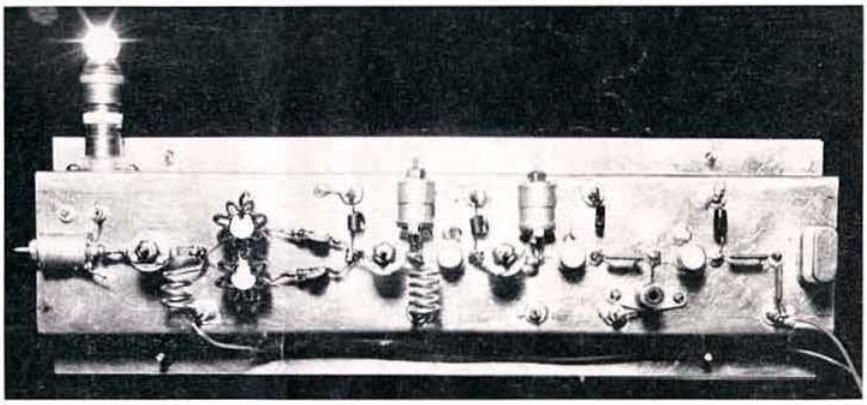
FEBRUARY 1969

RADIO COMMUNICATION



TWO METRE "SNOWFLAKE" TRANSISTOR TRANSMITTER

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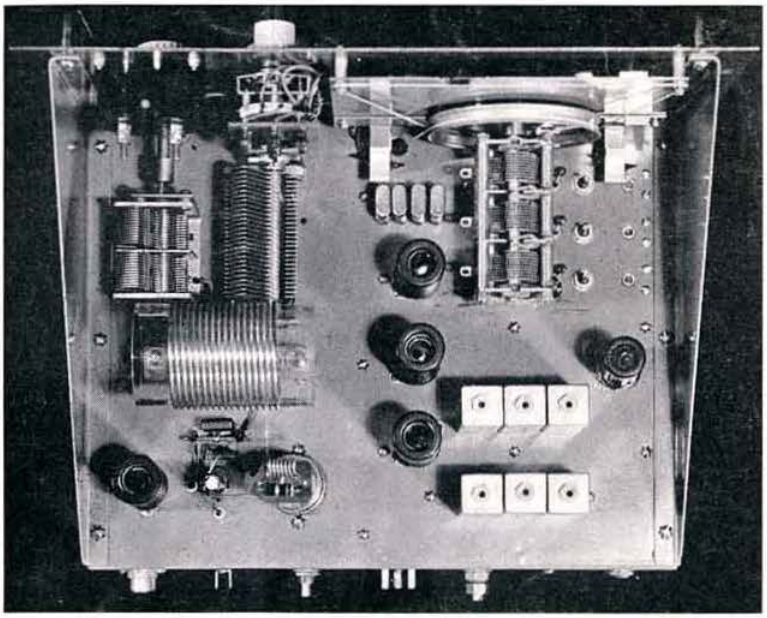

WIRRAL NFD TRANSMITTER

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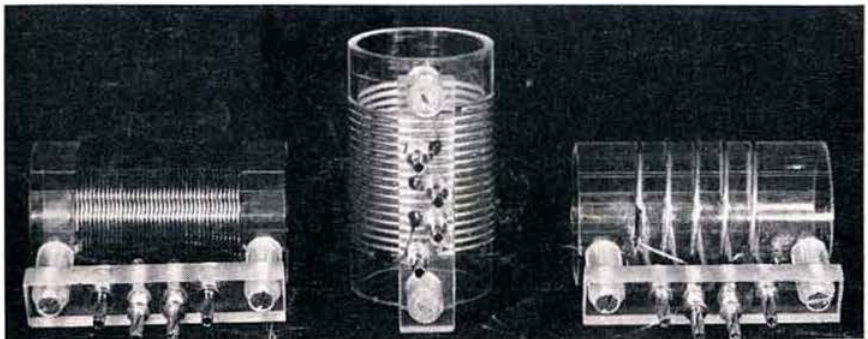

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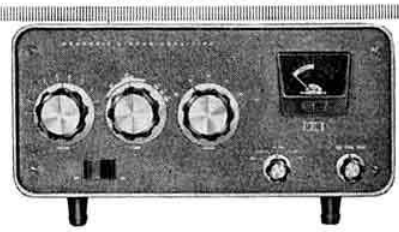

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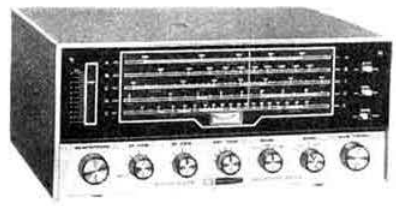

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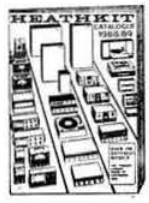

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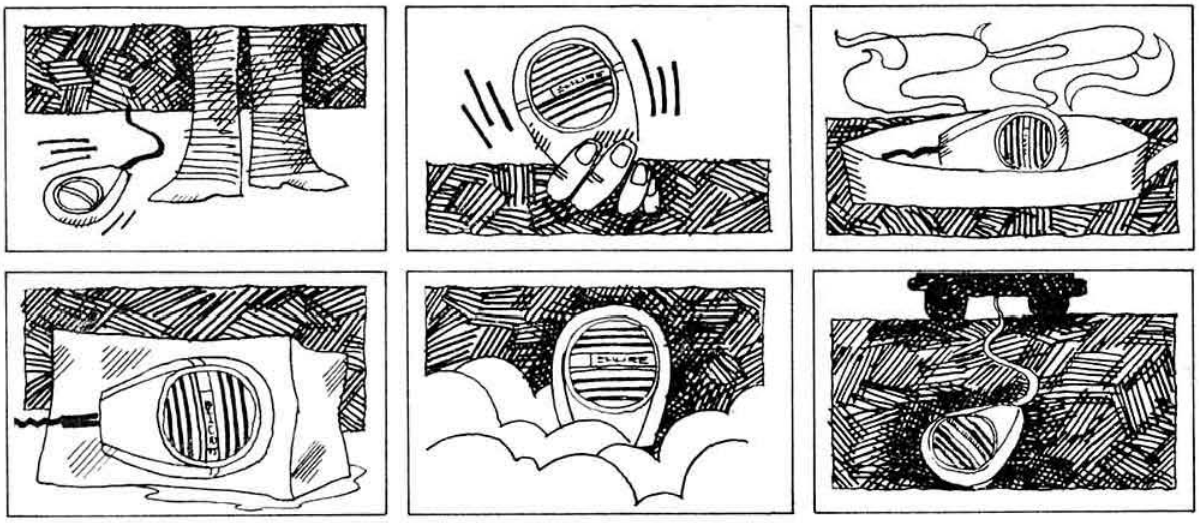
just to make sure that you never will



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SOMMERKAMP

I've been scratching my head for good advertising slogans—I know that what I peddle is the best value for money on the market, but I've got to think of some nice catchy slogans to induce you to part with your loot. The snag is that this new law on misrepresentation makes it an offence to indulge in misleading advertising. You have to tell the truth. The bit about marvelling at complete perfection is right out (many's the chuckle I've had at this one). What about "Transceiver for the Connoisseur." No, that's no good—a connoisseur would have separates with transceive facility. How about "Rock-like stability." No—even crystals in an oven drift a bit, so that's out. O.K. then, what about something like "Fabulously low price." No, I don't think I'd get away with it—I import at the Manufacturer's price and add my profit. Reasonable price yes, but nothing fabulous about it. "Fantastic Bargain." No, I don't think so. Actually there's no such thing advertised. A fantastic bargain needs no advertising and usually only occurs when the seller doesn't know what he's selling! ! Most "Fantastic Bargains" I've ever come across are when the seller knows exactly what he's selling and wants to get rid of it as quickly as possible. I know, let's try "Top Quality." Oh dear, no! Quality costs a fortune. You might get it in Apollo 8 electronics, but not in Amateur Radio, not by a long chalk. O.K. then, let's try "Built to an exacting specification." Back to Apollo 8 again! Best advertising gimmick is the "blind-you-with-science" technique using meaningless phrases. Fantastic the number of people impressed with some meaningless garble like "Fourth Generation Dynamic Concept Receiver with exclusive DMP (Digital Modular Parameters).

It's really a problem what to put in advertising. I think I'll stick to my line that Sommerkamp, Star and Inoue are the best value for money. You can't even believe specification sheets and it just doesn't do to accept as gospel what the maker claims. Also of course, specification sheets cleverly tell you what the maker would like you to know but even more cleverly conceal the bits he doesn't want you to know. A rig looks good on paper—people buy it—then come the snags! How then is the average chap going to choose a rig. It's a problem and no getting away from it. The answer is to talk to as many people as possible. to listen to as many QSO's as possible. Try and get intelligent and reasoned arguments for and against a particular rig. Eliminate as far as possible the bigotry and listen to the moderates. I suppose the ideal way is to do what I do—the above plus a very careful evaluation using good test equipment to measure performance. Then, like me, you too will go for Sommerkamp, Star and Inoue, as being the best value for money on the market.

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SOMMERKAMP FR-100-B	£90 0 0	HRO	£20 0 0
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Marconi TF885A video oscillator, mint	£45 0 0
Industrial Electronics 2300 'scope, tiny thing	£15 0 0
ME-11B/U 15/60W, 30-600 MHz, r.f. wattmeter	£20 0 0

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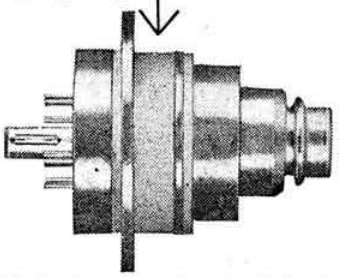

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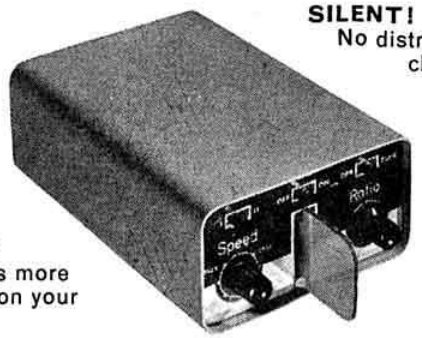

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Region 4.—East Midlands.	No nomination received.
Region 5.—Eastern.	No nomination received.
Region 6.—South Central.	No nomination received.
Region 7.—London.	P. A. Thorogood G4KD, 35 Gibbs Green, Edgware, Middlesex.
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Region 10.—South Wales.	C. H. Parsons, GW8NP, 90 Maesycoed Road, Heath, Cardiff, Glam.
Region 11.—North Wales.	No nomination received.
Region 12.—North-East Scotland.	A. W. Smith, GM3AEL, 1 Sclattie Place, Bankhead, Bucksburn, Aberdeenshire.
Region 13.—South-East Scotland.	No nomination received.
Region 14.—West Scotland.	No nomination received.
Region 15.—Northern Ireland.	J. Thompson GI3ILV "Albany," Newry Road, Armagh, N. Ireland.
Region 16.—East Anglia.	W. J. Green G3FBA, Meadway, Links Avenue, Brundall, Norwich, Norfolk, NOR 86Z
Region 17.—Southern.	C. Sharpe, G2HIF, 20 Harcourt Road, Wantage Berks.

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Current Comment

Are You a Security Risk?

Many members will have noted the radio and newspaper comments on the Report of the Security Commission appointed to enquire into the security aspects of the Britten affair. Perhaps not so many have read the Report for themselves: if they did so they would note several comments which appear to place the integrity and practice of Amateur Radio in this country, and especially operation by Services personnel, under the gravest suspicion.

The Report states: " We think the present case justifies the security risks attaching to amateur radio activities by members of the Armed Forces and of the public service generally being reassessed by the competent authorities, and we are causing the matter to be brought to their attention." We may well ask: When this has been done—what next? Are we in danger of awakening one morning to find that as members of the Forces, workers at Government establishments, or even as holders of reciprocal licences, we have had our facilities drastically curtailed without warning? And this because one person admits to having received (no more) a message at his Service Radio Club—a task which he could have carried out anywhere and on any receiver freely available for the purpose.

We are left with the impression that Amateur Radio has been made a scapegoat to allay public criticism of the RAF security procedure, however unwarranted. When Britten is described in the Report as displaying " a surprisingly high degree of incompetence " as a spy, we suggest that the easiest and quickest place to reveal that incompetence would be by attempting to pass espionage information on the amateur bands. There is no evidence that Britten attempted to do so, and he remained at large for six years. On its own admission, no expert evidence was called by the Commission to glean anything of the nature or methods of amateur radio operation. To suggest reassessment of security risks in something only imperfectly understood seems as sensible as closing a road simply because it was used by bandits in a getaway car.

But one sad aspect of this case is the implication that amateurs as a body are suspect. We resent this slur—there is no more loyal body of citizens than Amateur Radio operators—and when not only our loyalty is held in question but we are made to suffer for the one rotten apple in the pile, we must uphold our reputation where and when it is threatened.

J.W.S.

The report did however include an important comment that the RAF " see great merit in Amateur Radio clubs, which have a high interest and training value for many on signals work. The RAF believe they have struck the right balance in their instruction."

QTC

GPO Baldock Visit
Radio Amateurs' Examination
QSL Bureau Change

Visit to GPO, Baldock

It was with enthusiasm that a number of Council members accepted an invitation from the Post Office to visit the Radio Services Receiving Station, Baldock, situate some 20 minutes drive from Stevenage, Hertfordshire. The party comprising of RSGB President, J. W. Swinnerton, G2YS, fellow Council members, B. Armstrong, G3EDD, N. Caws, G3BVG, G. R. Jessop, G6JP, R. F. Stevens, G2BVN, G. M. C. Stone, G3FZL, E. W. Yeomanson, G3IIR and J. J. Adey of Headquarters Staff, assembled at 11 am in the monitoring block by the main gate. The party split, and one half tramped the ¾ mile ice covered tarmac service road to the commercial receiving block. Here the visitors thawed out whilst being shown around the maintenance rooms and workshops. Amongst sophisticated equipment associated with such establishments, was a CR100 and other receivers usually found among Radio Amateurs. The main receiving room, however, contains some thirty receivers where accuracy is measured in cycles and where the latest frequency synthesizer techniques are employed. This station is used in conjunction with the Rugby transmitters as part of the overseas and ship to shore communication channels.

In all the first part of the visit took some 60 minutes and after returning to the reception area it was time for refreshment. Following a visit to the village of Baldock it was time to look over the interference bays.

Here five receiving consols are used in conjunction with a switchable inverted vee and vhf/uhf yagis, permitting monitoring on all frequencies from 10 Hz to 500 MHz. A majority of transmission modes can be resolved including facsimile.

The tour was over only too soon, and following tea and biscuits we parted for the return journey.

Our thanks are extended to Mr Johnson (Engineer-in-charge) and Mr Foster of the Receiving Station for their hospitality and interest.

Radio Communication Handbook Reflectometer

Some members have had difficulty in obtaining the toroidal core used in the reflectometer on page 13-79 of the Radio Communication Handbook. These are made in quantity by Salford and single units are rare.

Now George Jessop, G6JP, of the RSGB Technical Committee has arranged to keep a small stock of these cores. The core, GEC type G29S, is available directly from G6JP price 7/6 plus post and packing. G6JP's address is 32 Northview, Eastcote, Pinner, Middlesex.

Radio Amateurs' Examination, 21 May, 1969

The Society will be providing a centre in London for this examination. Applications to sit the examination must be sent to the General Manager, RSGB, accompanied by the entry fee of 35s. for members of the Society or 45s. for non-members. The number of places available is restricted.

The closing date for entries is 20 February, 1969.

Book Orders

It would greatly assist our Accounts Department, if when ordering publications, members would print clearly their name and address. This will assist in the processing of orders and avoid any despatch errors. Please remember to use the **Publications Order Form** which this month is printed on page 144.

Maurice Mason, G6VX

Maurice Mason, G6VX, who is a GB2RS news reader for the West of Britain, has been awarded the OBE. Mr Mason is the Superintending Electronics Communications Engineer at GCHQ.

Oldest Radio Amateur?

A note from a Bristol member, G5KT, queries whether another west of England amateur, Will Badman, G2ZG, is the oldest amateur in the British Isles. Mr Badman is apparently well into his ninetieth year. It seems to us that he could be the oldest amateur in the world. Does anyone have other ideas?

G5KT mentions that G2ZG charged the batteries for Marconi's experiments across the Bristol Channel in 1897, when he was 18 years old.

Affiliated Societies Booklet

In the published list of Affiliated Societies and Clubs, Mr H. Davidson, G3TVW, is shown as secretary of the Cheltenham Amateur Radio Society. He is in fact Secretary of the Cheltenham Group. Secretary of the CARS is A. B. Fletcher, G3LDA, 40 Chelmsford Avenue, Warden Hill Estate, Cheltenham, Glouc s.

Affiliated Society—Change of Secretary

The new Hon. Secretary of the South Birmingham Radio Society, G3OHM, is Mr R. A. Brice, 60 Colrain Close, Chelmsley Wood Estate, Chelmsley Wood, Birmingham 37.

Affiliated Societies

The following societies are now affiliated to RSGB:

SWINDON AND DISTRICT AMATEUR RADIO CLUB.
Secretary: E. J. Windsor, G3JAP, 56 Windsor Road, Swindon, Wilts.

TAUNTON AND DISTRICT AMATEUR RADIO CLUB.
Secretary: H. P. Jones, 17 Bowood Road, Taunton, Somerset.

10TH WARRINGTON BOY SCOUTS AMATEUR RADIO CLUB.
Group Scout Leader: J. Hughes, G3RRM, 41 Highfield Avenue, Great Sankey, Warrington, Lancs.

MID-CHESHIRE AMATEUR RADIO SOCIETY.
Secretary: A. J. Greenwood, 83 Ash Road, Cuddington, Northwich, Cheshire.

PLESSEY SPORTS AND SOCIAL CLUB (Electronics Section).
Secretary: D. A. Golder, The Plessey Co. Ltd., Carr Lane, Chorley, Lancs.

The new secretary of the Silverthorn Radio Club is now D. L. F. Standley, G3XSA, 212 Westward Road, Chingford, London, E.4.

The new secretary of the Harlow and District Amateur Radio Society is B. G. King, 36 Upper Park, Little Parndon, Harlow, Essex.

The new secretary of the Crawley Amateur Radio Club is G. Bowden, G8BQE, 51 Leighlands, Pounds Hill, Crawley, Sussex.

Forestry Commission Exhibition Station

The 50th anniversary of the Forestry Commission will be celebrated by numerous local events and also an exhibition at Bush Estate, Edinburgh, on June 5, 6 and 7, 1969.

The Forestry Commission have approved the setting up of an amateur radio station at this exhibition. The GPO has allocated the callsign GB3FC for this period and a special QSL card has been designed to mark this Jubilee Year.

It is proposed to operate on 160, 80, 20 and 15 metres. The organizer is W. A. Lindsay-Smith BSc, G3WNI, 22 Kingswood Crescent, Copthorne, Shrewsbury, Shrops.

The Britten Case

The Report of the Security Commission referred to in the Current Comment in this issue is document Cmnd 3856 and can be purchased at a price of 1s 3d from any branch of Her Majesty's Stationery Office.

RSGB QSL Bureau

The QSL sub-manager for the series commencing G3YAA is P. R. Cheeseman, 10 Nursery Road, Hook End, Brentwood, Essex.

After many years as sub-manager for the series G3AAA-G3BZZ, Mr Charles Olley, G3AIZ, has had to give up the position. Taking over Mr Olley's duties will be C. A. Bradbury, BRS1066, 13 Salisbury Avenue, Cheltenham, Gloucs. Mr Bradbury is also sub-manager for the series G3CAA-G3DZZ.

Licensing Authority Address Change

The new address of the Radio and Broadcasting Department is now: Waterloo Bridge House, Waterloo Road, London, SE1. The telephone number is 01-928 7878.

Silent Keys

It is with sorrow that we must record the deaths of the following:

H. W. Sollom, G3GNV, of Rustington, Sussex.
N. Evans, G3FRT of Wirral, Cheshire.
W. W. Willcocks, G8BAO, of London, N2. (Shown incorrectly last month as P. W. Willocks, G8AIE.)
N. G. Robson, of Carlisle, Cumbs.
O. Read, G2FP, of Exeter, Devon.
W. R. Huxley, GW3RIB, of Chester, Cheshire.
C. C. Wilson, G3CCW, of Wirral, Cheshire.
W. G. Lewis, G4MN, of Birmingham 32.
A. E. Clipston, G8DZ, of Nottingham.
S. Howson, BRS19251, of Norwich.
J. W. McCreight, BRS24732, of Saltcoats, Ayrshire.
K. Lawless, G3NIZ, of Huddersfield, Yorks.

RSGB QSL Bureau Sub-Managers

G2:	J. W. Russell, G2ZR, 45 Shakespeare Avenue, Bath.
G3, 4 and 5 two-letter calls and GC:	E. G. Allen, G3DRN, 65a Melbury Gardens, London, SW20.
G6 and G8:	A. J. Mathews, G6QM, 62 Ashlands Road, Hesters Way Estate, Cheltenham.
G3AAA-DZZ:	C. A. Bradbury, BRS1066, 13 Salisbury Avenue, Cheltenham.
G3EAA-HZZ:	W. J. Green, G3FBA, "Meadway," Links Avenue, Brundall, Norfolk, NOR 86Z.
G3IAA-KZZ, BRS and A numbers:	G. L. V. Butler, G2BUL, 9 The Heath, Chaldon, Caterham, Surrey.
G3LAA-NZZ:	F. Bliss, G3IFB, Coppalex, North Road The Reddings, Cheltenham, Glos.
G3OAA-PZZ:	J. H. Brazzill, G3WP, 43 Forest Drive, Chelmsford, Essex.
G3RAA-RZZ:	K. Walden, G3OLN, 250 Gloucester Road, Cheltenham, Gloucestershire.
G3SAA-TZZ:	E. G. Allen, G3DRN, 65a Melbury Gardens, London, SW20.
G3UAA-VZZ:	P. R. Cox, G3RYV, 20 Allenby Road, Maidenhead, Berks.
G3WAA-G3XZZ:	R. W. Martin G3RWM, 76 St Paul's Crescent, Coleshill, Warks.
G3YAA series:	P. R. Cheesman, G3KDE, 10 Nursery Road, Hook End, Brentwood, Essex.
G5AAA series, all prefixes:	E. G. Allen, G3DRN, 65a Melbury Gardens London, SW20.
GD:	T. R. Moore, GD3ENK, "Glyn Moar," St John's, Isle of Man.
GI:	R. R. Parsons, GI3HXV, 45 Erinvale Avenue, Finaghy, Belfast.
GM:	D. Macadie, GM6MD, 154 Kingsacre Road, Glasgow, S4.
GW:	J. L. Reid, GW3ANU, 28 Waterston Road, Gabalfa, Cardiff.

The address of the QSL Bureau Manager (Mr A. O. Milne, G2MI) is 29 Kechill Gardens, Bromley, Kent.

Cards must be sent to G2MI but envelopes may be sent to the appropriate Sub-Manager or to G2MI. Printed, gummed labels are obtainable from G2MI by sending an sae.

A New Year Message from our thirty-fifth President

John W. Swinnerton, G2YS

My first duty as your thirty-fifth President is a very pleasant one—it is to wish you a happy and successful 1969. I would like also to ask your help in making this a year of significant progress in the Society's affairs. We now have our own Headquarters, and the latest edition of our Handbook promises to be a " winner." We are therefore broadly based for *expansion;* now is the time to endeavour to increase the *value* of membership. This is difficult when increased costs are pressing us from all sides because it involves giving a better service for the same subscription rate and it *can* be done. You can help by persuading many more persons—especially licensed amateurs—to join and so bring down " unit costs " of our Journal and our services. At the present time, out of every ten British Isles amateurs that you hear or work, four are not members of your Society. They are therefore getting " for free " the high-level representation, better licence facilities, the activities and new developments which you as members help to finance. But more than that they are weakening the voice of Amateur Radio in those places where we should always appear united and unanimous.

This year there are three notable events of " political " significance to us—the emergence of the Ministry of Communications, the IARU Region 1 Conference in Brussels, and the triennial Conference of the Society's Regional Representatives. For the first, let us hope that our contacts with our " opposite numbers " will be fruitful and cordial, and that the " shaking down " period of the new régime will see no diminution of the cooperation which we have established with the representatives of the GPO.

For the second, we hope that the Region 1 Conference will strengthen old friendships and improve the science and practice of Amateur Radio in Region 1. We wish our delegates well.

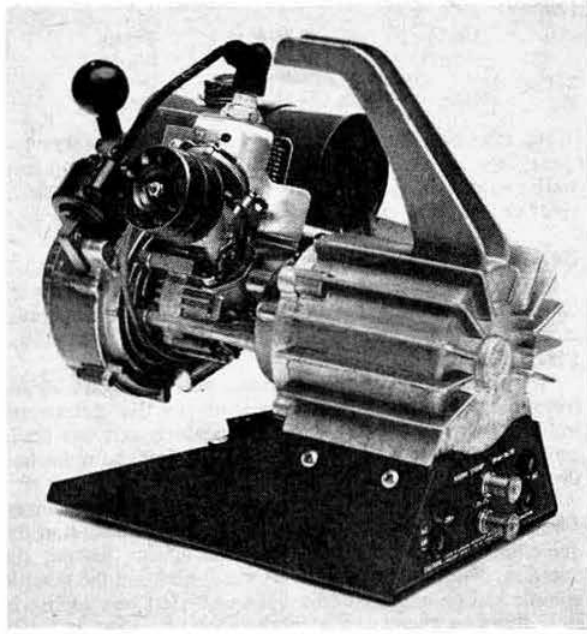
For the third we want to see you play your part. The Society is run for you, whether you live in Caithness or Cornwall, Belfast or Brighton. If we are not going about it in the right way—tell us so. Tell your Area or Affiliated Society Representative, because he is in touch with local conditions and local opinions. Through him brief your Regional Representative, and see that he comes to the Conference eager to thrash out with his colleagues and Council the basis of Society policy for the next three years. *Do it now*—at club and group meetings, or wherever " two or three are gathered together." Think—talk—discuss—argue—but above all *act.* And give your delegate your ideas on how to make ours a better Society—how to make it *expand* in 1969.

I look forward to meeting you personally or on the air whenever my duties permit; meanwhile I offer you this thought: you cannot take anything out of your pocket unless you have first put something in. Many members spend a lot of time and trouble " putting in " to your Society—do you? Or are you simply content to " take out "?

EQUIPMENT REVIEW

Petrol Generators Carters "Champ" and Honda EIV 300

By B. D. A. ARMSTRONG, G3EDD and P. J. SIMPSON, G3GGK



ONE of the main problems of portable events is primary power supplies.

With transistors creeping into amateur portable equipment all too slowly, the problem is greater than it need be. Nevertheless even with full transistorization, 24 hour operation necessitates illumination at night, and a battery with sufficient capacity to cope with the total load without charging is a large and heavy unit.

The selection of small petrol generators of modern design is not large. Amongst those available is the British/American Carters "Champ" and the Japanese Honda EIV 300.

The Carters "Champ"

The Champ generator model H110 was loaned by: Carter and Co., (Nelson) Ltd., Sycamore Avenue, Burnley, Lancs. and the price is £42 15s. Carters are the sole agents for the Champ which they state is of British origin. A very similar generator, the "Amp Champ," was marketed some years ago by Varo Inc., California.

Description

The engine, a 1 hp two stroke, is manufactured by O and R Engines Inc., Los Angeles. Speed governing is obtained by a small tab in the cooling blower air stream. Needle bearings are used for main and big end.

The generator is interesting in that the rotor is a permanent magnet and ac is produced in the stator. The finned generator housing has a carrying handle as part of the generator casting. Engine and generator are bolted together and in turn mounted on a steel base plate. This plate also acts as a heat sink for the high voltage diode bridge and the full wave low voltage rectifiers.

Manufacturers Specification

Power	1 HP two stroke		
Petrol/Oil ratio	24 : 1		
Tank capacity	13 Fl oz		
Speed	6300 rpm		
Outputs	230 V ac 630 Hz	300 watts	5 amp 2 pin sockets
	230 V dc	300 watts	
	12 V dc	150 watts	Screw terminals
Weight	13 lbs		
Size	10 in L × 8¼ in W × 9 in H		

Tests

The load used for the high voltage outputs was a series of light bulbs. With both ac and dc 230 V outputs the voltage varied from 250 no-load to 205 V on full load. Owing to continuous "fidget" of the engine speed, the variation at any load was up to 20 volts. This would not create a problem in using power tools but could be annoying for lighting.

Since the 12 V dc output would be used exclusively for battery charging no voltage tests were carried out. However currents of up to 12 A were recorded during battery charging.

The waveforms of all three outputs were observed with a VHF oscilloscope and were very clean and free from spikes. The 630 Hz waveform was only very slightly distorted.

Interference

Tests were carried out on two sites with generator operating at full load on the ground beneath aerial arrays. The

results correlated very closely and were summarised as follows:

Up to	15 MHz	Clean
	21 MHz	Slight
	28 MHz	Heavy
	70 & 144 MHz	Heavy

On television bands 1 and 3 the interference was not annoying. This may seem illogical, but amateur band tests were carried out with no signal input, whereas the television receiver was receiving good signals.

General Comments

One comment which was unanimous with all observers concerned the noise. It is not a device which can be operated close to domestic premises without a complaint from all but the most tolerant.

However, since portable operation sites are invariably far from the madding crowd, complaints of this nature are unlikely. Out of interest a distant measurement was made on a still day. It was found that at 250 feet the noise had decreased to barely audible.

The speed fidget is probably the result of two features. First, there is no weight in either the engine crankshaft or the generator rotor to provide a flywheel effect. Second, the speed regulator is very simple. It was found that the throttle spindle had an end float and if it was biased very lightly in one direction there was a marked improvement in speed regulation.

The Champ is extremely light and small, in terms of watts per pound is unlikely to have an equal. The petrol tank capacity is such that one filling will give a timed duration of 47 minutes on a full load, but in this time it is possible to put a reasonable charge into a 12 V battery. The fuel consumption was thus 1 gallon for 9·6 hours.

Starting was no problem.

The Handbook

There is no handbook as such but there are excellent exploded views of all parts of the engine and alternator. This is supported by descriptions and part numbers. Adequate operating instructions are given but apart from the usual spark plug and fuel checks there are no servicing details.

Guarantee

The guarantee is 90 days for home use and 30 days for commercial use. There is a list of twenty conditions not covered by guarantee including the use of inferior fuel, accident, lack of lubrication, etc.

Conclusions

The Champ generator is an attractive proposition to a portable operator for use in topping up a 12 V battery. The high voltage outputs are of limited use except for operating a soldering iron or a small electric heater. For size and weight there can be few competitors. The generator would have to be placed at a distance from the operating position in order to avoid both electrical and aural interference. It is not recommended for float charging a battery which is being used to run radio equipment.

The Honda EIV 300 Generator

The Japanese Honda EIV 300 generator was loaned by Choppen and Co Ltd., 110 Fitzroy Street, Cambridge.

Usually equipment submitted for review is brand new but on this occasion the generator reviewed had seen many hours of service. The price is £79.

Description

The engine is a four stroke with a capacity of 55·4 cc, it is direct coupled to the generator. The assembly is resiliently mounted on a base and protected by pressed steel panels of which two are easily removable. The removable panels are rubber mounted to avoid rattle. A slab petrol tank which holds 3½ pints is mounted on top. A plastic carrying handle is fixed to the tank. Under the rear cover are fitted a spare plug, two spare fuses and a small tool kit. The tool kit consists of a double ended box spanner in which is a double ended screw driver shaft (blade and Phillips head), and a flat spanner.

The controls include a vernier throttle knob, a semi-rotary on/off switch coupled with a fuel tap and an ac-dc switch to prevent simultaneous use of ac and dc outlets. A small edgewise meter is calibrated at 50 and 60 Hz to enable speed to be closely controlled. Over the meter is a small lamp for illumination of the control panel.

The dc output is full wave rectified from 50 Hz ac.

Speed regulation is a spring biased centrifugal arrangement, the bias on the spring is adjusted by the vernier throttle. Both the ac and dc outlets are fused with in-line cartridge holders mounted under the front cover.

Manufacturer's Specification

Capacity	55·4 cc side valve four stroke
Compression ratio	5·5 : 1
Speed	3,000 rpm
Tank capacity	3½ pints
Fuel Consumption	0·62 pints per hour
Dry Weight	39½lbs
Size	13·2 in L × 9·8 in W × 12·1 In H
Outputs	250 V ac 50 Hz 250 watts Triple American 2 flat pin socket 12 V dc 5·4 A Single special socket

At the same price and with identical mechanical arrangement, the ED250 model will supply 24 V dc at 250 watts or 12 V dc at 220 watts.

Tests

A lamp load was used to evaluate the ac performance. At constant throttle setting the no load/full load variation was 250 to 212 volts. At constant speed (throttle readjusted at each test load) the no load/full load variation was 225 to 212 volts. The handbook indicates that it is necessary to increase speed (and consequently frequency) slightly to maintain the voltage at 300 watts, also the speed should be reduced slightly on light loading.

The dc outlet was used to float charge a battery during a portable expedition and found satisfactory.

The wave forms at both outlets were examined and found to be free from undue harmonics and transients.

Engine starting was no trouble.

Interference

The test site was identical to that used for the Champ.

No interference at any frequency was noted. When a two metre station was powered from 12 volt battery with the Honda float charging, slight interference was noted. This was only noticeable when listening to very weak cw signals.

General Comments

The Honda has an unusual characteristic for a small engine in that it was extremely quiet. It was possible to carry out a normal conversation in a small room with the generator running at full load. This is of course not recommended but does serve to illustrate the low noise level. During a 24 hour contest the Honda was placed under the car in which the operation took place; it was, of course, heard but was not in any way obtrusive.

Removal of the covers gives an immediate impression of compact inaccessibility, further examination however showed that a lot of thought has been applied to servicing. Plug and socket connections are provided for the internal cableforms and all preset adjustments are easily accessible.

Speed regulation at constant load was excellent. With the test lamp load under a fluorescent lamp the beat between the two 50 Hz supplies was very regular. No voltage variation was discernible on a meter.

Starting with a full tank and a 250 watt lamp load the generator ran for 7 hours 25 minutes which gives 16·8 hours per gallon.

