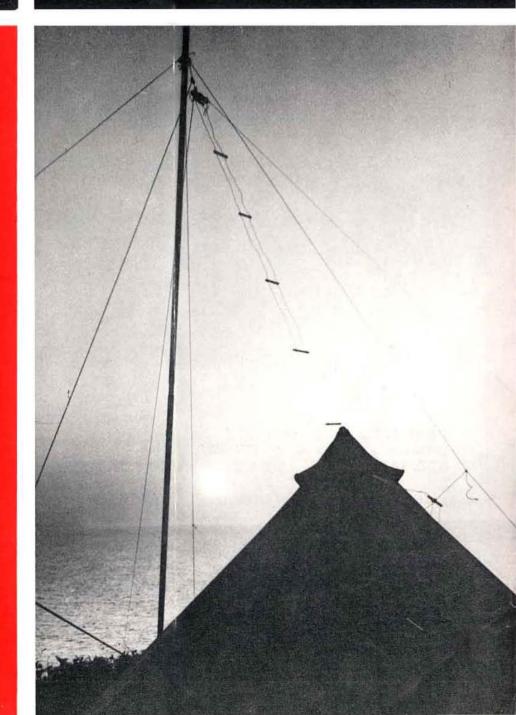


VHF-NFD RESULTS page 564





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8 AUGUST

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INDIVIDUAL COPIES 4s.

