Complete 80–10m cw/am station. Tx Geloso vfo, 807, keying relay, sidetone, mod, xtal mic, ptt, compact psu, c/o relay, swr bridge. Rx Hallicrafters SX140 8 in spkr £35. Inspc and col. P. MacLaren, GM3WXR, 14 Southbrae Dr, Glasgow, W3.

Heathkit gdo gd wkg ordr comp with set of coils and manual £4 post extra. M. Jupp, G8BJX, 1a Blackfen Parade, Sidcup, Kent. Tel BEX 7638.

AVO Valve tester £4 10s carr paid in UK. R. Hattersley, G3PJN, Hilltop, Gallery Lane, Holymoorside, Chesterfield. Tel Ches 6040 (after 6.30 pm).

" Radar " video and sync generator 405 lines pos or neg video or rf output, Band 1 plus sound £6 or exch for base and chimney for 4CX250B. Also TR101 tcvr. £2. J. German, GM3VBB, 15 Dalmahoy Cres., Balerno, Midlothian. Tel 031-449-3050.

Heathkit Lab scope 0-12-U wkg but less crt £20 ono. Would part exch for vidicon tube or vidicon lens f1·8. Also Heathkit B-1U Balun Coil set £2 10 ono. J. Hudson, G3RFL, 68 Glebe St, Gt Harwood, nr Blackburn, Lancs. Tel Great Harwood 3395.

Heathkit sig gen RF1-U purchased last November factory built unused £16 prefer buyer collects. R. Mutton, G3EVT, Summerhayes, Mill Lane, Oversley Green, Alcester, Warks. Tel Alcester 2041.

CSE2A10 transistor tx exc cnd. Spare CRT for CRM1 RTTY monitor offers. G. Ellison, G3LZN, The Bell House, Rowington, Warwick.

Heathkit Mohican £22 ono also Hallicrafter S36 27 MHz to 144 MHz with step down tran for 240V £20 ono. Wanted 2 metre Rangers and FT243 xtals 12029·167 for RAEN. A. Glassford, GW3ACF, 22 Smallwood Rd, Baglan, Port Talbot. Tel Briton Ferry 3433.

Mech filter 455 kHz Lafayette HA350 rx type. 2·2 kHz at 6dB with new QCC carrier xtal for usb. New cnd £10 or why in rtty, vhf, hi-fi. C. Horrobin, G3TZW, 50 Fletcher Road, Stoke-on-Trent. ST4 4AJ.

Hallicrafters SX24 with manual. S27 vhf rx both gd cnd £15 each. TW 160m tx £12 10s. Wanted TW 2m transverter. TW 2m vfo. Mobile psu for KW2000A. H. Storey, G3UPB, QTHR. Tel Ponteland 3706.

70cm rx cavity £1. 100 kHz xtal B7G £1. Ventaxia extractor fans (2) £4 each. Meters 2 in round 0–2mA (2), 20-0-20 mA (1) 10/- each. Meter 1½ in round 0-75 mA (1) 7/6. 5U4G (4), EL84 (2), EF86 (3), 5B255M (2), B5/254 (3), £3 lot. Xtal oven 7 in cube holds 4 B7G £1. Marriot, G3LTN, 28 Astrop Road, Middleton Cheney, Banbury, Oxon. Tel Middleton Cheney 623.

National NCX3 tcvr with NCXA psu, will deliver, £100. Pye Reporter tx and rx, bot xtal controlled on 70·26 MHz, 2W output, mod needs attention, £4 15s. R. Porter, G3VXK, 11 Cranmore Ave, Crosby, Liverpool 23. Tel 051-WAT-1610.

Cossor 339 o'scope, manual and spare tube new £12. Sig gen triplet 1632 as new £15. BC433G with tuner, panel and drive cable £5. TX53 vfo, will drive 2 813's. QST 1922-1938 offers. S. Ward, G3HBM, 7 Regent St, Burnham-on-Sea, Somerset. Tel 2152.

HRO-MX completely rebuilt and professionally re-aligned 15, 20, 40, 80m bs coils and two gc coils, stabilised psu £30. P. Kelley, 245 Kenton Rd, Harrow, Mddx. Tel 01-907-5218.

Hatfield Balun wideband matching unit ST64C 75 ohm to 150 ohm, 100 kHz to 100 MHz. Brand new unused offers. P. Hunt, 11 Adrossan Gardens, Worcester Park, Surrey.

Complete station of the late G2MX, including Viking Valiant tx, and aerial matching unit, Eddystone 680X, Zenith frequency meter, scope, bfo, variac also KW160. Mrs George. Tel (except Sunday, Monday) 9 to 5, Castle Donnington 621 ext 283.

R206, six bands, 0·55-30 MHz with power pack and minimitter conv to spread amateur bands. Gd cond, instruction book, offers over £15. F. Chitehead, 91 Blackpool Rd, Andsell, Lytham, Lancs. Tel (evenings) Lytham 7680.