After the review had been carried out it was discovered that the latest Honda generator has some modifications.

The oil filler cap previously under the front cover is now accessible from the outside; the American flat two pin ac outlet has been replaced by a 13 A flat three pin socket; the inline cartridge fuses under the front cover have now been replaced by panel mounted types.

The Handbook

The handbook is an excellent production and free of "Japanese English" which is normally a potential source of amusement. It is freely illustrated with drawings and photographs, working on the principle that pictures are multi-lingual. The sixty-four pages also contain details of the sister ED250 dc generator. It was noted that one of the accessories supplied with the ED250 is a hydrometer. Electrical circuits are good and the maintenance section gives full instructions for normal maintenance up to decarbonising. The only comment, perhaps, is that there is no spares list; but neither has a car driver's manual.

Guarantee

The Honda generator is guaranteed for twelve months from date of purchase provided the guarantee card is returned to Honda (UK) Ltd, within ten days of purchase. Parts replaced free of charge under guarantee are guaranteed for ninety days. Honda do not undertake to bear the cost of labour involved in fitting any new or repaired parts supplied. There are the usual exclusions for neglect or misuse.

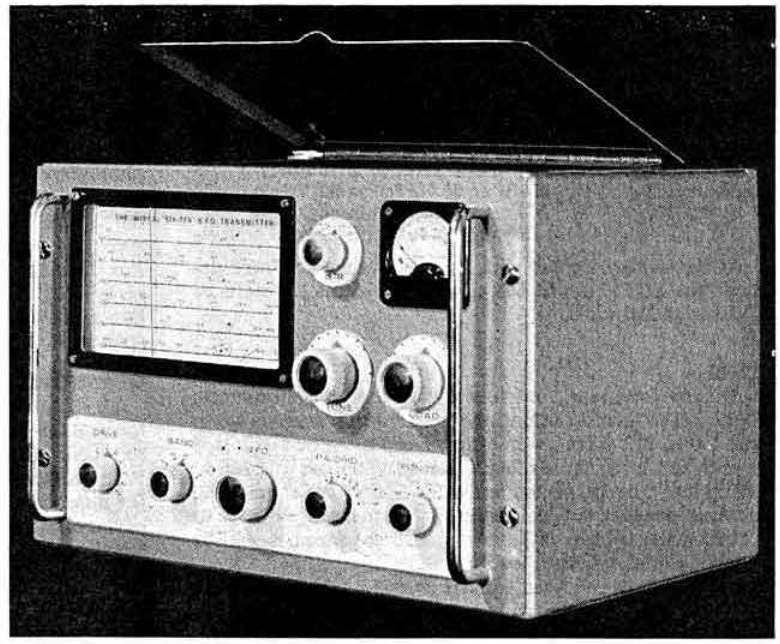
Conclusions

The Honda is a generator which deserves superlatives. It is well engineered and presented. A portable operator can have the choice of usable 50 Hz ac or dc literally at his elbow.

The only prerequisite is £79.

The Wirral Six-Ten NFD Transmitter

By N. KENDRICK, G3CSG*



CONSEQUENT upon the new NFD rules the Wirral Amateur Radio Society decided to build a pair of transmitters that would comply strictly with the new regulations, since previous transmitters had each used an 807 in the pa stage. The article that follows is a description of the transmitters. It is not suggested that clubs build transmitters exactly to this design, but the circuitry may be of interest since it collates a number of systems which produce an extremely stable transmitter with full break-in facilities.

No doubt part of the circuitry, particularly the vfo/co, could have been simplified but the writer wished to have good bandspread with an open dial on all bands from 160 to 10 metres.

A glance at the circuit shows that only five valves are used, all of them readily obtainable in the UK.

VFO CO

A 12AT7 operates as a crystal oscillator in one half and as a variable frequency oscillator in the other—the sum or difference of their frequencies providing output in the 160 to 10 m amateur bands. In order to allow each band to occupy all or most of the dial, the vfo has three switched tuned circuits. If constructors are not concerned over the problem of good bandspread then one tuned circuit will suffice as is common practice with many transmitters.

Mixer

Mixing takes place in the anode of the mixer valve, a 6BA7, and it is in this stage that keying takes place. The vfo/co runs continuously thus avoiding the risk of chirp. Drive on the amateur bands is only produced when the mixer is conducting which allows listening through under key up conditions. In the event that leakage does take place then the cathode of the crystal oscillator can be keyed simultaneously though, in the writer's experience, this was not found necessary.

Buffer

The buffer valve is a 6CH6 which gives ample drive to the pa. Indeed, drive is embarrassing on the bands between 160m and 20m. Despite the fact that a screen was erected across the base of the 6CH6, such that its anode could not 'see' its grid, this stage was unstable and had to be neutralised.

PA

The power amplifier is a 2E26 which has an anode dissipation greater than that required to run a genuine ten watts dc input. With 250 V on the anode, however, it can be kept within the limit using the constants shown. This valve was chosen since it has such excellent characteristics on the hf bands and has a top cap anode. A TT11 would have been quite suitable but its performance on 15m and 10m is not as good.

TR Switch

An EF80 triode-connected, acts as a transmit-receive switch and receiver muting. Under key up conditions the valve conducts and couples the pa pi-network to the input of the receiver. It is so effective that signals can only be heard in the receiver when the pa pi-network is resonant. Under key down conditions the valve is cut off by the rectification of a little rf taken from the pa. A potentiometer adjusts this bias such that it is possible to monitor the note of the transmitter in the receiver—this being absolutely essential during fast operating. The bias available lies between −10V and

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zero volts dependent on the potentiometer setting. This bias is fed to the avc system of the receiver and experience has shown that fast avc is necessary in order to achieve full break-in working.

Circuitry

The circuit is self explanatory though some details require a little comment. As has been already mentioned, the vfo has three switched tuned circuits in its grid in order to achieve an open dial. Some constructors may not trust the stability of the switched vfo but it has not given any trouble and all reports have been T9. The writer used various surplus crystals of HC6 U mounting and adjusted the vfo frequencies to suit them. All crystals were not available on the surplus market and some had to be bought at retail prices. The frequencies of crystals and vfo tuned circuits are shown below, but it is realized that constructors may use crystals available to them with suitable modifications to the vfo in order to bring the resultant mixing in the amateur bands.

Amateur band	Crystal Freq	VFO Swing
1·8–2 MHz	6978 kHz	4978–5178 kHz
3·5–4 MHz	9000 kHz	5000–5510 kHz
7·0–7·2 MHz	1994 kHz	4978–5178 kHz
14·0–14·350 MHz	9000 kHz	5000–5510 kHz
21·0–21·450 MHz	15,940 kHz	5000–5510 kHz
28·0–28·5 MHz	23,000 kHz	5000–5500 kHz

The coils in the mixer anode are wound on Aladdin formers, rescued from old television receivers. Each former carries two coils, one at either end. Thus only three formers are used resulting in a saving in space and short leads. The lf bands (160, 80, 40m) coils were wound at the top of the formers and the hf bands (20, 15, 10m) wound at the bottom.

Ideally coils not in use should be shorted out but in practice this was not found necessary. The only capacitance used to bring these coils to resonance was that resulting from self capacitance of the coils, inter-electrode capacitance of the 6BA7 and circuit strays. By this means tuning is reasonably flat such that output is fairly constant over the full width of the amateur bands.

A similar arrangement is used in the driver stage though the coils are brought to resonance by a 5 to 50 pF variable capacitor in the grid circuit of the pa A 50 kilohm potentiometer in the screen of the 6CH6 controls the drive available on the pa grid.

The pa is quite conventional except for the plug-in coils in the pi-network. Coil changing is timewasting and constructors may wonder why they were used in a contest

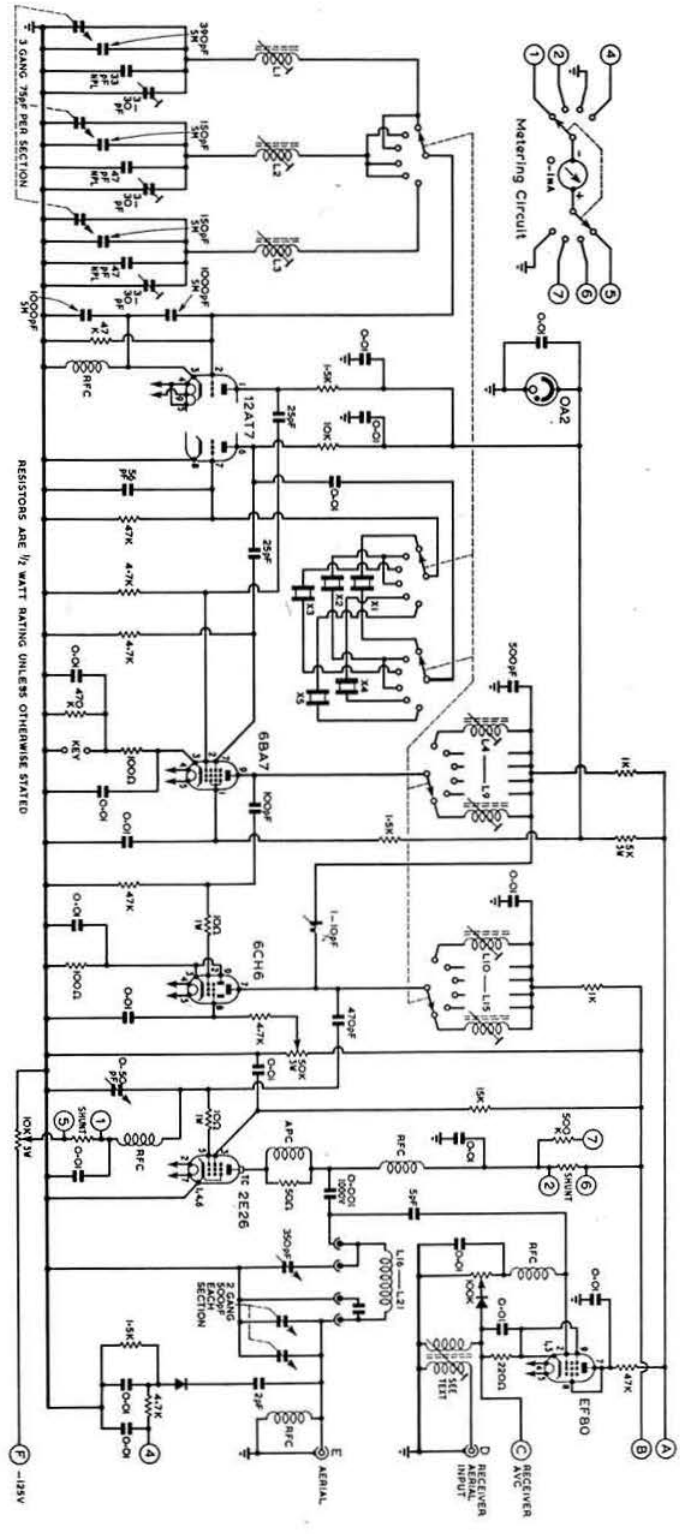
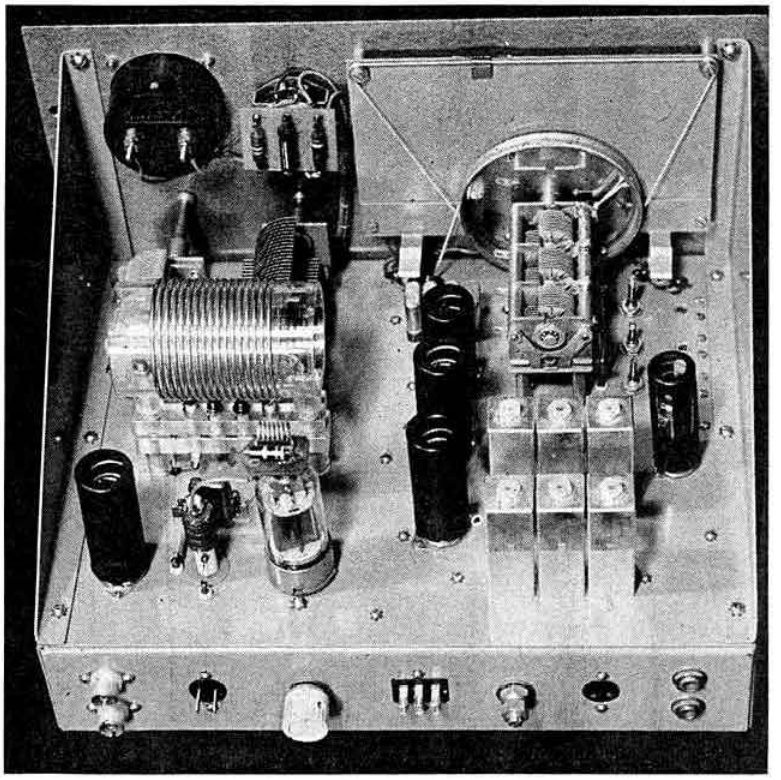
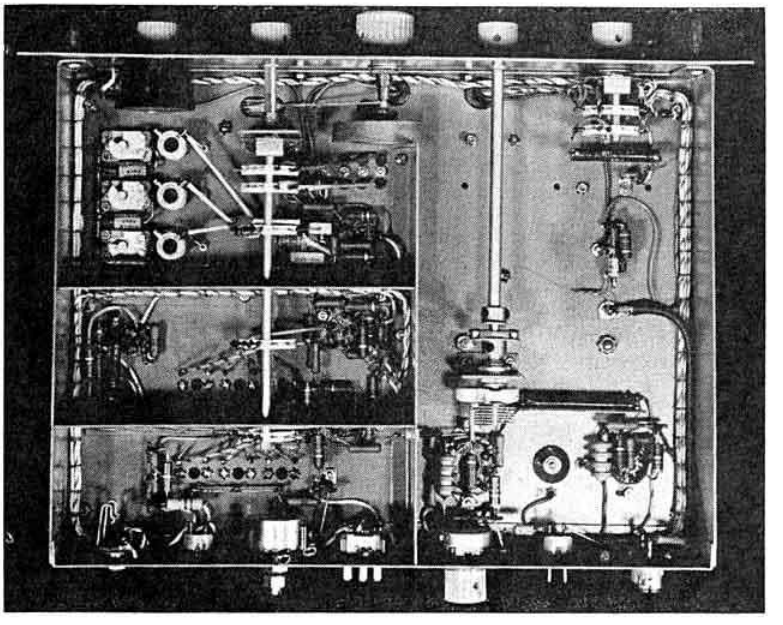


Fig 1. Circuit diagram of the transmitter.



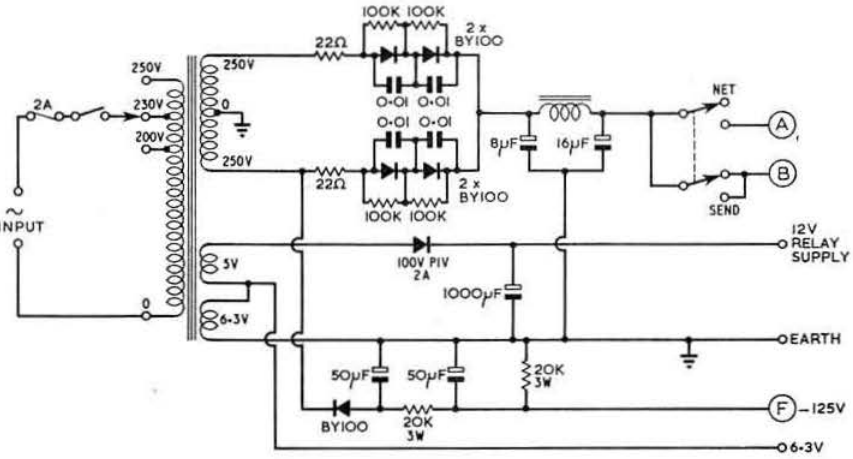
Plan view showing the layout. On the right hand side can be seen the vfo three-gang tuning capacitor and behind this the six cans containing the coils for the mixer and driver stages. On the left hand side is the 2E26 pa and the EF80 TR switch.

Photo by R. E. Foster



Underside view of the transmitter. The screening between sections can be seen with the vfo and co compartment on the lower right. Immediately above is the mixer stage and the top screen passes across the base of the 6CH6 driver stage effectively screening the grid circuit from the anode components. On the top left is the pa and tr switch. The rear apron contains (from left to right) aerial socket, avc mute socket, mute gain, services socket, pa bias potentiometer, relay socket and key jack.

Photo by R. E. Foster



Mains psu for NFD transmitter

designed transmitter. Several members of the Wirral club have often expressed some doubt about the efficiency of shorted coils in a pa pi tank and felt that plug-in coils would be preferable for a low power transmitter. Further it is not always desirable to terminate at 80 ohms impedance, particularly for end fed aerials on the lf bands. By using plug-in coils inductances and capacitances of the correct value could be used in order to feed the aerials direct from the pi-tank thus eliminating the use of a tuning unit. Television interference is not usually a problem on NFD.

The function of the transmit-receive switch and receiver muting arrangement has already been dealt with and all components are standard except for the transformer in the cathode circuit of the EF80. This is wound on a slab of ferrite as used in small domestic transistor receivers. Details of the coils appear in the table.

Since the writer was not certain how the break-in facilities would work in practice a net/send/receive switch was fitted and provision for an aerial changeover relay. In fact these were found unnecessary and constructors are advised to arrange for netting simply by switching on all stages except the pa.

Only the pa is metered by means of a two pole four position switch as follows:

1 Grid current	0–5 mA
2 Anode current	0–50 mA
3 Anode volts	0–500V
4 RF	

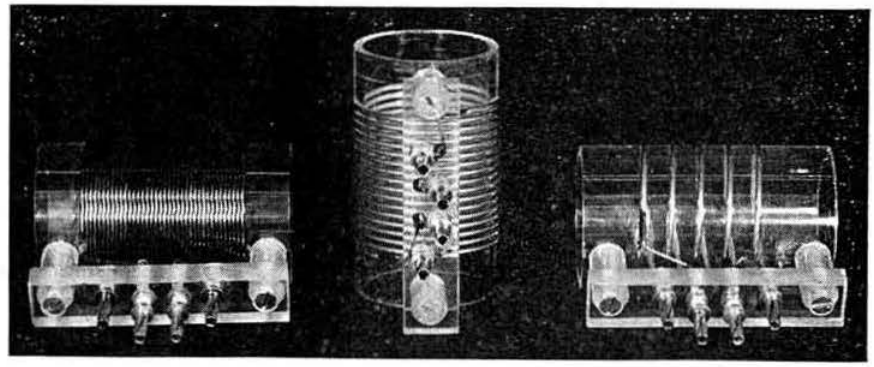
The rf reading is simply an indication of the feed to the aerial and consists of the rectification of a small amount picked up by means of a capacitor consisting of two insulated wires twisted together a few turns.

Complete constructional details are not given in this article since it is felt that few clubs will wish to take the trouble to build a pair of transmitters for NFD. In the event that some may do so the layout of components can be easily seen from the photographs. A cord drive was used for the vfo in order to keep costs down and the dial was home-made for the same reason. The size of chassis and front panel will depend largely upon what is to hand, but in the instance of the Wirral transmitter, the cabinet, panel and chassis were purpose made by the writer and his colleagues. No attempt was made to produce a transmitter of small physical dimensions simply for the sake of miniaturization. Rather was the size and layout suitable for available components.

Coils

Coil data for the transmitter is shown in the accompanying table. Polyurethane varnish is used to keep windings in place and here mention should be made of the method the writer used to wind coils on Aladdin type formers.

The former is secured in the chuck of a wheel-brace by means of a length of 0BA studding and the wheel-brace clamped horizontally in a vice. One end of the coil is secured to one of the spill holes at the base of the former and the coil wound on neatly by rotating the former. The free end



This shows the construction of the plug-in coils. They are made from Perspex tubing of 2 in od and 3½in long, with a wall thickness of ⅛in. The base of the coil former is also made from Perspex, 3½ in long, ¾ in wide and ¼ in thick. Four plugs on the coil enable extra capacity to be placed across the loading capacitor and series capacity inserted to the tuning capacitor in order to attain ease of resonance on the hf bands.

Photo by R. E. Foster

Coil Table

Coil Number	Function	Inductance	Coil Former	Dia.	No. of Turns	swg
L1	vfo 1·8/7·0 MHz	4·5 μH	Cambion L55 series	0·375 in	21	26 close wound
L2	vfo 3·5/14/21 MHz	6·4 μH	Cambion L55 series	0·375 in	30	26 close wound
L3	vfo 28 MHz	6·6 μH	Cambion L55 series	0·375 in	30	26 close wound
L4	mixer 1·8 MHz	105 μH	Aladdin type former	0·3 in	¾ in	40 enam. close wound
L5	mixer 3·5 MHz	37 μH	Aladdin type former	0·3 in	⅞ in	38 enam. close wound
L6	mixer 7·0 MHz	14·4 μH	Aladdin type former	0·3 in	⅞ in	34 enam. close wound
L7	mixer 14·0 MHz	4·4 μH	Aladdin type former	0·3 in	28	26 close wound
L8	mixer 21·0 MHz	1·9 μH	Aladdin type former	0·3 in	13	26 close wound
L9	mixer 28·0 MHz	1·42 μH	Aladdin type former	0·3 in	6	26 close wound
L10	Driver 1·8 MHz	130 μH	Aladdin type former	0·3 in	1 in	40 enam. close wound
L11	Driver 3·5 MHz	36 μH	Aladdin type former	0·3 in	⅞ in	38 enam. close wound
L12	Driver 7·0 MHz	9·8 μH	Aladdin type former	0·3 in	⅞ in	34 enam. close wound
L13	Driver 14·0 MHz	3·0 μH	Aladdin type former	0·3 in	24	26 close wound
L14	Driver 21·0 MHz	1·65 μH	Aladdin type former	0·3 in	7	26 close wound
L16	PA 1·8 MHz	48 μH	Perspex tube × 3½ in	2 in	40	16 enam. close wound
L17	PA 3·5 MHz	26 μH	Perspex tube × 3½ in	2 in	30	14 enam. close wound
L18	PA 7·0 MHz	10·4 μH	Perspex tube × 3½ in	2 in	17	14 spaced 2 in
L19	PA 14·0 MHz	3·45 μH	Perspex tube × 3½ in	2 in	9	14 spaced 2 in
L20	PA 21·0 MHz	1·37 μH	Perspex tube × 3½ in	2 in	5	14 spaced 2 in
L21	PA 28·0 MHz	1·07 μH	Perspex tube × 3½ in	2 in	4	14 spaced 2 in

The rf transformer in the cathode circuit of TR switch EF80 consists of a slab of ferrite 2 in long, ½ in wide and ½ in thick. Fill the slab with bifilar wound 26 swg enamelled wire. Form a suitable length of wire into a single pair. Wind on from one end so that the pair lie side by side, fill the slab completely and then varnish with polyurethane. When dry secure the whole to a suitable tagboard and earth one end of each wire. Other ends of wire are connected as shown, one to the cathode circuit and the other to the receiver aerial input terminal.

of the wire is then tied to the paxolin spill holder at the top of the former and the coil then coated with clear polyurethane varnish. Allow 24 hours for the varnish to dry and harden and then peel off excess turns and secure ends of the wire to the 18 swg spills. The same method is used when winding two coils on one former, if different gauges of wire are used then join the wires temporarily at the centre of the former, varnish and make up as previously.

Power Supplies

Power supplies for the transmitter are quite modest and the circuit shows the required information. Needless to say they are constructed on a separate chassis and are connected to the transmitter by a five core cable.

The Wirral Amateur Radio Society have used a pair of these transmitters for NFD in the past two years and they have proven very satisfactory. Much time is saved with full break-in though only a few groups take advantage of the fact that we are able to listen through. Indeed one group were quite amused by our calling CQ BK.

No claim is made by the writer for the originality of any of the circuits shown. Most of them are now commonplace—he has simply brought together ideas from other people and put them on one chassis. In the event that further information is required an sae to the writer will ensure a prompt reply.

G3LUB R, C and L Bridge

It is regretted that several errors occurred in the article by G3LUB on the R, C and L Bridge published in the December, 1968 issue of *Radio Communication*.

Corrections appear below.

1. Page 819, switch S1B contacts 2, 3 and 4 connected together should go to the other side of the 3K ohm/potentiometer (lower end as seen on the diagram), not as shown going to the upper end of this potentiometer.
2. Page 822, top right diagram all references to S1 should be S3.
3. Switch S1 has wafers numbered from A to I with the exception of the letter G which is not noted and not used.
4. Switch S4A contact 3 connected to the 0·1 μF capacitor should go to contact 3 of S1F and not contact 2 of S1F.
5. Page 821, oscillator signal output leads should be lettered from the top A, B, C. Page 819 bottom oscillator lettered anticlockwise A, B, and C, C being below +9V.

Obituary

Tom Hall, G2TH

We regret to report the death of Tom Hall, G2TH, due to a heart condition on 22 October, 1968. He died at his new house in Wivelsfield Green, Sussex, aged 58 years.

He was first licensed in 1927. After service with the GPO for several years he joined Sullivan's and then resigned to take up an appointment with the Gold Coast Post and Telegraphs in 1937. Many older members will recall with nostalgia the cw signals from ZD4AB. Tom was the first amateur station operating from the (then) Gold Coast and was eagerly sought after by DX men. He returned to the UK in the early 50's (together with his wife who he met and married in South Africa during World War II) to live at Ewell in Surrey.

From here he was consistently active on all bands from 160 to 2 metres. His passing will be mourned by many amateurs across the world.

Our sincerest condolences to his wife Dorothy, his son Tommy and the Hall family.

J.D.L.

Tim Hughes, G3GVV (RSGB Council member) operating the hf band station; a KW 2000A which was on loan to the Society from KW Electronics Ltd.

Maurice Margolis, G3NMR (left) and Terry Edwards, G3STS (owner of Radio Shack Ltd) in "reception" at the new headquarters.

RSGB Headquarters Open Weekend, 14 and 15 December, 1968

The idea of an Open Weekend to show the new Headquarters to members was quite late in forming. We had hoped to get the Society's Patron, HRH the Prince Philip, Duke of Edinburgh to be present at a formal opening ceremony. Unfortunately, Prince Philip was not available until well into 1969, so it was decided that a less official occasion would be more appropriate in these circumstances.

An Open Weekend, where members could come at their leisure to see around their new property, seemed a sensible proposition. It could be a minor social function giving amateurs a chance to talk with friends, for a change! This was decided upon and it fell to David Evans, G3OUF to organize and the Society's Public Relations Officer, Mrs Sylvia Margolis, to publicize the event.

An important part of the weekend was to be the installation of several stations in the building. This was from the start a major problem. The Headquarters is in a block of large Victorian houses, each with four storeys above ground level. The roof space is negligible, being for the most part steeply gabled. There is, however, a little flat space available. With all this in the centre of the city and without having yet opened up friendly relations with neighbours, aerials were an obvious difficulty.

We wanted to have stations on 160, 80, 40, 4 and 2 metres. In the end all of these proved feasible except for 160 which was left alone. We apologise to any members who were unable to work us owing to our not operating on this band, but a suitable aerial was just not possible. On 80 we used a large fibre glass whip with a wire counterpoise running down the side of the building. On 40 and also on 10, 15 and 20 metres, a Webster Bandspanner mobile aerial was used as a loaded groundplane. Results on the hf bands before the Open Weekend were surprisingly good, with several continents being worked despite the dubious operating conditions. Four and two presented little problem, vertical and horizontal dipoles being used for the former and a J-Beams Omni-V for the latter.

The Open Weekend itself was a great success, with some two hundred licensed amateurs from all home counties and from the USA, Rumania, Eire, France and Israel plus many sundry listeners, friends and relations visiting the Headquarters. The universal attitude was one of admiration for the gracious building and a feeling of pride amongst members was very evident.

The three stations in use were situated in the library, the Council Room and in a third floor office. The station on 80 and 40m was a KW2000A transceiver and on 2 and 4m, converted commercial equipment performed well. The special callsign GB2HQ was an undoubted attraction on the bands.

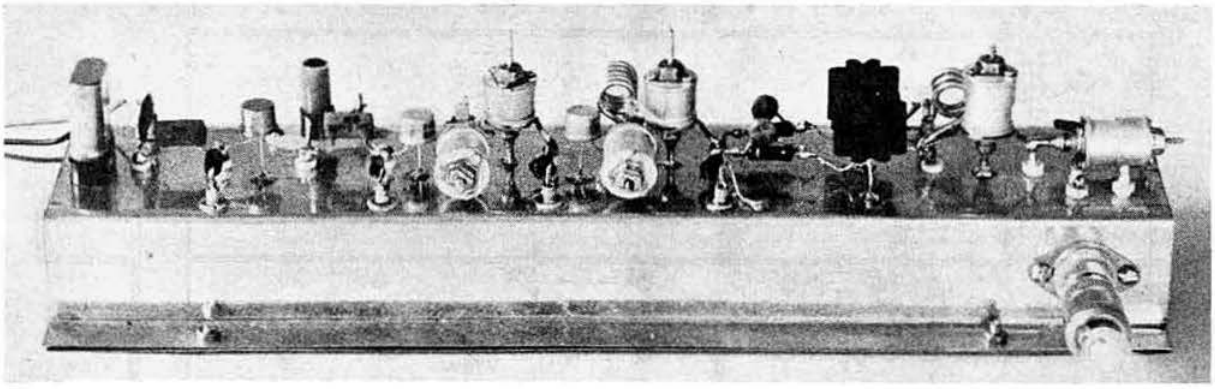
Conditions on all the bands used were good and a total of some 400 contacts were made. It was interesting to note that many contacted expressed a desire to see a permanent Headquarters station. This is a possibility for the future. On 80m, over forty counties throughout the United Kingdom were worked, whilst an experienced vhf operator from the Midlands appeared quite flabbergasted at the large number of contacts made on 2m.

A full list of acknowledgements to all those who helped in some way, would be impractical, but the following deserve special mention. Mr R. G. Shears, G8KW, of KW Electronics without whom the hf station would not have been. Messrs E. Yeomanson, G3IIR and P. J. Simpson, G3GGK for providing vhf equipment. Mrs M. Slasburg and Mrs Hum (xyl of GSUM) for assisting with catering. Mr S. Jacobs, G3SUS, of Danor Engineering Ltd., for assistance with aerial mounting. All staff and operators who gave up a substantial part of their weekend to help in various ways. Thank you all.

The 4 m station operated by Don Hayter, G3JHM with G5YY (left) and Jack Hum, G5UM (of Four Metres and Down) looking on.

Mike Wallace, G8AXA operating the 2 m station in the library.

Two Council members, Eric Yeomanson, G3IIR (left) and Geoff Stone, G3FZL (right—the Society's VHF Manager) seen talking to Charlie Newton, G2FKZ (Member of the Scientific Studies Committee) in the library.



A Two Metre "Snowflake" Transistor Transmitter

By R. J. Barrett, GW3DFF*

THE transmitter described in this article is the result of investigation and experiments over the past few years in an effort to build a cheap 144 MHz Transistor Transmitter with a reasonable power output that can also be used for portable work.

The design breaks away from the usual highly expensive semi-conductor associated with vhf transmitter stages, and uses four 2N2218 "Snowflake" transistors, so called because the internal geometry of this device resembles a snowflake in design (see Texas Instruments 2N2218 Data Sheet No 633544). At present, these devices are available at 7s 9d each. The 2N2218 has a maximum voltage rating of 60V between collector and base (Vcbo) and an Ft of 250 MHz. These are used in a common base configuration, taking advantage of the high collector base voltage rating. Although the power gain in common base is less than in the more usual common emitter configuration, stability is much improved and unwanted frequencies from the crystal oscillator and multiplier stages are not passed through to the final pa so easily. The oscillator and doubler stages use the well known 2N1613 transistor which has a Vcbo of 75 volts, an Ft of 60 MHz and is priced at 4s 3d. The transmitter was designed using easily obtainable parts and may be attempted by anyone who has had a little previous experience with transistor circuitry.

The chassis is made from tin plate folded as shown in Fig 1 and its rigidity may be improved by fixing a bottom plate cut from the same material with four 6BA screws. This material has been chosen because the design calls for many soldered connections direct to the metal, and no-one wishes to make connections to transistors with a 150 watt soldering iron! Caution must be taken with the decoupling capacitors and only 1000 pF feed-through types should be used. Efficient decoupling is of extreme importance in low impedance circuits. Only the specified radio frequency chokes should be employed. These are critical components and must be of the lowest inductance possible consistent with performance. Start by drilling the chassis and fixing the feed through insulators in position. Some of these are used as feed throughs and some as convenient anchor points for components and wires. Note that the feed-through next to the aerial output socket is in fact earthed. This is to provide a convenient earth point when trying various lamp loads should you not wish to use the method described later.