522 QTC-AMATEUR RADIO NEWS

523 RAE COURSES

524 CW KEYER USING DIGITAL ICS

John Crawley, G3LBX

526 NRSA CONVENTION 1969-GB2BVC

527 LONG TERM OBSERVATIONS OF METEOR SCATTER ON

70 MHZ

G. E. Goodwin, G3MNQ

534 TECHNICAL TOPICS

Pat Hawker, G3VA

540 IARU REGION 1 CONFERENCE

Roy Stevens, G2BVN

544 BRINGING THE LAFAYETTE HA350 ON TO TOP BAND

AND MEDIUM WAVE

R. F. Pilkington, G3IAG

546 A CASE OF NO TVI-NOW

John C. Graham, G3TR

548 THE MONTH ON THE AIR

John Allaway, G3FKM

551 PROPAGATION PREDICTIONS

554 FOUR METRES AND DOWN

Jack Hum, G5UM

560 BRIDGE BALUN FOR THE 80 AND 40 METRE BANDS

John C. Graham, G3TR

561 SOCIETY AFFAIRS

562 SPECIAL EVENT STATIONS

562 OBITUARIES

563 LOOKING AHEAD-CONTEST DIARY-MOBILE RALLIES

563 RADIO AMATEUR EMERGENCY NETWORK

564 NATIONAL FIELD DAY 1969-RESULTS

569 CLUB NEWS

572 CONTEST NEWS

573 MEMBERS' ADS

583 INDEX TO ADVERTISERS

AUGUST 1969 VOLUME 45 No. 8

LOWE ELECTRONICS

50-52 Wellington Street, Matlock, Derbyshire. DE4 3GS

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Straight floggeroo this month, lads, no chat-got to get some loot into the till! On with the motley:-Katsumi EK9X electronic keyer **NEW STUFF** £7 15 0 NEW STUFF
Complete Sommerkamp line in stock at the time of writing—the separate FR-500 (£160 0 0), FL-500 (£145 0 0) and FL-2000 (£110 0 0) linear. The top value transceivers, FT-500, (500W p.e.p. £250 0 0 complete), FT-250 (240W p.e.p. less p.s.u. £160 0 0) and the transistorised FT-150 (120W p.e.p. with both AC and DC psu's built in £215 0 0).
Inoue 700 series—transistor Rx £(£85 0 0) companion Tx and psu (£95 0 0).
Manuals for Inoue Rx and Tx 5/- each. Katsumi DA1 keyer, mint s/hand Morse buzzers (crummy note but not a bad key) 100 kc/s HC18/U crystals, accurate to less than 5 cycles. Series £2 0 resonant 6d. a yard £7 10 0 15 0 £1 10 0 300 ohm ribbon feeder 200W
Baluns, ex U.S.A.F. 70/200/700 ohms
Manuals for Marconi TF390 sig. gen
Crystals HC6/U 1-750000MHz for band edge marker
Crystals HC6/U 2-00000MHz, 5-0000 and 9-0000MHz
MEDCO L.P. filters 50 or 75 ohm, Belling Lee sockets
Sohm S0239 sockets (THESE ARE THE LP FILTERS THEY'RE
ALL TALKING ABOUT)
Low Immediate sodded bedges 300 ohm ribbon feeder 200W The above are to my mind, without any shadow of doubt your best buy in £1 5 0 each the respective price ranges. £4 10 SECONDHAND TRANSMITTERS AND TRANSCEIVERS:
Heathkit Abache #50 0 0 4m 50W linear com-£5 0 £2 2 £1 5 15 £4 0 06000000 Heathkit Apache Heathkit SB10 £50 0 0 plete commercial job. Low Impedance padded headsets £2 Sommerkamp FT500 A beauty Ferrograph tape recorder motors £75 Magslip 2" receivers, Mk. 2 (50 cycles) £4 Paros 3 bander, beautiful rig KW 2000 Bug keys Filters, Kokusai mechanical 455kHz 2·4kHz SSB FE Super 600, £120 0 0. New, complete with both AC and DC psu's. This Kokusai 600 cycle CW £12 10 should be a real cracker—fine on transmit, but Rx audio is terrible. 2—6146B's, 9 mHz filter. Will someone really clued up buy this at lots less than cost—we haven't the time to redesign a "one-off" job. Collins KWM2, complete with the following accessories: noise blanker, mobile mount, separate VFO, both d.c. and a.c. power supplies, carrying case. £450 0 0 complete. SkHz AM TEW 9MHz crystal filter 2-4kHz complete with both carrier £7 10 £10 0 COMPONENTS:
Disc ceramics SOV- '01 6d. each, 5/- doz.: '001 4d. each, 3/6 doz. 50 volt '002, '005, '01, '3d. each or '2/6 doz.: '02, '05, '4d, each or '3/6 doz.: Tubulars, miniature ceramic 350V, 330pF, '001, '002, '005, '3d. each or '2/6 doz.: Tubular trimmers \(\frac{1}{2}\)-5 or '3-15pF 1/- each or 10/- doz. Feedthroughs, screw type, '1000pF 500V 1/- each, 10/- doz.: Electrolytics 100mF 500V 7/9: Miniature low voltage types: 10mF 16v 6d. each, 5/- doz.: 35mF/16v; 100mF/12V 8d. each, 7/- doz. 100mF/16V 11- each, 10/- doz.: 2,800pF variables, ideal top band loading, 1/-. PL259 plugs, SO239 sockets 5/- each. reducers 1/3, r.f. chokes 2'5mH 1/6 each, 15/- doz.: B9A '/holders skirted each, 15/- doz.: B9A '/holders beling Lee coax plug Aluminium 1/4 sockets standard 1/- line connectors 1/3. Panel lights miniature red or green 2/-. Lilliput bulbs to suit 6v 1/-. 3-5mm screened jack plugs 2/6. Sockets 1/6. HC6/U xtal holders, 1/- each, 10/- doz.: Fuseholders panel mounting (1\frac{1}{4}') 2/-: Heat resisting sleeving COMPONENTS SECONDHAND RECEIVERS £30 £130 0 0-£35 0 0 0 0 SR-200 (Star) Lafayette HA500's Eddystone EA12 £30 0 0 Lafayette HA600 Lafayette HA350 Heathkit RA1 with 0 0 National NC190 Sommerkamp FR-100-B 0 0 £35 €50 £55 Hallicrafters SX117, a £30 0 £100 0 0 calibrator Geloso G209 beauty Trio 9R-59DE £30 0 0 £30 0 Still a few AR88's rewired, checked, serviced, aligned, fitted tuning meters and new Philpotts cabinets. LF's £40 0 0. D's £47 10 0. 10/- doz.: Fuseholders panel mounting (1½") 2/-: Heat resisting sleeving 2mm 2d. a yard: Standard jack plugs 3 way, 2/6: Good selection of AR88 spares but no meters or gear boxes: Lots of other bits and pieces too Marconi TF885A/1. This is the 12 MHz Video oscillator, mint and c/with Marconi 1F885A/1. This is the 12 MHz Video oscillator, mint and manual. (Usually £85 0 0 in Wireless World)

All Noise Generators, CT82 15kHz to 160MHz, Tested

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Teissco DM501 PTT dynamic 50K mikes
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Katsumi MC22 Speech compressor
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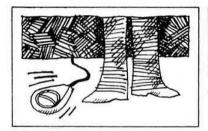
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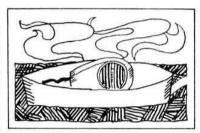
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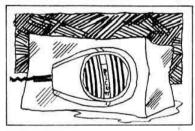
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BC108, C111, 3/9 each.

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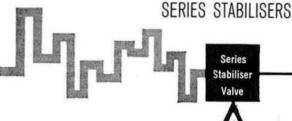
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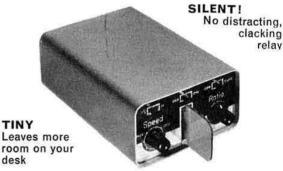
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AMATEUR RADIO NEWS

RSGB Approved for Purposes of Ham Radio Magazine at RSGB Section 16 Finance Act. 1958

Members may like to be reminded that the Commissioners of Inland Revenue have approved the Society for the purposes of Section 16, Finance Act, 1958.

The circumstances and manner in which members may make claims to income tax relief are as follows:

A member who is assessable to income tax under Schedule E in respect of the emoluments of an office or employment is entitled to a deduction from those emoluments of the whole of the annual subscription which is due and payable by him to the Society in the income tax year provided that:

- (a) the subscription is defrayed out of the emoluments of the office or employment, and,
- (b) the activities of the society so far as they are directed to all or any of the following objects:
 - (i) the advancement or spreading of knowledge (whether generally or among persons belonging to the same or similar professions or occupying the same or similar professions).
 - (ii) the maintenance or improvement of standards of conduct and competence among the members of any profession.
 - (iii) the indemnification or protection of members of any profession against claims in respect of liabilities incurred by them in the exercise of their profession:

are relevant to the office or employment. that is to say, the performance of the duties of the office or employment is directly affected by the knowledge concerned or involves the exercise of the profession concerned.