Vibroplex, chrome plated as new £8. Heathkit gdo £8. B44 in exc cnd £8 ono. W. Metcalfe, Cairndhuna, Little Hyden Lane, Clanfield, Hants. Tel Horndean 2521.

New Nombrex RF31 transistorized sig gen 100 kHz-350 MHz £9. Homebuilt guitar fuzz box £4. C. Burrows, 123 Carlton Rd, Gidea Park, Romford, Essex, RM2 5AU.

Lambda Investment Co. £50 stock for sale with dividend due June 69. R. Pollock, G5KU, 108 The Fairway, N. Wembley, Mddx. Tel. 01-904 2402.

Pair Eimac 2E27's, complete with bases and blower, brand new, £5. J. Farlow, G3BXI, 49 Mount Pleasant Road, Chigwell, Essex. Tel. 01-500 4546.

McCoy " Golden Guardian " 9 MHz with usb, lsb xtals. Response 2·65 kHz at 10dB and 3·8 kHz at 50dB, slightly better than characteristic. F. Gay G3CFV, 61 Abbey Rd, Yeovil, Somerset.

Hallicrafters S-120 rx 550 kHz—30 MHz. Electrical bs, bfo, auto tran for 240V, suit beginner, gd cond, £11 10s ono. P. Brown, 9 Fairfield Rd, Isham, nr Kettering, Northants. Tel Burton Latimer 2789.

Collins KWM1 tcvr s/n 1034 with DX Adaptor, ac psu and auto tran all in perfect wkg ordr. Prefer buyer insp and col. Nearest offer to £150. J. Masters, G3MBM, 7 Homefield, Thornbury, Bristol. BS12 2EW. Tel Bristol 622851 ext 102.

Garrard RC75 three speed changer £5, deliver Gatwick/Victoria or exch for am tx covering 3·6 MHz, with or without psu. J. Roscoe, GM4QK, 39 Letham Rd, Strathaven, Lanarks. Tel 3332.

Wireless World all issues 1938 to 1962 inclusive. Perfect cnd, offers invited. Wanted 19 set tcvr with associated equipment, must be in gd wkg ordr. K. Clark, G3WIF, 16 Goldney Rd, Clifton, Bristol 8. Tel Bristol 293738.

HRO Senior, 8 coils 100 kHz-30 MHz, psu, spkr, manual, excellent £18, carriage extra. Lucas 11AC alternator complete with ancillary gear, as new, £20. Juliette transistor portable, mw, sw, fm/vhf plus 148-174 MHz, mint, £25. M. Margolis, G3NMR, QTHR. Tel 01-550 0882.

1155 Rx £2. Morrison, 95 Sutton Rd, Heston, Mddx. Tel 01-570 6181.

Sideband Engineers model SB-34 mint, with unused mobile aerial comprising ball mount and Mark Heliwhips for 15, 20 and 40m £150. Heath SB620 Scanalyzer, new, £57 10s. Mrs. D. Barry, G3XLY, 15 Fairlawn Court, London, W4.

888A first offer over £50 or Ferrograph tape rcdr with cash adjustment. D. A. Jowers, 10 Teignmouth Rd, London, NW2.

Fully transistorized psu 16 Vdc 1 A regulated supply, fully metered and protected in steel chassis and cabinet 9 in by 13¾ in by 8 in, prefer buyer col owing to weight. M. Bay. 13 Elmbank Ave, Barnet, Herts. Tel 01-449 1740.

Heathkit DX100U tx, exc cnd with hb and spare 6146 £45 ono. Deliver reasonable distance from London. G. Crump, G3VGC, 80 Lennard Rd, London, SE20.

Standard 19 in rack 5 ft 6 in £4. Buyer coll. 2 2051 (CV1798) thyratrons 5/- each. 3 931A (CV2696) photo tubes £3 each. Please add postage. F. Fairclough, G3OEI, 28 Rimmer Green, Carr-Cross Southport, Lancs.

GEC Miniscope in case with leads £5. 8 vols Newnes Radio and TV Servicing Vol 1 to 1958 clean £3. 1 kW ALC unit for KW2000 £1. 2 Murphy V410 tv's, good tubes etc for monitors £5 each. A. Spray, G2AVR, 90 Darvel Down, Netherfield, Sussex.

DX100U £35 ono. H. Powell, G3RAQ, 12 Christchurch Ave, London, NW6. Tel 01-836 1207 ext 1457 (office hours except Fridays).

Wireless Worlds 1946-50, *Popular Wireless* 1931–35 incomplete, *SWM* 1958–68 complete, Bulletin 1958–68 complete, Cyclopedia of Applied Electricity 7 vols 1914. Offers, sae partics. Require gdo, audio osc, KW Z-match. F. Parsons, QTHR. Tel. Maidenhead 26723.

DX100 and SB10 £60 ono. L. Barlow, G3JMR, 15 Kinnerly St, Walsall, Staffs.

Yaesu Musen FTDX400 £210. FL2000 £85. FTV650 6m transverter £55. All unused and in original packing. 6KD6 valves offers. W. Wildigg, G3JZI, 31 Goldhurst Dr. Lower Tean, Stoke-on-Trent, Staffs. Tel Tean 527.