The crystal oscillator uses a 24 MHz overtone crystal and is built on the underside of the chassis. The emitter biasing components, R1 and C1, are soldered direct to the chassis at the one end with the other ends soldered direct to the emitter of TR1 with no additional support. The normal base biasing resistors are R2 and R3. Feedback through the crystal is achieved by a centre tap on L1. Output from the oscillator stage is taken via C6 to the emitter of TR2. This transistor is connected in common base and its base lead should be cut to approximately $\frac{1}{8}$ in and soldered direct to the chassis. The bias resistor R4 is beneath the chassis and soldered direct to it. (See Fig 2.) Reference to Fig 3 should make the mounting of the transistors quite clear. Transistor TR2 is doubling to 48 MHz and output is taken via C10 to TR3 tripling to 144 MHz. Tuning for TR3 is arranged by two concentric trimmers C14 and C15 connected from TR3 collector to chassis. C15 has its centre connections soldered direct to the chassis and C14 is supported by soldering one of its outer connections to the adjacent feedthrough insulator. Refer again to Fig 3. Capacitor C16 which is connected in parallel with C15 is soldered below the chassis. Output from this

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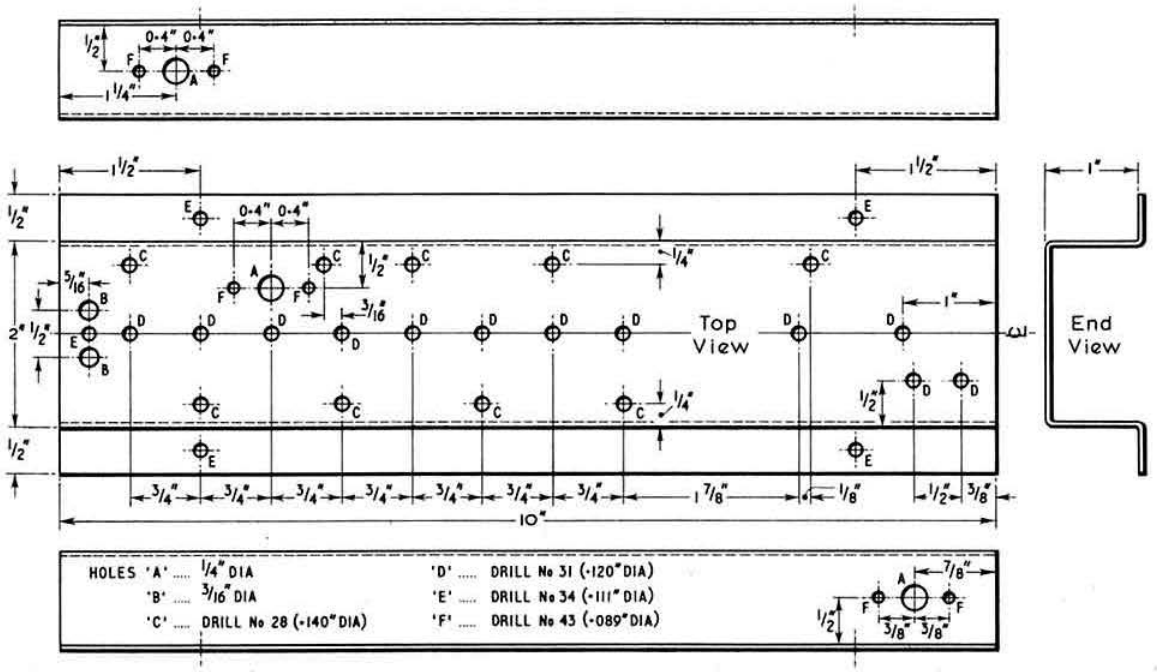


Fig 1. Drilling template.

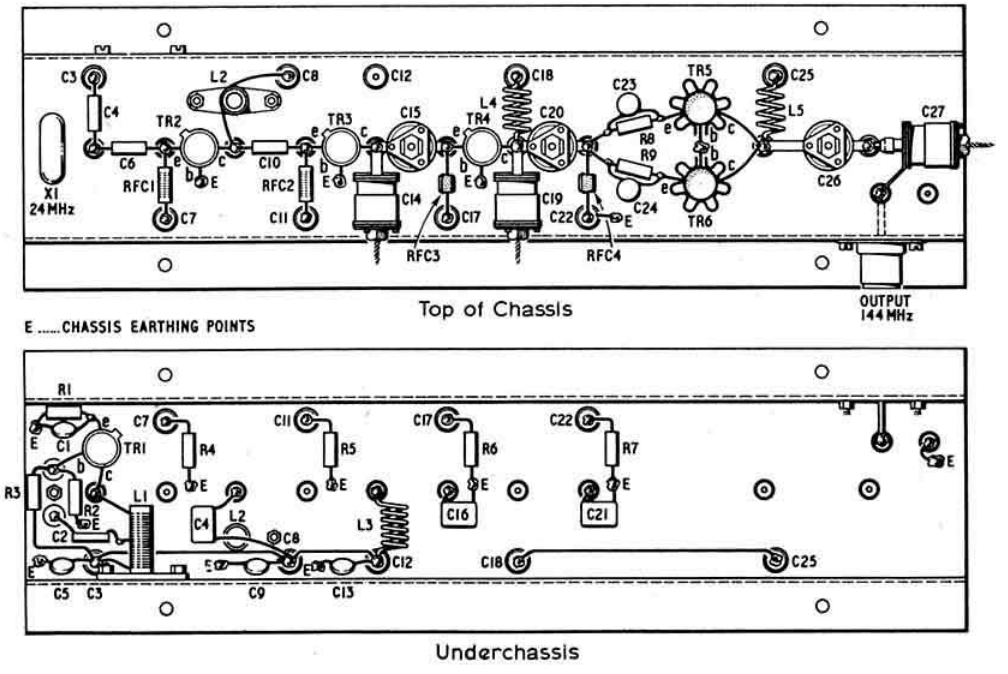


Fig 2. Component layout diagram.

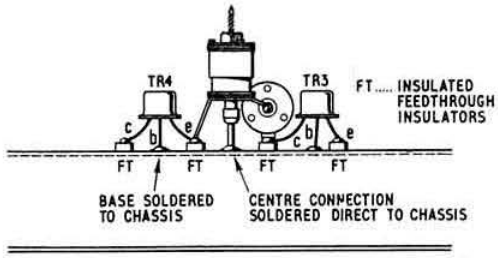


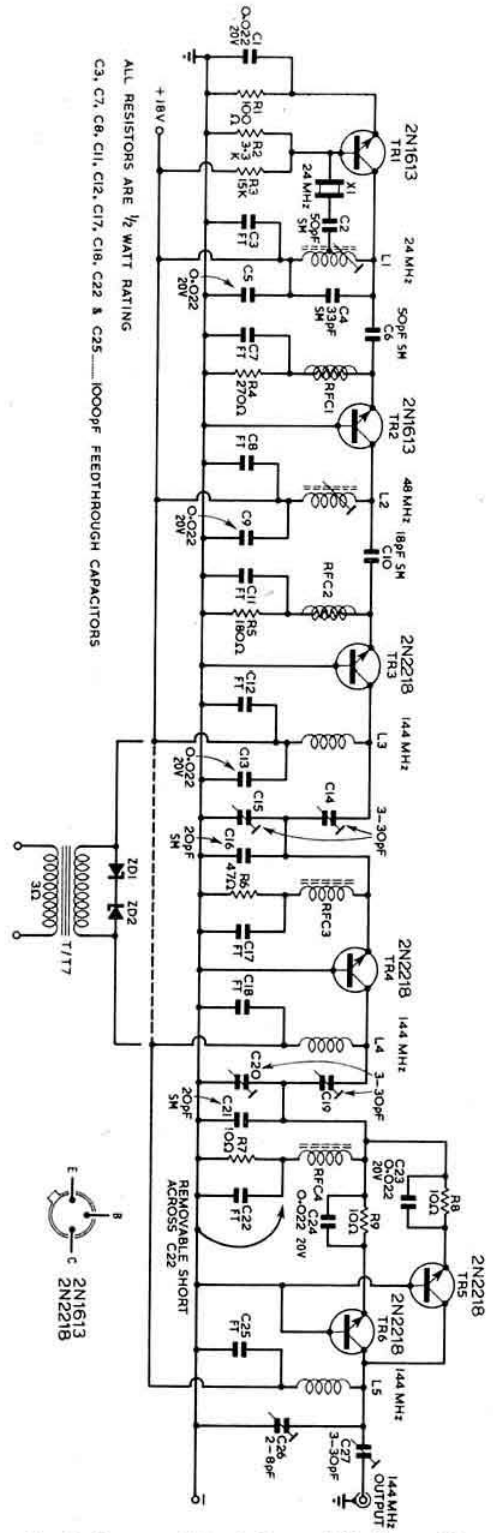
Fig 3. Diagram showing detailed layout of the pa.

stage is taken from the junction of C14 and C15 and by adjusting the two capacitors which in effect are tapping up the coil and matching the impedance to the following stage. Transistor amplifiers of this type perform best when heavily loaded and instability may result if the lower capacitor is screwed in too far. TR4 is the driver stage and feeds TR5 and TR6, the power amplifiers, connected in parallel through separate emitters thus preventing "current hogging" by one transistor. Should one of the power amplifier transistors become much hotter than the other increase the value of R8 and R9 slightly. This will reduce the output somewhat but slightly increase the efficiency. Another way to overcome this trouble is to try various pairs of transistors until they appear to run approximately at the same temperature. Testing with the finger is quite adequate. All the transistors in this transmitter run quite hot to the touch. To assist cooling TR5 and TR6 are fitted with small clip-on heat sinks. Silicon transistors can run quite safely to 200°C so do not become too alarmed if you only have experience of germanium types. The output stage has been designed to work into a 75 ohm load and lamps which do not approximate to this resistance when hot may give a false indication of the output. A 6 V, 60 mA type is probably best for initial tuning but it should be possible to light a 6 volt 0·1 A bulb to the point of burn out when the circuit is peaked for maximum output. No meter is included in the power amplifier circuit of the transistor and this may be viewed with some concern by amateurs who feel that a transmitter without a meter may be uncomfortable to use. In practice it has been found that one soon becomes quite accustomed to its absence, but of course a meter may be fitted if desired.

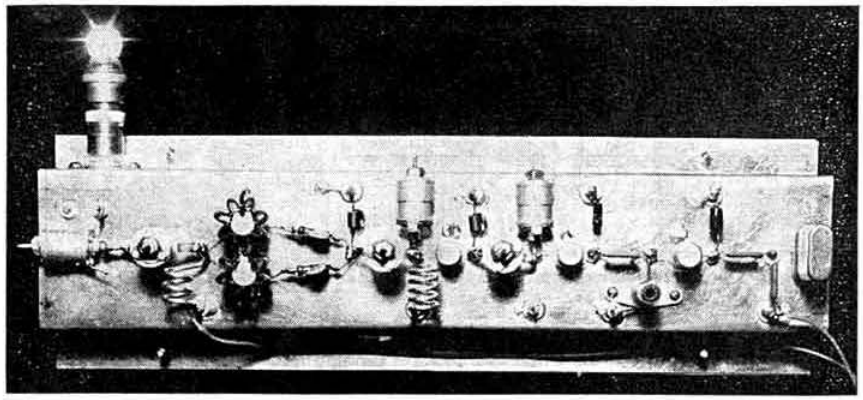
Alignment

Alignment of the completed transmitter will be assisted by connecting a 6 V, 60 mA pilot lamp as a load across the output and by an absorption wave meter tuning 24, 48 and 144 MHz.

Unscrew all trimmers to the minimum capacity position. Unscrew both slugs in L1 and L2 as far out as possible. Connect a 0 to 10 volt dc meter between C7 and the chassis. Apply positive 18 volts to the supply rail. Screw in the slug in L1 and adjust for maximum meter reading. This should be approximately 2 volts. Remove the meter and reconnect it between C11 and the chassis. Adjust the slug in L2 for maximum meter reading, approximately 1·5 volts. Connect the meter across C17 and adjust C14 and C15 for maximum voltage on the meter, approximately 1 volt. Connect the meter across C22 and adjust C19 and C20 for maximum voltage, approximately 0·6 volt. Remove the meter and short out C22 to the chassis. Adjust C26 and C27 for



Circuit diagram of the rf stages of the transmitter.



General view of transmitter taken during the alignment process.

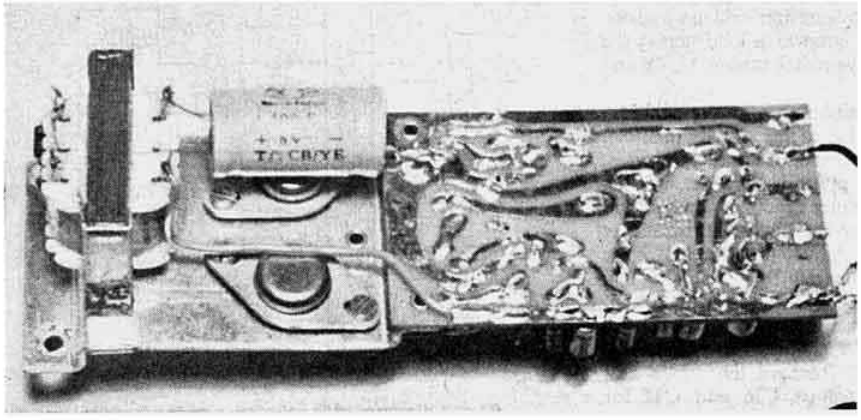
maximum brightness in the lamp load. Connect a 200 mA meter in the supply to the driver and power amplifier stages. Adjust all slugs and capacitors again, starting with the crystal oscillator, this time for maximum current in the meter, approximately 150 mA. For high level modulation the short circuit across C22 should remain. Removal of the short should cause the combined driver and power amplifier current to drop to approximately half. This is the correct condition for low level modulation. With a positive 18 volt supply, power input to TR5 and TR6 is about 2 watts and output at 144 MHz is approximately 1 watt.

Modulation

Amplitude modulation of transistor power amplifier stages can be most successful providing one or two precautions are observed. It is most important that the maximum collector to base voltage rating (Vcbo) is at no time excceeded, in our case 60 volts. If a supply rail of positive 18 volts is used then twice this voltage can appear at the collector as the tuned circuits are, of course, inductive. Any modulation voltage applied to the collector will be superimposed on the top of this and, therefore, must be limited to 24 volts peak to peak. This is assured by connecting two 12 volt Zener diodes back to back across the modulation transformer secondary, thus clipping off all modulation peaks above 24 volts, thereby safeguarding the final transistors and providing a measure of speech clipping.

The feed-through capacitance in a transistor will allow power to pass through the final amplifier even if down modulating audio has reduced the collector voltage on the final to zero. This produces an under-modulation effect in which it is impossible to modulate fully in the downward direction. This is overcome by modulating the driver stage as well as the final. A suitable modulator for this transmitter would deliver about 2 watts output and could be completely transistorised. The unit shown in the photograph has been used very successfully and is a type PC5 Newmarket transformerless amplifier which is obtained ready built at a very reasonable price. The output is rated at 3 watts using a negative 12 volt supply, but we are using it on a negative 9 volt rail, reducing its output considerably. Note that this unit uses PNP transistors and must have its own separate battery. The modulation transformer presented quite a problem as an easily available type was required together with small size. A Radiospares type T/T7 transistor transformer was used, the output of the amplifier being taken via a 500 μF capacitor to its low resistance winding (3 ohm). The other winding, the centre tap of which is not used, serves as the modulation transformer secondary, and has the two zener diodes Z1 and Z2 connected back to back across it. Although this transformer is only rated for 500 mW output it performs very well, and reports on the modulation have been excellent. The transformer is mounted on the amplifier by a tinplate strap $\frac{1}{4}$ in wide, soldered around the laminations, the ends bent around the amplifier heat sink.

The power amplifier stages in the transmitter are working



The modulator unit.

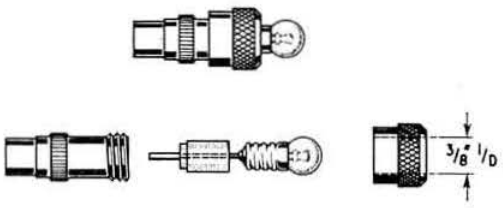


Fig 4. Diagram showing construction of rf load.

in class B and low level modulation may be successfully applied by removing the short across C22 and feeding audio in at this point. This may be via a large capacitor or R7 may be replaced by a transformer, the secondary resistance of which is approximately 10 ohms. A few milliwatts from a small single ended transistor amplifier will fully modulate the transmitter at this point.

Some success was achieved with narrow band frequency modulation by connecting a type BA107 variable capacitance diode across the crystal. A maximum deviation of about 5 kHz was achieved at 144 MHz.

A suitable method of constructing a lamp load by drilling out one section of a standard co-axial aerial plug to hold a pilot lamp is shown in Fig 4. The lamp is a 6 volt 100 mA type and has a short length of wire soldered to its centre tip, and this is passed down the body of the plug and soldered to the centre pin.

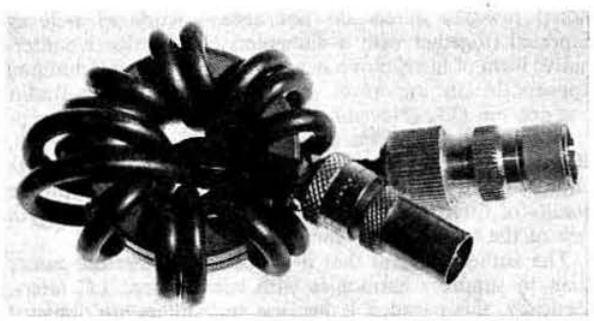
COMPONENTS LIST

RFC 1, RFC 2 — 25μH.—90 turns of 36 swg enamel covered wire pile wound on a 1 Mohm 1 watt resistor.
RFC 3, RFC 4 — 3 turns of 23 swg on Radiospares Ferrite bead, toroidal wound.
12 Lektrokit feed through bushes part No LK2121, 12 Lektrokit soldering pins part No LK3011 — Or Radiospares lead through insulators (fit 5/32 in hole).
L1 16 turns centre tapped 22 swg enamel covered wires on ¼ in od former.
L2 8 turns 22 swg enamel covered wire on ¼ in od former.
L3 5 turns 16 swg tinned copper wire ¼ in id, ⅜ in long.
L4 5 turns 16 swg tinned copper wire ¼ in id, ⅜ in long.
L5 4 turns 16 swg tinned copper wire ¼ in id, ⅜ in long.
1000 pF feed through capacitors from Radospares.

Results

The transmitter is quite cheap and simple to build. Up to this time four models have been completed, one on a printed circuit board. All the transmitters produced a similar power output. The best DX result so far is over 200 miles, and stations have often been surprised when told of the low power input, and all transistor construction. The output is sufficient to drive a type 4388 Varactor diode tripling to 432 MHz, giving about 400 mW at this frequency. Excellent reports have also been received on this band. The transmitter should be eminently suitable for RAEN work and brings the completely transistorised portable station, to be transported by one man if required, within reach of the vhf enthusiast.

High Pass Filter



Visitors to the RSGB Exhibition last October will probably have seen a new type of filter demonstrated by the GPO and designed for insertion in the coaxial feeder of a television receiver. Many cases of tvi result from the pick-up by the feeder of fundamental frequency rf from an adjacent hf bands transmitter. Rf voltage appearing on the inner conductor can be greatly attenuated by the usual type of high pass filter, but rf existing on the feeder braid is not reduced and can be transferred to the television receiver by the capacitor usually fitted in modern sets.

The new type of filter has been found to be very effective in cases where rf pick-up of the fundamental is troublesome. There is a slight attenuation of the TV signal but in normal service areas this is not a problem. As will be seen from the illustration the filter consists of a number of turns of thin coaxial cable wound round two ferrite toroids. In the GPO filters the rings used were of Mullard manufacture type FX1588 and these have been found to be satisfactory by other users. A close equivalent to the Mullard toroid is the Neosid type 4324R/3 in F14A material. Other users have found that the grade of toroid is not critical and the material used in rtty filters has been successfully used.

No formula can be quoted for the number of turns of coaxial cable required. Success has been reported with various permutations using two or three toroids and between 8 and 18 turns. Like almost all tvi problems each case has its own individual solution. The toroids cannot be obtained by retail customers from Mullard Ltd. but they are held in stock by KW Electronics Ltd. of 1 Heath Street, Dartford, Kent. The post paid price is 10/- for one pair of rings and extra rings are 4/- each.

G2BVN

TECHNICAL TOPICS

By PAT HAWKER, G3VA

DURING recent months, several novel ideas have emerged as useful aids in the battle against TVI. Nevertheless, for many years it has been taken for granted that one of the most important means of reducing harmonic radiation is the multi-section low-pass filter. Many designs have been published which, when inserted in a coaxial aerial transmission line, should virtually stop any vhf harmonics from reaching the aerial elements. Yet, increasingly, there have been doubts whether the high theoretical attenuation figures of these filters are always (or even often) being achieved in practice.

Absorptive Filter Approach to TVI

What may well prove to be an extremely valuable contribution to the better understanding of just why the conventional low-pass filters do not always work as well as expected (together with a discussion of an attractive alternative form of filter, plus a new filter construction technique) appears in an important article by two Collins Radio engineers in *QST* (November, 1968). This article—" Absorptive Filter for TV Harmonics " by Richard Weinreich, K0UVU and R. W. Carroll—deserves to be read in its entirety by anyone who has ever been disappointed with the results of fitting a low-pass filter. For the present, only a few of the major points can be abstracted.

The authors suggest that it is possible to increase rather than to suppress harmonics with conventional LC filters. Basically, this paradox is because such filters are designed to be driven from a purely resistive source and loaded into a resistive termination. Now, even in a correctly set up filter system, the typical transmitter output impedence tends to be resistive *only* at the output frequency, and is likely to be highly reactive at least at some of the harmonic frequencies. The transmitter reactance at these harmonics may partially, or even wholly, cancel the filter input reactance, and thus permit vhf power to reach the aerial elements.

The Collins engineers believe that the solution to this " unhappy chapter in filtering " is to use filters which achieve filtering by absorption of the harmonic energy rather than by attempting to reflect these harmonics back into the transmitter. They suggest that this can be done in much the same way as the audio high-fidelity enthusiast has long directed higher frequencies to his tweeter, and bass frequencies to his woofer. In other words, by means of an effective cross-over filter which separates out the vhf from the hf and then matches the vhf energy to an idling resistive load where it can do no harm, leaving the hf energy to go to the aerial. Fig 1(a).

The *QST* article presents full design formulae for 2, 3, 4, 5 and 6 pole filters to this general specification, with constructional details of a representative 4-pole filter; see Fig. 1(b). They report that in practice some 16 filters have been constructed, with six-pole units proving the best from the standpoint of all-channel protection (but remember that the Americans are not concerned with the toughest Channel 1). Furthermore, they note that an effective notch can be put in for a particular channel by using one or more series-tuned trap sections.

These filters make use of a new constructional technique which could equally play a significant role in the improvement of filter results: the fixed capacitors, the interconnecting " wires," and the screening are all formed by using double-clad copper printed circuit board. The copper surfaces not only provide low-inductance capacitors and interconnects but, with proper lay-out, an effective self-shielded box, or internal screen. It is further claimed that this approach results in low costs compared with other TVI filters of comparable power-handling capabilities. For maximum power-handling, copper-clad Teflon boards are recommended, but the more readily available double-clad fibre-glass-insulated boards are reported to have performed satisfactorily with transceivers of 100 watts output.

Capacitance of these boards per square inch can be determined using a test coil and grid-dip meter; subsequently

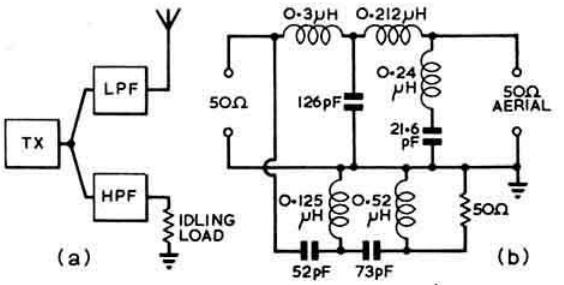


Fig 1. (a) General principle of absorptive filters. (b) Representative circuit of four-pole filter with design cut-off at 40 MHz and rejection peak in American Channel 2 (54-60 MHz), using double clad printed board having capacitance of 10 pF per square inch for screening and capacitors. Design formulae for two to six pole filters of this type are given in the original *QST* article.

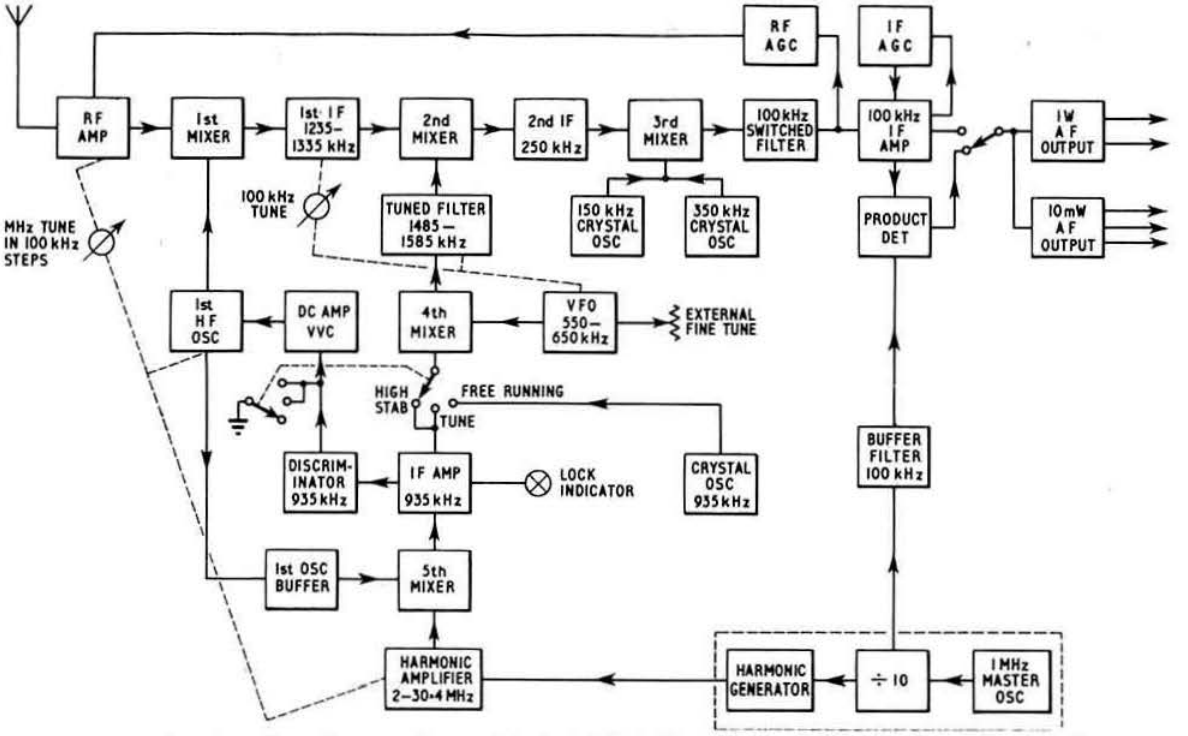


Fig 2. Simplified block diagram of new Eddystone 958 receiver (lf/mf switching arrangements omitted).

low-value capacitors can be fabricated simply by marking out the required area of copper. The outer " box " for the filter can be formed from similar board, with both outer and inner surfaces bonded together to form a double screen. For transmitter powers of under 300 watts pep, the vhf idling load can comprise a pair of 2 watt 100 ohm resistors in parallel, assuming a reasonably flat line.

Attenuation of a 6-pole filter is given as better than 40 dB throughout the vhf stop band, and mostly of the order 45-50 dB. Filters using printed-board capacitors are stated to be effective well up into the uhf region, whereas similar filters based on mica capacitors may give little attenuation at uhf.

One final point emerges vividly from this article: no low-pass filter can be fully effective unless the basic transmitter is adequately shielded, with all emerging leads adequately filtered. It is reported that, in a Channel 2 fringe area, transceivers of four different makes were operated—none had adequate shielding/filtering, as they stood originally, to allow the absorptive low-pass filter to do its job properly.

In other words, not even an absorptive filter can hope to cure TVI if the harmonics can leak out along paths other than the aerial feeder.

New Eddystone Solid-state Receiver

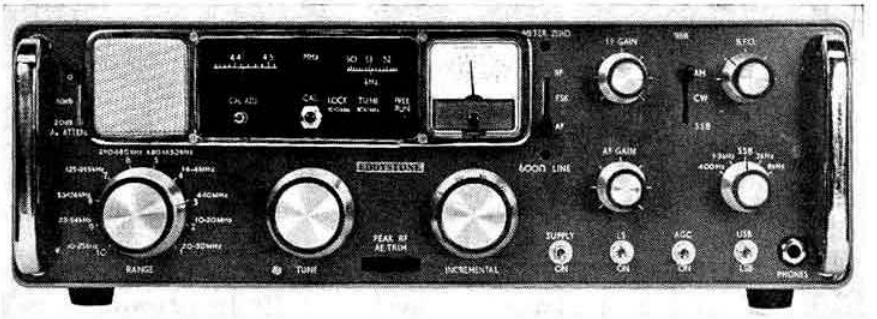
Last month *TT* reported on work by Eddystone on new receivers for marine ssb. *Point-to-point Telecommunications* (January, 1969) contained preliminary details of a new advanced all-semiconductor general purpose receiver from the same stable: the Eddystone 958. This is a wide range (10 kHz to 30 MHz) receiver aimed at the commercial market and designed for ssb or fsk reception and in much the same category as the comparable Racal, GEC, Plessey and Redifon high-grade units to which previous reference has been made. While it is unlikely that many of the Eddystone 958 receivers will grace amateur shacks, there is no reason why some useful tips on modern receiver design should pass unnoticed.

Basically, the set is triple-conversion on hf with first tunable if of 1235 to 1335 kHz, and fixed if of 250 and 100 kHz. On the lower frequency bands, double or single conversion is used. For high-stability ssb mode, tuning is in 100 kHz bands with a narrow-bandwidth drift-cancelling loop, and a stable interpolating oscillator tuning 550 to 650 kHz in conjunction with a phase-locked hf oscillator. The use of a 100 kHz rather than the more usual 1 MHz band is noteworthy.

A simplified outline of the complex front-end arrangement is shown in Fig 2 and a fairly detailed explanation is given in the *Point-to-point* article, together with other design points of general interest.

FETs rather than bipolar devices are used in all signal-handling circuits. The rf stage is a triple-tuned cascode amplifier using a junction-FET in the grounded-source section and a MOS FET in the top section. The reason for this unusual mixture is that the JFET has a relatively high gate-breakdown of 25 volts; in addition the rf gate is protected against very large off-tune signals by the bandpass high-Q input circuit which gives some 40 dB attenuation at 10 per cent off tune.

Signals from nearby transmitters are reduced to 2·4 volts peak-to-peak by using four high-current silicon diodes connected directly across the aerial input. A peak rf/aerial



The Eddystone 958 is a solid-state receiver with a frequency coverage of 10 kHz to 30 MHz capable of high-stability operation on the hf bands. The frequency setting accuracy is within 200 Hz.

trimmer uses variable voltage capacitance diodes; a subsidiary benefit is that these diodes conduct and damp the tuned circuits when rf voltages exceed about 5 volts.

Another interesting feature is the use of a microcircuit (SIC) wideband amplifier between the first oscillator and the harmonic mixer. This buffer is needed to stop 100 kHz harmonics from the harmonic generator from being coupled, via the first oscillator, into the first mixer and so causing spurii. It was found very difficult to achieve 80 dB isolation with conventional circuitry because of stray coupling between components and printed circuit leads. The microcircuit amplifier has an output impedance of only 1·5 ohms, with little stray radiation from the tiny chip, so that " the far superior performance justifies the extra cost."

The tuning arrangements include the use of a finely-printed film-disc of 10 inches circumference optically projected and magnified to form a 50-inch tuning scale; it is suggested that this avoids the inherent mechanical loading problems of the more usual film strip for this purpose. A 0·5-inch of scale length thus represents each 1 kHz, and the tuning knob acts at 2 kHz per complete revolution, or 9° rotation per 50 Hz.

General construction is based on a diecast aluminium front panel 5·25-inch high, and the chassis includes nine removable circuit modules. The rf assembly has six double-sided printed-circuit discs, which carry all inductors, trimmers, trackers, etc and form a complete printed-circuit turret switch, with gold plated edge contact areas. Any disc can be removed and replaced.

The basic 958 receiver, described by D. W. Ford, is the first of a number of versions based on this general constructional technique. The article does not provide final performance specifications, and it is uncertain whether the receiver is yet in quantity production. But clearly this advanced receiver is likely to represent a further notable British contribution to high-performance solid-state hf receiver design.

FET Oscillators

The interpolation oscillator (i.e. the variable frequency oscillator of the heterodyne pre-mixer or partial synthesis system) of the Eddystone 958 adopts the relatively low-frequency of 550 to 650 kHz. But it is interesting also in that it is based on an FET which, because of its high input impedance, loads only very lightly the high Q inductor. A large tuning capacitor is used together with a variable reactor circuit to permit remote fine tuning. The entire circuitry for this stage is constructed on a double-sided fibre-glass board, mounted integrally with the capacitor and the whole circuit accurately temperature compensated.

The more general question of whether to use FETs rather than bipolar devices for oscillators has perhaps not received the detailed attention it deserves, although the subject has cropped up a number of times in *TT*. Evidence collated from a number of sources all seems to favour the use of FETs provided that only low output from the oscillator stage is required.

For example, some comparisons between the stability of LC oscillators at 100 MHz for FETs and bipolars appear in the book *FET Applications Handbook* (although two different curves presented in different chapters do not correlate too well!). It is suggested that over the temperature range 30–100° C, a bipolar unit drifted about 50 kHz whereas the drift with the FET was only about 5 kHz (for this test the temperature of the other components was held steady). The second comparison does not give quite such a sweeping advantage to the FET but still shows a useful improvement; it also indicates that the FET has a steady drift lower with rising temperature whereas the bipolar starts off with a positive drift and then turns over, possibly making accurate temperature compensation more difficult for the bipolar.

This question also receives careful attention by A. Lorona, W6WQC in an informative article " A zero-temperature-compensated JFET VFO " (*73 Magazine*, December 1968). This shows how the temperature coefficient of a JFET oscillator can be adjusted by varying the operating point, and can be set up to provide virtually zero temperature coefficient over a limited temperature range, or possibly even adjusted to provide equal and opposite drift characteristic to that of the tuned circuit. Alternatively a thermistor or other temperature sensitive resistor might be inserted in the source lead to provide a precise temperature correction.

Because of the spread of FET characteristics, it is necessary

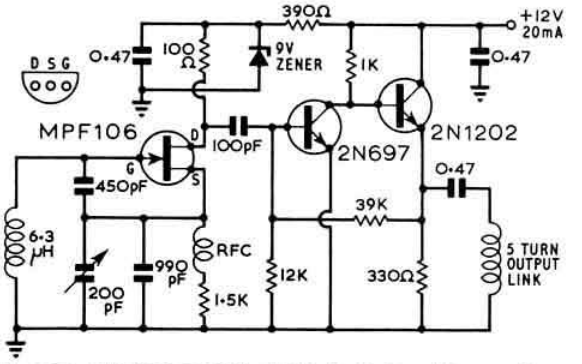


Fig. 3 The W6WQC 3·5 MHz JFET vfo designed for zero temperature coefficient operation.