A member of the Society who is entitled to the relief should apply to his tax office for Form P.358 on which to make a claim for adjustment of his PAYE coding.

For the first time a US journal will have its own space at the Society's Exhibition, Mr T. H. Tenney, Jr., publisher of Ham Radio Magazine and President of Communications Technology, will be attending with the intention of introducing his journal to Exhibition visitors. Mr Tenney, who holds the call WINLB, is the Society's sole agent for Society publications in North America. It is due to his efforts that the demand for RSGB books in the USA has far exceeded previous figures. The Radio Communication Handbook, of which a first reprint of 10,000 copies was recently made, is proving an extremely popular volume with American amateurs.

VHF-UHF Manual Correction

The attention of readers is drawn to Fig. 10.37 of the Manual which shows the wiring and component layout of the G3HBW transistor dip oscillator. The lead shown as leaving the meter + ve terminal for chassis earth should be removed leaving the meter +ve connected to the collector of TR2 as shown. The solder tag to the left of the meter should be connected to battery +ve. The circuit of the dip oscillator, Fig. 10.36, is correct as shown in the Manual.

Week-end RAE Course

THE Education Committee again invite members who are interested in attending this proposed course, to write to R. J. Hughes, G3GVV, 102 Harlands Road, Haywards Heath, Sussex; if you have already done so, there is no need to write again. Full details appeared in the March 1969 issue of Radio Communication, but the aims of the course are repeated; they are to revise certain topics which appear frequently in the questions, to deal with individual questions, and to give advice on examination techniques.

Honda Generators

Since the review of the Honda Generator type EIV 300 which appeared in the February 1969 issue of Radio Communication a new model has been introduced known as the type E300. Although basically the design has not been altered the new model contains several new features. Elsewhere in this issue there is an announcement by Advanced Developments of Weybridge, Surrey, concerning a special offer to members on the price of Honda Generators.

RSGB Dinner Club

Forty members and guests attended the meeting of the Dinner Club held on Friday, 18 July at the Kingsley Hotel, Bloomsbury Way, London, WCI. The visitors included CTISQ, LA8YB and KIYZW. After dinner colour films of the Apollo 8 and Apollo 9 space trips were shown. The quality of these films was of the highest order. The next meeting of the Dinner Club will probably take place on Friday, 10 October and this date will be confirmed in Radio Communication. Proceedings are completely informal and one of the objects of the Dinner Club is to provide an opportunity for overseas visitors to meet RSGB members.

URE Convention

As mentioned last month, the Spanish Amateur Radio Society, URE, are holding a convention in Tenerife, Canary Islands from 12-17 September. We have since been approached by Iberia Airlines who say that if 15 or more people were to go from Britain there would be a very substantial saving on the inclusive travel, hotel and convention fee. Even without this number, Mr Gonzalez at Iberia will greatly facilitate booking arrangements here. Those interested are requested to contact Mr Gonzalez at Iberia Air Lines of Spain, 169 Regent Street, London, WIR 8BE, telephone 01-734 6351, at the earliest possible opportunity.

Radio Amateur JP

A cutting from the Burnley Express, courtesy of G5ZN, informs us that Mr Thomas Pollard, G2AYY, has been made a Justice of the Peace in that City. Mr Pollard is in the music trade in Burnley in a long-standing family business. During the last war he was in the Intelligence Service of the War Office. He is an active Rotarian.

Licensing Figures

Radio licensing stood thus	on 30
April, 1969:	
Amateur Sound (A)	13,175
Amateur Sound (B)	1,530
Amateur Sound Mobile (A)	2,628
Amateur Sound Mobile (B)	172
Amateur Television	188
Model Control	15,781

Bishop Wordsworth School ARS

In May Radio Communication, on page 304, the callsign of this Affiliated Society was given as G3XUB. This should read G3XVB.

Affiliated Society

Change of name and secretary.

The society formerly known as the Amateur Radio Society of the Guild of Students will now be called the University of Aston Radio Communication Society. The Secretary is D. Willets, G3XXT, Guild of Students, The University of Aston in Birmingham, The Union, Gosta Green, Birmingham 4.

Affiliated Societies

The following societies are now affiliated to RSGB.
WIRRAL DX ASSOCIATION
Secretary: J. A. Share, G3OKA, "Trelawney," 21 Curlender Close, Bidston, Birkenhead, Cheshire L41 7BN. RADIO AND ELECTRONICS SOCIETY.
Secretary: I. G. Medlicott, University College of Wales, Students Union, Aberystwyth.
SULLY AND DISTRICT SHORT WAVE CLUB.

SULLY AND DISTRICT SHORT WAVE CLUB. Secretary: J. Sugden, GW3SLA, 7 David Street, Coldbrook, Barry, Glam. CF6 7NA.

Electroniques Move Premises

Electroniques, major suppliers of electronic parts and equipment have moved to a new and larger premises. The address remains unaltered, that is Electroniques, Edinburgh Way, Harlow, Essex but the telephone number becomes 0279-6 26811 (Harlow). The manager is Mr J. A. Browning. Electroniques is a subsidiary of STC which in turn comes within the vast ITT group.

Silent Keys

It is with sorrow that we record the passing of the following radio amateurs J. Cookson, BEM, G6KK, of Blackpool, Lancs.