G2DAF tx, QCC xtals, hf filter, sb switching £7. TF987 noise gen £5. Amplivox Jetlite Headset boom mic £5. Wanted Kokusai filter. D. Rae, G3NCR, 68 Melrose Ave, London, SW19. Tel 01-946 9244.

Mohican rx £25. 6 ft enclosed 19 in rack on castors £5. Pye Ranger, 2m, unmodified £6 10s. Ediswan valve stabilised psu 0–100 V. 50mA continuously variable £10. 2m tx QQQV03-20 requires pu £15. Buyer collects. M. Wellspring, G8AWE, 202 North Hyde Lane, Southall, Middx. Tel 01-574 0418.

CS2 with mains psu and spares £8 10s. Also over 1500 stamps and catalogue £1 10s the lot. K. Radley, 27 Broughton Dr, Wollaton Park, Nottingham. NG81DW. Tel Nottingham 282814.

BC342N £16. RF26 £1. Franklin vfo 1·8 MHz and 3·5 MHz outputs £3. Speech amp/mod £2. Power packs less valves 1000 V £1, 650 + 470V and switching unit £2. Buyer collect. J. Randall, ex G3GJR, 3 Boston Grove, Ruislip. Middx. Tel Ruilsip 35594.

Star SR40 communications rx with integral PR30. New bfo and anl using external stabilized psu. In gd cnd £13 ono. Prefer buyer collects. D. Waters, 99 Shenley Ave, Ruislip, Middx. Tel Ruislip 34792.

RK34 vhf double triodes used in S440B 5/- inc post. N. Waring, 3WQP, 33 Chestnut St. Southport, Lancs.

Eddystone 504, similar 680X, revalved, overhauled, £25. Heathkit HW12, 32, immaculate £40 each. Fire service 98 MHz tx 300W complete valves, manual £40. Admiralty 50W rack mounted audio amplifiers, useful modulators £10 each. G. Storey, 12 Vereker Dr, Sunbury-on-Thames, Middx. Tel Sunbury-on-Thames 84422.

AR88LF good mechanically, bodily, electrically £35. Also low-band Pye Vanguard am 12 volt offers. Pye fm base station 70cm PTC8710, gd cnd, offers. H. Bottomley, G8BCL, 36 Bubwith Grove, West End, Halifax, Yorkshire. Tel. 0422-67875.

Heathkit RA-1 rx, CL-1 calibrator and QPM-16 Q-mult in exc cnd £35. Class D mk II wavemeter converted to 240V ac operation. As new in transit case with phones £5. All manuals available, buyer collects. L. Hall, G3IGI, 24 Calthorpe Rd, Walsall, Staffs. Tel 021-357 3840.

BC221 freq meter stab psu charts £18. CR100/8 mod cab, s meter, stab bfo, ne £20. Heathkit RF1U sig gen £10. Joystick de luxe. £4. H. Johnson, Onslow, 14 Honor Rd, Prestwood, Gt Missenden, Bucks.

BC348 rx, 240Vac psu. 6V6 output, spkr and circuit £10. H. Jenkins, G8AWK, Oranjewoud, Horsemarling Lane, Stonehouse, Glos. Tel Stonehouse 2536.

Dictionary of Radio and TV by Parnett. Cost 36/- absolutely new cnd sell 20/- plus 2/6 pp. E. Shackle, G3MIS, The Mead, Todber, Sturminster, Newton, Dorset. Tel Marnhull 209.

19 Mk III complete with psu, rx only, s meter built in, £3 plus carriage. Valves 3/- each plus pp. 807, 6H6, 6Q7, EF50, 6SG7, 12AT7, 6B8G, 6K8G, PCR if trans 3/- the set plus pp. PCR output trans 3/- plus pp. LF tran ratio 3 : 1 2/- plus pp. O. Walker, 63 Harbridge Ave, Roehampton, London, SW15.

R209 rx 1–20 MHz 12V ideal for mobile £12. CR100 rx gc to 30 MHz vgc £16. Power unit 180 mA Eddystone 840A rx perfect order £28. Wanted amateur bands only rx, lp filter, gdo, trasceiver. D. Wilkinson, 35 Street Lane, Leeds, 8. Tel Leeds 664823.

NCX5 and psu/ls perfect cnd £210. Compact psu suitable for linear (voltages 750–300V, 6·3 ac, –180 gb 150 sb). Psu type 234A ht 350V

It 6·3V KW swr meter new cnd. HRO and psu 8 coils (4 bs). Wanted Lafayette HA600 or Trio 9R59DE. P. McConnachie, GM3CRY, Bonfield Rd, Strathkinness, St Andrews, Fife. Tel Strathkinness 219.

AR77E rx unmodified with hb gd cnd £25 ono. Heathkit RA-1 rx gd cnd £28 buyer collects. W. Gordon-Laycock, G3XYD, 33 Douglas Ave, Watford, Herts. Tel Watford 43516.