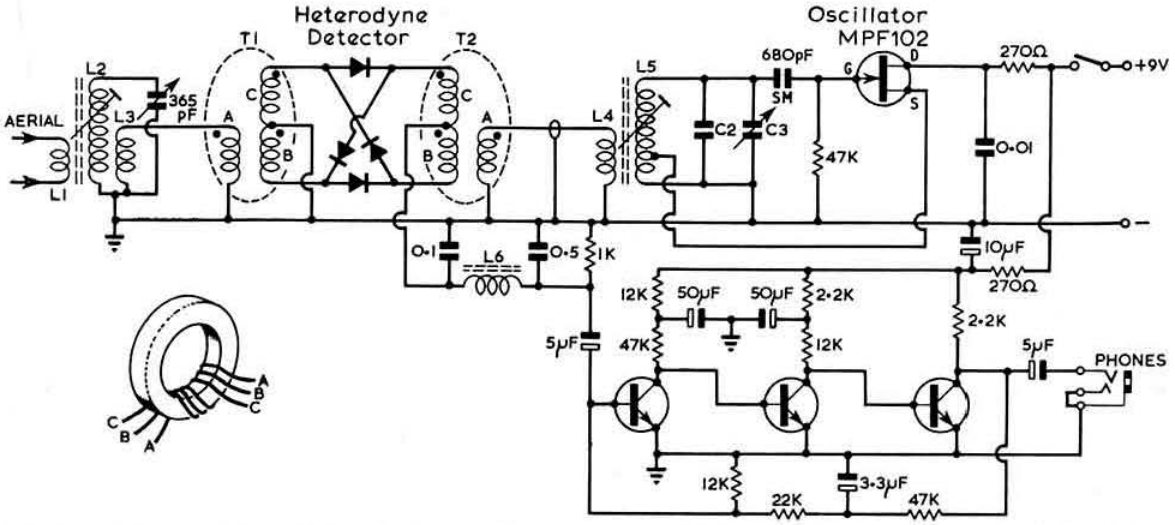


Fig 4. Circuit diagram of 3·5 or 7 MHz direct-conversion receiver, and details of toroid coils for the double-balanced linear detector. C2 is 470 pF SM for 3·5 MHz, 120 pF for 7 MHz. C4 is 140 pF to cover full American 3·5 MHz band, 40 pF for 7 MHz. The three resistors are all RCA 40233. L1, L3 3 turn link, L2 40 turns, No. 28 enam. on 0·680 toroid; L4 5 turn link, L5 22 turns No. 28 enam. on 0·680 toroid with tap 5 turns from earthy end. L6 is 88 mH toroid (small smoothing choke might prove reasonably suitable).

for maximum benefit to find the optimum operating point of an individual FET, and W6WQC provides a good deal of advice on how this can be done. He also includes a practical vfo intended to take advantage of this unique FET property of zero dc drift: see Fig 3. It will be noted that the usual grid capacitor/resistor combination is omitted and a source bias resistor used instead. The arrangement thus resembles the so-called thermionic " class A " oscillators about which there used to be some controversy. The FET oscillator in this circuit provides only a few microwatts of output but this can be amplified to a useful level in the two-stage bipolar amplifier.

Altogether, the signs are favourable for using JFETs and IGFETs in oscillator circuits, and a brief reminder is made of the FET Seiler and Vacker circuits by W1DTY which appeared in *TT* (July, 1968). Reprinted from *Ham Radio*.

" Direct Conversion " Receiver

For some two years, repeated attention has been drawn in *TT* to the possibilities offered by the receiver technique in which a balanced linear detector is used to convert hf signals directly to af by using what we have generally referred to as the " simple synchrodyne " system. Notably an all-semiconductor receiver of this type by PA0KSB was reprinted in *TT* (March, 1967) and subsequently in *Amateur Radio Techniques* (page 65), together with a number of suggestions on possible alternative approaches. This is felt to be a useful technique for simplifying the construction of practical ssb/cw receivers of medium performance, and so, in effect, reviving the " straight " receiver in a form suitable for modern amateur operating.

Therefore it was of considerable interest to find Wes Heyward, W7ZOL and Dick Bingham, W7WKR putting forward supporting views on this technique in *QST* (November, 1968) under the title " Direct Conversion—a neglected technique " along with full constructional details of a 3·5 MHz receiver capable of copying cw signals down to below the microvolt level and of sufficient stability to give reasonably good ssb performance.

Their particular approach is to use four hot-carrier diodes as a double balanced mixer/product detector (ie as in the fm tuner reported in *TT*, November, 1968), plus an FET oscillator and a three-stage direct-coupled high gain af amplifier following the low-pass audio filter which determines selectivity: see Fig 4.

The beauty of this approach is that there is only a simple preselector tuned circuit, with all fine tuning by controlling the FET oscillator. No if alignment, no ganged circuits. The only stage presenting any real constructional problems is the linear detector with its two toroid wide-band transformers and four Hewlett Packard 5082–2800 hot-carrier diodes (these retail in single units at about one dollar each in the States).

The entire amplification (about 100 dB) needed for headphone use is provided by the three high-beta, low-noise RCA 40233 audio transistors. Not even an audio gain control is fitted since automatic level control is provided by the transistors saturating on loud signals (this is of no consequence on cross-modulation provided that the af filter is effective). Some care may be needed to ensure that there is no instability in the high-gain af section, and this should be checked before completion of receiver (if necessary increasing value of decoupling resistors in the first two stages). It will be noted that no attempt has been made in this design to overcome the inherent problem of the audio image, though for cw-only operation selectively could be sharpened up a lot by using resonant af filters rather than the lpf type needed for ssb. The possibility of using simple phasing techniques such as the old " hetrofil " might be worth considering.

It is reported in the article that several W7 amateurs have adapted this receiver to form simple transceivers along the lines which we believe were first suggested in *TT* by Charles Bryant, GW3SB who pointed out (*TT*, July, 1967) that the

receiver oscillator can be used as the transmitter vfo without having to heterodyne it into the band.

It is well worth emphasising that this category of receiver has many possible variations; for example has anyone yet tried using a 7360 or 6JH8 as the detector? Provided that this stage is sufficiently linear, so that there is no need to worry about cross- or inter-modulation, then the only " spurious " responses should be those caused by oscillator harmonics, and these could be eliminated or minimized by even a modest degree of front-end selectivity. Such receivers should thus have many advantages over simple superhets.

The double balanced linear detector in the American design is based on two small toroidal coil forms (about $\frac{7}{16}$ inch diameter) winding trifilarly three pieces of No. 28 enamelled wire, held together, on each toroid: see Fig 4. The *QST* article says: " Fifteen turns are adequate. After winding, the leads are trimmed to about an inch in length and the enamel removed. Then, using an ohmmeter, beginning and end of each of the three windings is identified (A, B. C). Winding A is used as the low-impedance winding. The beginning of winding B is connected to the end of winding C, providing the centre tap for the bifilar high-impedance winding." Start of each winding is indicated on the diagram by the dots; a symmetrical balanced lay-out should be used for this stage.

Both the signal frequency and oscillator coils are wound on 0·68 inch toroids. The mixer provides a constant load on the FET oscillator, eliminating the need for a buffer stage. Not even voltage regulation is used.

The authors have measured usable sensitivity on cw at better than one microvolt over 3·5 to 50 MHz, and suggest that with hot carrier diodes the principles are also adaptable to 144 MHz and perhaps even higher frequency receivers. Conventional point-contact diodes could probably be used but would result in some loss of sensitivity (this might be overcome by using an rf amplifier).

It is appropriate perhaps to recall that separate heterodyne detectors have been used in some " straight " receivers almost since valve oscillators first came into use. What is perhaps new in these latest versions is the serious attempt to reduce non-linearities in the conversion process and so improve the effectiveness of post-detector selectivity, allowing full advantage to be taken of any subsequent signal processing.

On this latter point, some useful ideas on audio filtering have come from Alex Gartshore, GM3UMW but we have run out of space on receiver techniques for this month, and will have to return to these another month.

Detached Tuning on Transceivers

The ability to " detach " the single vfo of a transceiver so that transmission and reception can be on slightly different frequencies is a feature which has proved its value on some commercial equipments. A. Ducros, F5AD (*Radio-REF*, November, 1968) has come up with a neat arrangement allowing either transmitter or receiver frequency to be detached from the nominal frequency and detuned by up to about 5 kHz and yet returned to nominal at the flick of a switch. This uses change-over switches to put a differential voltage on a single variable-voltage-capacitance diode: see Fig 5. This is a later version of an earlier arrangement (*Radio-REF*, July, 1968) which provided such " decontrolled " tuning only on transmit.

The VVC, the 10 pF trimmer which governs the degree of

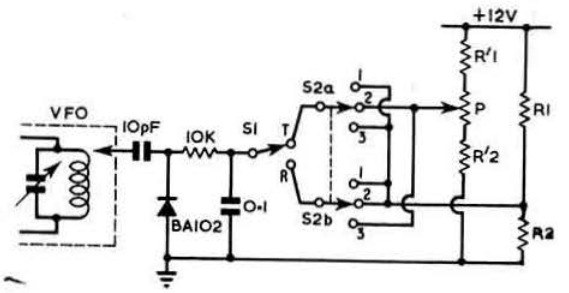


Fig 5. The F5AD system for " detached " tuning of transceiver vfo on either transmission or reception. S1 is part of transmit/receive change-over (preferably controlled automatically by relay). S2 provides three positions: 1. Oscillator on its nominal transceiver frequency; 2. Detached or incremental tuning by P on transmit mode; 3. Detached tuning by P on receive mode.

detuning possible, the 10 ohm resistor and the decoupling capacitor should all be mounted close to the tuning circuit of the vfo but the remaining components (at dc only) can be in any convenient position. In practice, the two divider networks for controlling the VVC will depend on the diode and the voltage available. For a BA102 the permanent voltage should be +7 volts, and the potentiometer P should allow an excursion of from about 5 to 9 volts. For a 12 volt control line, suitable values would be R1 4·7 k ohm, R2 6·8 k ohm, R'1 3·3 k ohm, R'2 4·7 k ohm and P 5 k ohm.

If a high voltage line is used for supplying the network, this should be stabilized by a 12 volt zener diode since any variation of this voltage will cause a frequency variation of the vfo. F5AD suggests that a 250-volt line can be used in conjunction with a 47 k ohm, 2W dropping resistor and 12 volt zener of adequate power rating.

Gold-bonded Noise Limiter

A modification to the conventional self-adjusting shunt diode noise limiter by drawing on the " low-knee " forward characteristic of germanium gold-bonded diodes (AAZ17, etc) is suggested by D. A. Tong in the new " Circuit Ideas " feature of *Wireless World* (January, 1969). This is stated to have given excellent suppression of car ignition interference on a 70 MHz transistor receiver, even in the absence of a received carrier.

The circuit is shown in Fig 6 and incorporates an extra " back-off diode " (D2) in a forward-biased detector circuit in order to bring the clipping level right down to receiver noise level. This diode should be of the same type as the

Continued on page 116

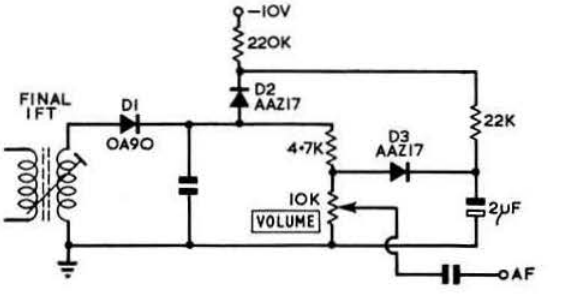
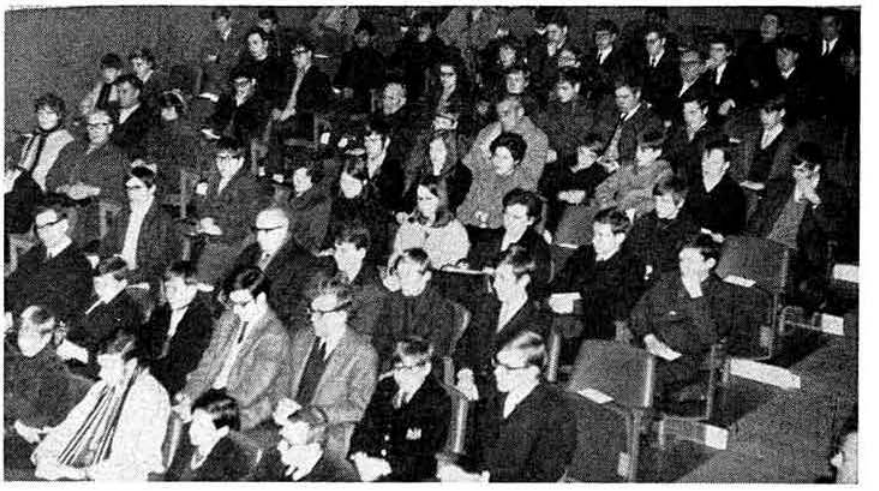


Fig 6. Improved noise-limiter using gold-bonded diodes.



SCIENCE MUSEUM LECTURE

The World of Amateur Radio

By SYLVIA MARGOLIS, RSGB, PRO

A SIGNIFICANT feature of the RSGB in the past few years has been the distinct broadening of the Society's scope in every field, so that the Society, ranks now not only as one of the oldest amateur radio organizations in the world, but, in proportion to its size and finance, probably the most go-ahead and enterprising.

Typical of this trend was the lecture—*The World of Amateur Radio*—which the Society was invited to deliver at the Science Museum in London on January 4th. It took 18 months of negotiations and planning for the idea to gell, but the result was well worth the effort put into the project by the RSGB Education Committee, under the chairmanship of Tim Hughes. G3GVV.

The lecture and demonstrations were given in two sessions, each lasting 1½ hours, morning and afternoon. Tickets were distributed through schools and colleges and the whole consignment was claimed by applicants. The morning session was almost house-full (the Lecture Theatre seats about 200) and in the afternoon about 130 people attended.

This Lecture Theatre in the Science Museum is one of the best equipped in the country, with perfect acoustics, every modern audio-visual aid, including closed circuit TV, and a most elaborate lighting system. Mr Hughes said it was the facilities provided by the Science Museum that set the exceptionally high standard of lecture achieved by his team. He pays tribute to Mr Gerald Garrett, G5CS, and Mr John van Riemsdijk, of the Science Museum, for their great help at every stage of the arrangements.

The majority of both audiences were Sixth Formers, most of them doing A-level physics this year. Several I spoke to had a basic knowledge of amateur radio to start with and we saw at least one RSGB badge worn on a school blazer. There were several girls and many younger children in the audiences, too.

Four lecturers formed the team. Len Newnham, G6NZ, opened the programme with a masterly general description, in non-technical terms, of amateur radio. His section was called *Why Amateur Radio?* I confess that I plan to lift, unashamedly, several points that he made, for the talks I give to outside organizations on behalf of RSGB!

Next, Norman Kendrick, G3CSG, described how we communicate. Even I followed every single stage of his argument, so the youngest members of the audience must have been with it too! Tim Hughes followed, describing how to get started in the hobby, how to choose a receiver, with special emphasis on economy and home-building, a little about the RAE and some basic technicalities. I lost him on his definition of " modulation," but that was all. I am told

Female, yet !

—continued from page 114

Tim Hughes, G3GVV, explains the technicalities in simple language.

since that it is almost impossible to define the word for non-technical people!

During the talks given by Mr Kendrick and Mr Hughes some simple home-built equipment was demonstrated, with the assistance of Mr R. Wallwork, G3JNK, who later explained how to fill in a QSL-card. Colour slides were shown by Mr D. Pratt, G3KEP, The closed circuit TV was used to show details of the equipment. Even the slight kick-over of a meter came over clearly.

Each programme ended with a live demonstration of a QSO between the rig in the Theatre and a mobile rig in the street outside, in Kensington, operated by John Swinnerton, G2YS, on 1·9 MHz. Those of us with experience of mobile operation held our breath, thinking of the 1,000 things that could (and usually do!) go wrong, but each time the voice of the RSGB President came blasting in, 40 over 9, to amaze and enchant the audience.

I believe that not only was this ambitious project another first for the RSGB, but I think it might be the first time a national amateur radio organization has ever been asked to deliver such a lecture, to attract young people of the right kind into amateur radio. But then, as Tim Hughes said: "What other national amateur radio society can have an organization like the Science Museum to work with?"

Norman Kendrick, G3CSG, successfully communicating how we communicate.

shunt diode (D3). It is pointed out, however, that if supply voltage and ambient temperature are stable, the back-off diode D2 can be replaced by an appropriate resistor with little loss in performance. Because of the high slope resistance, performance of the circuit with conventional point contact diodes is inferior to that with the AAZ17.

Mobile Loop Aerials

The controversy over the US Army "down-to-earth" loop aerial (*ART*, page 135) continues to simmer. A detailed account of commercial tests by HB9AGK with a large static aerial of this type while seeking an aerial without high angle nulls for working short distances out of deep valleys suggests that the loop is at least some 15 dB below an inverted vee dipole using a 40 ft mast in the range 2 to 3·5 MHz.

On the other hand, J. E. Taylor, W2OZH in the same issue of *QST* (November, 1968) describes a 3·5 MHz half-loop mobile aerial rising over the vehicle from front to rear bumper (some 30 ft of radiator) performed "better than all previous configurations tried." The aerial (using two vertical section and two whips bent over and joined with stout wire in low resistance joint) is fed by coax with a 2000 pF capacitor down to the front bumper, and resonated by a neutralizing type capacitor to the rear bumper.

It may be argued that it is the length of the radiator rather than the loop configuration that puts out the strong signal. But it can hardly be a coincidence that in *CQ* also of November, 1968 a basically similar arrangement using two 8ft vertical section joined by a 17ft horizontal length of heavy gauge wire is described by W2OZH as "a substantial improvement on previous configurations." All this suggests that somebody should try out a G6NA type coax loop (*Radio Communication*, September, 1968) as a Top-band or 3·5 MHz mobile aerial.

Here and There

Strong doubts have been expressed by G3HBW, G3NUQ and others on whether it is really possible to measure true rf current in coax feeders with the F8ZF meter (*TT*, December 1968). For instance, G3NUQ, believes that the device detects instead "common mode" currents (sometimes called "antenna currents") and could be useful for this purpose. We should be interested to hear of practical experience with the F8ZF technique—meanwhile take warning.

On several occasions reference has been made in *TT* to the use of mains transformers as substitute modulation transformers. Latest report comes from W. H. Jarvis, G8APX who has found a Radiospares "Midget Mains" transformer provides an efficient replacement in the TW Communicator Twomobile. He connects the EL84 anodes and HT line to the 125-0-125 volt secondary while putting the primary 0 and 225 volt taps in series with the feed to the pa. This transformer is about the same as the original, and no problems have arisen from the absence of shrouding.

REGULAR FEATURE

THE MONTH ON THE AIR

By JOHN ALLAWAY, G3FKM*

IN a letter to your scribe concerning the opening paragraph of January *MOTA*, Ted Robinson, F8RU, Secretary of IARC, takes exception to the reference therein to amateur radio as a " hobby." He asks for the use of the proper definition of " amateur service " as defined by international regulations, and points out that we have the advantage of being on an equal footing with the Fixed and Broadcasting services—even if some of the latter do sometimes intrude within our frequency allocations. Ted also points out that the new ICAA award described in the same issue has no connection with IARC. Unfortunately the copy received by G3FKM caused some confusion as it mentioned the award being formulated by five IARC members and issued by the IDXO, an organization closely connected with the station manager of 4U1ITU. Sincere apologies are extended to IARC for the error.

Readers may be interested to know that Ferne, wife of WA6AHF (who acts as QSL Manager for a number of DX stations), is seriously disabled following a back injury. One of her great joys is her stamp collection. Anyone wishing to send along some stamps should send them to Ferne Hughes, 17494 Coldbrook Avenue, Downey, Calif., USA where they will be much appreciated.

The Ex-G Radio Club

Owing to the prolonged absence of W8YHO on business matters, the Honorary Secretary's post has now been transferred to Don Rayner, W3CTR, 416 Burkhart Street, Johnstown, Pa., 15906, USA.

Readers may be interested to know that membership of the club is open to anyone born in the UK, or a naturalized citizen of the UK, provided that he or she is resident abroad for at least six months of each current year. Club meetings are held every Sunday between 19.00 and 20.00 on 14,346 kHz ssb (except during June, July, and August when there are meetings on the first and third Sundays only).

One of the club's printed aims seems well worth quoting: " To cherish and perpetuate the love and respect we hold for Great Britain and all she stands for."

News from Overseas

Margaret, VP8KL, received her licence about three months ago and is very active around 28,550 kHz at 18.00 on ssb. She also is to be found in the 14,220–14,240 kHz region between 22.00 and 23.00, often in contact with her QSL manager WA3IKK. Her husband Frank, VP8KD spends most of his operating time on 28 MHz ssb earlier in the day. Other news from the VP8 area is that Lew, VP8JW, and Derak, VP8KN, are new operators on the air from Stonington Is, Antarctica. Jacques, VP8JQ has now come on from Signy Is (S. Orkney) and is with Les, VP8KO. VP8KH has now reached S. Shetland. The QSL situation for VP8's FL, JG, JH, JI, JQ, JW, KN, and KO is dealt with by Eric Chilvers, 1 Grove Road, Lydney, GL 15 5JE, Glos, England.

Norman Addison, G3POA, is at present serving with the RAF on the island of Sharjah in the Arabian Gulf. He has been on 20 and 15 metres ssb and gives 14,200 kHz every day between 13.00 and 17.00 as the place and time when he is on the lookout for UK contacts, MP4MBJ is the only MP4M licensed at present. A new station is also on from the Trucial States—this is G3VTO who is using the call-sign MP4TCL and who is expected to be there for a year or so. QSL's for MP4MBJ go to his home QTH (see *QTH Corner*, January *MOTA*).

Greg, MP4BGX, reports that his G3XHE call has been pirated on 20m ssb. The pirate gives the correct name and is telling people that he has just returned from Bahrein! Greg will in fact be back home in February or March for a four week spell, and will be returning from MP4 land for good in June. Some 40 and 80m activity is likely to take place before Greg's return, so far he has found results not too encouraging on these bands as far as UK signals are concerned.

G3IRM has received a copy of a call-book from Czechoslovakia. This seems to be the first to be issued since 1945 and lists all OK and OL calls, as well as the world and ARRL QSL bureaux.

XE1RV is the present call of Bernard, G3ALE. He is reported to be active on 7 MHz and also to be keeping a sked on 28 MHz at 15.00 every Sunday.

Top Band News

Some information on Loran stations which is of interest to users of 160m has been supplied by G3LTU. There would appear to be four channels—Channel 1 on 1950 kHz, Channel 2 on 1850 kHz, Channel 3 on 1900 kHz, and Channel 4 on 1750 kHz. The 1850 kHz frequency has been mentioned previously in connection with reception of DX signals in the USA and it seems that this channel is used by a chain of stations including 2S2 (Japan), 2L6 (Haiti), 2S7 (North Canada), 2L4 (Hawaiian Is), and New Guinea and Northern Australia (2L1). The 1950 kHz channel is the source of European Loran signals from Norway, N. Ireland, N. Scotland, the Shetland Is, etc., but there is also a group of stations in the Pacific using this frequency. As a matter of interest identification is indicated as follows: first number is frequency, the letter is the pulse frequency (H, L, or S), and the third number is chain identification. It is possible that identification of some of these stations could be an indication of DX openings. This would not of course be possible with a normal receiver, but many brand new Loran

*10 Knightlow Road, Birmingham 17. See page 122.

receivers have been on the market for some time at very low prices which may make them an interesting buy for those really addicted to 160m DX.

The first Transatlantic Test on 1 December appears to have been a great success according to the latest W1BB *Bulletin*. The band stayed open until 08.00 and many Europeans worked into the USA as far west as W9. W2RAA is reported to have worked 13 G's, GM3IAA, and GI3OQR. VO1FB worked 14 European stations including G3PKW, G3TKN, G3XGC, G3XTJ, G5AQ and G5TN, all new ones for him; this appears to be a very satisfactory start for Joe's new half wave dipole which is now 45 ft above ground.

During the CQ WW DX Test CX3BH contacted VP8KF and also managed to work G3SSO, a very fine performance. The multi-operator station in Curacao, PJ0CC, worked G3VUM. W1BB himself raised 12 countries in six zones, 18 of his contacts being DX.

Special Transcontinental European Tests have been arranged by JA3AA. Japanese stations will look for European signals between 1823 and 1827 kHz during the period 20.00 to 22.00 on 15 February, and will transmit in the 1907·5 to 1912·5 kHz sector. Tests were also arranged for four earlier dates but unfortunately information concerning their taking place has only just been received.

VP2GBR is thought to have erected a more effective DX aerial and may be more successful in getting his signal across the Atlantic soon.

F/O Ron Launchbury, G3RFB, who recently visited Australia and had hoped to operate from VK on 160m was unfortunately not able to do so. He sends his sincere apologies to all who were listening for his signals.

TF9AA who has been worked on 160 is reported to have had a special 18 day experimental license for the band which has now expired. Another rumour is that ON stations will be permitted on 160 as from 1 January, and that Germany no longer permits operation on the band. Confirmation of these three items is awaited.

Certificate Hunters Club Nets

Current CHC Nets are as follows:

1. Tuesdays on 14,340 kHz ssb—the Asian Division of International CHC/FHC Service net with YA5RG in control.

2. Wednesdays on 3660 kHz ssb at 21.00. CHC/FHC Service net sponsored by the Italian CHC Chapter 54. May change to Thursdays later.

3. Fridays on 3770 kHz at 19.00. Organized by Scandinavian CHC/FHC Service net (LJ2X). LA5RJ is net control, assistant n/c on alternate weeks is G3XCS.

DXpeditions

Steven Gibbs, VQ8CC, hopes to be able to visit **St Brandon** and **Rodrigues Is** sometime during the period March to May this year before he returns to Europe on a holiday. Callsigns will be VQ8CCB (St Brandon) and VQ8CCR (Rodrigues). All band 160m to 10m operation using Drake equipment is planned. Particular attention will be paid to operating on the lf bands, to help those working towards the new 5BDXCC Award. Further information about dates and times of operation, frequencies to be used, and QSL arrangements will be announced when these are definitely known. As mentioned in last month's *MOTA* Steve has no QSL manager for his VQ8CC cards. He will send out fast airmail replies to those who send their QSL's plus three IRC's to Box 14, Curepipe, Mauritius, otherwise cards will be sent via the bureaux.

Dick Moore, also known as ZB2AO and GI3PLL, will be operating from the republic of **Malagasy** with the callsign 5R8AO by the time this is being read. He expected to commence all band operation in late January and hopes to be active as much as possible for two months. His gear consists of a Courier CTR-1 with a trap half wave aerial and he will probably concentrate on 40 and 80m. QSL's should be sent to GI3PLL (see *QTH Corner*).

Rumour has it that there may possibly be a trip to **Malpelo Is** imminent. K6JGS, K4PHY, K4RTA, W4IBA, and TI2CMP have been mentioned as possible operators for a one week stay during February or March. Swan equipment capable of am and ssb/cw transmission should be available, and also a beam. All bands will be used, depending on the availability of aerial space on the island.

Further information has now been received about the visit of the USCG cutter *South Wind* to **Heard Is** in March. At least two licensed amateurs will be with the party—W7ZFY, who is a diver, and WB4HWP, the chaplain. One report says that some of the personnel will be there for two months. Readers who saw the film " To climb Big Ben " on television a few months ago will appreciate the arduous nature of a trip to Heard.

The VE6AJT/VE6APV Pacific expedition had reached **Tonga** at the time of writing. Exact details of future movements are not known, but it is believed that permission to operate from **Tokelau Is** (ZM7) has been obtained, but will not become valid until April. The New Zealand authorities are said to have declared the area ' off limits " during the hurricane season between December and April. If all went according to schedule VE6AJT and KH6GLU were to have operated from 1–6 February from **Wallis Is** (FW8). This should be followed by four days in **W. Samoa** (5W1). Frequencies to be used were given as 3505, 3795, 7005, 7095, 14,005, 14,195, 21,005, 21,245, 28,005 and 28,495 kHz. Callers should follow instructions and *never* call zero beat. According to *Long Skip* Don's VR5AE operation was with a dipole as George had gone to Australia and taken the beam with him. In spite of this quite reasonable signals from Tonga have been received in Europe around 18.00 (on 14,198 kHz ssb).

Although the commencing date of W4BPD's mammoth expedition is 1 February there was still no information released at press time concerning an itinerary or even the location of the first operation. Gus has some first class equipment ready to take with him, including a 200W transmitter for 160m. From information already given, it is clear that anyone exceeding two contacts per band per mode will experience delay in reception of QSL cards. All cards should be sent to W4ECI, 3101 4th Avenue South, Birmingham, Ala., USA 35233.

As mentioned on a previous occasion W4WS (VK2BRJ) and W6BPO (VK2BPO) will be operating from **Norfolk Is** (VK9) for two weeks from 12 February, and from **Cocos-Keeling Is** for a similar spell commencing 2 or 3 March. Frequencies will be 7005, 14,025, 21,025, and 28,025 kHz. QSL's go via W4WS with sae and IRC. W4WS may prolong his return trip to the US and operate from other areas including VR5.

Awards

As from 1 January, 1969 all Argentinian awards issued by

RCA will cost seven IRCs instead of five. Applications should be addressed to C. L. Hardy, LU1DJU (QSL and Award Manager, RCA), Rodrigues Pena 406, Banfield, BA, Argentina.

The **Islands on the Air Awards** are issued by:

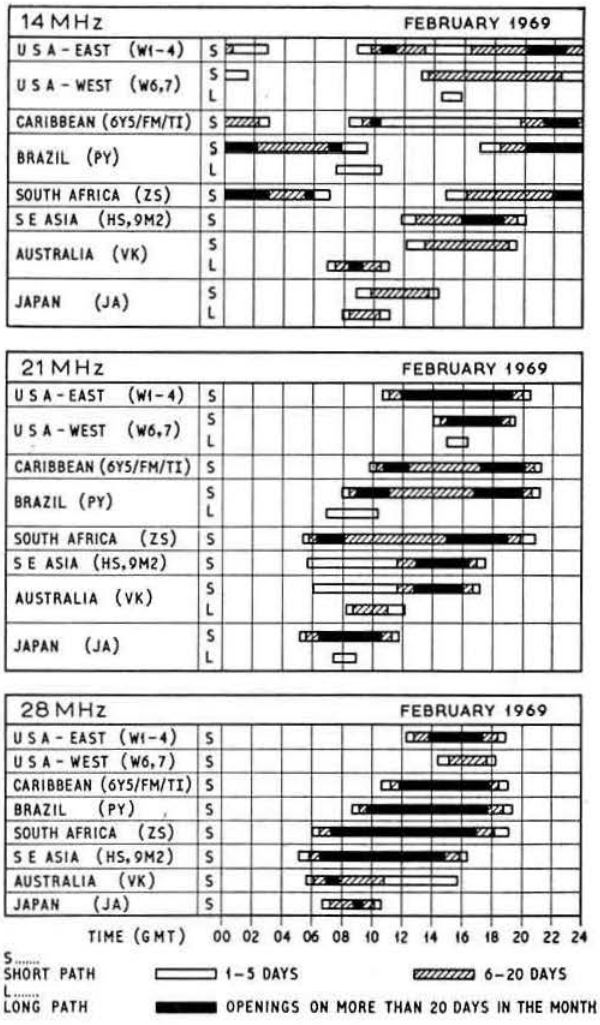
Geoff Watts, 62 Belmore Road, Norwich, NOR 72 T.

These are issued in conjunction with the annual IOTA contest which runs from 1 January to 31 December each year, the winners of which (both amateur and listener) receive a silver cup. A further silver cup is now available to those who claim all 12 IOTA Awards as listed below:

IOTA-AF Africa Award.
IOTA-AN Antarctica Award.
IOTA-AS Asia Award.
IOTA-EU Europe Award.
IOTA-NA North America Award.
IOTA-OC Oceania Award.
IOTA-SA South America Award.
IOTA-CC-100 Century Club 100 Award.
IOTA-WW World Diploma.
IOTA-AI Arctic Islands Award.
IOTA-BA British Isles Award.
IOTA-WA West Indies Award.

QSL requirements for the last three listed have now been made much easier. The 18-page *Directory of Islands* lists all the islands and island groups which count for IOTA awards and the IOTA contest. It may be obtained, price four IRC's, from Geoff Watts at the address at the beginning of the paragraph. The revised rules for the IOTA-AI, IOTA-BA, and IOTA-WA may be obtained price one IRC.

The Radio Friends of the Ockenden Venture have now issued two more certificates in addition to their basic **Ockenden Award.** Both are being printed at the moment, and the " fee " for each is a donation of £1 or equivalent to the Venture. They are called the Advanced Class awards, and one is for working 50 members, the other for working 25 members in 25 different countries. Listeners may apply on a heard basis. Applications should be sent to Frank Fletcher, 53 St Ives Park Road, Ringwood, Hants, BH24 2JX. (Only certified log data required and all contacts to have been since 1 January, 1961). Readers will no doubt know that this charity is the UK equivalent of the Austrian " Save the Children " Trust; they will be pleased to learn



PROPAGATION PREDICTIONS

The decrease of sunspot activity after the maximum of summer 1968 is a slow process. For this reason the propagation predictions for this month will be only slightly less favourable than those for February 1968.

On 28 MHz Western North America will not be heard with certainty, otherwise all continents should be workable even if only during short periods. On 21 MHz all continents should be workable. The effects of the forthcoming springtime conditions will be most marked on 14 MHz, as conditions during the latter half of the night will be much better than the previous month. However, this band will probably not really open up again for night-time DX until some time in April. If in the forthcoming ARRL DX Contest the F2 mufs are above the monthly mean, there will be some opportunities for working the USA on this band during the first two to four hours of the latter half of night. Conditions should be best in Southern Europe in this respect. It should be pointed out once again that in equal competition a Southern European station will always fare better in a USA Contest than stations further north.

The propagation conditions on 7 and 3·5 MHz will differ little from those of last month. USA traffic on 7 MHz will probably be possible from a few hours before midnight onwards, and on 3·5 MHz most favourable from about three to four hours before sunrise until dawn.

The provisional sunspot number for December 1968 from the Swiss Federal Observatory was 112 with the period of greatest solar activity occurring during the second half of the month. The predicted smoothed sunspot numbers for April, May and June are 90, 89 and 88 respectively.

that almost £100 was collected for the movement via amateur radio in 1968.

The PACC Award is issued by:

Traffic Bureau, VERON, PO Box 9, Amsterdam, Holland. This requires contacts with 100 PA0/PA1/PI stations since 1 June, 1945 and contacts in the PACC contest may be used for credit instead of QSL's. It is issued for cw, phone, or mixed modes.

QSL's plus an alphabetical list of stations worked and contest credits claimed should be sent to the address above with five IRC's.

Readers who have recently ordered copies of K6BX's **Directory of Certificates and Awards** may experience considerable delay in delivery owing to the current shipping strike on the East coast of the US which is holding up all surface mail.