J. E. Carkes, G31YK, of Stourbridge, Worcester.

E. G. Bright, G3JW, of Exeter, Devon. W. K. Miller, G6QF, of Worsley, Manchester.

F. Richardson, G3LBR, of Stockton-on-Tees, Co Durham.

RAE Courses

Barry, Glam. Barry College of Further Education, Colcot Road, Barry, Glam. Tuesdays (Theory) and Thursdays (Morse and practical) from 7.30 to 9.30 pm. Commences 23 September. Enrolment: 8-12 September. Fee: 30/- (under revision).

Bath, Somerset. City of Bath Technical College, Bath, Somerset. Commences September. Also 10 week Morse Course between September and Christmas 1969.

Bedford, Beds. Westfield Further Education Centre, Chester Road, Queens Park, Bedford. Enrolment: 8 September, Two term course.

Brentford, Middx. Brentford Centre for Adult Education, Brentford Secondary Girls' School, Clifden Road, Brentford. Commences 22 September—6.30 to 8.30 pm. Enrolment: 11, 12, 15 and 16 September. Also High Fidelity and Tape Recording Course commences 24 September.

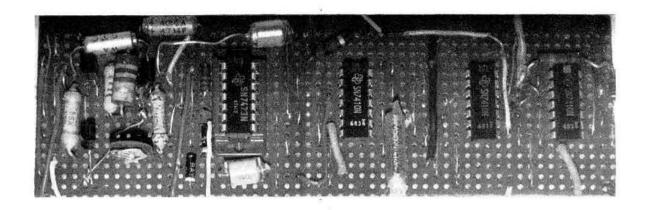
Brighton, Sussex. Brighton Technical College, Richmond Terrace, Brighton BN1 2SZ.

Carshalton, Surrey (London Borough of Sutton). Carshalton College of Further Education, Nightingale Road, Carshalton. Thursdays 7.00 to 9.30 pm. Commences 15 September. Enrolment: 8, 9, 10 September.

Grimsby, Lincolnshire. The Adult Education Institute, Hereford Centre, Ely Road, Grimsby. Mondays from 7 to 9 pm. Enrolment: 16, 17, 18 September between 7 and 9 pm. Fee: 22/6 per term or 10/- per term for under 18s not in full employment.

Slough, Bucks. Slough College of Technology, William St., Slough, Bucks. Thursdays and Fridays—Theory by G3WQC and Morse by G3FVC. Enrolment: Thursday 11 and Tuesday 16 September.

Wombourne, Staffs. Wombourne Evening Institute, Ounsdale School, Wombourne, Nr. Wolverhampton. Commences September. Enrolment: Applications should be made as soon as possible to the Head Teacher of the Institute, Mr D. E. Battison.



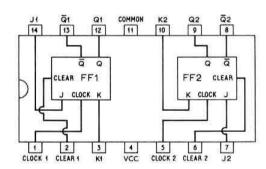
A CW Keyer

using Digital ICs

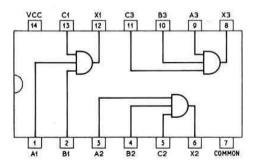
The availability of J. K. Master-Slave Flip-Flop integrated circuits makes possible the building of an extremely sophisticated CW Keyer. It is designed for use with a double or "squeeze" key for the most relaxed and effortless sending. Any morse character can be sent with only two finger movements! The circuit will work up to about 10⁶ bits per second which is several million times faster than the author can receive. With the dit key down, a string of dits is produced; with the dah key down dahs go out; with both pressed dah-dit-dah-dit ad infinitum! If, in a string of dahs, the dit key is momentarily pressed, a dit will be inserted after the end of the next dah, and vice versa in a string of dits.

The operation of the device is best explained by reference to the diagram. On either key being pressed a logical 1 appears on the output of gate G owing to the zero applied to one of the inputs—this 1 at the output of gate G will hold the multivibrator switched "on" until the keys are both released and the final dit or dah completed. The multivibrator drives gates M and L which produce a sufficiently steep edge to the pulses to clock the flip-flops. In the case of the dit key being down, gate E will put a 1 on the K input of FF2. This will pass to \overline{Q} and thence to the bottom input of gate A, which will then pass the dit-sized pulses which are present at its other inputs. Q on FF2 is now 0, so the output of gate D will be 1, the dits now pass gate B and thence operate the relay via gate C. FF2 is clocked by the down going edge of each dit or dah; and the output of gate G is

By JOHN CRAWLEY, G3LBX*

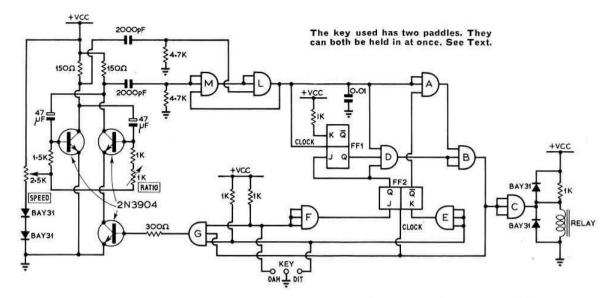


Connections for the FN7473N or FJJ121 Integrated Circuit.



Connections for the SN1410N or FJH121 Integrated Circuit.

^{*} St. Mary Magdalene Hospital, Claremont Road, Newcastle-upon-Tyne 2.



kept at 1 until the upgoing edge of each dit or dah in order to complete each character, even when the keys are up.