19 set rx gd wkg cnd with internal psu, 2 meter, variometer and manual £8. F. White, 31 Astbury Ave, Wallisdown, Poole, Dorset.

Lafayette KT340 gd cnd £20. Consider exch AR88 with cash adjustment. P. Balderston, 46 Cromwell Rd, Cleethorpes, Lincs. Tel CLE 62873.

Tx DX40U 2 years old £15. Rx R209 1-20 MHz 6V dc version mostly new valves and realigned £9. No offers. F. Houghton, G3VZM, Lily Ponds Cottage, Cottage Drive West, Gayton, Wirral, Ches L60 8NX.

AR88 gd cnd £40, BC221 £18. Delivered free 100 miles. B. Fawkes, G3VQW, 6 Oak Ave, Brickfields, Worcester. Tel 27835.

Panda Cub, wkg all bands 160–10m £12. Buyer collects. R. Cox, G3PLP, 59 Berkeley Rd, Shirley, Solihull, Warks. Tel 021-744 3187.

Supertone seven (Perdio parade 159) fb lw mw trans superhet, sae details £6 or exch HRO bs coils why. T. Upstone, 76 Cleevelands Ave, Cheltenham, Glos GL50 4PS.

Canadian no 9 tcvr, exc wkg ordr, 150W am, cw, mcw, complete with 12V psu and steel rack and cables, less 813 valve £5. Deliver 50 miles. D. Stockley, 47 Nixon Ave, Ramsgate, Kent. Tel Thanet 523666 (work).

1132A rx offers. BC455B Command rx £3. 20H 100 mA if choke 7/6. 522 mod tran 7/6. 250-0-250 30mA, 6·3V 0·6 mA, 5V 1A, 230V prim 7/6. All carriage extra. E. Handcocks, G5HN, 1 Conisboro Way, Caversham, Reading, Berks. Tel Reading 73650.

KW 50 ohm swr bridge £3. Wanted rf output wattmeter such as Hunter, Waters etc, also speech processor, clipper. D. Whitehouse, G3YV, Vicarage Hill, Tamworth-in-Arden, Warks. Tel T. in A. 326.

RSGB Bulletins 1943–1965 complete, offers. *QST* 1947, 1948 and 1953 complete £2. *SWM* 1951–55 complete, offers. All gd cnd. Wanted QST 1931. Cook, G5XB, QTHR. Tel 073-525 2195.

Handbook, linear components 1250-0-1250V 400mA tran, two 10V 5A £4. Steel cabinet, modern design 19 × 9 × 15 in sprayed grey, hinged side handles £3. Prefer buyer collects heavy items. Many other components, send sae J. Speake, G3URX, 10 Mill Close, Tiptree, Essex. Tel Tiptree 6533 after 5 pm.

RA-1 brand new £35 ono. Command tx 5·3-7 MHz £2 ono. Command rx 6·0–9·0 MHz £2 ono. Both for £3. Sifam 500mA £1. Jap 10mA £1. 100mA £1. R. Furness, G3RUI, 17 Hillingford Ave, Gt Barr, Birmingham 22A. Tel 021-357 9474.

Marconi 4m tx £8. Rack psu £3 10s. AVO valve voltmeter £9. Parmeko tran 300-0-300V, 125mA, 6·3 V CT4A, 6·3V, 1A for Mullard amplifier 45/-. Exch for communications receiver to 30 MHz, or TV, why. H. Seymour, 25 Ryde Buildings, Webb St, London, SE1.

R1155 rx int psu, spkr, var bfo, Woden UM3 mod tran. Three transistor vhf/uhf tuner. Two transistor vhf tuner with skts. Exch for small scope. S. Rae, GM3SWF, 400 King St, Aberdeen, Scotland.

Joystick £2. Tran 2000-0-2000V, 500mA, £4. Scope £8. Rx R206 Mk II £19. Four U19 rectifiers £1. 30 A selenium rectifiers £1. 3kV 4mF capacitors, £1 each. ono. Buyer collects. M. Kidman, G3SDK QTHR. Tel OLU-2-55001.

KW160 and Geloso 209 plus Heathkit Q multiplier first-class cnd. Buyer collects £50. W.Windle, G8VG, 121 Laburnam Ave, Dartford, Kent. Tel DA26464.

BC348R, R1132, tx 1154, rx TCS6, pp and 1s, all wkg and gd cnd offers or exch why. Buyer collects. G3COD QTHR.

Brand new monitor scope, 19 in rack mounting switched tb, int psu, with transport cabinet, make ideal RTTY mod mon £8. SCR522 tx £2. Rx £1. D. Barrow, 47 Cannon Lane, Stopsley, Luton, Beds. Tel. Luton 25595.

Canadian Marconi 52 tx with 12V psu, 813 heater, tran, the lot £12, carriage extra or will exch for 2 walkie talkie 28·5 MHz and make cash adjustment. J. Barlow, G3TCJ, The Pippins, Lake Lane, Liskeard, Cornwall. Tel Liskeard 2073.