Contests

The PACC Contest 1969.

12.00, 26 April to 18.00, 27 April.

All bands 1·8 to 28 MHz; contacts may be on phone or cw but not mixed mode or cross band. On 160m only cw will be used and PA0 stations will only be found between 1825 and 1835 kHz.

Exchanges consist of RS(T) plus serial number of QSO (starting from 001), PA/PI/PE stations also give two letters indicating their province.

Each contact confirmed by " R " or " OK " counts three points, 2 points may be claimed for correct reception of the control number, one point for receiving confirmation that the transmitted number has been received. Each station may be worked once per band, either on phone or cw. A multiplier of one per province worked on each band (maximum therefore 8 x 11) is used to obtain a final score.

Logs to be sent to Mr W. J. M. Paas, Contest Manager VERON, Zwerfruststraat 1, Middelburg, Netherlands, postmarked no later than 1 June. Logs should show date and time of QSO, callsign, province, multiplier, number sent, number received, points claimed. A statement that the entrant has obeyed the rules and the radio regulations in his country should also be enclosed. A number of rule sheets are available from G3FKM (sase please). Contacts in this contest may be used as credits for the PACC Award (see *Awards* section). In the 1968 event top UK station was **G3ESF** (4080 points), other entries being G3IAR (3591 points) and G3VPS (24 points).

Preliminary results of the **1968 CQ WW WPX SSB Contest** have now been received. World winner in the all band single operator category was ET3FMA (1,291,680 points), top European was DJ6QT (892,422 points), and top UK station **G3NMH** (807,275 points). G3NMH's score was world eighth, which is a very creditable performance. In the single band classes **G3SZG** was world second on 3·5 MHz with 28,090 points, and **GM3VTB** world fourth with 14,784 points. More detailed UK results will be given when they are received from W1WY.

The **1969 IARC Propagation Research Competition.**

00.01, 1 March to 24·00, 16 March (CW/RTTY).

00.01, 29 March to 24.00, 13 April (Phone).

All bands 1·8 to 28 MHz.

Exchange RS(T) plus CPR Zone number (UK is 27). Stations may be worked as many times as is desired for as long as desired. A QSO exceeding six minutes is counted again for each six minutes or fraction of six minutes it continues.

One point per contact, but no QSO points for contacts with stations in one's own CPR Zone. Multiplier is one per Zone worked on each band.

QTH Corner

A2CAU Box 200, Francistown, Botswana.
CT2AK Box 143, Ponta Delgada, S. Miguel, Azores.
DL4/5 QSL Bureau (new) Headquarters, STRATCOM, APO. NY. USA, 09056.
FP0DM VE3FEC, D. L. MacLeod, RCMP Hqrs., Telcoms Branch, 1200 Alta Vista Dr, Ottawa 7, Ont., Canada.
FP0MD VO1FB, Box 51, St Johns, Nfd., Canada.
FR7ZC Paul Ferrand, Saints Suzanne, Reunion.
KV4FZ Box 428, Christiansted, US Virgin Is. (Correction from Jan *MOTA*).
MP4TCE Eric Chilvers, 1 Grove Rd, Lydney, Glos., GL15 5JE.
OX5AC via K2MTW, D. F. Quagliana, 115 Los Robles St, Williamsville, NY., USA.
SV0WE, SV0WU SV0WE, c/o US Embassy, VOAR, APO, NY., 09223. USA.
SV0WY PO Box 86, Rhodes, Greece.
TA2E via VE3ABG, d. Caberlin, 90 Orchard Park Blvd., Toronto 8, Ont., Canada.
TA2SC via K4EPI, Roland Guard Jr, Box 7542, Patrick AFB, 32925, Fla, USA.
TA3AB via W5RBO, PO Box 416, Anna, Texas, USA.
VK2BPO/9, VK2BRJ/9 via W4WS, Robert James, Box 635, Dunedin, Fla., USA.
VK0KJ via VK7KJ.
VP2MO via WA8RWU, Terry Dillahunty, 281 Carilla Lane, Columbus, Ohio, USA.
VP8KL via WA3IKK, Wilton Chapman, 113 Old Ford Drive, Camp Hill, Pa, USA.
VR4EZ via W2CTN, 159 Ketcham Av, Amityville, NY, USA. 11701.
VR5AE via VE6AO, George Sargenia, 3211 Kenmare Cresc., Calgary, Alberta, Canada.
VS5PH via DL3RK, Walter Geyrhalter, PO Box 262, 895 Kaufbeuren, Germany.
XW8BP via DJ9SX, Goesta Hahn, Bluecherstr. 20, 2 Hamburg-Altona, Germany.
ZF1GC VE4XN, E. D. Snydal, 25 Queens Crescent, Brandon, Alberta, Canada.
ZS2MI (New M'gr) ZS6OB, PO Box 838, Johannesburg, Rep of South Africa.
5R8AO (GI 3PLL/5R8) R. P. Moore, 1 Club Rd, Ballykelly, Limavady, Co Derry, N. Ireland.
6J2RV Reg Evans, Sigs Branch, PO Box RW 103, Lusaka, Zambia.
9L1HE PO Box 1011, Freetown, Sierra Leone.
9V1OS Sgt. L. J. Dicker, 249 Signals Sqdn, c/o GPO, Singapore.
RSGB QSL Bureau, G2MI, Bromley, Kent.

FINAL 1968 COUNTRIES TABLE

	160m	80m	40m	20m	15m	10m	Total
G3IAR	9	54	52	129	105	84	433
G8JM	—	—	10	210	117	81	409
G3OLY	—	6	18	146	116	111	397
G3XBY	4	35	43	75	92	71	320
9J2BC	—	—	17	106	54	64	241
G8VG	5	17	29	46	64	70	231
G3TXZ	5	30	9	25	68	92	229
G3PQF	10	26	38	65	12	64	215
G3VPS	13	33	18	78	16	18	176
SM2BYD	—	21	27	62	30	29	169
G3TBK	4	7	38	51	35	31	166
G3VJG	—	2	17	18	24	60	121
G3ING	12	16	22	21	20	14	105
G3XDV	15	10	17	38	1	18	99
BRS25429	3	64	94	179	148	125	610
BR362780	6	36	28	193	191	137	581
A5662	15	40	63	157	150	155	580
A5390	4	22	35	166	167	97	491
BRS30094	10	33	29	157	150	111	490
A4886	14	56	50	187	103	89	489
A5154	3	36	41	166	143	97	486
A5135	5	45	54	121	85	64	374
BRS28198	3	37	63	82	59	109	353
A5489	—	18	20	121	112	72	343
A5466	6	35	33	110	47	43	274
A5950	7	23	20	66	73	68	257
A5852	5	15	11	110	114	1	256
A5126	2	31	31	81	53	44	242
A5943	10	42	30	53	65	33	233
ORS30694	—	—	11	80	84	56	321
A5459	8	28	42	89	39	24	230
A3942	14	38	36	58	60	50	213
A6015	6	16	30	65	53	43	213
A5620	10	71	17	35	25	31	191
A6081	—	18	12	61	62	—	153
A5437	4	24	14	42	25	8	117
A5805	—	—	42	—	—	—	42

Congratulations to the winners—**G3IAR** and **BRS25429** on their fine scores. Many other entrants put in fine performances under adverse conditions, e.g. low power or TVI difficulties. The 1969 table will start in next month's issue. A copy of the W9WNV "*DX Handbook*" will be awarded to the top licensed amateur and top listener in 1969.

Entries may be single operator/single band, single operator/all band, mnlti-operator/all band, Radioteletype/all band, mobile/all band, or " all events "—a total score of all modes and bands. Winners in each Zone will receive a certificate, and entrants with 100 or more valid QSO's will receive a CPR Certificate of the appropriate grade.

Logs and summary sheets may be obtained from IARC, Box 6, 1211 Geneva 20, Switzerland. Completed logs should be posted before 1 June to: L. M. Rundlett, 2001 Eye Street NW, Washington, DC USA. 20006.

The **Spring RTTY Contest.**

02.00, 15 March to 02.00, 17 March.

All bands 3·5 to 28 MHz.

Only 36 hours operating time may be used of the 48 available and rest periods must be marked in logs and be of not less than 2 hours at a time. Stations may be worked on different bands for credit. Exchanges consist of message no, time, country and continent. QSO's with one's own country count two points, with other countries 10 points. A bonus of 200 points for every country worked. Scoring consists of (*a*) exchange points × no of countries worked, and (*b*) country points × continents worked. These totals added together are the final score. Use separate logs for each band and send entries to: Ted Double, BARTG Contest Manager, 33B Windmill Hill, Enfield, Middlesex. Last year's winner was I1KG (190,400 points). G scores were **G6JF** (60,900), G3LNN (32,550) and G6CW (13,500).

DX Briefs

According to reports in the *DX'ers Magazine* there is a possibility that the US Coastguard may be reconsidering their attitude to possible amateur radio operation taking place from **Navassa Is** (KC4). It seems that W4WXZ, who is a US Government employee, is interested in making such a trip.

G2HFD informs us that a South African Antarctic Expedition will shortly be leaving Capetown for a one year spell in Antarctica. They have been allocated two callsigns —ZS1ANT and ZS1AMB—one for their base station and the other for the outpost station 300 miles away in the mountains. Both will have ssb and will also be working on commercial frequencies. QSL cards should be sent via the ZS QSL bureau, they will be answered 100 per cent after the return of the expedition. Howard also mentions the fact that he still has logs and a few QSL's for his GC2HFD/A operations in 1962/3 and 64, and also for GD2HFD/A in 1964 and 67 if any QSL's are still needed.

ZS2MI, **Marion Is,** has been heard fairly regularly on Mondays, Wednesdays, and Fridays between 17.00 and 18.00. The station is using am and usually operates between 14,160 and 14,180 kHz.

Greg Johnston, VK7KJ, was due to arrive on **Macquarie Is** around 20 December, and is expected to be there until the end of March. VK0KJ will be on the air alternate weeks only as he will be on scientific trips every other week. As much activity as possible is promised with most taking place on 14 MHz but with some 21 and 28 MHz operation at weekends if conditions permit. QSL's for US contacts go via K4HJE, and for all others to Greg's home address. VK0MI will be there for 12 months and will be on on all bands 10 to 80m on cw and am. The third station, VK0IA, will also be leaving in March, 1969. Cards for both these operators should be sent via VK7KJ.

A station appears to be active from **Guinea.** 7G1CG has been heard on 21 MHz am around 20.00 asking for QSL's via Box 33, Conakry, Guinea. 5V4EG, who appears to be the only station currently active in **Togo,** has been worked around 18.00 on 14,150 kHz ssb.

Anyone wishing to contact Tom, VR6TC, on **Pitcairn Is** is invited to write to W5OLG for a sked. Tom works W5OLG every Tuesday on 21 MHz—the first Tuesday of each month on 21,060 kHz at 21.30, and on every other Tuesday on 21,350 kHz ssb at 22.00. Interested parties should write to W5OLG, Box 261, Grapevine, Texas, 76051, USA, saying which nights they will be on frequency and allowing plenty of advance notice. They should then wait to be called in and not call unless they are called. VR6TC has been reported on ssb on 14,225 kHz at 07.00 on Wednesdays.

The level of activity from **Brunei** should have increased considerably by the time this is being read, VS5MH left San Francisco, together with a KWM2 transceiver and 30L1 linear, on 20 November en route for VS5. VS5PH (ex-DJ6PH) hopes to be active on all bands cw and ssb soon. He has an SB100 with crystals for 14,112, 21,112, and 21,397 kHz, and should be on the air around 10.00 and 17.00.

There now seem to be three stations on the air from **Rhodes.** SV0WE has a TR4 transceiver and is to be heard on ssb only, SV0WU is confined to cw and am, and SV0WY favours 28 MHz cw.

The recent visit to **Lord Howe Is** by VK2BKM resulted in over 2500 QSOs. He enjoyed his visit so much that he hopes to return again this year and stay for three or four weeks.

A report has been received that Ian, ZL5AA, operating /3 from his home in New Zealand, would be leaving for **Campbell Is** (ZL4) almost immediately and would be there for two to three months.

KH6GLU intended to open a **Pacific DX Net** on 3 January at 07.00 on 14,240 kHz ssb and then hoped that this would take place at the same time and place every Friday afterwards. Check ins from the Pacific will be taken first and then calls from others wishing to join in. Latest DX news will be given and then each station in the net will be given the opportunity of two calls to others per round. The DX news and general information will be given hourly until closedown at 10.00.

Band Reports

An overall increase in activity seems to have resulted from the beginning of the new five band DXCC on 1 January. All continents have been workable on all bands (except 160m) at some time during the 24 hours on many days.

Very sincere thanks to all who have written during the past month, and particularly to the following who supplied the information in this section: G2BOZ, G2HKU, G3AAE, GW3AX, GM3CSM, G3HB, G3HCT, G3HDA, G3IGW, G3NKQ, G3OLY, G3TBK, GM3UCI, G3URX, G3UYM, G3VJG, G3VPS, G3WKT, G3WPO, G3XBY, G8JM, G8VG, SM2BYD, BRS19682, BRS20439, BRS28198, A5135, A5390, A5459, A5466, A5637, A5662, A5812, and A6215. As usual stations printed in italics were cw, the rest ssb unless otherwise stated.

1·8 MHz GC3UJE (Guernsey), GC3LPV (Alderney) both 23.45. GM3TKV/A (Morayshire 20.40). *HB9CM* (20.50), *OH1RG* (23.00), OK1's (21.00), *KV4FZ* (00.10, 04.50), *VE3QU* (06.20), *VO1FB* (05.10), *W2QD*, *K1PBW/8*, *K8CRJ*, *W3FMN*, etc, peaking around 05.00, sometimes worked as late as 08.00. ZB2AY (21.44, 03,30),

9A1VF (genuine, ? 22.58), *6W8CW* (genuine, ? 22.09).

3·5 MHz 05.00 VE1LL. **06.00** CM2DC, TG9EP, 3A2MJC. **07.00** KG4DO, *KV4FZ*, OX3WC, OX5AC, VE7PRJ/8, W3BMS, W4QCW, etc. **08.00** *ZL3FZ*, *ZL4IE*. **20.00** CT2AS, EA6BG, EP2AW, BQ, F9UC/FC, OY7S, VK5KO. **21.00** CN8AW, VE1AAW, 4X4VB, 5A3TW, 5N2's AAJ, AAX, 9H1R. **22.00** CT2AS, *OY2H*, OY4OV, TF3BV, *UL7IQ*, VS9MB, 4S7EC, 5Z4LS. **23.00** JA2BTV, 5A3TW, 9M2's DQ, DW, 9V1LN. **24.00** TF3CC, PZ1CF.

7 MHz 02.00 *PZ1AV*, *XE1EU*. **06.00** CM2DC, HC0BY/HR, *KZ5KM*, VR5AE. **07.00** KZ5KN, OA1CN, PX1PA, XE's 1WS, 3EB, ZD8Z, ZL1DS, 5N2's AAX, ABG. **08.00** XE2BTR, *ZL2AFZ/C*. **09.00** *HI3PC*, *W6NKR*. **18.00** JA2BTV, JA3HV, JX3DX, ZS6AM. **19.00** *DU1AT*, VK's 2AVA, 2BKM, 2NN, 7PA, etc, *ZS6BT*, 9K2BJ. **20.00** HS3AL, *PY7AWD* (Fernando de Noronha), *UI8AZ*. **21.00** *CR6AI*, OD5FA, *4X4BZ*, 5N2AAX, 5Z4KS. **22.00** 4X4MR, 9J2MX, 9K2CF, 9Y4KR. **23.00** CM2DC, *VP9GG* (ex-G3DLH), YV5BPG, 9Y4TA.

14 MHz 00.00 VS5JT, *XE1FE*. **03.00** *FB8XX*, *4S7JP*. **04.00** KH6EZU, W3UEQ/KL7, VU2CK. **06.00** KC4's USD, USF, USN. **07.00** KS6CG. **08.00** *CE2PN*, KW6DJ, ZL's. **09.00** FO8CG, HL9KG. 10.00 KR6JT, VK0KJ (Macquarie Is). **11.00** *FP8's AP*, *CW*, *PZ1BL*, *VP2MK*. **12.00** *PJ2VD*, *ZP5CE*. **13.00** VK0KJ, VR4EL (a.m.). **14.00** JX3XK. **15.00** AP5HQ. **16.00** *KL7MF*, OX5BA. **17.00** FR7ZG, *VP2MK*, 5R8AH, 9K2CF. **18.00** *CR6CH*, FG7XX (Box 7, Ste. Claude, Guadeloupe), FP8's SCS, CT, HS1DL, KL7BJC, MP4TCF, *TA2E*, ZC4BX, 9X5AA. **19.00** VP8JT, *VQ9B*, *7P8AB*, 8QAYL. **20.00** *ZD8Z*, ZS3JJ. **21.00** HI8XPM, 8P6AZ. **22.00** *XP1AA*. **23.00** KL7RE.

21 MHz 08.00 UA0AJ. **09.00** WA7BYX/KG6, *YA1YB* (QSL via WA9AAT), ZL's. **10.00** *CT3AS*, VS6AL, *ZL3JC*. **11.00** *FG7's XE*, *XM*, *XX*, W6NFM/DU1, LG5LG, *TA2E*, YA1HD, *YV6EE*, VK's, 9Y4LF. **12.00** *HP1IE*, *PZ1CM*, VK's, *VS6FX*, *ZL3's BJ*, *CC*. **14.00** *FB8XX*, *HH9DL*, *9V1OS*. **15.00** OX3LP. **16.00** JX3P, HK0BKN, *MP4TCE*, 5R8CJ (WA0RZB, will be in Europe soon). **17.00** A2CAQ, HR2HTA, TI5CPG, *W7SU* (Utah), 9G1GK. **18.00** HR1KAS, *VP2LE*, 7G1CG. **19.00** HI3AGS, *VP2MO*. 21.00 *8P6BU*.

28 MHz 08.00 VK4DD, VS6AL. **09.00** HS3RF, MP4BBA, 9N1MM. **10.00** CT2AS, VU2KZ. **11.00** *CR6AI*, XW8CS, ZD5X, *ZL3IS*, 7Q7WW. **12.00** A2CAQ, DU1UP, *HZ1AB*, *JX2BH*, *TA2E*, *VK8HA*, VP2LX, 6Y5NY. **13.00** HK0BMO, OD5FG, *TJ1QQ*, VP2MO, W7HFC/8R1. **14.00** FG7XL. **15.00** VP2MO, VP8FL, XE1FFC, *YS10*, *9J2XZ*. **16.00** HK3WO, TG8CD, VP5AA, VP8KD, ZS3HX. **17.00** W6's and W7's. **18.00** *W0DIA* (regular good signal).

Many thanks are due to all correspondents and also to the following for permission to reproduce items from their publications: **NARS Newsletter** (*5N2AAF*), **Long Skip** (*VE3HJ*), *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*), and **CQ DX** (*ARI*).

Please send all correspondence for the **March** issue to **reach** G3FKM no later than **11 February,** for the **April** issue by **11 March,** and for the **May** issue by **15 April.**

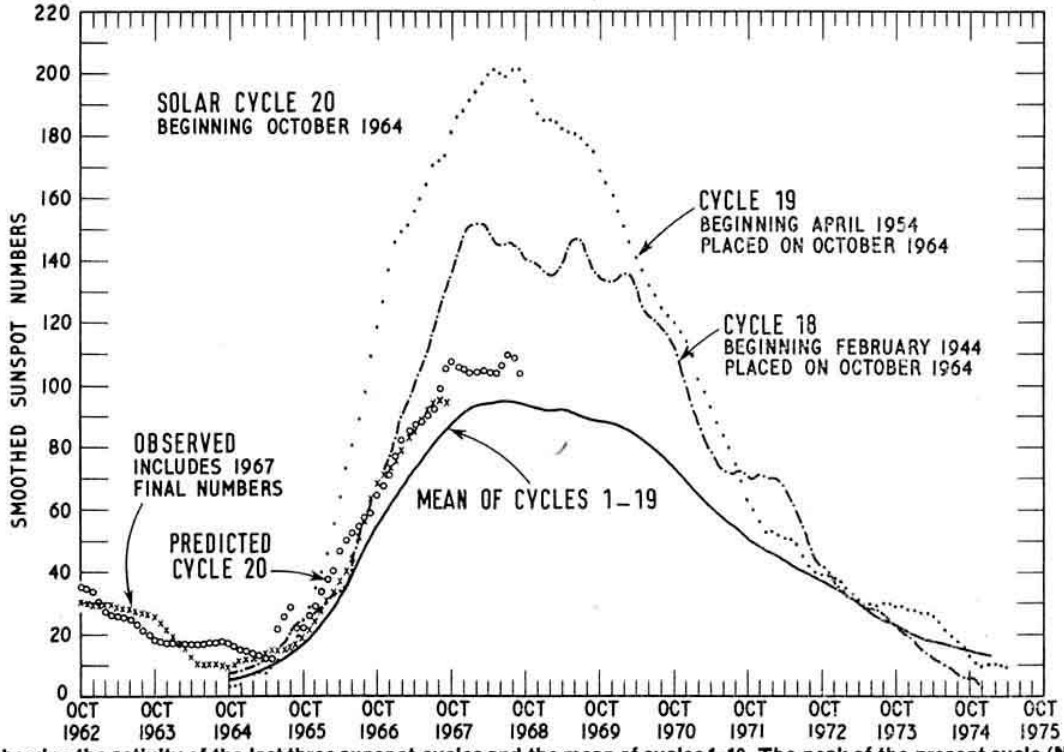


Chart showing the activity of the last three sunspot cycles and the mean of cycles 1–19. The peak of the present cycle (No. 20) is now generally accepted as being May 1968. The sunspot numbers at the peak of the present cycle were roughly half of the numbers noted at the peak of cycle No. 19.

REGULAR FEATURE

FOUR METRES AND DOWN

By JACK HUM, G5UM*

Flexibility

ARE those of us who inhabit the vhf and uhf spectrum sufficiently flexible in our operating procedures? May there not be some room for improvement in one or two particulars? Tom Douglas, G3BA, of Sutton Coldfield, in ruminating upon this question over the turn of the year, thinks that perhaps there is. He writes:

"Looking over the last six months' 'Four Metres and Down,' I am struck by the apparently hidebound attitude of some of our vhf men. On the ssb front I have worked several stations who have intimated that unless someone calls them on ssb on their own frequency they will not work anybody else. All right, so ssb is a wonderful mode to operate, but there is no need for such a dogmatic attitude, I am sure.

"Again, with nbfm, an excellent mode, there are many who will not even consider trying to receive it because this means making an adjustment to the receiver to accommodate slope detection, or installing a discriminator."

Among the A3 men Tom thinks there are still many adherents to the myth that ssb is "a duck like system of communication where good intelligible speech quality is quite impossible to achieve." Even the cw operators are not without their hidebound statements of "cw only, and never work anything else," he thinks—though from our own observation we'd say that all the 2m cw men we know do have phone facilities available, and indeed tend to use them more often than A1.

Looking ahead over 1969 G3BA leaves us with these thoughts "... work all modes appropriate to conditions rather than one only. This would produce greater activity and a much healthier outlook. More power to the elbows of those amateurs on vhf and uhf who are trying new techniques and improving their operating abilities to advance the state of the art rather than shackling it to old outworn ideas. Let *flexibility* be our keyword, not intractability."

From which sentiments few of those who read this page would dissent. To translate them into practicalities we would add the thought that flexibility can be furthered in a number of ways, several of which were implicit and explicit in "The Metre Wave Man's Code," published here last month. To hear a single sidebander state his intention to tune other than to 145·41 gives hope to the double sidebander of a contact with him. Conversely, the dsb-equipped operator widens his range in more than one sense by specifically stating "Monitoring 145·41" rather than just simply "Tuning high to low."

Another thought: sideband is readable at greater range than A3. So is cw. More contacts between the two could be made at DX if each group tuned the other's segment: easy for the cw man, less so for the ssb man, transverter-tied to a narrow range of frequencies. There's further scope for flexibility here.

"Encourage New Techniques . . ."

There's some more looking ahead over 1969 in a thoughtful contribution received from G3UFP of Rickmansworth. Welcoming the Technical Committee's organizing of the November meeting and last month's article on VHF/SSB, he urges the need to find out what level of spurii can be tolerated, both legally, that is, before infringing the terms of the licence, and practically, *i.e.*, before causing inconvenience to neighbours on the band and other services, notably aircraft. Says G3UFP: "The use of ssb not only facilitates but encourages the use of high power and we must therefore be more careful than hitherto."

He goes on to develop the view that attempts to confine ssb to a spot frequency, or its environs, on "Two" are doomed to failure: "I can see no advantage in co-channel working except to satisfy aesthetics and oneupmanship . . . nevertheless, a geographically based band plan is essential, and increasingly so, as weak signals do not then have to be looked for among strong ones. To sum up, we must encourage the use of new techniques while being very careful to conquer the problems they bring, and not to be content just to 'radiate a signal'."

Californian Kilowatt on "23"

Following his successful E-M-E two way with California on 23cm last November, Peter Blair, G3LTF, was at the Chelmsford end of a further series of tests in December, when K6HCP of San José was heard at 3 to 5dB above noise in a 100 Hz bandwidth, sending the prearranged code which indicated he was not hearing G3LTF. Although this was a disappointment for Peter and for Willie McLintock, G3VPK, who was assisting him, they have hopes of a further two-way come the Spring, when conditions toward the US are expected to be more favourable.

In E-M-E tests such as these allowance is made for the change in transmit frequency caused by Doppler shift. At G3LTF the receiver tuning was offset by 1 kHz, and there was K6HCP bang on frequency 1296·000!

At the Californian end the transmitter was delivering 600-800 watts of rf from a water cooled final comprising six 3CX1000A valves.

Later in December—

The Geminids Give

—and back to the 2m band, G3LTF was one of several operators on watch during the Geminids manifestation mid-month. His contact with OM1VHK was his twelfth by ms (the prefix OM was used by our Czech friends during the Republic's fiftieth anniversary celebrations).

* Houghton-on-the-Hill, Leicester LE7 9JJ. Send reports for the March issue by 11 February, and for the April issue by 11 March.

Between 02·00 and 05·15 GMT on 13 December many pings and short bursts giving a count of 16 over a five minute period pushed signals fleetingly to 30dB over noise in a 1 kHz bandwidth; but as will be gathered from the elapsed time (3¼ hours) information transference was slow. Eventually reports of S24 out and S28 in were exchanged. Meanwhile on 4m BRS15744 in Sussex had GB3GM pinging at 539 over a 3-hour session.

Next day G3CCH of Scunthorpe, who collaborates closely with G3LTF, G3MNQ and others on meteor scatter propagation work, also made a QSO with OM1VHK. And from Birr in County Offaly comes news from EI7AF of a contact via meteor scatter with OZ9PZ—Bob Williams's first ever by this mode. His QQV06-40A was feeding what he calls an extended expanded colinear array, the gain of which, some 6dB better than the 6-over-6, warranted the effort of erecting it, with EI4AL helping. The array measures 15 ft by 8 ft by 20 in deep. Even more ambitious aerial plans are in the making: four long Yagis in a box 20 ft square up at 40 ft, giving it is hoped a gain of 22dB over a dipole. And on 14 December the first ever ms contact OY to OZ: OY2BS to OZ5NM on "Two".

During the Geminids signals were even coming down from Finland. At Chelmsford OH2BEW was heard calling LX1SI on single sideband, peaking 6–8dB over noise in a 2 kHz bandwidth, though G3LTF reports that full identification of the Finn took some time to complete. The Geminids were producing very short bursts in December so it was a case of waiting. This is what serious MS operators are prepared to do: infinite patience is a part of their make-up. So is a refusal to be disheartened when after hours of trying to sustain a contact complete reports are not exchanged, or the final "R" is not received. Without these it's "no QSO".

Which brings us to a subject which has had desultory comment here from one or two members. . . .

Pickaback Contacts

Occasionally on vhf, more often on uhf, signals can be so weak as to be virtually inaudible, when ordinary tuning procedures are employed. You just pass right over them.

Someone half way along the path can be a help in reporting the exact frequency on which to look. He can also, if each party asks him, relay signal strengths—but when this happens it's "no QSO" between the distant stations. Each must exchange RS or RST full two-way with one another.

Stating the obvious? Maybe. We do so in case anybody is misled into submitting for "Four Metres and Down" certificates QSL cards in respect of "by proxy" contacts and not real ones.

The 13CM Tests Continue

Operating "Stroke P" in the UK in Winter is to invite discomfort. This has in no way deterred G3EEZ and G3BNL from prosecuting further tests on the 13cm band, the former sited on Cannock Chase and G3BNL/P in the Cotswolds. On 8 December signals were exchanged over a 68 mile path at RS59, with QSB evident for the first time: the Cotswold signal drooped to S6 on occasion.

On 5 January G3EEZ/P moved further north to Mow Cop in Cheshire, and G3BNL/P worked him over a 95 mile path again at RS59 and again with fading to S6. When G3BNL/P moved to Nymphsfield, upping the QRB to 103 miles, he took G3EEZ/P at S6, but the path was not two-way.

"Further investigations and tests will proceed when weather allows," says G3EEZ, adding that he hopes that G3OAD, who has rendered enormous assistance in the tests so far conducted, will still be available. He has a narrow band receiver ready against the time when the G3BNL narrow band transmitter is complete. The relative merits of pulse, as used to date, and narrow band emissions will then be assessed.

Midlands Convention '69

Last year was a sabbatical year for the organizers of Midlands VHF/UHF Conventions. The decision was to hold instead two informal dinners during 1968 *pour le mieux sauter*, as it were, for a really slap-up Convention in 1969. All the signs are that this year's event will be something to remember.

The thing for members to do right now is to note the date, which is Saturday, 14 June (it conveniently avoids any RSGB contests that weekend), and the place, which will be the Dunstall Suite at Wolverhampton Racecourse, two miles north of the town centre on the A449 to Stafford. This suite is a new one, opened only last September; having a large conference room upstairs it is just the right sort of venue for an amateur radio gathering. However, to avoid overcrowd-

TROPHY FOR SSB ARTICLE. The Wortley Talbot Trophy is one of the largest in the Society's collection of memorabilia. When crated for dispatch it occupies most of the boot width of an 1100 motor car.

Offered to the Society by the late G6WT of Torquay, this trophy is engraved with the names of many who have furthered technical development in the field of amateur radio. The first holder in 1929 was Jimmy Mathews, G6LL, then a pioneer of world DX on the 28 MHz band, now an enthusiastic advocate of vhf. The latest holder is Eric Goodwin, G3MNQ, a leading (an early) exponent of single sideband at vhf. It was in recognition of his masterly article last June describing an all-solid-state phasing exciter for ssb that the Council awarded the "Wortley Talbot" to him for 1969.

At a time when most of the publicity about sideband on vhf is directed towards transverter devices—and rightly so in view of the havoc which these can cause when unintelligently used—it is worth remembering that there are other methods of producing single sideband on "Two." The G3MNQ design is one of them—and a re-read of last June's article about it is worth doing.

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	E.N.E.
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 v.h.f. beacon transmitter frequency at Wrotham, Kent, measured by the BBC Frequency Checking Station (nominal frequency 144·50 MHz):

Date	Time	Error
19 - 12 - 68	1007	1230 Hz high
24 - 12 - 68	1527	1220 Hz high
31 - 12 - 68	1335	1280 Hz high
7 - 1 - 69	1335	1250 Hz high

ing, the Organizing Committee intend to limit the number of people sitting down to dinner to 130. For the afternoon lecture session the room will take 170.

This does suggest that, even now in darkest February, it is no bad thing to get a ticket application in early. Past Midlands VHF/UHF Conventions have proved so attractive, and the Wolverhampton area so convenient to get to from most parts of the country, that there is sure to be a big crowd going along to the 1969 event. Apart from the dinner that evening, a strong lecture programme is being laid on for the afternoon session. Mike Dormer, G3DAH, past chairman of the Society's VHF Contests Committee and conductor of *Short Wave Magazine's* "VHF Bands," has accepted an invitation to act as Convention Chairman for the day.

A cheque for £2 made out to "Midlands VHF/UHF Convention" and sent to G8AEV, J. R. Hartley, 30A Salop Street, Bridgnorth, Shropshire, will ensure a place at the dinner and the lecture session, plus afternoon tea. For the afternoon session only, including tea, the ticket price is 10s.

Peter Walters, G3THW, is Joint Convention Secretary. He can be reached on Wolverhampton 23414 during the day and Wolverhampton 36497 at home.

Keep RF Gain Up, Mondays

Many "Monday Nighters on 70cm" tune around with their gain controls at reduced level to keep down the sound of strong local stations and in consequence miss the less strong sound of the more distant ones.

Says Denis Gaskell, G8BGW, of Matlock: "After a CQ, do not always reply to the first S9 signal you come to upon tuning, but look for that weaker signal which is also calling you. More than likely it will be from someone poorly sited, such as those of us in the Derbyshire hills, where *any* signal is seized upon as a potential contact. If you do not find a weak signal calling you, your local friend will still be there."

Very true. We'd add the further thought that if the first few CQ calls produce no replies, keep on at it with beam directed in turn to different points of the compass. You never know who's listening.

Monday Night on 70cm seems to start in earnest about 8 pm, reaching a peak about 9.30, and tailing off after 10pm in accordance with the well known phenomenon that few uhf men stay up late—even during contests.

Apropos 70cm . . . .

"Only One Crystal Here . . ."

In spite of the grunts of disapproval about out-of-zone operation on "Two," there is no doubt that many of the younger newcomers to the band conscientiously wish to get in zone but are thwarted by lack of finance.

Cheltenham's G8BTV has got himself a crystal for 144·3 correctly in the SW zone but is worried that when tripled to 70cm it will put him out of zone—and he can't yet spring a second one for "Seventy." What should he do?

Being out of zone on "70" will cause far less havoc than being out of zone on "Two" where the population is much greater. When the 432-434 MHz communication sector fills up we'll need to observe the 70cm bandplan more rigidly than we do now. Meanwhile, 'tis better to have G8BTV on 70cm even if out of zone than not at all.

. . . Or No Crystals?

Problems with crystals in (or out of) zones will be solved when the use of the vfo is universal at vhf. The practical value of the variable frequency oscillator is expressed by G3NOH of Watford: "Its use saves a great deal of time and frustration," he declares, and goes on to add: "I used to spend literally hours waiting for a DX station to tune up to my frequency when crystal controlled. Now I have no bother at all in raising the rare ones using a vfo."