If the dah key is pressed at any time, a 1 appears on J of FF2 this need only be a momentary pulse (anything over 20 ns!) at the next clock pulse this is passed to Q and a zero appears at Q cutting off the dits at gate A. The 1 at Q lets FF1 operate gate D producing dahs at the input of gate B which pass to the relay as before. The 0.01 capacitor between gates L and A keeps the clock pulse to FF1 clear of unwanted spikes.

All the gates are triple 3-input Nand Gates such as SN7410N or FJH121 (three needed). The flip-flops are both in one package—an SN7473N or FJJ121. These four ICs are mounted on Veroboard together with the components of the Multivibrator. Any silicon NPN transistors would do—2N3904 happened to be in the author's box. The timing components could be changed to suit individual operators;

the ones shown give speeds from unreadably slow to about 30 wpm; a 30 μ F electrolytic in each side would possibly be better for most users. The two BAY31 diodes shown in the speed control of the multivibrator can be pretty well any small silicon diode. The author is experimenting with a two-finger key using two micro switches. He is getting on well with operating this as he happens to be a flautist!

A polarized relay can be driven from gate C as shown, or a transistor used as a switch in its place. The arrangements of this stage depend largely on the transmitter to be keyed. In the writer's prototype all the VCC points are supplied through a toggle switch from the + side of a 4½ volt battery. The "Common" connection on each device and the earth point on the Multivibrator go to the negative of the battery. The supply voltage must not exceed 5½ volts and no surge voltage is tolerable—spikes will kill!

RSGB National Mobile Rally WOBURN ABBEY, BEDFORDSHIRE

Sunday, 10 August, 1969

The park opens at 11 am. Among attractions will be visits to the state apartments, more than 3000 acres and 2000 animals, a trade exhibition, surplus sale, Grand Raffle, children's playground, Pets Corner and boating lake, children's sports, children's lucky dip, an amusement park and funfair, the Woburn Safari Service, restaurants and snack bars. There will also be a bring-and-buy sale. Please price any surplus equipment for sale before putting it on display and remember that a deduction of 10 per cent will go towards rally funds.

Car parking in a specially reserved car park.

Talk-in stations GB2VHF, G3VHF and GB3RS on 2m, 4m and 160m.

Organized by the Radio Society of Great Britain. Use of Woburn Abbey by kind permission of His Grace, the Duke of Bedford.

NRSA Convention

1969—GB2BVC

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

Due to the success of the 1968 Convention, held at the Kent Suite, Belle Vue, it was decided to hold this year's Convention at the larger premises of the Cumberland Suite, which is located within the 84 Acre Zoo and fun fair of Belle Vue, with attractions for the whole family, the North's biggest showground.

The Association comprises 11 member Societies, most of whom were represented at the Convention, drawn from the Radio Societies of the North.

Represented at the Convention were:

Bury & Rossendale Radio Society; The North-West VHF Group; Eccles & Dist Radio Society; Manchester & Dist. Amateur Radio Society; Stockport Radio Society; East Lancashire Radio Society; North Liverpool Radio Society; Liverpool & Dist. Radio Society; British Amateur Television Club; BARTG; Manchester Model Boat Society; Radio Society of Great Britain (Bookstall), and 15 Commercial Trade Stands.

The Convention was open to the public at 11 am, and was officially opened by Brian Trueman, the well known Television and Radio personality, at 2 pm.

After the Chairman's introductory remarks Brian Trueman made a short but jocular speech, in which he spoke of the debt which the professional engineer owed to the early experiments made by Radio Amateurs, and then declared the Exhibition open.

After Brian Trueman's speech, the Chairman then introduced John Graham G3TR, RSGB Immediate Past President, representing the RSGB. Mr Graham had previously agreed to judge the member Society stands with a view to awarding the G8AYD Trophy, which was presented to the Association by R. M. Clarke, G8AYD, G6AEF/T for the best Amateur stand of a member of the Association at the Exhibition. Up until then, the trophy had been kept secret, so none of the Societies were aware of its existence until Mr Graham announced it, after having judged the stands. Mr Graham then explained that as he was not following any precedent he had judged the stands on the basis of which stand gave the most information to the complete beginner.

After complimenting all the stands, he then awarded the Trophy jointly to the Manchester & District Amateur Radio Society, and the South Manchester Radio Society, as, in his opinion both stands were complimentary to one another, in that the Manchester & DARS stand showed the various pathways to Amateur Radio, whilst the South Manchester RS stand continued this theme, with a display of home constructed equipment. The Trophy was then presented jointly to Mr A, B, Langfield, G3IOA and Mr W, L, Seddon, G3VIW, Chairman of the respective clubs.

Talk-in stations were operating on 2, 4 and 160 metres, and were kept busy all day. A demonstration station, operating on 20m had been set up, in order to show the



Photo by G3SEN

GBAKG operating the 2-Metre talk-in station located in the North-West V.H.F. Group's caravan.



Photo by G3SFA

One of the winners of the G8AYD Trophy, the South Manchester Radio Society, depicting various aspects of home construction. In the centre of the photograph are the G3BMF Trophy, and the G8AYD Trophy. Left to Right: G3VIW, G3WFT, G3HZM.

public how an Amateur Radio Station operated. Despite problems with aerials, many European stations were worked. All stations used the call-sign GB2BVC.