Heathkit Apache, SB10 adaptor, Deltra control unit £60. LG300 psu, 100W modulator £40 ono. B44 mk III modified tunable rx, xtal tx £10. QSY'ing VK land. Donohue, 41 Garway, Woolton, Liverpool, L25 5LP. Tel 051-428 3938.

Selling DX100 and SB10 adaptor £50. Prefer buyer collects, otherwise carriage extra. R. Jones, G3PIX, 24 Forest Ave, Forest Hall, Newcastle-upon-Tyne NE12 9AH. Tel Newcastle 665334.

Hallicrafter 80–10m ssb rx SX111, matching speaker, 100 kHz xtal cal £65. J. Birley, G3PYN, 2 West Tofts, Thetford, Norfolk. Tel Thetford 3224.

Labgear LG300 3·5–28 MHz tx, all pwr supplies, hb mod pr 807, UM3 opt, spare valves ihcluding 813 (cost £120) £30 the lot. G8KP, QTHR, Tel Wakefield 73548.

Hammarlund Super-Pro rx, 16 valves, bandspread, mint cnd, no 1s, £30. Buyer collects. A. Hill, 11 Douglas Rd, Crossens, Southport, Lancs.

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Tatty CR100 £5. STR9X (civilian TR1985) exc cnd £10 ono. Mains psu 350V 200mA, 2 kV 5mA, 6·3 V 17A £5. Collaro pu TX88 cartridge diamond lp stylus £4 collect or carriage at cost. C. Atkins, G8AFA, Garden Cottage, Hazelgrove, Sparkford, Somerset.

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A2521, A1714, 10/- each. EM93 8/-, 10F1 6/- 75B1, GV5A/1600 (6140), 6CH6, 6BW7, 5/- each. ECC82, 12BH7, PCC84, ECL80, 3CB6, 6F13 3/- each. EF80 EF91 2/- each. Sae list. G. Jeapes, G2XV, 165 Cambridge Rd, Great Shelford, Cambridge.

BC342 rx psu £13. SCR522 tx 2m unmodified £3. Type 234 psu £3. 20,000 ohm/volt multirange test meter £3. Buyer to collect or carriage extra. D. Robinson, G3FMT, 25 Hamilton Ave, Tolworth, Surrey. Tel LOW 2918.

BC221 chassis 15/- Case 15/-, Chest of gdo's (3), psu G8TL £4. Marconi TF643B wavemeter 20-300 MHz new £6. Medium wave Command rx £5. Double 807 mod tran 30/- 6 ft GPO rack 30/-. D. Fletcher, G3SDF, 7 Tintern Gdns, N14. Tel 886-3647.

Vanguard Mk I 160–10 £30 ono. Codar AT5 and mains psu £16, Both exc cnd. M. Roach, G3TWJ, 104 Old Lodge Lane, Purley. Surrey. CR2 4DH.

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HE40 rx £12 10. B2 rx, tx and pu 28W cw £12 10. Various other items, valves, meters, etc. SWM, P Wireless from 1939, ½ price. Wanted or exch Codar AT5, KW160, gd rx or why. J. Philips Sen, 3 Queens Rd, Westbury, Wilts.

Linear amplifier, professionally home built, 4 fan cooled 811A's, separate lt/ht trans, solid state 2000V ht, 2 relays, engraved panel with 3 flush meters, £59 ono. N. Jacobs, G3OGB, QTHR. Tel 01-550 1697.

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Pye mobile tcvrs, 2m with psu, exc cnd, few only, 15W output £12. Type 53 tx, complete wkg gift, £20. Part built G3JJG ssb exciter (vfo complete), components available £10. P. Cooper, G3CXI, 11 Hardy Rd, Bishops Cleeve, Cheltenham, Glos. Tel Bishops Cleeve 3834.

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BC348, vgc, built in psu £10 or exch RAE course or good multimeter. Cash diff either way. Will deliver 30 miles. G. Oddy, 8 Pendas Way, Crossgates, Leeds 15.

KW2000A, ac psu, E-Zee Match, Shure 444, lot £175. Twomobile rx, solid state psu, tx valved, halo £30. S. Climas, G3NYH, QTHR. Tel Alton 3044.

AR88D, realigned with new valves, S-meter, handbook, very clean cnd, £40 ono. Delivery possible over reasonable distance. D. Chapman. G3NGK, 64 Heath Rd, Holtspur, Beasonsfield, Bucks. Tel Beaconsfield 3109.

Two BC342N £12 each. Converter £2. Valiant tx and psu £35. D. Wavemeter mains £6. SME plus gram superhet no cabinet £5. B44 modified for 4m £7. Other gear sae. D. Owen, G3MCA, QTHR. Tel 01-692 8790.

KW201 mint with cal, Q mult, details sae. Wanted Collins 75A2/4 or similar rx with full 10m coverage, and Marconi 365A key. P. McAlister G3YFK, 10 Woodfield Rd, Shrewsbury, Salop. Tel S'bury 55673,

Valves, components, mains fittings very cheap, sae for lists. E. Trowell, G2HKU, Hamlyn, Saxon Ave, Minster, Sheppey, Kent. Tel Minster (Sheppey) 3100.