Which is exactly what is recommended by the 1966-updated band plan: position yourself in the band where you will be found swiftly by the searching station (who will have announced his tuning direction), but if the contact looks like being a leisurely one (*i.e*, not contest) tell him you will QSY into your zone to continue it.

All very nice if you have a signal like that from G3NOH (or G6LL or G2DCI or another score or two with vfos indistinguishable from crystals). It will do vhf a serious disservice if half-engineered master oscillators get around.

Concentration

Our old friend serendipity states that if a given number of radio transmitting stations are active over a number of kilohertz during a lot of hours the chances of contact between them are remote and random.

Concentrate the same number of stations in fewer kilohertz (or even on one spot frequency) in a shorter space of time, and the result is a lot of contacts.

Yes, it has all been said before with the object of persuading vhf and uhf operators to come on at set times in the sure knowledge that there will be plenty of others there waiting for them.

"Monday Nights on Two," initiated by G5KG and yours truly about a dozen years back, and succeeded by "Monday Sideband Nights on 145·41" and of course "Monday Night is 70cm Night" are demonstrations of the theory in practice. Its extension at local level is shown by the large number of spot-frequency nets which have sprung up on 2m over the last two or three years, giving the regulars regular contacts and the newcomers new ones.

Down in the mid-Severn valley something stirs, not just once a week as with most nets, but *every weeknight*. The Mid-Severn Raynet Group, formed a year ago, meets regu-

larly at 19·30 BST on 144·486 MHz under the aegis of Tony Blackmore, G3FKO, who is group controller. It attracts RAEN checkers-in from Radnorshire, way out west, to East Worcestershire, from Dudley down to Cheltenham. A dozen or more engage in well-drilled communication exercises as well as in the less formal get-together over the air which spot frequency operation of this kind affords.

Crystals etched to the channel are supplied at cost (7s) to members. And the now-famous Mullard all-transistor transmitter-receiver (*Mullard Technical Communications*, January 1968) is being built in quantity on standardized printed circuit boards (of which G8ARV helped the design and G8AEV the supply of bits).

Portable operation, another activity by the Mid-Severn Raynet Group, recently called for two units to establish themselves on the hills at Minehead (G3NUE/P) and in Herefordshire (G8ASO/P), in very different circumstances from the usual fine-weather forays of high summer. Contact was maintained between the two portables and many of the net stations, in spite of a high level of snowflake static.

Operators within range of the Group might find it profitable to listen out for its contest next Sunday morning, 9 February, 11.00 BST, and to its next exercise on the Sunday afternoon of 9 March.

Yorkshire Contest

Another local contest scheduled for this month is that being laid on by G8BUP and G8BVA of Leeds on Sunday, 23 February, 09·30–10·00, 13·30–15·00 and 19·00–21·00 GMT. It is for am or fm phone only on 2m, and all stations within the county of Yorkshire are invited to participate. A copy of the rules can be had on sending an sae to R. J. Nettleton, G8BVA, 129 Stainbeck Lane, Leeds LS7 2EB.

Tech Corner

From G8AWO (Ron Gray of Welwyn Garden City):

The John Gazeley design still remains one of the best 70cm converters to have been described in print. The following notes show how G8BGM and myself set about making one or two small modifications to the original to enhance its performance still further.

We felt that a layout of chassis as shown in Fig. 1 was desirable; it makes the unit easier to work on. The multiplier stages run down one side of a piece of double-sided copper board, and the rf and i.f. section is disposed next to them and screened from them by another length of double-sided copper board.

The rf and i.f. board was extended to give room for the final i.f. transformer. The two ends of this board are isolated

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VHF Personalities: No. 6

Bert Mills, GW3LJP

It was a pre-war interest in radio that prompted Bert Mills to go in for airborne radar maintenance when he was called up. Fascinated by what he saw of crt applications in RAF nightfighters he decided when he got back to civvy street to see what could be done to bring television into his Radnorshire home using ex-RAF units which were then available in abundance as war surplus.

At a time when Alexandra Palace (17 kW) was the only television transmitter in the Kingdom, receiving its pictures on home-built equipment over a difficult 140 mile path was no mean feat—and with no ac mains.

From these experiments sprang an interest in vhf. When at last ac mains arrived and GW3LJP was licensed in November 1956, there was a brief spell on 80m and then concentration on 2m. Over the next four years 300 stations were worked on "Two" from a site at Llandrindod Wells 720 feet up but surrounded by higher land rising to 2000 ft in the east. Signals were hard to find, and nearly all were DX to a station out on a vhf limb; but persistence brought its rewards.

In 1967 there was a move to a 900 ft site atop a little hill that was a previous obstacle, and offering a take-off much better than before. The QTH at Cross Gates is a house built in 1721; it adjoins a Baptist Chapel of the same age. It is the parent church of its denomination in Radnorshire, and GW3LJP and his wife Joyce are its caretakers. "Perhaps it is unique to find the old and the new (amateur radio) in association with one another" he says.

By trade a television engineer and aged 49, Bert works in nearby Llandrindod Wells. There is a daughter Valerie, who is married and lives some 6½ miles away in Rhayader. In the picture at right, Bert; centre, Valerie; left, Valerie's husband Barrie.

Thanks to the superbly sited new QTH, Radnorshire is no longer a county difficult to work on vhf, even though GW3LJP seems to be the only metre-wave man in it. Many people now find that they can work him readily on 4m, 2m, and 70cm, where respectively there are Yagis of 4 elements, 7 elements and 11 elements on a common 47 ft mast rotated by a tiny 50 volt motor geared 2000 to 1.

The aerials like the transmitters which feed them are home-built. Any of the transmitters can be brought on to the air by a master relay selection system, which also routes the output of the common modulator to the selected transmitter.

Television's early fascination continues to exert its pull, even though Bert works at it all day, and there is a possibility that "Stroke T" operations may be launched in the not distant future.

The future holds another possibility; that Radnorshire may disappear, engulfed in "Powys" along with Montgomery and Brecon, if the boundary-adjusters have their way. So those who haven't worked GW3LJP on any of the three metre wave-bands ought to think about collecting Radnor before it is too late.

by making saw cuts where shown; all this in the interest of stability.

Another modification made both in the interest of stability and to allow the rf amplifier to be set up for optimum performance was to replace the recommended 620 ohm emitter resistor with a pre-set potentiometer of anything up to 1000 ohms.

Any residual i.f. breakthrough can be effectively obliterated by putting a goof rf amplifier ahead of this converter. The one used at G8AWO is shown at Fig. 2. The circuit was obtained from G8AVL, though who the original designer was is not known. He deserves a medal for a very efficient job. The transistor used is a BF180 which is highly thought of by the 70cm fraternity. The box is of 28 gauge sheet brass, $3\frac{7}{8} \times 1\frac{1}{8}$ inches.

The input and output lines consist of identical lengths of $\frac{3}{16}$ in copper tube, each tuned by a small trimmer at the hot end. A sheet of 28 gauge brass firmly isolates output from input, which can "see" each other only through the tiny hole through which the collector lead is passed. The transistor itself must be mounted as close as possible to the screen and its case earthed.

The inset drawing to Fig. 2 shows the positioning of the lines within their troughs, as centrally as possible. Where the co-axial sockets meet the lines they are soldered to a tag secured by nut and bolt to the lines.

The emitter and base feed resistors are accommodated on top of the assembly as shown. All components values are shown in Fig. 2.

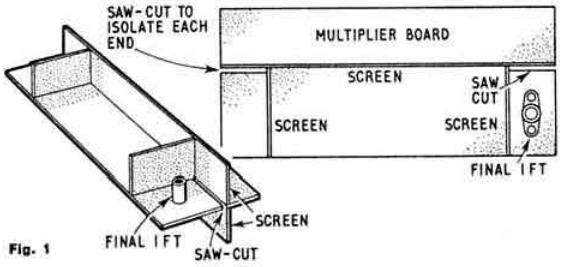


Fig. 1

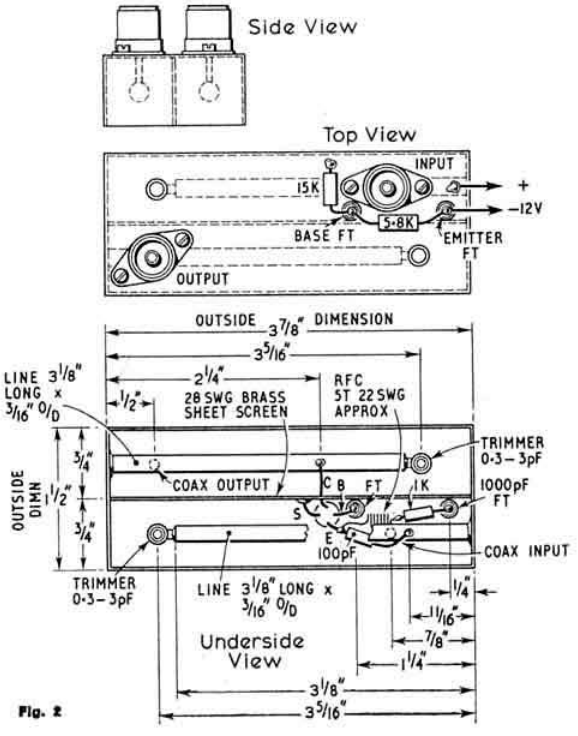


Fig. 2

Here and There

"All quiet in Gibraltar at the moment, although we are listening and calling on 6m. Rather to be expected in mid-Winter, but we'll still be around in the Spring when things should pick up"—ZB2BO.

* * *

"... the article by G2HIF on the transistor linear is a work of the highest quality, a practical design backed by sound theory and experiment and presented with great clarity and logic"—G3UFP.

* * *

"A small point regarding QLF and QLM. Appendix 13 of the Geneva Radio Regs states that QRA to QVZ are for use by all services. QAA to QNZ are for the aeronautical service and QOA to QQZ for the maritime service. Strictly, QLF and QLM are for Stroke AM use only!"—G2BVN.

Tip for telegraphists: if you *do* decide to drop the "Q" and to use just "ML" or "LF" (or whatever) to denote tuning direction, the latter won't sound like part of the callsign if you insert a short break in front of it: "CQ2 de G1AB diddit diddit LF AR K."

* * *

"I was saddened to read that G6JI had become a silent key. He was a pioneer of the 5m band. He, the late G5VY and I used to transmit to each other on 56 Mc/s (as it was then) every Sunday morning in 1935"—G5BB.

* * *

Many listened for the Apollo 8 on the satellite frequency of 136 MHz. It wasn't there. Where was it? G3MYI rang Jodrell Bank to find out. They said, "On 2280 MHz."

The aerial system, says *Electronics* magazine, was four 31-inch parabolic reflectors around an 11-inch-square wide-beam horn, with automatic lock-on to the Earth station.

* * *

" ... will be on ssb when I open up at the new QTH at Newton Aycliffe, Co Durham ... it's a good mode and certainly better than hi-fi am. A broad transmission is a confounded nuisance anyway in areas of high activity "—G8ANQ.

* * *

Any moment now the Gibraltar beacon will be back on the air—but look for it on its new frequency of 70·29 MHz.

* * *

" I am opposed to the idea of 4m Cumulatives on Sunday mornings. Many members have religious and domestic commitments at that time. And Sunday morning is *not* outside TV hours ..."—G2WS.

SOCIETY AFFAIRS AND NEWS SUPPLEMENT

A Brief Report of the RSGB Council Meeting held on Thursday, 5 December, 1968.

Present: The President (J. C. Graham in the Chair), Messrs. B. Armstrong, N. Caws, J. Etherington, R. J. Hughes, A. F. Hunter, E. G. Ingram, H. E. McNally, L. E. Newnham, A. D. Patterson, J. Petty, R. F. Stevens, J. W. Swinnerton, E. W. Yeomanson (Members of Council), C. P. Pope (Secretary), A. E. Dowdeswell (General Manager) and J. Adey (Editorial Staff).

Apologies for absence were received from Messrs G. M. C. Stone, D. M. Thomas and G. Twist.

Membership and Affiliation

It was resolved:

(i) To elect 164 Corporate and 56 Associated Members.

(ii) To grant Corporate Membership to 18 Associates and BRS numbers to four Associates.

Council approved the waiver of the subscriptions of eight members on the grounds of blindness or other disability.

Applications for affiliation were received from the following and approved by Council:

Taunton and District Amateur Radio Club, Secretary H. P. Jones G3WPJ; Swindon and District Amateur Radio Club, Secretary E. J. Andrews, G3JAP; 10th Warrington Boy Scouts Amateur Radio Club, Group Leader J. Hughes, G3RRM; and Mid Cheshire Amateur Radio Society, Secretary A. J. Greenwood, G3SIQ.

Area Representation

It was reported a majority of votes had been received in favour of Mr R. A. E. Fronius, G3MCW for the vacancy of Area Representative at Brentwood, Essex and Council approved his election.

It was reported that the following late nominations for Area Representatives had been received and these were approved by Council.

G. Lancefield, G3DWQ—Preston.

R. Holland, G3BPE—Bexley, Kent.

D. F. Beattie, G3OZF—*Area yet to be defined.*

Supplementary Report of Council

The draft of the report to be presented at the 1968 Annual General Meeting was accepted subject to minor alterations.

Future Annual General Meetings

It was decided to defer the question of holding Annual General Meetings in centres other than London to a future meeting of Council.

RAE Manual

Council approved the preparation of a revised edition of the RAE Manual.

Minutes of Meetings of Committees

Council accepted the minutes of the following committee meetings: Education Committee (26.10.68); GPO/TVI Committee (21.10.68); IARU Working Group (5.11.68); HF Contests Committee (14.11.68); Scientific Studies Committee (31.11.68).

New Headquarters

It was reported that the clock in memory of the late Mr F. Ruth, G2BRH had been installed in the Council Room.

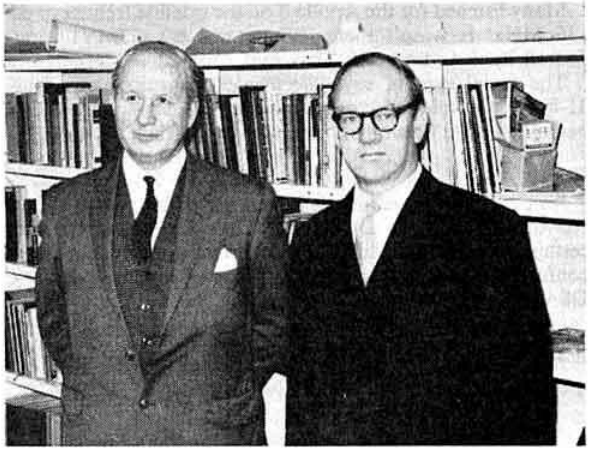
Radio Amateur Invalid and Bedfast Club

Mr Petty reported that he had received a letter from Mrs Frances Woolley, G3LWY, Honorary Secretary, who had agreed to submit information on the club's activities for publication in *Radio Communication*.

Retiring Council Members

The President thanked the two retiring Council members, J. Etherington, G5UG and A. D. Patterson, GI3KYP for their work during their term on Council and also expressed thanks to all Council Members for their co-operation during his year of office.

Council was in session for 4½ hours.



Harry Wilson, EI2W (IARTS VHF Manager) seen here with Eric Dowdeswell, G4AR (RSGB General Manager) in the Library at 35 Doughty Street, during a visit in mid-January.

Supplementary Report of Council

The Council is pleased to submit the following Report on Society activities since 30 June, 1968. The period 1 July, 1967 to 30 June, 1968 was covered by Council's Report published in the November, 1968 issue of *Radio Communication*.

New Headquarters

After several delays, Headquarters was able to move, at long last, to 35 Doughty Street, WC1 on Saturday, 2 November, 1968. Thanks to the excellent co-operation of Headquarters staff and others, the routine work of the office was continued with a minimum of delay. It was hoped that members and others would find it possible to visit the new Headquarters on the " Open weekend ", Saturday and Sunday, 14-15 December, 1968, when staff and Council members would be pleased to entertain visitors.

RSGB International Radio Engineering and Communications Exhibition

Visitors packed the Hall for the Opening Ceremony, performed by Mr W. J. Sharpe, CBE, Director of the Diplomatic Wireless Service.

Financially, it was the best ever for the Society, due mainly to the timely appearance of the fourth edition of the Handbook.

This year Council awarded the Founder's Trophy to the Exhibition Organizer, Mr Phil Thorogood, G4KD, as a further token of their grateful thanks to him for all the work undertaken on their behalf.

Exhibition Committee members, under the able guidance of Mr Yeomanson, G3IIR, organized the largest Society stand yet and the record takings are a tribute to their efforts. The President and Council express their thanks to those who assisted on the stand.

IEE Lecture

A more topical subject than " Single Sideband at VHF " could hardly have been chosen and the record attendance of over 100 was ample reward for the four speakers, Mr Greenwood, G3LBA, Mr Griffiths, G3MED, Mr Pett, G3SHK and Mr Stone, G3FZL, at the Lecture on 15 November, 1968.

Radio Communication Handbook

The long-awaited Handbook was made available in time for the Exhibition and nearly 2,000 copies were sold. Council is pleased to report that substantial orders from overseas have been received.

Unfortunately, delays beyond the Society's control prevented the simultaneous despatch of Handbooks previously ordered by members. Council would like to apologise to all concerned for the delays. All outstanding orders have now been filled. The Treasurer will report later on the present position.

Radio Amateurs' Examination

The Winter Examination was held on 3 December, 1968, the Society organizing a centre at the College of Preceptors. The total of candidates was restricted to 90, due to the difficulties of accommodation.

GB2LO

An Exhibition station was set up at the *Daily Mirror* building in connection with the City of London Festival in July and many thousands of members of the public, including the Lord Mayor of London, visited the station during the two weeks it was in operation. The Council is indebted to Mr M. Margolis, G3NMR, and his team of helpers for their efforts.

Meetings

An Official Regional Meeting was held in Region 1 at Southport on 29 September, 1968, at which Council was represented by Mr A. D. Patterson, GI3KYP, Mr J. R. Petty, G4JW, and Mr H. E. McNally, GI3SXG, each of whom addressed the hundred or so members present at the business part of the Meeting.

The Scottish VHF-UHF Convention was held at Glasgow on 16 November, 1968 and was opened by Mr G. M. C. Stone, G3FZL, on behalf of Council. Mr Stone also lectured on the problems of VHF Single Sideband operation.

The Society's National Mobile Rally at Woburn Abbey on 18 August, 1968 and the Scottish Mobile Rally on 22 September, 1968, both proved successful and attracted large crowds.

The GI-EI Convention on 6 October, 1968, at Dundalk, was pleased to see the President, Mr J. C. Graham, G3TR, who was accompanied by the President of ARRL, Mr R. Denniston, W0DX, both of whom travelled there overnight, direct from the Exhibition.

Cristoforo Colombo Prize 1968

Council was delighted to learn that the Gold Medal and Diploma had this year been awarded to Mr C. E. Newton, G2FKZ, for his work on Auroral Propagation during and after the International Geophysical Year.

RAEN

Council notes, with gratitude, the efforts of a number of RAEN groups in the recent disastrous floods, but regrets that the User Services did not take full advantage of the organization.

Obituaries

Norman Evans, G3FRT

It is with deep regret that the Wirral Amateur Radio Society report the death, after a long illness, of Norman Evans, G3FRT, past treasurer of the Society.

Norman was a most energetic worker for the Wirral group and was largely responsible for the raising of funds which purchased much of the club's field equipment. His boundless boyish enthusiasm acted as a spur to all who came into contact with him. When, several years ago, he announced his retirement it came as a shock to us all.

His name will long be remembered in the Wirral Amateur Radio Society, for he was an outstanding figure. We extend our deepest sympathy to his widow and children. F.N.K.

Ken Lawless, G3NIZ

The Huddersfield and District Radio Amateurs learnt with great sorrow of the sudden death of Ken Lawless, G3NIZ, at the early age of 42.

Ken was known for all his efforts over the years in the Scout Jamboree of the Air. He took part in this year's event operating all night. He was not very active from home, but always took part in any combined radio events. He was noted as one of the very reliable participants and will be impossible to replace. All of us who knew Ken as a friend were shaken by his passing, and extend deepest sympathy to his widow Jean and young family. J.H.F.

Walter Huxley, GW3RIB

The death occurred on Saturday, 21 December, 1968 at his home of Walter Huxley, GW3RIB. Walter was a well known operator on 80 and 160 metres am, but lately he became interested in ssb on the hf bands.

His main interests were talking to his friends, classical music and offering all amateurs who came his way the hospitality of his home, and his shack was the admiration of many people. He was a bright and cheerful person and one would not guess his disabilities. He was also a member of the RAIBC.

The deepest sympathy of his friends and fellow amateurs in Flintshire, Cheshire and Lancashire is extended to his wife and son who survive him. J.J.M.P.

IARU

Region 1 calling

INTERNATIONAL AMATEUR RADIO UNION

By R. F. STEVENS, G2BVN

Region 1 Conference May, 1969

The next triennal Conference of the Region will be held at Brussels between 5 and 10 May, 1969. The Conference venue is the Hotel Metropole in the centre of Brussels which is the only hotel capable of providing suitable accommodation and meeting rooms. It is expected that of the 31 Member Societies of the Region 1 Division at least 18 will send delegates to the Conference. A number of the smaller Societies for whom travelling expenses are a problem have already indicated their desire to participate by securing representation and a proxy vote with one of the other national societies. A number of Eastern European countries will be sending delegations and these will include USSR, Poland, Czechoslovakia and Bulgaria. Yugoslavia, which was the host nation at Opatija in 1966, will be sending a delegation and is represented on the Region 1 Executive Committee by Janez Znidarsic, YU1AA.

The Conference, after a formal opening, divides into three Committees and their titles indicate the nature of their interests, i.e. *Administrative and Operational, VHF,* and *Finance and Credentials.* The A & O Committee will have a membership of about 60 delegates and will deal with matters affecting the hf bands and the regulatory questions concerning the amateur service.

Member Societies of the Region contribute papers for discussion at the Conference. These comprise both technical matters and items proposing operating procedures, such as the Region 1 Band Plan. Generally the amount of work to be completed is such that evening sessions are necessary.

The detailed arrangements for the Brussels conference are being made by the Belgian Society, UBA, with overall responsibility resting with ON4VY. Production and distribution of the Conference documents and the administrative work at Brussels are in the hands of the Conference Secretary, G6CL.

RSGB Participation

The Society's delegation will comprise: N. Caws, G3BVG; E. G. Ingram, GM6IZ; L. E. Newnham, G6NZ; and G. M. C. Stone, G3FZL. As Vice-Chairman of the Executive Committee, R. F. Stevens, G2BVN will also be present.

Amongst the papers that have been submitted by the Society are:

Television transmission in the amateur bands, prepared by the British Amateur Television Club (G6KKD/T).

Harmful Interference To The Amateur Service, by the Society's Intruder Watch Organiser, C. J. Thomas, GW3PSM.

The Radio Amateur Emergency Network, by the Chairman of the RAEN Committee, P. Balestrini, G3BPT.

Amateur Radio Contests by J. C. Graham, G3TR on behalf of the HF Contests Committee.

Results from the ZB2VHF beacon by D. T. Hayter, G3JHM of the Scientific Studies Committee.

VHF and SSB submitted by G. M. C. Stone, G3FZL on behalf of the Technical Committee.

In addition to the above there will undoubtedly be considerable discussion on matters which are considered at every Conference and the most important of which is the question of maintenance and expansion of the Amateur Service. Basically this is the action and strategy necessary to ensure that the amateur bands are retained intact for our use. Action by one society on its own may be unrewarding but concerted action by the societies of the Region is vastly more effective.

Beacons

In order to derive the maximum benefit from beacon stations, both operationally and from the analysis of results, it is desirable that there should be a world-wide plan. The German Society, DARC, are submitting a plan to the Conference setting out their ideas for beacons on bands between 21 and 144 MHz. These proposals will have the support of the RSGB. Propagation study is one field where the amateur service is able to back theory with practical results of a quantity and quality that the professionals cannot equal.

Changes of Address

The following have been notified:

ARI, now via Scarlatti 31, Milan 20124, Italy.

IRTS, now 2 Templegogue Park, Templegogue, Dublin 14, Republic of Ireland.

VERON, now Central Bureau, 262 Overtoom, Amsterdam (C), Holland.

The JARL have advised that their Secretary is now Shinji Miki, JA1XMK, The League's address is: PO Box 377, Tokyo Central, Japan.

International Television Convention

The Club Francais de Television d'Amateur announce that an International Amateur Television Congress will be held at the Salle des Sports, Place St. Vaast, Armentieres (59), France on 19 and 20 April, 1969. Further information will be available from the General Secretary, of the BATC, I. Lever, Abbotts Close, Swanley, Kent.

Amateur Licences

The numbers of licences issued by the GPO as at 31 December, 1968, were:

Amateur (Sound A)	13,082
Amateur (Sound B)	1,352
Amateur (Sound Mobile A)	2,589
Amateur (Sound Mobile B)	132
Amateur (Television)	186
Model Control	15,080

CONTEST NEWS

National Field Day, 1969

Rules

1. The General Rules for RSGB HF Contests, published in the January, 1969 *Radio Communication* will apply.

The provisions of General Rule 4b are amended by NFD Rule 7 below. General Rule 8 is amended by NFD Rule 14 below.

2. Applications—Each Group intending to compete must send in a properly completed application form to the RSGB HF Contests Committee, 35 Doughty Street, London, WC1, not later than Thursday, 1 May, 1969. Application forms are obtainable from RSGB Headquarters; entries made other than on these forms will *not* be accepted.

The information required on the application form includes the following:

i Callsigns of stations, together with the bands to be used.
ii Full name and address of the RSGB member responsible for each entry.
iii Exact site location six figure National or Irish grid reference. In addition entrants are required to give full site access information to enable a site to be located by station inspectors, who may not be familiar with the district. Incorrect or inadequate information may be grounds for disqualification.

3. When—from 17.00 GMT Saturday, 7 June to 17.00 GMT Sunday, 8 June, 1969.

4. Eligible Entrants—All Clubs, Affiliated Societies and RSGB Groups within the prefix zones G, GC, GD, GI, GM and GW. NFD is a multi-operator contest as provided in General Rule 5b.

5. Contacts—A1 (CW) only in the 1·8, 3·5, 7·0, 14·0, 21·0, 28·0 MHz bands.

6. Sections

a Double Station—Each competing group must operate two portable stations; the one using the lowest frequency shall be called the "A" station and the other the "B" station.

Each "A" station may operate on a maximum of three of the above bands; and up to three of the remaining bands may be allocated to the "B" station.

The "A" and "B" station need not be operated from the same site, provided that they are located within the same RSGB Region.

b Single Station—Each competing group must operate one portable station on not more than three of the above frequency bands.

7. Apparatus—No apparatus, and this includes aerials, aerial fittings and station tents, may be erected on the site prior to 12.00 GMT on Saturday, 7 June, 1969. This does not apply to a tent used only for storage purposes.

8. Tents—Stations must be operated from tents.

9. Aerials—are subject to the following restriction:

a No part of any aerial shall be higher than 45 ft above the ground.
b Except for vertical radiators (which may be of any construction) all aerials must be constructed from wire of a size not greater than 14 swg cross sectional area.

10. Equipment—at any one station must not exceed three transmitters and one receiver. Reserve equipment may be kept available, but not connected.

11. Power Input—The total dc input power to the valve, valves or other devices energizing the aerial, or to any previous stage of the transmitter, shall not exceed 10 watts.

The valve or valves energizing the aerial shall have a total maximum rated anode dissipation not exceeding 13.5 watts.

Where semiconductor devices are used, the total maximum rated dissipation (at an ambient temperature of 25°C) of the device or devices energizing the aerial shall not exceed 20 watts for the purpose of this rule. Manufacturers' published ratings only will be accepted.

12. Scoring—Points will be scored on the following basis:

a	Fixed stations in the British Isles	1 point
b	Fixed stations in the rest of Europe including Eire	2 points
c	Fixed stations outside Europe	3 points
d	Fixed stations in the British Commonwealth	6 points
e	Portable and mobile stations in the British Isles	3 points
f	Portable and mobile stations in the rest of Europe including Eire	4 points
g	Portable and mobile stations outside Europe	6 points
h	Portable and mobile stations in the British Commonwealth	12 points

13. Group Contacts—Points must not be claimed for contacts made by a competition station with members of its own group, whether fixed, mobile or portable.

14. Entries—are to be in accordance with General Rule 8, with the following exceptions and additions:

i The normal cover sheet will *not* be used; Special Cover and Summary Sheets are provided for this contest, and will be sent to the person submitting the Application (see Rule 2).
ii Points claimed must be separately totalled for each band.
iii Entries should be sent to the RSGB HF Contests Committee at an address to be advised to the person submitting the Application. **Entries sent to RSGB Headquarters will not be accepted.**

15. Trophies

a National Field Day Trophy to the group obtaining the highest combined score.
b Gravesend Trophy to the group obtaining the second highest combined score.
c The Scottish NFD Trophy to the Scottish Group scoring the highest number of points.
d The Frank Hoosen Memorial Trophy to the group with the highest score on the 14 MHz band.
e The Bristol Trophy to the group having the highest score in the Single Station Section.
f Commemorative plaques to the groups having the highest scores on the 1·8, 3·5, 7·0, 21 and 28 MHz bands.

16. Check Logs—Whilst overseas stations are not eligible to enter NFD, check logs are very welcome. A certificate will be awarded to the overseas station whose check log shows that he contributed the most points to competitors.

17. Inspections—All stations are subject to inspection by nominated representatives of the HF Contests Committee.

(These representatives will make every endeavour to interfere as little as possible with the stations' operations, and to assist in this, entrants should make it easy for the inspector to see the final stage(s) of the transmitters).

80M Low Power Contest

1. **The General Rules** for RSGB HF Contests, as published in the January, 1969 *Radio Communication*, will apply.
2. **When** 09.00 GMT to 19.00 GMT on Sunday, 30 March, 1969.
3. **Contacts:** Cw (A1) only in the 3·5–3·8 MHz band. The location of the station must be sent.
4. **Scoring**

Max. Power input to PA	0·5	1	2	3	4	5	watts
Points	100	50	25	15	10	5	

5. **Logs** (Column 5) must be headed "Location as received" and (6) "My Power." Entries **must** be addressed to HF Contests Committee, c/o D. Thom (G3NKS), "La Collinette," 6 Bracken Close, Copthorne, Crawley, Sussex.
6. **Trophy** The 1930 Committee Cup will be awarded to the winner.

Third 144 MHz (Open) Contest 1969

1. **Date and Time:** From 1700 GMT 1 March to 1700 GMT 2 March, 1969.
2. All entries *must* be sent to the adjudicator at: VHF Contests Committee, 7 Barclay Close, Hertford Heath, Hertford, Herts.

In addition the following **General Rules** as published in the January 1969 issue of *Radio Communications* will apply: 3a, 4a, 5a, 6a, 7a, 8a, 9a, 10a, 11 to 28.

The **VHF-UHF Contest Cover Sheet** is now known as **Form 427.** Ask for this when writing to HQ. **Log Sheets** and copies of the **1969 General Rules** are also obtainable from HQ. Please remember to send a **very large** sae when requesting any of the above items.

Fourth 70 MHz (Open CW) Contest 1968

A very low number of entries were received for the Fourth 70 MHz (Open CW) Contest held on 1 December, 1968. This despite several entries from stations that do not normally send in logs. One such station is G3JVL who is located on the wrong side of the South Downs at sea level on Hayling Island, which is just to the east of Portsmouth. G3JVL made 23 QSOs, the best being GW3UCB/P at 312 km. To the VHF Contests Committee this is a fine performance, for which G3JVL is to be congratulated. Another excellent entry came from G3GZJ in Cornwall, he made eight contacts at over 300 km and several over 400 km. The winners in each section will receive certificates of merit subject to the approval of Council.

Almost all the entrants agree that the contest was far too long, which hardly needs saying in view of the low level of activity. One could perhaps believe that those capable of transmitting cw would increase over the years, but sadly this does not seem to be the case on 70 MHz. It will be interesting to see the amount of activity in the new summer 70 MHz cw contest this coming August. Few other comments were received apart from approval of the 1969 scoring system.

Section A—Single operator, fixed stations

Call-sign	Posn	Score	QSOs	Cnty Code	Best QSO stn	dist (km)	Power (Watts)
G3NEO	1	3751	33	YS	G3GZJ	435	50
G3LAS	2	3705	32	HF	G3GZJ	420	40
G3MOT	3	3069	37	BS	G3GZJ	—	36
G6HD	4	1950	29	KT	G3GZJ	405	23
G3GZJ	5	1830	16	CL	G3NEO	435	50
G3JVL	6	1482	23	HE	GW3UCB/P	312	50
G3OHH	7	1455	22	SD	G3DAH	295	50
G3VJR	8	884	19	YS	G2WS/P	—	25
G5UM	9	841	17	LR	GW3UCB/P	194	18
Section B—Club, /A and multi-op fixed stations							
G3OXD/A	1	5046	47	WR	G3GZJ	364	30
G3KMI	2	1716	24	HE	GW3UCB/P	310	35
Section C—Portable Stations							
GW3NUE	1	13068	54	BR	G3DAH	310	50
GW3UCB	2	10057	45	CR	G3DAH	405	45
G3VPK	3	2800	25	EX	GW3UCB/P	312	25
G3RLE	4	1435	22	YS	G3LAS	298	20
G3VXK	5	1313	19	WE	G3GZJ	320	50
G2WS	6	306	9	ST	G3VJR	264	10

Seventh 144 MHz (SSB) Contest 1968

It is very pleasing to the VHF Contest Committee to see such a good number of entries for this ssb contest held on 11 November, 1968. In fact the highest number of entries for a 2m ssb contest to date. Activity during past ssb contests has always been high but entries low. Thank you to all those who sent in logs—please do the same next time—this can only be beneficial to 2m ssb in general, you never know, a high number of entries may encourage others to come on the band. Congratulations go to both G3BHW and G3DAH for their good scores and close finish, both will receive Certificates of Merit.

Conditions appear to have been on the poor side, as may be apparent from the comments by PA0EZ (who is thanked for his check log). " The conditions were minimal and the PAs active did not hear other stations than the three worked by me. (No activity?) " PA0EZ worked G8BBB, G3WW and G3BHW. There were about 50 British stations active, so either they did not look for Continental stations or conditions were not good enough. Several stations remark that two hours for this contest is too long and that the last half hour tended to drag a little. Perhaps it depends on where you are beaming! After working all the stations at short and medium distances, a quiet last half-hour should encourage the longer contacts.