The Convention as a whole was considered to have been a success with an estimated 4000 people attending, many spending the whole day there, and many trade enterprises expressed their desire to attend next years event.

The Committee would like to express their thanks to the Ladies who "manned" the reception stands, and to Brian Trueman for his valuable time and to John Graham, G3TR for his time, and to all those who attended, and the trade and society stands, all who helped to make this event possible. A provisional date has been fixed for Sunday, 26 April, for the 1970 Convention and Exhibition at the same venue. All enquiries for next year's event should be made to the NRSA Business Manager, R. M. Clarke, A.M.Inst.E. G8AYD, G6AEF/T "Hillside" Quickedge Road, Mossley, Ashton-u-Lyne, Lancs.

Long Term

Observations of Meteor Scatter on 70 MHz

By G. E. GOODWIN, G3MNQ*

THE phenomenon of meteor scatter has been of interest for a number of years, and over a period of time casual observations of Dresden TV on 145-26 MHz were made, but these were curtailed by the removal of the transmitter from the 2m band.

For some time it was felt that a more permanent record of MS could be made, and it was suggested by G3CCH that Continental stations operating around the 4m band could be used. Subsequent investigations showed that there were a large number of medium power (4–8 kW erp) FM transmitters between 66 and 72 MHz in Poland and Czechoslovakia, and some of these were on discrete frequencies which was considered essential to eliminate double path recognition. Finally, a station on 69-86 MHz was selected as it was clear of any other known channel and also clear of our own 4m band so that interference from this source was unlikely.

It is interesting to note that up to this time (late 1966) nearly all QSOs via MS had been made on 2m where higher transmitter power is allowed and higher aerial gains are practical, while very little work of this sort had been done around 70 MHz. Since then interest in the use of the 4m band has increased, and with the advent of GB3GM on 70·305 MHz some observers have been studying MS between Scotland and the South Coast, on a N-S path.

The selection of a station in Czechoslovakia also satisfies one of the original requirements that observations should be made in the E-W direction as it is this direction that is of most interest to MS operators in order that the more distant and little heard of Continental stations can be contacted. The use of 70 MHz (as against 144 MHz) is an advantage in that the signals will be some four times stronger (for the same erp), which can be utilized in producing a larger number of usable signals and/or simpler aerial systems at the receiving end.

The selected transmitter uses frequency modulation which is of the usual wide band deviation used in this country, but the actual modulation is not important for these observations so a narrow band receiving system can be used with greatly improved signal-to-noise ratio.

When listening for MS signals receiver noise only will be heard for most of the time, and then at some random intervals bursts of signal will be heard. A burst may be very weak or relatively strong and may last for only a fraction of a second or for several minutes. If one is attempting to have a QSO then the information obtained in each burst must be extracted and appropriate action taken, but if as in this case the strength of the signal and the number of times which it occurs is important then some permanent record must be made automatically. The results can then be analysed hourly, daily or at any other convenient time interval. All signals received in this way cannot be recorded because some of them will be inseparable by simple means from the noise level and therefore some decision has to be made as to the signal level to which signals must rise to operate the recording mechanism. In making the decision it is necessary to observe such things as the noise generated by thermostats on domestic electrical equipment, fluorescent lamps, car ignition systems, etc and then set the recording level above these. Much can be done in the receiver to eliminate the impulse interference (thermostats, ignition) but the "hash" produced by fluorescent lamps and power lines can be more of a problem.

The number of bursts of signal received can be recorded either on a mechanical decade counter or a pen recorder, and at first both of these were incorporated in the equipment at G3MNQ. The decade counter recorded all the signals which exceeded a certain level and from this daily rates of meteors obtained. The pen recorder provided a recording of all the signals received irrespective of the level and from this the rate of signals above any level for any period of time can be obtained by the rather laborious method of counting the number of strokes of the pen. A sample of this type of recording is shown in Fig. 8, and as can be seen the horizontal scale is 1 in per hour while the vertical scale is equivalent to a signal strength of $1\mu V$ or S9 approximately for full scale deflection.

^{* 4} Elfin Grove, Dunton Bassett, Rugby, Warks.

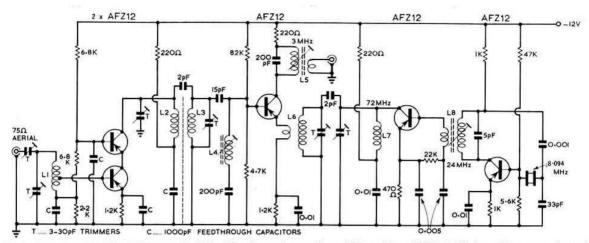


Fig 1. Converter. T—3-30 pF trimmer. C—1000 pF feedthrough capacitor. All transistors AFZ12. L1 6: turns 22 swg en, tapped 1: turns. L2 4 turns 22 swg en. L3 4 turns 22 swg en. L4 32 turns 36 swg en. L5 32 turns 36 swg en, plus 2 turn coupling. L6 5 turns 22 swg en, plus 1 turn coupling. L7 5 turns 22 swg en. L8 25 turns 36 swg en, plus 4 turns coupling. All on Radiospares formers with cores where indicated. NB: A 001 capacitor has been omitted. This should be connected between earth and the conjunction with the 220 ohms resistor, 220pF capacitor and L5, located at the top centre of this circuit.