WANTED

Unwanted or uncompleted Heathkit projects, good prices given, collect up to 200 miles. D. Bradley, G2DVA, 3 Keswick Dr, Frodsham Cheshire. Tel Frodsham 3407.

RSGB Bulletins March and April 1961. Also "Communication Receivers" by G. R. Thornley, G2DAF. G3CGO, 31 The Crescent, Donnington, Wellington, Salop.

Four Eddystone 763 coil formers urgently required to complete hb gdo. R. Bowell, 16 Margarite Way, Wickford, Essex.

Buy or borrow circuit diagram and/or details Minimitter 160m transistor rx. E. Janes, G3FWA, Hillside, Bushcomb Lane, Woodmancote, Cheltenham, Glos. Tel Bishop's Cleeve 2229.

Xtal 2075 KHz or near, 10XJ or HC6U, J. Allsop, 15 Woodland Grove, Mansfield Woodhouse, Notts.

Frustrated swl requires station, spend up to £18. Would like ex WD gear if complete with pus, wkg and in gd cnd. N. Campbell, 39 Packard Rd, Lisburn, Co. Antrim, Northern Ireland. Tel Lisburn 5111 ext 438 (during working hours).

Thermo-couple for Marconi sig gen TG144F. Spare unit normally with each instrument. A. Twine, 169 Ashburnham Rd, Hastings, Sussex. Tel 01-432 9336 (business hours) or Hastings 29794.

3·5 MHz xtals HC6U. RF27 dial assembly. A. Burden, G3IIZ, Woldsee Moorland Rd, Shepherdswell, Dover, Kent. Tel Shepherdswell 462. Urgently required by 9J2RQ/A. Ex G3RQT electronic keyer with paddle in gd cnd will pay up to £15 all queries acknowledged. G3RQT QTHR.

Klystron 2346 wanted urgently for 3cm experiments. Your price paid. Also coax to waveguide conv (X band). S. Bennet, G3HSC, 45 Green Lane, Purley, Surrey. Tel 01-660 2896.

Gd cnd Electroniques coils QL10, QL4, reasonable price. P. Lee, 116 Sylvan Avenue, Timperley, Altrincham, Cheshire. Tel 061-973 0217.

BC545, preferably unmodified. R. Morris, 29 Nettleton Rd, Benhall, Cheltenham. Tel 0242-83295.

LG300 tx rf section, gd cnd, will collect London and home counties. P. Jobson, G3HLE, 41 The Avenue, Gravesend, Kent. Tel Gravesend 4571.

January 1969 *Radio Communication* February offered in exch or perhaps another issue. G3IDD, 17 Queens Rd, Leytonstone, London, E11.

Diesel or petrol generator, 1–5kW output, any type or cnd, 240V ac or dc considered, but 730-750V single phase ac preferred. R. Anderson, 43 Hillmarton Rd, Holloway, London, N7. Tel 01-607 3620.

Bandspread 21 mHz coil for HRO-5T. J. MacEachran, GM3XGX, 70 Stafford Rd, Greenock, Renfrewshire. Tel Gourock 32716.

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Circuit, hb, BC348R, borrow or buy. A. Hatch, 22 Curzon Green, Offerton, Stockport SK2 5DJ. Tel 061-483 7176.

1L5 valve. A. Aldridge, 319 Portobello Rd, London, W10. Tel 969-2799.

G2DAF type rx. Details to P. Hardy, G3VNH, Jellicoe 89 Mess, HMS Collingwood, Fareham, Hants.

Xtals. 24017–24037 KHz or 8005–2012 KHz. Trans 350-0-350, 400mA or sim. QQV06–40A, Jackson type U101/SS split stator. All must be cheap. A. Blockley, G8CCH, 84 Elmwood Way, Basingstoke, Hants.

Original S meter for AR88. Painton Radio Society, G3PHC, QTHR. Diesel or petrol generator wanted by Southampton RSGB Group. Suitable for NFD. Purchase or even loan. R. Baldwin, G3WZ, 67 Ashmead Rd, Maybush, Southampton. Tel 74178.

HRO coil 1·7–4·0 MHz, swop with 0·9–2·05 MHz or purchase. J. Burton, G3TJR, Hope Farm House, Hope, Battle, Sussex. Tel Cooden 3851.

6Y6 clamper tube, M. Whitaker, G3IGW, Rose-Dene, Wood Lane, Hipperholme, Halifax.

HRO without coils or psu, also Command rx 0·52 MHz to 1·3 MHz. A. Walker, G3DAR, 20 Station Rd, Esholt, Shipley, Yorks. Tel Guiseley 3279.

Mains tran for Minimitter Top 2–7. T. Bennet, G3TMY, 73 Guildhall St, Bury St Edmunds, Suffolk. Tel Bury St Edmunds 4073.