Call-Sign	Posn	Score	QSOs	Best QSO	Power	County
G3BHW	1	7585	39	G3OUL	250	KT
G3DAH	2	7293	41	G3OUL	150	KT
G3BA	3	4697	41	G3BHW	600	WK
G3JWZ	4	4485	35	G3BHW	400	SE
G6RH	5	4216	34	G3OUL	300	KT
G8BBB	6	3969	34	PA0EZ	200	CE
G3NEO	7	3200	34	G3BHW	150	YS
G3PWJ	8	2660	30	G3BHW	150	SD
GW8ASA	9	1831	19	G3BHW	200	GN
G3MNQ	10	1632	25	G3BHW	90	LR
G3OHK	11	1280	23	G3BHW	100	LR
G3COJ	12	962	17	G3EGK	150	BS
G3USB	13	880	19	GW8ASA	100	CE

YOUR OPINION

Postal Deliveries of "Radio Communication"

From: D. A. Hyams, GPO, Operations Division, EC1.

The January 1969 edition of *Radio Communication* contains reference to me personally as the individual to whom complaints about the postal service should be forwarded, instead of to local Postmasters.

This publication of my name was without my knowledge, and I was not consulted by anyone about your intention before-hand. I shall be obliged if you will retract the publication of my name and the suggested treatment of complaints. Your readers should be advised to address their enquiries to their local Postmasters, who will do their best to seek out the cause of the delays and put matters right.

I should explain that this office of the London Postal Region Headquarters is not appropriate for enquiries about your postings at Letchworth which is in the Eastern Postal Region. Furthermore most of your readers come under Postmasters in other postal regions. When dealing with complaints about postal delays Postmasters communicate direct with each other. Persistent complaints which they cannot resolve are referred to their appropriate Regional Headquarters.

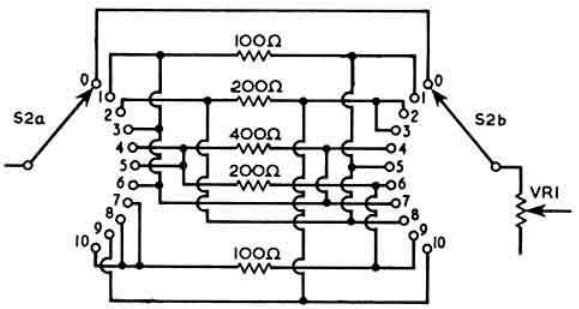
The letters that I am receiving from the journal readers as a result of your action are being referred to you through the Western Central District Post Office.

G3LUB R C and L Bridge

From: W. E. Thompson, G3MQT, St Leonards on Sea, Sussex.

The wiring of switch S2 in the R, C and L Bridge by D. R. Bowman, G3LUB on page 822 of the December issue of *Radio Communication* can be simplified to dispense with wafers S2c and S2d if an additional resistor is used, and two of the specified values are changed.

My diagram below shows one way of simplifying the wiring.



Radio Communication

From: A. J. Hall, A6085, Folkestone, Kent.

I received my copy of *Radio Communication* this morning, and am writing to tell you that the new cover you have incorporated on the Magazine is definitely an improvement on the original.

May this letter help to persuade you to keep to the new style.

Many thanks for a fine magazine, which at an average cost of 2s. per copy (to myself at present) is still the best value for money for a magazine of its type of content available.

Armchair Critics

From: F. Allan Herridge, G3IDG, Basingstoke, Hants.

It is all very well G6JP (letters, January) blasting the Society's arm-chair critics, but he should first consider more carefully the position in which the more remotely situated members are placed.

Not all of us are within easy travelling distance of London and, consequently, are unable to visit Headquarters or attend the AGM. I was fortunate enough to be at the recent Open-Weekend and to have all my many questions and criticisms answered in the most comprehensive and satisfying manner. But how is a member, living in the wilds, hundreds of miles away, expected to have all the facts at his finger-tips?

The only answer is for the Society, through *Radio Communication*, to devote a fair space to a thorough write-up of the Society, its Headquarters, the Staff, what is done, how and by whom (yes, even at the expense of the technical articles, beloved by some!). I'm sure few of us are psychic and, unless we are reliably informed, there will continue to be ill-founded criticism.

I would just like to add that it's hard luck if one cannot criticise without having the well-worn "If you can do better" thrown back in reply. Criticism of any sort at least shows an active interest on the part of the membership.

Sky Hooks

From: Alan Hall, G3UWA, and Richard Hall, G3UWB, Stoke on Trent, Staffs.

We were very interested to see the article last month on balloon borne aerials by GM3SIY, as we carried out some similar experiments in conjunction with G3PPT about two years ago.

Comments that may prove useful to other aspiring "balloonatics" are as follows:

1. We too found that the aluminium-caustic soda method was most economical and effective. The reaction is more complex than the formula given would indicate, but all this means is that one gets an even better yield of hydrogen.

2. The heat liberated is *very considerable*. We also used a bucket of water as a cooling medium, and this *boiled* in a very short time! This means that careful control of the reaction is imperative—if a glass vessel were used it could easily crack, while polythene is not too happy if the temperature nears boiling. Steam can easily pass to the balloon and does not help the lift, and the dangers of leaking caustic alkali need no elaboration!

3. We would suggest always having a plentiful supply of cold water handy—switching to a new bucket of coolant slows off a "runaway," and it is the most effective way of controlling the operation.

4. The transit of the aluminium and caustic soda together could be dangerous if any damp seeped into the container and started the reaction—we actually added the metal as required and this helped to control the reaction speed.

5. The supply of balloons as specified seems to have "dried up" in this neck of the woods, but G3PPT had some success using the "king sized" toy balloons in multiple clusters. These are easier inflated if "pre stretched" by normal mouth inflation first, and have the advantage that a puncture in one unit is not disastrous.

6. One can erect a phenomenal amount of wire this way, but never forget the hazards involved—an almost vertical wire can rapidly approach the horizontal if a breeze springs up, and power lines, etc. can be most embarrassing. Directivity is also a somewhat variable parameter.

7. Lastly, the social aspects need watching—when G3PPT started using this system in a built up area he rapidly had police patrol cars taking an interest, while later an enterprising neighbour shot down the "flying saucer" with an air rifle!

RADIO AMATEUR EMERGENCY NETWORK

By S. W. LAW, G3PAZ*

WITH the advent of the shortest month, the New Year is well on the way and (with a sidelong glance at the Weather Man) we may think of getting out and about a little more. The old saw anent " February Fill-dyke " may yet prove false as we have had more than our share during the last few months. Let us hope that we may be spared for a good time yet. At the time of writing such other types of civil disaster as have occurred have followed the usual dismal pattern—that is that many of them could have been avoided with more care and patience. The motorway fog-maniacs may be thought of in the macabre sense as a dying race—but of that, the least said the better. The record of our hard-pressed and under-staffed rail system is still good on a passenger-mile basis, with mercifully few major catastrophies. Nevertheless, even though the evenings now begin to draw out, there still remain the opportunities to check over our gear on the bench in order that we may not be too unprepared for the sudden call-out. It behoves us to be ready to cope with not only the unlikely but also the apparently impossible happening, since the Fates are no respecters of sweet reason.

Get Professional

So you belong to a Group, but you are still a fierce individualist? Good, you will be able to stand on your own feet when faced with an awkward situation—but does the plug on your own transmitter fit the one on the power unit you scrounged from the Controller in a hurry? If not, have you made up a set of adaptors to enable you to use any Group equipment at the drop of a hat? No professional projectionist would dream of rushing off to a last-minute cinema show in a village hall without a complete set of mains plug adaptors (and a fearsome bunch they are!). What is more, in case of catastrophic failure he could get another projector sent along and know that the loudspeaker plug would fit. He is there to provide a service —how about you?

Still Under a Bushel?

Our image still seems to be a candle in the wilderness of the halls of Authority. It seems a long time since 1953 (when RAEN was conceived spontaneously, if unwittingly, during a natural disaster), yet only now is the realization seeping through to some in charge of our civic welfare that there are actually citizens who lawfully transmit messages by wireless and who might be persuaded to assist in times of emergency. To this end (as we have already reported) some local authorities have even set up sub-committees to try and ascertain how these citizens might be discovered and approached! We heard recently of a well-known amateur of long standing who received a letter from the mayor of his local borough asking if it were possible to obtain the assistance of local amateurs. Our members would be astonished if we revealed the name of the amateur in question and his long association with RAEN, to say nothing of his QTH, station set-up and his untiring efforts over the years to further the cause of Amateur Radio. If there is a moral to be gleaned from this, it must surely be an argument against complacency on our part. Let us reiterate our previous exhortations on this page to ensure that your Group is known in your district, not only to the statutory User Services but to all branches of Local Authority who might be faced with an emergency situation. Don't forget, however, to make clear the present terms of the licensing regulations; keep within the letter of the law!

Balance

A tip from the professionals never comes amiss and perhaps the following may come as a help to those who might have overlooked it. There are a number of circuits in the equipments which we use where it is most important that two parts of the circuit are in exact balance. To this end we may well use a meter at similar points in the two halves of the circuit to ensure that the readings are the same. One half will naturally be adjusted so as to match the other as precisely as possible, but if the reading on the meter is not exactly on a division it may not be too easy to be sure of exact balance. The trick is to take the reading on the side which is *not* to be adjusted and to deliberately set the zero adjustment so as to bring the pointer nicely on to a division. Then transfer the meter to the other point and get the same reading.

Ranger Modulation

Hearing an excellent mobile signal recently we commented upon the strength of the speech. The operator explained that he had modified his Ranger by utilizing the unused half of the 12AX7 double triode as a speech amplifier. We must confess that it had not come to our notice that such an obvious improvement was so readily to hand on this equipment and we hasten to pass the information to those who may not yet have discovered this for themselves. The changes to the circuit should be so obvious that we hesitate to publish any instructions, but should we receive a number of enquiries we will do so in a later issue.

Delicate Situation

Certain unfortunate civil disturbances which have taken place in the last few months have posed a difficult problem for certain RAEN Groups. Broken heads (and bones) are the same no matter how caused and the relief of suffering is a civic duty irrespective of the cause. Nevertheless, we must at all costs sedulously at all times avoid the slightest hint of any kind of partisanship whatsoever in our provision of communications. It must be made crystal clear to all concerned that our interest lies solely in the relief of human suffering and that only such messages as come under this heading will be accepted for transmission. Controllers would do well to talk this point over with their Group in order that no tricky situations may arise at any time through thoughtlessness or over enthusiasm by operators in the heat of the moment. At the best a licence may be lost and at the worst a very nasty situation arise. Whilst we hesitate to advise Controllers to refuse a call-out in cases of civil disturbance, we do recommend that a great deal of serious thought be given to Group policy in this matter.

Films

May we point out to Controllers who have access to a 16mm sound film projector that our RSGB Film Library Curator G3NDF is always ready to give advice and information on the availability of films of RAEN interest. Also, should any group have photographic records of interest G3NDF would be only too pleased to hear about them.

Not Again!

We are sorry to report that we met a rather disgruntled Member some time ago with the usual unloved and neglected complaint. On investigation it appears that the " Member " had lost the Registration Card some years ago—and was duly astonished to be shown our card stamped up to date! Well, we do try, don't we?

* 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.**

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—Got off to a very good start on 6 January with an attendance of 21. It is proposed to retime the next lunch on the basis of 12.30 for 12.45. The first Monday in the month appears suitable for most members and the next meetings will therefore be on 3 February and 3 March.

Ainsdale (ARC)—12 and 26 February, 8 pm, " Morris Dancers," Scarisbrick.

Allerton (Liverpool) Scout Radio Hobbies Society—Thursdays, 8 pm, 3rd Allerton Scout Group Headquarters, Church Road, Woolton, Liverpool.

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

Blackburn—East Lancashire Amateur Radio Club—6 January (Demonstration and Talk " RF Distribution " by R. Isherwood). 6 March (Film Show (Members only) Motor Racing, R. Anderson, Carreras Rothmans). 7.30 pm, YMCA, Limbrick, Blackburn.

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

Bury (B & RRS)—11 February, Film Show, 8 pm, George Hotel (Private Room), Market Street, Bury. Club Secretary G3VVQ, 411 Holcombe Road, Greenmount, Bury.

Cheshire (Mid Cheshire ARC)—Wednesdays, 7.30 pm, Technical Activities Centre, Winsford Verdin Grammar School, Winsworth, Cheshire. 7.30 pm-8 pm, Morse tuition. Secretary, G3SIQ, 83 Ash Road, Cuddington, Northwich.

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)—Second and fourth Wednesday each month, 7 pm, 19 Rosemount, Douglas. 12 February (RSGB Film), 26 February (Film Show). Further information from W. T. McEvoy, 19 Rosemount, Douglas. Tel Douglas 6146.

Eccles (E & DRC)—Tuesdays, 8 pm, Patricroft Congregational School, Shakespeare Crescent, Patricroft. Every Thursday Club Top Band net 2030 hours.

Leyland Hundred Amateur Radio Group—Thursday night net at 2000 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)—14, 28 February, 8 pm, Landsbury House, 13 Crosby Road South, Liverpool 22. Secretary R. Simmons, G3PNS, 62 Daneville Road, Liverpool, L4 2RG.

Macclesfield (M & DARS)—11 & 25 February, 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, Division Office, 449 Palatine Road, Northenden, Manchester 22.

North West VHF Group—Tuesdays at 8 pm, 26 Cannell Street, Manchester 4. Club Secretary G3FNM, 141 Norris Road, Sale. Tel 061-973 1472.

Preston (PARS)—6 & 20 February & 6 March, 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.

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

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

Stockport (SRS)—5, 19 February, 5 March, 8 pm, Royal Oak Hotel, Castle Street, Edgeley: new members are always welcome. Further details from *G3FYE*.

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.

Wirrall (WARS)—1st, 3rd Wednesdays each month, 8 pm, Former Civil Defence Headquarters, Upton Road, Bidston, Birkenhead. Secretary—G3FOO.

REGION 2

Barnsley (B & DARC)—14 February ("Rx circuitry stage by stage " by G6LZ), 28 February (" Amateur TV " by G8AKQ), 7.30 pm, King George Hotel, Peel Street, Barnsley. *G3LRP*.

Hull (H & DARS)—7 February (" Demonstration of the Society's Swan type transceiver " by G3OHT), 14 February (Junk Sale), 21 February (Technical Topics—discussion), 28 February (" Receiver Fault Finding " by G3SSA), 7.45 pm, 592 Hessle Road, Hull. *G3MVO*.

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

Northern Heights—12 February ("An Approach to VHF working " by J. Burgess, G3KKP), 26 February (" Computers " by W. G. Scarlett, G3RXS), 12 March (Sale of surplus equipment), 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. *G8KU*.

South Shields (SS & DARC)—14 February (" Logic Circuits " by T. Williamson), Meetings Fridays, 8 pm, Trinity House Social Centre, Laygate, South Shields, *G3SFL*.

Spen Valley (SVARS)—6 February (" Transistors at RF " by A. B. Yarker, G3TAY), 13 February (" Power Supplies " by A. Petts, G3PXF), 20 February (No Meeting), 27 February (" Propogation at 420 MHz " by J. P. Billingham, G8AAC), 7.30 pm, The Grammar School, Heckmondwike. *G8BSC*.

Teeside—Second Saturday every month, Social Evening, 8 pm, The Crown Hotel, Yarm. *G3JMO*.

York (YARS)—27 February (Film Show), Meetings Thursdays, 7.30 pm, British Legion Club, 61 Micklegate, York. *G8BOK*.

REGION 3

Birmingham (MARS)—Third Tuesday in the month, 7.45 pm, Midland Institute, Margaret Street, Birmingham 3.

(Solihull)—20 February (Film Show), meetings third Thursday in each month at 7.30 pm at Masons Arms, High Street. *G3VXV*.

Cannock Chase (CCARS)—Thursdays, 8 pm, Bridgtown Social Club, Walsall Road, Cannock, Staffs. Lecture meeting first Thursday in month. February 13 (Buffet and Social evening at the Plum Pudding, Armitage, Nr Lichfield. *G3ABG*.

Coventry (CARS)—7 February (Night on the air), 14 February (Club Junk Sale), 21 February (Night on the air), 28 February

(Lecture, 2m Portable Equipment, G3TXR), Scout HQ, 121 St Nicholas Road, Radford, Coventry.

Dudley (DARC)—11 February, 25 February, 8 pm, Central Library, St. James's Road, Dudley.

Mid-Warwickshire (MWARS)—Mondays, 8 pm, 28 Hamilton Terrace, Leamington Spa.

Hereford (HARS)—7 February (Annual General Meeting), 21 February (Informal Club Night), Trinity Hall, Whitecross Road, Hereford.

Leamington Spa (Mid-Warwickshire ARS)—10 February ("Using Veroboard" by A. Woodhouse of Vero Products), 17 February ("Aerials," RSGB tape lecture), 24 February (Open meeting), 3 March ("Radio Navigation" by C. Coggins, G3TFC), 8 pm, 28 Hamilton Terrace, Leamington Spa.

Salop (SARS)—6 February (Members Colour Slide Show), 13 February ("VHF" by GW3RBM and G3RME), 27 February (Come and see what G3UDA and G3UQH have arranged for you). Meetings will be from 7.30 pm to 10 pm at a new venue, The Signals Hut, Shrewsbury School. *G3WNI.*

Sutton Coldfield (SCRS)—10 February (Annual Equipment Sale), 24 February (Natter and Projects Evening), HQ SCTFC Clubhouse, Coles Lane, Sutton Coldfield.

Wolverhampton (WARS)—3 February (Electronic Control in Industry), 10 February (Natternite), 17 February (Discussion on modes for MF, HF, and VHF working), 3 March (Amateur TV Demonstration), 8.00 pm, Neachells Cottage, Stockwell Road, Tettenhall.

Worcester (W & DARC)—Meetings are held on Wednesday and Saturday at 7.45 pm in the Club HQ, 35 Perdiswell Park, Droitwich Road, Worcester. *G3TQD.*

REGION 4

Derby (D & DARS)—5 February (AGM), 12 February (Surplus Sale), 15 February (Annual Dinner and Dance), 19 February ("VHF Aerials," illustrated talk by V. R. Hartopp of J. Beam Aerials), 26 February (Technical Film Show), 7.30 pm, Room No 4, 119 Green Lane, Derby. *G2CVV.*

(NHCAARG)—The Derby Short Wave Experimental Society has been reformed as part of the Alvaston Community Centre and will in future be known as The Nunsfield House Community Association (Amateur Radio Group). Meetings are held each Friday evening, commencing 7.30 pm, in Nunsfield House, Boulton Lane, Alvaston, Derby. *G3LCV.*

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

Heanor (TSEDRS)—Tuesdays, 7.30 pm, The South East Derbyshire College of Further Education, Ilkeston Road, Heanor. *G3LGK.*

Leicester (LRS)—Mondays, 7.30 pm, Sundays, 10.30 am, The Club Room, Gilroes Estate Cottage, Groby Road, Leicester. *G3UQX.*

Loughborough (LARC)—7 February ("VHF Contest operating," by D. Watson, G3PXP), 14 February (Informal), 21 February (Social evening at "The Falcon," Long Whatton), 28 February (Informal) 7.30 pm, The 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.*

Melton Mowbray (MMARS)—21 February ("G3FXP Shack Visit"), 8 pm, 74 Eastfield Avenue, Melton Mowbray. *G3NVK.*

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, Woodthorpe House, Mansfield Road, Sherwood, Nottingham. *G3SRX.*

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

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)—17 February (Electronics as applied to machine—tool industry—Derek Fearnley, G3XYI). Meetings on third Monday of each month at 8 pm, British Legion Club, Windhill, Bishop's Stortford, Hertfordshire.

Cambridge (C & DARC)—7 February ("How I got started on the air," by some of our more recently licensed members), 14 February (Informal), 21 February (Provisionally reserved for Amateur TV), 28 February (Informal). Meetings on Fridays at 7.30 pm, Club Headquarters, Corporation Yard, Victoria Road, Cambridge.

Cambridge University (CUWS)—Meets in the Psychology Department Lecture Rooms, Downing Site on Tuesdays at 8.15 during University Term.

Dunstable Down (DDRC)—7 February ("In Between" Night), 14 February (AGM—the Club celebrates its 1st birthday). Fridays, at Chew's House, High Street South (Opposite Police Station), Dunstable, Bedfordshire.

Luton (Vauxhall Motors)—Bill Stedman and his son Graham, both employed at Vauxhall Motors, have recently passed their RAE, and have the call-sign G3XWS. They would now like to form an Amateur Radio section within the Works Recreation Club. Will those interested ring Bill on 4063, or contact him at 10 Wychwood Avenue, Luton.

Shefford (S & DARC)—6 February (Quiz and Surplus Sale), 13 February (G2DAF Receiver, G3OLY), 20 February (Crystals, J. Johnson), 27 February (Indicators and their uses, G3VMI), 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.

REGION 6

Cheltenham (RSGB Group)—First Thursday in each month, 8 pm, Great Western Hotel, Clarence Street, Cheltenham, *G3TVW.*

Chiltern (CARC)—Last Thursday in each month, 8 pm, British Legion, St. Mary's Street, High Wycombe, Bucks.

Gloucester (GRC)—Second and fourth Thursdays in each month, 7.30 pm, Lamb Inn, Market Parade, Gloucester.

REGION 7

Acton, Brentford, Chiswick (ABCRC)—18 February (Hybrid Transistorised CW tx by G3OJX), 7.30 pm, Chiswick Trades and and Social Club, 66 High Road, Chiswick.

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

Ashford (Middx), Echelford (ARS)—10 February (Natter Night), 27 February (Demonstration), St Martins Court, Kingston Crescent, Ashford.

Barking (BDREC)—Every Tuesday and Thursday, 7.30 pm, Gascoigne Recreation Centre, Gascoigne School, Morley Road, Barking, Essex.

Bexleyheath (NKRS)—13 February (Dartford Tape Recording Club "Splicing and Editing"), 27 February (Junk Sale), 7,30 pm, Congregational Church Hall, Chapel Road, Bexleyheath.

Cheshunt (CDRC)—7 February (Talk and demonstration by KW Electronics), 7.30 pm.

Chingford Group—Fridays, tel 01-524 0308.

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

Civil Service Radio Society—First and Third Tuesdays, Civil Service Sports Centre, Monck Street, Westminster.

Croydon (SRCC)—18 February, 7.30 pm, (Mr Ralphs of the Diplomatic Wireless Service is to speak about the Piccolo System), Swan and Sugarloaf, South Croydon.

Crystal Palace (CP & DRC)—8 February (AGM subject to the approval of altering date at last meeting), 7.30 pm, Emmanuel Church Hall, Barry Road, Dulwich.

Dorking (DR & DRS)—Second Tuesday, 8 pm, Wheatsheaf, Dorking, Surrey.

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

East London—16 February (Messrs Keraplate Ltd on Photoelectronics, etc), 2.30 pm, Wanstead House, The Green, E11.

Edgware & Hendon (EADRS)—10 and 24 February, 8 pm, St George's School, Flower Lane, Mill Hill, NW7.

Gravesend (GRS)—Third Wednesday, 8 pm, RAFTA Club, Overcliff Road.

Guildford (GDRS)—11 February (Contests in 1969 at Surrey University), 28 February (G2YL and her adventures), 8 pm, Guildford Engineering Soc in Stoke Park.

Hampton Court (TVARTS)—First Wednesday in month, 7.30 pm, "Cardinal Wolsey," Hampton Court. The annual dinner was a great success with RSGB President John Graham, G3TR, as principal guest. There was excellent support from the Sutton and Cheam, Crawley and Reigate Societies.

Harlow (DRS)—Tuesdays, 8 pm, Junior meetings Fridays, morse class Tuesdays, Mark Hall Barn, First Avenue.
Harrow (RSH)—Fridays, 8 pm, Roxeth Manor School, East Cote Lane, Harrow.
Havering (H & DARC)—12 February (ATU's by G3SKV), 26 February (Junk Sale), 8 pm, British Legion House, Western Road, Romford.
Hemel Hempstead (HH & DARS)—First and third Fridays, 8 pm, Rucklers Hall Lane, 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, 50 Mortlake Road, off Ilford Lane, Ilford.
Kingston (K & DARS)—12 February (Design for a Solid State tx/rx for 4 metres by G3GVU), Second Wednesday, Penguin Lounge, Brighton Road, Surbiton.
Leyton and 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—14 and 18 February, Loughton Hall, (nr Debden Station).
Maidenhead (N & DARC)—18 February, 7.30 pm, Victoria Hall, Cox Green, Maidenhead.
New Cross (CARS)—Second and fourth Tuesdays, 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 in month, 8 pm, Railwaymans Hall, Side Entrance, 58 Whyteclff Road, Purley.
Reigate (RATS)—First Wednesday, 7.45, George and Dragon, Cromwell Road, Redhill.
Romford (R & DRS)—Tuesdays, 8.15 pm, RAFTA House, 18 Carlton Road.
Scouts ARS—20 February, 7.30 pm, Baden Powell House, Queensgate, South Kensington, SW7.
Sidcup (CVRS)—6 February (The GB5QM Story by Eric Godsmark, G3IWL), 8 pm, Congregational Church Hall, Court Road, Eltham, 20 February (Natter Night), 8 pm, All Saints Church Hall, Bercta Road, New Eltham.
Slough (SDR) Group—First Wednesday in month, 7.30 pm, United Services Club, Wellington Street.
Southgate Radio Club—13 February, 7.30 pm, Note new address at Alexander Tower School, Bounds Green Road, N22 (nr Bounds Green Station). The new secretary is Alan Hydes, G3XSV, 6 Glenbrook Nth., Cotswold Way, Enfield, Middx.
St. Albans (Verulam ARC)—Cavalier Hall, Watford Road, St Albans.
Stevenage (SDARS)—First and third Thursdays, details from 83 Spring Road, Letchworth.
Sutton and Cheam (SCRS)—Third Tuesday, The Harrow Inn, High Street, Cheam.
Welwyn (Mid Herts ARS)—13 February, 8 pm, Welwyn Civic Centre, Welwyn.
Wimbledon (W & DRS)—14 February (Heathkits by Daystrom Ltd.) 14 March (Talk by GPO), 8 pm, St John Hall, 124 Kingston Road, South Wimbledon, SW19.
Wembley (GECARS)—Thursday, 7 pm, Sports Club, St Augustin Avenue, North Wembley, Phone ARN 1262 first.

REGION 8

Canterbury (EKRS)—details from *G3MDO*.
Crawley (CARC)—26 February (" RSGB Affairs " by Eric Dowdeswell, G4AR, RSGB General Manager).
At the recent AGM, John Graham, G3TR, was re-elected as Chairman, and Michael Underhill, G3LHZ, as treasurer. Ron Vaughan, G3FRV, secretary of the club since its inception, has resigned due to pressure of other activities. Geoff Bowden, G8BQE, was elected as new Hon Secretary. *G3FRV/G8BQE*.
Eastbourne (SARS)—3 February (Junk Sale), 7.30 pm, Victoria Hotel, Latimer Road, Eastbourne.
Maidstone (MYMCAARS)—Wednesdays, 8 pm, Y Sports Centre, Melrose Close, Cripple Street, Loose, Maidstone.
Mid-Sussex (M-SARS)—All meetings at Marle Place Further Education Centre, Leylands Road, Burgess Hill.
Worthing (W & DARC)—Tuesdays, 8 pm, Rose Wilmott Youth Centre, Littlehampton Road, Worthing. 11 February (Constructional Contest), 22 February (Saturday—annual dinner at Lennox Hotel, Chapel Road, Worthing). *G2DHG*.

REGION 9

Bristol (BARC)—Every Monday and Thursday from 7.30 pm, Club HQ (G3TAD), University Settlement, 41 Ducie Road, Barton Hill, Bristol 5. *G3WLZ*.
(RSGB Group)—24 February (" Early days of Radio in the South West of England from 1896 " by G5KT and G6GU) 7.30 pm, Becket Hall, St. Thomas Street, Bristol 1. A new Committee was elected in December at the AGM and it is hoped to start a RAEN Group this year. *G3ULJ*.
Burnham-on-Sea (B-O-SARC)—Meet second Tuesday in each month, 8 pm, Crown Hotel, Burnham-on-Sea. *G3GIW*.
Cornish (CRAC)—6 February, South Western Electricity Social Centre, Pool, Camborne.
(SSB Group)—Second Thursday in each month. *G3OCB*.
(VHF Group)—Third Thursday in each month, both 7.30 pm, Truro. *G3XC*.
(Newquay Group)—Alternative Wednesdays, Treviglas School, Newquay. *G3THT*.
Plymouth (PRC)—First and Third Tuesday in each month. 7.30 pm, Virginia House, Bretonside, Plymouth. *G3UQF*.
Saltash (S & DRC)—Alternative Fridays, Burraton Toc H Hall, Warraton Road, Saltash. *G3UBY*.
South Dorset (SDARS)—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, Taunton. A new meeting place, weekly has now been obtained; for those who wonder what the initials stand for, it is Somerset Emergency Voluntary Organization who have provided a room for the club. Also another room has been allocated for the setting up of a HQ Station for the Somerset Raynet which is being organized by G3NNE. A Club station is being set up under the call G3XZW. A visit was made during January to the new Hinkley Point Atomic Power Station. Congratulations to the Secretary, G3WPJ on his marriage. Graham Swetman has taken over as a temporary relief. *G3DTB*.
Torquay (Torbay ARS)—Every Tuesday and Friday Club nights, 22 February (Business meeting), 7.30 pm, Club Headquarters, Bath Lane, rear of 94 Belgrave Road, Torquay. *G3VNG*.
Wells (WARS)—Mondays, EMIE Social Club, Chamberlain Street, Wells. *G3MQQ*.
Weston-Super-Mare (W-S-MARS)—7 February, 7.30 pm, Westhaven School, Ellesmere Road, Uphill, WSM. January meeting was well attended, and featured the showing of an excellent film on Theory and practical applications of Aerials of all Bands. Visits are being arranged to local places of interest. *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, Barry College of Further Education, Colcot Road, Barry, Glam. *GW3VPB*.
Cardiff (RSGB Group)—10 February (Finishing Home Made Equipment by GW3HJR, GW3VNO), 7.30 pm, TA Centre, Park Street, Cardiff. *GW3GHC*.
Pembroke (ARC)—Last Friday of month, 7.30 pm, Defensible Barracks, Pembroke Docks, Pembs. *GW3LXI*.
Pontypool (ARC)—Tuesdays, 7 pm, Educational Settlement, Rockhill Road, Pontypool, Mon. *GW3JBH*.
Rhondda (ARS)—Pengelli Hotel, Treorchy, Glam. Details of meetings from *GW3PHH*.
Swansea—The university radio society has had a very successful first term with a large increase in membership. Many other members sat the December RAE. The society's station, GW3UWS, is active on the Universities Net on 7060 kHz.
Meetings of the society take place at 8 pm on alternate Wednesdays in the Lab Technicians Common Room, West Wing College House. Anyone in South Wales interested is invited. 5 February (Junk Sale), 19 February (" What the Wild Waves are Saying," a talk by Dr. V. J. Philips, 5 March (SSB Part 1), 19 March (SSB Part 2). Both the latter talks are by B. Drewson, GW3PWH.
Further details from the Club Secretary (SASE please), D. West, GW3TYI, Cymdeithas Radio, Adran Peirianneg Drydandl, Cloeg Prifysgol, Yr Abertawe, Parc Singleton, Abertawe, Sir Forgannwg.
University College, Cardiff (ARS)—Students Union, Dumfries Place, Cardiff.—Meeting details from GW3XSQ, c/o Students Union.

REGION 11

Ryhl (R & DARC)—Second Tuesday in each month, Rhyl's Silver Band Room, Windsor Street, Rhyl.

REGION 12

Aberdeen (AARC)—Fridays, 7.30 pm, 6 Blenheim Lane, Aberdeen. *GM3HGA.*
Moray Firth (MFARS)—Details from *GM3IAA.*

REGION 13

Border Area—Members in the area are asked to contact G. Shankie, GM3WIG, who has recently formed a club to cater for amateurs in the district. Mr. Shankie is at 8 Ettrick Terrace, Hawick.
Edinburgh (Lothians RS)—13 February (Film "Its the Tube That Makes the Colour" by Mullard, "Radio News of 1968" by RSGB and local films by A. Masson, GM3PSP), 27 February ("Television Servicing" by D. Roe), 7.30 pm, YMCA, 14 St Andrews Street, Edinburgh. *GM3VBB.*

REGION 14

Ayrshire (Ardeer Recreation Club ARC)—Tuesdays and Thursdays, 7.15 pm, Ardeer Recreation Club, Amateur Radio Section, Stevenston, Ayrshire. Details from J. F. McCreight, GM3DJS, 40 Auchenharvie Road, Saltcoats, Ayrshire.
Ayrshire (AARG)—Refer to R. Harkness, GM3THI, 36 Wellington Street, Prestwick, Ayrshire.
Glasgow University (GURC)—14 February, 7.30 pm, Engineering South Building, University of Glasgow.
Greenock (G & DARC)—21 February, 7.30 pm, Arts Guild, Campbell Street, Greenock.
Lowland Royal Signal Group (LRSG)—4, 18 February, 7.30 pm, 21 Jardine Street, Glasgow.
Mid-Lanark RSGB Group—21 February, 7.30 pm, YMCA, Brandon Street, Motherwell.