By using the hourly rate of meteors obtained by counting, a daily graph can be constructed showing how the rate changed during the day, and the maximum and minimum rate obtained. This can become rather tedious over a period of months and it was decided to change the pen recorder circuitry so that it would plot the graph automatically as the day progressed.

The pen recorder was replaced by a small meter so that the gain of the system could still be set to the same level, and it also served as an audio "S" meter. The mechanical decade counter and its drive circuit were retained as before, with the exception that an output was taken from it to operate the new pen recorder drive circuit. This consists of a diode-pump integrator which in effect counts and, for a given time, stores the number of pulses fed to the decade counter. The facility for recording the strength of each signal burst is lost, but this proves to be of little consequence in practice, and if needs be another pen recorder could be used in the original position.

The system now produces the type of graph shown in Figs 9–12. The horizontal scale has been reduced to ½ in per hour—mainly for the sake of economy of paper—and the vertical scale is 50 counts for each main division, giving a full scale range of 250 counts per hour. Other ranges were originally built into the equipment giving 500, 1000 and 2000 counts per hour, but of these only the 500 range has ever been used.

Equipment

Aerials

Although several types of aerial were tried it was found that a simple two element beam at about 20 ft provided ample signal to operate the equipment and this is in a fixed position beamed slightly south of east.

Converter

The original converter used was the old valve device built in the early days of 4m. It had ample gain and a fairly low noise figure but required its own power supply since all the other equipment is transistorised. As soon as was practical a transistorized converter (Fig. 1) was produced with similar gain and noise figure. The crystal used is an 8-094 MHz FT243 which was a left over from the crystal controlled days on 2m. Multiplied by nine it produces an output of 72-845 MHz which is on the high side of the signal frequency, resulting in an i.f. of 3 MHz. Injection on the high side has the advantage that the image is away from the TV channels. In order to reduce the chances of response to unwanted signals the crystal is operated in the overtone mode and the output is bandpass coupled to reduce harmonics other than the third getting to the mixer.

Receiver I.F.

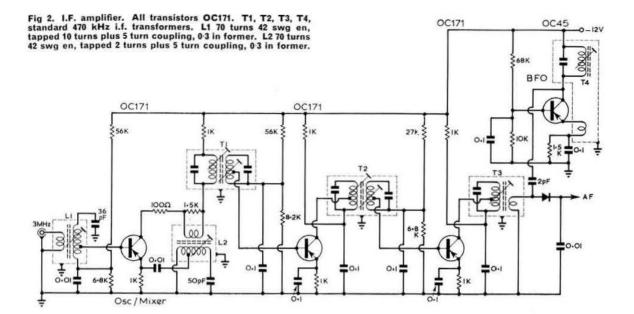
The 3 MHz signal from the converter is tuned by the input circuit of (Fig. 2) and applied to the self-oscillating mixer to produce an output at 470 kHz. The oscillator runs at 2.5 MHz and stability appears to be adequate at normal room temperatures. The i.f. amplifiers are conventional, using double tuned transformers and unneutralised OC171 stages, except that age is not used, the resulting overload on strong signals being of no consequence.

A BFO is required so that the unmodulated carrier can result in an audio signal. This uses a single tuned i.f. transformer connected as a simple oscillator and the output injected via a small capacitor into the diode detector along with the signal.

Receiver Audio

A good noise limiter (Fig. 3) is essential for reasons already given and the one used is a modification of one by John Gazeley, BRS20533 in RSGB BULLETIN Jan. 1963 has proved to be very good. It must, however, be fed into a reasonably high impedance, hence the 22 K ohm resistor between the noise limiter and the volume control.

The AF stages are conventional and can produce over one watt into a 3 ohm load. Except for monitoring purposes a speaker is not normally used and a resistive load is used in its place.



Original Pen Recorder and Decade Counter Drive Circuit

The AF output from the receiver is applied to a step-up transformer of about 1:40 ratio, rectified by the bridge and partially smoothed by the 4 μ F capacitor (Fig. 4). The resultant voltage operates the pen recorder via its load resistor causing the pen to move proportionally to the strength of the received signal and also drives the following electronics. TR1 and TR2 are connected as a Schmitt trigger, and it is this circuit which determines how strong the signal has to be before it is counted. With no output from the bridge rectifier TR1 will be cut-off and TR2 will be conducting holding off TR1 by emitter bias, and it will remain in this state until the voltage from the rectifiers reaches a certain value. Then TR1 will conduct and this will cut-off TR2 producing a sharp positive-going voltage change at its collector. The circuit will remain in this state until the output from the rectifiers falls again below the critical value, when the circuit will resort to its original state. Since the rectifier

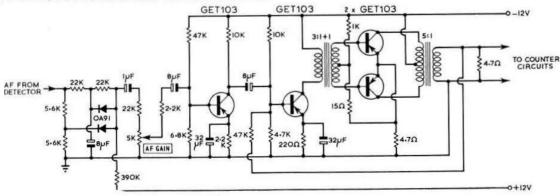
output is directly related to the signal arriving at the aerial the actual point at which TR1 and TR2 switch over and produce the positive-going voltage level is also related to the signal.