Dynatron SRX24C circuit and service instructions sale or loan. Also xtals 7000 to 7020 and 3500 to 3520 kHz. State price, J. Maling, G5JL, 98 Waltham Ave, Hayes, Middx.

AR88 drive and dial assembly in gd wkg ordr. Also FT241 xtals in range channels 43–53 and 324–338. R. Whitehouse, 35 Princes Ave, Petts Wood, Orpington, Kent. Tel Orpington 22602.

Manual for SP600JX. Borrow or buy. I. Redfern, 115 Swan Cres, Oldbury, Warley, Worcs. Tel 021-552 2757.

Complete design for rcvr for cw only 160m. All offers acknowledged. C. Fowler, G3VNJ, QTHR.

4 Mullard Vinkors type LA2103 will pay list price. E. Ford, G3VRU, 106 Skinner St, Creswell, Worksop, Notts.

HA350 rx. Pse state price. S. Hindmarsh, 4 Rydal Mount, Castletown, Sunderland.

Large 2m aerial J-Beam, Hy-Gain, Telrex etc. At least ten elements. long yagis preferred to multi-stack. Details to L. Margolis, G3UML, QTHR. Tel 01-550 0882.

SSB gear such as M & G tcvr. Consider homebrew if reasonable. Powell, Lower-Odcombe, Yeovil. Tel West Coker 712.

Heathkit Balun B1-U. Price to J. Bernden, G3RND, QTHR.

RSGB Bulletin Aug 67 in gd cnd, needed to complete collection. Also offers of 1st, 2nd ed hb. C. Partridge, 2 York Cres., Torquay, Devon.

Circuit info US sig gen 1-222-A 3200-SCRL-43 150–230 8–15 MHz, also 3 ft. dish. F. Mathews, G8ACJ, QTHR, Tel Guildford 73912.

SSB rig. Anything considered. R. Butcher, G3UDI, 2 Clare Road, Cambridge.

Codar 12/RC control Class D wavemeter. RAE correspondence course, gdo. R. Andreang, 10 Vermont St, Beverley Rd, Hull, Yorks. Tel 0482-45140.

16mm movie sound projector in part exch or exch for AR88 in exc cnd. Other arrangements could be made to sell projector. A. Conway, 17 Mount Castle Rd, Leicester.

M & G tcvr, Webster Bandspanner, pair gd amateur band walkie-talkies, ex RAF kite, Jolly, G3TJY, Little Russel, Lytchett Minster, Poole, Dorset. Tel Lyt Min 142.

Any vols, years or long runs of *Amateur*, *Popular* or *Modern Wireless*; *Wireless Constructor*, *Magazine* or *Weekly*; *WW* 1915–1922; *Practical Wireless* 1932–1938; *Tele-SW World* 1935–37. G3IDG, QTHR.

Scout group want rx wkg or repairable, HRO, CR100 etc. £10 approx. 19 in rack, psu's, hb for KW Valiant, Minimitter 160–10 conv, S-meter, hb for 888A, 150W coax relay. Will collect if local. P. Vella, G3WVP, 78 Hurst Rd, Sidcup, Kent. Tel 01-300 5891.

2m gear, Ranger or similar, also converter, am tx. D. Walsh, G8CEF, Sedan, Stock Lane, Ingatestone, Essex. Tel Ingatestone 667.

De-luxe Joystick, type 4 or 4RF tuner, must be in gd cnd. Details to G. Boultbee, G3VHI, 50 Ferryview Est., Fiskerton, Lincoln.

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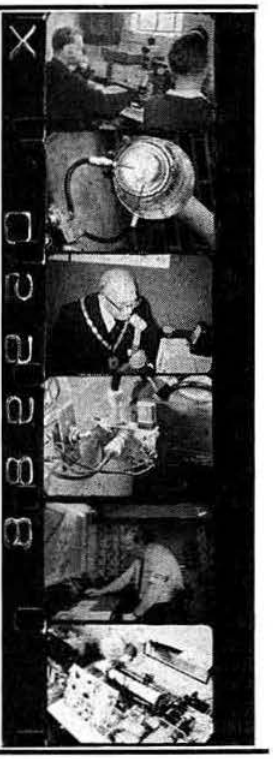

Radio News of 1968

The Librarian reports that three copies of the film have been in circulation since it was released in December last, and that after a slow start these have been almost fully-booked up to the end of March. Current bookings include: 3 April Cornish RAC, 16 April Swindon & DRS, 5 May Norfolk ARC and Mid-Warwicks ARS, 14 May Dunfermline RS, 15 May Loughborough University ARS. One of the copies has been earmarked for use overseas during the period from April to August. It is expected that there will be a heavy demand for the film in the coming Autumn/Winter/Spring film-show season and programme secretaries are urged to get in their bookings as soon as possible.

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QSL samples, excellent range at right price. Log books 7/-.—Bailey and Co, Greenfield Place, Weston-super-Mare.