REGION 15

Ballymena (Radio Club)—Tuesdays, 8 pm, morse and theory classes in progress, Club Rooms, 46a Bridge Street, Ballymena. Details from *GI3XDX.*
Belfast (B & D RSGB Group)—Wednedays, War Memorial Building, Waring Street, Belfast. Details from *GI2DZG.*

REGION 16

Gt Yarmouth (GYRC)—Fridays, 7.30 pm, 98 South Market Road, Gt Yarmouth.
Ipswich (IRC)—26 February, 7.30 pm, D. Godfrey, British Red Cross HQ, Gippeswyk Hall, Gippeswyk Avenue, Ipswich. *G3UJR.*
Norwich (NARC)—Mondays, 7.30 pm, The Clubroom, Brickmakers Arms, Sprowston Road, Norwich. G3PTB.
Southend and District Radio Society (SDRS)—7, 14 February, 8 pm, Staff Canteen, E. K. Cole Ltd. *G8BSB.*

REGION 17

Chippenham (C & DARC)—4, 11, 18 February (Mini lectures on design and construction of a transistor SSB tx by G3UFW), 25 February (DX Operating by Hal Perkins, G3NMH), 7.30 pm, Chippenham High School for Boys, Hardenhulsh Lane, Chippenham. *G3PQG.*
North Berks (AERE Harwell ARC)—Third Tuesday in month, 7.30 pm, Social Club, AERE. *G2HIF.*
RAE and Morse classes each Wednesday at 7.30 pm, In the Post Graduate Education Centre, AERE. *G3NNG.*

RAIBC—At the end of December, there were 333 members in RAIBC, 111 licensed, 222 swl's including 24 yl's, in 12 countries.
The auction of components left by the late President, G2BSA, organized by the Cornish Radio Amateur Club, realized £20 for Club Funds.
Walter Huxley, GW3RIB, died on December 19 (reported elsewhere).
Receivers are needed at Romford, Essex; Largs, Ayrshire, and Par, Cornwall, and two metre transceivers at Leicester. Any offers please to the Hon. Secretary, G3LWY.

LOOKING AHEAD

28 March—RSGB London Lecture Meeting.
26 April—VHF/UHF Convention, The Winning Post Hotel, Whitton, near Twickenham.
27 April—Bellevue Convention, Manchester.
5-10 May—IARU Region 1 Conference, Brussels.
21 May—Summer Radio Amateur Examination.
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

15-16 February—ARRL DX Competition (1st CW Weekend)
15-16 February—First 1·8 MHz Contest.
16 February—First 70 MHz (Fixed Station) Contest.
22-23 February—YL-OM Contest (Phone). 18.00 Sat-18.00 Sun.
1-2 March—Third 144 MHz (Open) Contest.*
2-3 March—ARRL DX Competition (2nd phone weekend).
8-9 March—BERU Contest.
8-9 March—YL-OM Contest (CW). 18.00 Sat-18.00 Sun.
15-16 March—ARRL DX Competition (2nd CW weekend).
30 March—Low Power 3·5 MHz Contest.
12-13 April—Second 70 MHz (Open) Contest.
3-4 May—Fourth 144 MHz (Portable) Contest.*
24-25 May—First 432 MHz (Open) Contest.*
24-25 May—First 1296 MHz Contest.*
22 June—Second 432 MHz (Portable) Contest.
7-8 June—National Field Day.
5-6 July—Summer 1·8 MHz Contest.
5-6 July—Fifth 144 MHz (Open) Contest.*
12-13 July—High Power Field Day.
27 July—Third 70 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—Eighth 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.

* To coincide with Region 1 IARU Contest.

MOBILE RALLIES

6 April—ARMS mobile meeting—Lydd Airport, Kent.
20 April—North Midlands Mobile Rally, Drayton Manor Park, near Tamworth, Staffordshire.
18 May—Northern Mobile Rally.
1 June—ARMS Rally (Central England).
1 June—Maidstone YMCA ARS Rally.
29 June—Longleat Mobile Rally, Longleat Park, near Warminster, Wiltshire. Organized by the Bristol RSGB Group, assisted by Bristol ARC.
6 July—South Shields Mobile Rally.
13 July—Worcester Mobile Rally.
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 Amateur Radio Society.
13-15 September—Radio Amateur Convention, Knokke, Belgium. Details from Lucien Vervacke, Lippenslaan, 284, Knokke, Belgium.
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 Stansted Road, Hoddesdon, Hertfordshire. Tel: Hoddesdon 66806.

NSRA Convention

The Northern Radio Societies Association is holding its annual convention and exhibition on Sunday, April 27, 1969.

Owing to the success of the previous event, the venue has been changed to the larger Cumberland Suite, Belle Vue Gardens, Manchester. Belle Vue Gardens is the biggest showground and exhibition centre in the North. This convention has become one of the major amateur radio events of the year.

Attractions include commercial demonstrations, displays by member radio societies, talk-in stations on 160, 4 and 2 metres, amateur television, and a special demonstration station. Further details can be obtained from R. M. Clarke, G8AYD, Business Manager NSRA, "Hillside", Quickedge Road, Mossley, Ashton-under-Lyne, Lancs.

MARS in Birmingham Show

The Midland Amateur Radio Society will, for the fourth year running, be operating an exhibition station from the Birmingham Boat Show. The operation will be from 22 February for two weeks under the callsign G3MAR and GB3BBS. Contacts with the UK and abroad are hoped for and visitors will be most welcome. The show is to be held at Bingley Hall, Broad Street, Birmingham.

MEMBERS' ADS

CLOSING DATE FOR MARCH—10 FEBRUARY *FORM ON PAGE 151*

Tokai TC99 transceiver new £7 10s. Four 813s at £1 ea. New Hy-Gain 14AVQ trap vert, needs parts otherwise OK £5 10s. Wanted, Q-mult for KW2000A. D. Patterson, G3WAX, 99 Shepherd Rd, St Annes-on-Sea, Lancs.

Eagle single headset with boom mike 30s. QCC 100 kHz xtal, B7G base 35s. Constant voltage transformer 240 V, 50 W, £1. Field strength meter, transistorized, hf only £1. M. Pawley, G8AWV, 52 Sumatra Rd, West Hampstead, London NW6.

Two new, boxed 813s 25s ea, pp 2s. Wanted HRO coil packs, type JD 1·7–4·0 MHz and type JC 3·5–7·3 MHz. D. Thompson, G8AKT, 34 Sandy Rd, Potton, Sandy, Beds. Tel Potton 462.

Lafayette HA350 ssb rx, 10–80m, mech filter, xtal cal, as new with hndbk £40. K. Willis, G8VR, 11 Old Downs, Hartley, Dartford, Kent. Tel Longfield 3552.

Mast 50 ft for heaviest beams £60. Re-engineered Minimitter rotator/indicator £15. BC221 £6. Scope £8. Labgear aerial selector-c/o rly £5. Viceroy cabinet £4. Atu £5. Multimeter £7. E. Cheadle, G3NUG, 27 London Rd, Shenley, St Albans, Herts. Tel Radlet 4435.

Z match 30s. Antenna match dummy load 30s. Nife cells, 12 V, 40 Ah 45s. 20m gp, 30 ft portable mast 50s. 160m mobile rx (command), 12 V psu £4. RSGB gdo coils incomplete 25s. R. Hedges, Eastcliff, Bookshill Drive, Harrow Weald, Middx. Tel 01-954 2960.

Labgear quad with three 50 ft feeders in gd cond, would exchange for commercial three band Yagi or vert. J. Taylor, G3RDT, 82 Victoria Drive, Bognor Regis, Sussex. Tel Bognor Regis 5254.

Offers invited, 13 doz valves, Brimar 6060 and Mullard M8162 (rugged 12AT7), 1 doz lots 12s inc pp. J. Swinnerton, G2YS, 29 Beacon Way, Rickmansworth, Herts, WD3 2PF. Tel Rickmansworth 76864.

DX4OU, VF1U in vry gd cond complete with cables and hndbk £25. byr collects or pays carr, reason for sale bying DX100. I. Brown, G3TVU, 47 Peak View Drive, Ashbourne, Derbyshire, DE6 1BR. Tel Ashbourne 3201.

KW Vanguard Mk 2, factory blt with top-band and lp filter £35. GEC BRT400 rx £55. Both in gd wkg order and immac apprnce. P. Hayes, G3POQ, 78 Hawthlands Rd, Hailsham, Sussex. Tel Lewes 3393 (daytime).

Tx rack cabinet with roller runners to take three chassis, in gd cond £2, byr collects. Wanted, xtals, two each of 32·5 and 33·0 MHz, HC6U, G3XWV, 63 Weoley Avenue, Selly Oak, Birmingham 29.

HRO-MX recently resprayed, complete set of gc coils, psu, spkr, manual, some spare valves £17. HW32 perfect cond £50. DX100U blt tatty but wkg £35. S. Rhodes, G3BAH, The Clive, Croft Rd, Neacroft, Bransgore, Christchurch, Hants, BH23 8JS. Tel Bransgore 478.

Ferrograph tape recorder series SAN £56 ono. Modern modulation transformer UM3 £3. Pair of KT88 30s. TT21 15s. B. Parsons G3OSK, 46 Beaumont Rise, Hill Park Gardens, Fareham, Hants.

Heath RAI rx. KW valiant tx with matching psu. All serviceable but cond generally rough, offers. G. Lovelock G3III, 10 Airfield Estate, Wellesbourne, Warks.

BC221 with original charts and spare valves £8. Unmodified B44 Mk 2 £4. Joystick VFA with tuner £2. Carriage extra, all items. E. Ross, G3TJC, 20 Briar Wood, Wrose, Shipley, Yorks.

BC455-B command rx £5. 250–0–250 at 30 mA, 6·3 V at 0·6 A, 5 V at 1 A 7s 6d. Woden 5/25H 250 mA lf choke 10s. 6·3 V at 5 A (twice), 5 V at 3 A 7s 6d. 300–0–300 at 80 mA, 4 V at 2 A, 4 V 5 A (drop-thru) 7s 6d. All trans std primar's, all carriage extra. E. Handcocks, G5HN, 1 Conisboro Way, Caverham, Reading, Berks. Tel Reading 73650.

Lafayette 10AZ27 455 kHz mech filter, 2·2 kHz at 6dB, 2·3 shape factor. Rectangular on PC board with QCC carrier xtal, usb o/p £10. HC-25U xtals suitable for 28 MHz walkie-talkies offers? C. Horrobin G3TZW, 50 Fletcher Road, Stoke on Trent, ST4 4AJ.

Eddystone 870A rx immaculate cond 150 kHz to 24 MHz £22 ono, would exchange for aircraft band receiver. R. Williams, 204 Dysart Road, Grantham, Lincs.

AR88D gd cond, spare set valves, hndbk, original S-meter £40 ono. KW Viceroy mint cond (model without 6146 pa) £55 ono. Deliver 50 miles Birmingham. M. Marment, G8ABP, 46 Vera Rd., Yardley, Birmingham 26. Tel 021-783 6399.

Heathkit sectional tower. CDR rotator, model TR44, 220 V, also indicator. TR33 jr aerial about 3 yrs old, can be seen wkg, do not want to split, £69. K. Eastell, G3SDU, 9 Prod Lane, Baildon, Yorks. Tel Shipley 53545.

CNYI Transmitter 160, 80, 40m, built in mod, ac/dc psu with xtal mike, please collect. A. Wilson, 11 Grosvenor Street, Liscard, Wallasey, L44 1RN. Tel 051-638 5027.

No 19 set transceiver, 2–3 MHz all attachments, control box, headphones and mike, etc, mains psu, rx " A " gd cond £4 10s, byr collects if possible. K. Ross, 35 Southfield Ave., Potterhill, Paisley, Renfrewshire. Tel 041-884 2988.

4m three el J-Beam aerial, as new £2. A. Marriott, G3VWC, 21 Thorley Hill, Bishops Stortford, Hertfordshire. Tel Bishops Stortford 4796.

HQ170 rx, 1·8–70 MHz (6m mod to 4m), 250 V, 50 Hz £70 ovno. R. Broadbent, G3AAJ, 94 Herongate Rd, London E12.

Museum or collectors piece. Brass Morse Key, H. White Co. No 464/3 1918. Send and receive telegraph relay (brass), Silvertown No 3392/2 1917. Both in mint cond, offers. M. Dawbarn, " Mellor," 8 Daylesford Close, Parkstone, Poole, Dorset.

Heath 'Two'er HW30 2 metre transceiver £19. Ameco R5 rx, 0·54–54 MHz plus PT preselector, advanced solid state gc £30. Stellaphone cassette recorder with 3 cassettes £22. Marconi TF517, 18–300 MHz vhf sig gen £12. M. Margolis, G3NMR, 95 Collinwood Gdns, Clayhall, Ilford, Essex. Tel 01-550 0882.

Linear amplifier 400 W pair 4E27's suitable 10m £10. J. Farlow, G3BXJ, 49 Mount Pleasant Road, Chigwell, Essex. Tel. 01-500 4546.

Green TMR5 min transistor rx covering 160/80, ideal mobile £12 ono, sae with enquiries. Urgently required, ssb pa valves type 6KD6, your price paid. D. Pratt, G3TJP, 28 Monmouth Place, Clayton, Newcastle, Staffs, ST5 3DF.

Heavy type morse key on wooden base £1 inc pp. D. Pickering, GW8CGH, 25 Penybont Rd, Pencoed, Nr Bridgend, Glam. Tel Pencoed 444.

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Codar CR45 home built, new but needs some attention with coils 1, 3, 4, 5 £3 ono, byr collects or will post for extra 10s. D. Austin, 9 Mansfield Road, Sheffield S12 2AE.

KW Electronics KW500 lin amp as new, first £50. G3AAE, J. D. Kay, 75 Roundmead Avenue, Loughton, Essex. Tel 01-508 3669.

NCX5 ac psu xtal calibrator £210. National dc psu pos/neg earth £35. SB200 lin amp £85. Luxury mobiling, Swantenna 5 band remote controlled mobile whip with output/band change meter £45. K. Rodger, G3SRZ, 11 Eburne Road, London N.7. Tel 01-272 2539.

SBE34 transistorized transceiver in mint cond complete with unused mark hellwhip mobile aerial comprising single swivel base and whips for 80, 20 and 15 metres, £155. J. Barry, G3UFU, 15 Fairlawn Court, London W.4. Tel 01-994 6931.

AR88D in fb cond resprayed cabinet pvc wiring, S-meter, ½ lattice filter, cal optional avc-am-ssb, realigned to spec, hndbk, spare valves £37. Lustraphone mc mic and stand £2. C. Stagg, G3KPW, 62 Prospect Place, Grays, Essex. Tel Grays Thurrock 3073.

Minimitter MR 44/2 amateur bands rx, unmodified £26 ono or exchange why rx wise. R. Threlfall, 13 Victoria Road, Whalley Range, Manchester 16.

Erskin scope 3 in tube with 465 kHz wobulator £15. BC610 control unit £10. Wire recorder o/p stage p/p 6V6 £8. Other not working £3. AR88D hndbk 25s, 813 30s. R. L. Whorwell G3CTR, 65 John Kennedy House, Rotherhithe Old Road, London, SE16. Tel 01-237 4604.

Offers unused BAY96 varactor diode. Sinclair Z12 amp useful as modulator. JXK 70 cm conv with GMO290 rf. 70 cm parabeam in excellent cond byr arranges transport for aerial. C. Howard, G8ANU, 60 Brocton Road, Milford, Stafford. Tel Stafford 62533.

Heathkit OS2, 3 in scope new £24, leads, manual, etc. Wanted 70 cm conv 28–30 MHz if also tx. Also small 2m transceiver. I. Dilworth, G3WRT, 4 Bovingdon Heights, Spinfield Lane, Marlow, Bucks. Tel Marlow 5310.

AR88LF realigned with tx Geloso VFO rack panel, 30 W £40 byr inspects, collect. Components 1200 V–200 mA, 6·3 V–3 A £7 p/p, 650 V–150 mA, 6·3 V–3 A on standard panel £7, small 250 V–50 mA 30s. Many oddments. E. Hunt, G5IK, Keyhaven House, Milford on Sea, Hants. Tel Milford-on-Sea 3221.

Open trailer 4 ft 6 in × 2 ft 6 in × 1 ft 5 in rear light automatic brakes coupling unit only used few times since new ideal for field days £90 or would exchange for KW1000 lin. J. Bate, The Old Rectory, Marchwiel, Wrexham. Tel Wrexham 2013.

Two hi-fi speaker kits, each comprises three speakers, lagging material details of cabinet and cross-over, new £10. 15 each 12 W valve hi-fi amplifier £10, exchange 2-metre beam, rotator or useful test gear. P. Jury, G8AKV, 5 Pinewood Avenue, Midsomer Norton, Bath, Somerset.

Eddystone 840C in mint cond, external S-meter, PR30X preselector offers or exchange for AT5, T28 mains psu RC unit mobile psu. W. Honeywill, 8B Fore Street, Salcombe, Devon. Tel Salcombe 2809.

Complete station for sale, KW Vanguard Mk 2 immaculate, AR88D with S-meter and product detector, new by-pass capacitors £30 each ono, together or separate, owner going ssb. A. McEwan, GM3WJF, 4 Teviot Road, Hawick, Roxburghshire.

36 Silicon diodes IN914 10s, will swop for QQVO3-20A valve base, or 12 MHz xtal for 144·7 MHz to 145·1 MHz, or 360° potentiometer, around 20 Kohm, suitable for servo system. B. King, G8CHC, 36 Upper Park, Little Parndon, Harlow, Essex. Tel Harlow 20812.

100 post war issues *Short Wave Magazine* 1s per individual copy plus postage or lot for £3 post free. S. Kharbanda, 39 London Road, Harston, Cambs. Tel Harston 454.

Swan 350 with built in xtal cal £210. R. Brade, 14A Roman Way, Farnham, Surrey.

Lafayette KT320 rx, excellent cond 50 kHz–30 MHz amateur bands bs, 4 band anl S-meter avc-mvc, bfo, Q-mult, rf stage 2if stages 2af stages, hndbk gd wkg order, kit version of HE30. Byr collects £18 ono. N. Mason, 60 St. Marys Crescent, Ruddington, Nottingham. NG1 6FR.

Exchange for 3·5/7·0 MHz cw xtals, FT243–3655, 7175, 7600, 7775. 10XJ–6498·9, 6076·7. Hamrad ¼ in pin 7100. R. Stringer, G3IOZ, 88 Pentley Park, Welwyn Garden City, Herts.

Two stroke generator, o/p for 230 V ac or dc at 300 W, also 12 V at 150 W, size 9½ × 8 × 12 In, used 10 hours only, see Advert *Bulletin* March 1968 p 205, cost £40 sell £25. J. Martinez, G3PLX, 6 Purbrook Gdns, Purbrook, Portsmouth, PO7 5LB. Tel Waterlooville 51372

Pair of walkie talkies, 27 MHz four months old perfect cond six transistor, half mile range, cost ten guineas new, (Mod to 10m?) £8 ono. M. Wood, 90 Childwall Valley Road, Liverpool LI6 4PF. Tel 051-722 1693.

Wavemeters, Class D No 1 Mk 2, seven, all brand new and tested, will sell at £5 ea inc post or swap for rx or anything useful also Taylor valve tester 45C with manuals. £8–10s inc post. B. Purchase, G3FWD, 126 Renton Road, Oxley, Wolverhampton, Staffordshire. Tel Fordhouses 2404.

NCX5 Mark 2 with NCX-A psu/ls and xtal cal. XCU-27 in first class cond throughout. with manuals and original packing £240. J. Ridley, G5NN, Fir Tree Cottage, Singleborough, Bletchley, Bucks. Tel Winslow 2498.

Rx DST100 50 kHz–30 MHz, switched selectivity, turret bandchange, 100 kHz xtal cal, hammer green finished panels, circuit diagram, internal loudspeaker, less psu, excellent wkg order £18. J. Drinkwater, G3RHR, 43 Heath Drive, Boston Spa, Yorkshire. Tel Oglethorpe 262.

KW 2000 A, ac psu. Z match Shure 201, 14 AVQ with radials 200 gns, Cannonball. ac psu £22 10s. T. Delvin, 165, Central Park Road, London, E6. Tel 01-472 1116.

Mint Codar CR70 rx 560 kHz–30 MHz, S-meter bfo complete with instructions, etc £10 10s. *Practical Wireless/Electronics/Short Wave Magazine* 1963–68 3d ea. K. Bromley, 11 Westmoor Terrace, Sunderland, Co. Durham. Tel Sunderland 59581.

Eddystone 770R offers. Elizabethan 150 W tx with vfo and modulator, psu £40, separate cabinets HW32–1 ssb transceiver mint, latest mods £45. Joystick with atu £3. Part-built ssb exciter (G3JJG) coils, xtals, etc. P. Cooper, G3CXI, 11 Hardy Road, Bishops Cleeve, Cheltenham, Glos. Tel Bishops Cleeve 3834.

7B tp £8. TU AP66862 £5. Psu's for above £4. Also 50–0–50 meter, tuning fork, Jones plugs, etc. Will deliver 100 mls or consider exchange any two or four meter gear. P. Lane, GW3MQX, 4 H.M. Coastguard Station, Holyhead, Anglesey. Tel Holyhead 2051.

BC 610 B tx, operational on 2m, consists of units: 1 × PN–8–B power amp, 1 × PN–9–B driver/osc, 1 × PN–10–B modulator, 2 × PN–12–A psu's and 1 × PN–13–B power panel. All contained in cabinet 7 ft high 19 In wide 17 in deep, 70 W dc input, working ok £25. P. Avill, 7 Moorland Crescent, Staincross, Barnsley, Yorkshire. Tel Darton 2517.

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New xtals, eight each: 9,021·8 and 9,371·8 kc., two 3,578·125, 3,629·16, 3,659·37, 4,770·83, 7,000·0, 7,333·3, 10,978·1, 14,383·13, 14,404·17, 14,408·3, 14,412·5, 14,637·5, 14,687·5, all 10s ea. New small mod tran 5763 to 6BW6 15s. E. Page, G3HKV, 16 Abbey Street, Crewkerne, Somerset. Tel Crewkerne 2662.

Valves 5s ea 807(12), PT 15 (11), 5U5 (2), 1622 (1), 1625 (1), 6L6A (2), 5R4GY (2), VR15U (2), VR 1053, (1), 6V6M (8), 2s 6d ea 6J7M (2), TT11 (1), 80 (1), 6J5 (3), 6C5 (2), 6J6 (3), 6B8 (2), 6Q7 (1), 6SG7 (1), 6AG8 (1), 12SF7 (1), 9003 (2), EF39 (3), 25A6 (1), 1W4/350 (1), pp extra. G. Layzell, 26 Newland Drive, Scunthorpe, Lincs. Tel 4572.

HA350 rx, nearly new and in vry gd cond £35 ono. W. Morris, G4HU, 34 Birch Ave, Romiley, Stockport, Cheshire. Tel 061-430 3858.

Pye Ranger in vry gd cond, transistor psu £5. HRO, 14 coils, 5 bs £20. Please enc sae. C. Baker, 18 Collingtree, Stopsley, Luton, Beds.

Heathkit DX100U tx with SB10U ssb adaptor £65. RG1 rx £25. Both with hndbks. F. Parsons, G3MIX, 96 Blackamoor Lane, Maidenhead, Berks. Tel. Maidenhead 26723.

Stab psu, 250 V at 500 mA plus heaters, in cabinet with meters £5. Wanted front panel for HRO. A. Williams, GM3KSU, 35 Howard Place, Edinburgh 3.

Codar CR45 factory blt, as new cond, all coils covering 150 kHz to 30 MHz £7. I. Pool, 41 Linton Rise, Leeds, LS17 8QW.

Marconi No 52 set rx in exclnt cond. Unconverted RF24 unit suitable to extend rx coverage to 30 MHz. Homebrew psu. The lot £8 10s ono. I. Richmond, Parkview, 33 Abbey Rd, Gt Malvern, Worcs. Tel Malvern 4579.

New Heathkit RF1U sig gen, few hours use only £15. KW 160 Mk 2 perfect cond £19 10s. E. Taylor, G3FK, 4 Brownsea Ave, Corfe Mullen, Dorset.

Trio S9-59DE comm rx, used only a few hours, still in original packing £27. G. Miles, G3TOV, 50 Chaddesden Lane, Derby, DE2 6LP.

Scope tube with base and screen also Cossor 26D tube (4 in dia). Both for 30s, byr collects. D. Clarke, 2 Parkwood Cres, Nottingham, NG5 4EA.

Regulated psu, 250 V at 250 mA also 500 V at 250 mA unregulated also 470 V bias, 19 in rack mounting £6. S. Andrews, G3OGY, 14 Crawford Ave, Chorley, Lancs.

Complete 22 set, mains psu £5 ono. Two 12 V psu's, 300 V 25s ea. Mains psu 500 V £3. Autotransformer 150 W 22s. 19 set chassis. M. Kinnersley, Seaton Ryde, Tranwell Woods, Morpeth, Northumberland. Tel Morpeth 2541.

Tx, Geloso vfo, 160–10m, 807 pa, grey hammer finish £25. Modulator, 813 on chassis £3. Brand new 813 £1. K. Manktelow, G3SKZ, 94 Ravenscroft Ave, Preston Rd, Wembley, Middx. Tel 01-994 1531.

Autotransformer, 230 V i/p, 115 V at 1 VA o/p £1. Class D wavemeter, 6 V ac, booklet, not wkg 30s. 12 V rotary generator, 275 V at 100 mA 10s. 15 copies of *RCM & E*, Oct 65–Dec 66, mint 12s 6d. K. Orchard, G3TTC, 25 Kenmore Drive, Yeovil, Somerset.

AR88D in exclnt cond with hndbk and spare valves, will deliver £30. C. Hanley, 81 New Rd, Chilworth, Guildford, Surrey. Tel Guildford 67613.

Hanson 50 ohm swr meter 50s. 1961 ARRL handbook 10s. RSGB Handbook 22s. Editors and Engineers Radio Handbook 16th edition 64–67 at 15s ea. Four vols of *SWM* at 15s ea. C. Burchell, Officers Mess, RAF Fylingdales, Pickering, Yorks.

EF80, ECC81, 6060, 12AT7, 6SA7, 6B8, 6SN7, EF50, 12A6, EF91, PY80, 10F1, PCC84, PCF80, 6F13, 6D2, any six to your selection 10s. G. Jeapes, 165 Cambridge Rd, Gt Shelford, Cambridge.

Tx, based on G2DAF design, pa requires completion, no psu, sep self-powered vfo £20. Command rx 1·5–3 MHz £3. Marconi CR150, wkg, needs attn, £10. Ac/12 V dc psu £3. BC221 case 15s. Collect or carr extra. J. Clegg, G3FQH, 8 Hillside, Leak Hall Lane, Denby Dale, Huddersfield, HD8 8QZ.

Tx 80–10m, 50 W, sep vfo, psu/mod matching cabinets £15. Cabinet 19 in, 3 ft, hinged rear door £3. New mics, Acos 39 30s, Lustraphone VMC £4. Beamec crt tester £10. Collect or carr extra. Bl Clegg, G3VQH, 8 Hillside, Lea Hall Lane, Denby Dale, Huddersfield, HD8 8QZ.

Collins 30L1 lin (as new). MP1 mobile psu. 351D mobile mount, KWM2, 4CC1 Carrying case. TD1 portable aerial. Heathkit Hamscan £25. Heathkit H010 scope £25. Hallicrafters S27, 27–150 MHz with manual, gd cond £20. J. Steele, G3KZI, 12 Broadwalk, London E18. Tel 01-989 2321.

Table topper tx/rx for 2m ready to go £12. G2DD conv for 70 cm, preamp 6AM4 95s. Modulator 30 W 95s. Nuvistor conv for 2m £95s. BC384 with psu, meter and 1s £12. Myriad of smaller items, sae for list. J. Hum, G5UM, Loughton-on-the-Hill, Leicester, LE7 9JJ.

New ceramic cap, feed-through—1000 pF solder—in 4s 6d per doz, nut fixing 8s 6d per doz. 100 pF 750 V 1s 6d per doz, 10,000 pF 350 V 2s per doz, 10,000 pF 750 V 2s 6d per doz, cwo and 1s pp. C. Bryant, G3WIE, Stockwitch Farm, Bridgehampton, Yeovil, Somerset.

Tubular ceramic trimmers, new Mullard, nut fixing, screw adj—0·75–3 pF, 0·8–6 pF 1s 8d ea, 0·9–12 pF 1s 9d ea. Send strong sae or 1s pp. P. Bryant, G3FWN, Stockwitch Farm, Bridgehampton, Yeovil, Somerset.

HW12. HP23. SB600. All exclnt cond £65, byr collects. S. Harle, G3MEA, 10 Everest Court, 259 S Norwood Rd, SE25. Tel 01-653 8211.

Cossar 339 scope gd cond complete with manual £11 ono. R. Dowell, 150 Chadacre Rd, Stoneleigh, Epsom, Surrey. Tel 01-393 2990.

Heathkit DX40U and VF1U in first class mech and wkg cond. L. Austin, 12 Whittle Close, Bawnmore Rd, Rugby, Warks. Tel Rugby 6229.

Heathkit HP23E psu, factory blt, new £22. National XCU27 xtal cal unused £5. Used Codar AT5 and psu with new control box/mobile psu £22. W. Clayton, G8ARG, 7 The Bancroft, Etwall, Derbyshire.

KW77 rx Mk 2 in gd cond £65 ono. AVO model 7 £5. B. Little, G3TLS, 28 Fitzgerald Rd, Bristol 3.

DX100U am/ssb. SB10. SB300. HA14 linear. HP24 psu. Mains c/o rly. TA31 jr. The lot £200 or will consider separating. Seen wkg weekends only. Will deliver within 100 mls. L. Barlow, G3JMR, 15 Kinnerley St, Walsall, Staffs.

Six 3J/160E vhf triodes and freq shift diplexer unit ref no W30848EDB used but gd cond. W. Wilkinson, G3WJH, 1 Company Fold, Little Clifton, Workington, Cumberland.

Woden DT1 new 30s. HRO 21–21·45 MHz bs coil also 14–14·35 MHz coil 45s ea, all post paid. M. Darkin, G3KTW, 4 Ash Drive, Catshill, Bromsgrove, Worcs. Tel Bromsgrove 5554.

Collins 75A2 modified to 75A4 spec, fitted 2·1 kHz, also 6 kHz filter (but not fitted), external audio filter for cw £110. KW Viceroy Mk 3b £85. Both exclnt. G. Harris, G3XSL, 25 Altcar Rd, Formby, Liverpool, L37 8DR. Tel Formby 72544.

KW Vanguard tx 10-160m £25. National HRO 9 gc coils £15. P.A. Swanson, G3NNV, 61 Hillary Road, Eastham, Wirral, Cheshire.

14AVQ 40-10m trap vertical antenna fb performer £10. Collect or post extra. H. Bluer, GW3UUZ, Nash Point Lighthouse, Llantwit Major, Glamorgan CF6 9ZH. Tel. Llantwit Major 306.

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UHF rx R1294 500-3000 mHz no psu £5. 1155 no psu £12. Mullard transistor stereo decoder £3. Pair new KT88s 30s. EL84 new 15s. pair. 3 gang 3-15 pf new 15s. G. Morrison, 85 Sutton Road, Heston Middlesex. G3MOU.

9 mHz phasing exciter ssb am cw vox printed circuit new £10. A. White, G2FCI, 5 Glenmore Road, St Loyes, Exeter, Devon.

4X150As, pair brand new, unused, made 67, list over £16 ea, sell at £6 ea or £10 the pair. Consider exchange for ic's, require μl 914,923,926 (Fairchild) and MC 724P, MC799P, MC789P, MC790P, MC791P (Motorola). Tregwyn, Stithians, Truro, Cornwall. Tel Stithians 480.

Labgear LG300 gd cond £20 delivered or why. H. Jones, 3 Bircham View, Austin Cres, Eggbuckland, Plymouth.

AVO multimeter £5. Commercial radio mike £4. Psu 350 V dc at 150 mA, 6·3 V ac at 5 A £3. Olympic Z-match £4. KW swr match/meter £4. (Both 75 ohm o/p). 50–0–50 microA meter 15s. 10·7 MHz xtal. Collect psu, postage on other items. B. Sutherland, G3IES, 336 Charlton Rd, Westbury on Trym, Bristol.

Heathkit HX20, HR20, HP20 (Mobile ssb twins with ac psu, used only as home station, never mobile, 10–80 m, five years old, ex cond £100 ono. K. Porter, G3KEN, Pinetrees, Rocky Lane, Heswell, Cheshire. Tel 051-342 4859.

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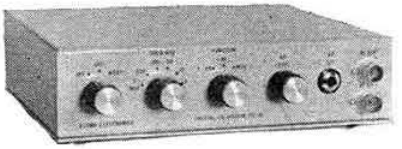

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ADDRESS .....

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.....

DATE ..... *SIGNED* .....

Classification

.....

Box. No.

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Wanted ☐

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Address

or state QTHR

Telephone number

DATE ..... *SIGNED* ..... *CALL-SIGN, BRS or A no.* .....

These advertisements are published free of charge for the benefit of members. The number of words is limited to 32, not including the address and telephone number. We must receive the advertisement at RSGB Headquarters by the date above for the following month's issue, typed or printed on a standard postcard or the form above. It must be accompanied by the last postal wrapper, the address, of course, agreeing with that in the advertisement. No advertisement obviously pertaining to a business can be accepted, but these can be submitted in the usual way for classified advertisements. We cannot guarantee the inclusion of Wanted Advertisements.

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INDEX TO ADVERTISERS

Radio Society of Great Britain

(Incorporated 1926)

Patron: HRH THE PRINCE PHILIP, DUKE OF EDINBURGH, KG

Application for Corporate Membership

Radio Society of Great Britain
35 Doughty Street
London, WC1

I hereby apply for election as a Corporate Member of the Society and enclose a remittance for £2. 10s. 0d. being the amount of my first annual subscription.

I, the undersigned, agree that in the event of my election to Membership of the Radio Society of Great Britain, I will be governed by the Memorandum and Articles of Association of the Society and the rules and regulations thereof as they now are or as they may hereafter be altered; and that I will advance the objects of the Society as far as may be in my power; providing that whenever I shall signify in writing to the Society addressed to the Secretary that I am desirous of withdrawing from the Society I shall at the end of one year thereafter after the payment of any arrears which may be due by me at that period be free from my undertaking to contribute to the assets of the Society in accordance with Clause 8 of the Memorandum of Association of the Society.

Date..... ***Signed***.....

PERSONAL DETAILS TO BE COMPLETED BY THE APPLICANT

Surname (BLOCK LETTERS).....

Christian Names in full (BLOCK LETTERS).....

Address for all correspondence (BLOCK LETTERS).....

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Nationality..... Age (if under 21).....

Current Call-sign (if any).....

Details of previous membership (if any).....

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I wish to propose.....for Corporate Membership.

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Address (BLOCK LETTERS).....

Call-sign (or BRS No.).....

Signed .....

*If the applicant is not acquainted with a Corporate Member willing to propose him for election he may submit a suitable reference in writing as to his interest in Amateur Radio.

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Prices include postage and packing except where stated.
Stamps and book tokens cannot be accepted.
Order form on page 151.

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