NEED THE MONEY. Must sell. KW77 receiver, £70. KW Viceroy Mk III transmitter, inc PSU £80. Excellent working order and appearance. Will demonstrate or you operate/A at my Qth. Personally deliver free to 100 miles. P. D. Smith, 38 Leasway, Wickford, Essex. G3PZZ. Telephone Wickford 2791.

EDDYSTONE 640, perfect, with S meter and ATU, £15. T. W. Kupicha, G3RUN, "Red Gables", Gt. Mongeham, nr. Deal Kent.

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SB10 and matching tx hb 80m to 10m. Fb working order. No psu £35 ono, will separate. G3MGW QTHR. Tel Brightlingsea 2382.

TRANSISTORIZED ssb generator USB, centre freq 8·528 MHz £5 reflectometer as page 13.79 Handbook in diecast box. Simultaneous forward and reverse metering £3. 14 MHz CW/ssb amp-pa ARC5 Box 200W pep £3. Buyer collects or sae. Speake, 10 Mill Close, Tiptree, Essex. Tel 6533.

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COLLINS KWM2 transceiver, 399C/1 pto and speaker, PM2, ac, psu PM1, 12V, dc, psu 351D/2. Mobile Mount. 136B/2 noise blanker. CC2 carrying case. £550 ono. Might split. New boxes 4CX1000A Valve. 2 valves 4X500A, good condition. With bases. Offers to G3OEM, 1 Baden Road, Brighton 7, Sussex. Phone Brighton 65132 (evenings)

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M & G TRANSCEIVER, Webster bandspanner, pair good hamband walkie talkies, ex-RAF Kite. New BC221 with charts, no case £17. Jolly, G3TJY, Lytchett Minster, Poole, Dorset.

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MOBILEERS G-whips latest designs 160/80M, Multimobile, 15MG Beam. All with the G-Whip reputation behind them. 73 GW3DZJ.

RADIO SKY, Journal of the Society for Amateur Radio Astronomers. Articles of interest for all radio amateurs. Three issues available at 7s each. Fuller details on request. Box No H7395, c/o Radio Communication, 4 Ludgate Circus, London EC4.

2DAF Linear amplifier, pair 4-250's. plus 3·5 kV variac psu. Bargain £50. Marconi fsk monitor unit, brand new, £20. Ht transformer 0–2800 at 300mA, ideal big linear £5. *Wanted:* Heathkit HP13 mobile psu.—G3UDR, A. J. Martin, REN Cottage, Abinger Common, Dorking, Surrey. Abinger 114.

TIGER 200W Tx. 10–80m. Excellent condition, will accept £25 if you collect G3XFJ. 23 Otterwood Lane, Acomb, York. OYO4 78857, evenings.

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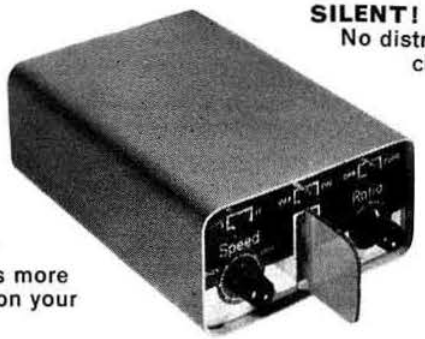

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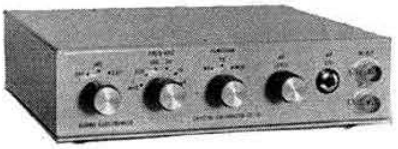

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INDEX TO ADVERTISERS

Amateur Electronics Ltd. G3FIK .. 232
BEQ Supplies .. 292
Burns Electronics .. 294
Daystrom Ltd. .. 229
Derwent Radio Ltd. .. 292
Dodson-Bull Carpets Ltd. .. 293
Dorset Radio Lectronics Ltd. .. 294
Echelford Communications Ltd. .. 296
Garex Electronics .. 228
L. Hardie .. 294
Henry's Radio Ltd. .. 294
Home Radio Ltd. .. *Cover iv*
Alfred Imhof Ltd. .. 293
JXK Converters Ltd. .. 292
Jackson Bros. Ltd. .. 296
K.W. Electronics Ltd. .. *Cover ii*
J. B. Lowe .. 226-7
Mark Equipment Ltd. .. 29
M-O Valves Ltd. .. 227
Mosley Electronics Ltd. .. 227
N.W. Electrics .. 292
Radio Shack Ltd. .. 296
RSGB Publications .. *Cover iii*
R.T. & I. Electronics Ltd. .. 294
Shure Electronics Ltd. .. 230
H. L. Smith & Co. Ltd. .. 294
Spacemark Ltd. .. 293
Stephens-James Ltd. .. 292
Swanco Products Ltd. .. 291
Ernest Turner Electrical Instruments Ltd. .. 234
J. & A. Tweedy Ltd. .. 293
Western Electronics .. 293
Westwoods .. 294
Chas. H. Young Ltd. .. 232

RSGB PUBLICATIONS

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Amateur Radio Call Book	7/2
Amateur Radio Circuits Book	11/6
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