The mechanical counter requires a pulse of about 12 volts amplitude and 20mS. duration to operate it correctly and TR3, TR4 and TR5 produce this by monostable action every time TR2 produces a positive-going voltage. Thus the circuit will advance the decade counter by one count every time the aerial voltage exceeds the predetermined value.

Final Pen Recorder Circuit

In order to make the pen recorder plot graphs of the rate of meteors the circuit was changed to that shown in Fig. 6. The pen recorder was disconnected from the bridge rectifier circuit and was replaced by a 50 µA meter which decreased the load allowing a smaller smoothing capacitor to be used. This improved the response time of the system, and the shorter duration bursts of signal now operate the counter.

Fig 3. AF Amplifier. All diodes OA91. All transistors GET103.



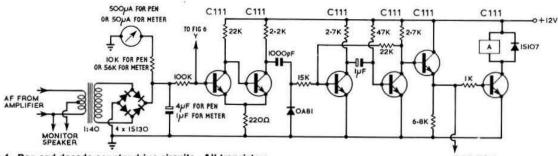


Fig 4. Pen and decade counter drive circuits. All transistors

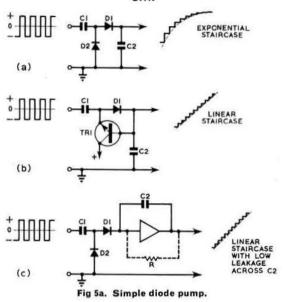


Fig 5b. Diode pump with amplifier.

Fig 5c. Diode pump with integrated circuit amplifier.

The mechanical decade counter circuit remained the same except that an output was taken from point "X" in Fig. 4 to operate the new recorder circuit.

This circuit is an expansion of the simple diode pump circuit shown in Fig. 5a. Here, when the input goes positive, C1 and C2 are charged in series via D1, and C1 discharges via D2 during the negative half of the input cycle. The charge on C2 is retained since D1 is now biased off and is dependent on the ratio of C1: C2. Successive pulses will charge C2 exponentially in a "staircase" waveform as shown. To improve the linearity of the staircase D2 can be replaced by an emitter follower amplifier as in Fig. 5b, and C2 will receive equal charges of energy for each input pulse. C2 will discharge via the transistor and this would be appreciable over a period of minutes. The circuit is therefore re-arranged as in Fig. 5c where the emitter follower is replaced by an integrated circuit amplifier so that the leakage from C2 is reduced to a low level and also power can be supplied to external circuits. To make this into a circuit which will produce an output which averages the number of input pulses with respect to time, all that is necessary is a large

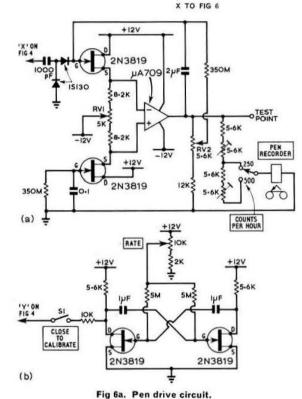
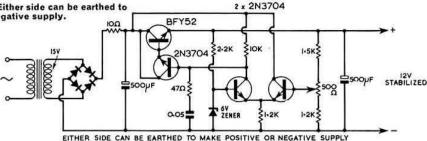


Fig 6b. Calibration oscillator.

resistor (shown dotted) shunting C2. In this case 350 M ohms is used which produces a time constant of about 12 mins. Most easily obtainable integrated circuits will not operate satisfactorily with such a high value resistor because they take a small but finite input current, and it is necessary to provide some impedance matching. This is accomplished by using a pair of FETs as source followers, as shown in Fig. 6. The amplifiers usually have balanced inputs so it is necessary to provide two inputs of equal impedance for correct operation, and also to have some means of making the amplifier output zero (RVI) when there is no input.

Calibration is achieved by RV2 which in effect changes the value of the 350 M ohm resistor by tapping it down the output and this changes the time constant of the circuit. To set RV2 an input pulse is fed into point "Y" on Fig. 4 with

Fig 7. Stabilized power supply. Either side can be earthed to make positive or negative supply.



the switch S1 in Fig. 6b set to "calibrate." This is the FET version of a multivibrator and by adjustment of the "Rate" control can produce pulses between about 1 every 5 seconds to 1 every 25 seconds. If this is set to give one pulse every 15 seconds the pulse rate per hour can be calculated and RV2 adjusted so that the pen recorder reads correctly.

When SI is opened the pen recorder will produce a trace which is directly related to the number of bursts of signal from the receiver.

Pen Recorder

This is a standard "Record" unit type MC with a 500 μ A movement and mains powered chart paper drive. Numerous chart speeds are available but for these observations 1 in per hour was used initially and later $\frac{1}{2}$ in per hour mainly to reduce the quantity of chart paper used. This could be reduced still further without loss of information but apparently slower speeds are not available.

Mechanical Decade Counter

Again this is a standard unit but no doubt currently available surplus items would do as well. The existing unit operates on 12 volts while most surplus items are around 50 volts, but with an increase in the supply voltage to the counter and a higher voltage rated transistor operation would be identical.

Power Supplies

These were standardised as plus and minus 12 volts as they were available at the time. While the oscillators are not particularly voltage/frequency dependent, it was found that the overall gain of the amplifiers could vary quite markedly should the supply change appreciably. Drift in supplies will affect the operating levels of the Schmitt-trigger circuit and the pen recorder drive circuit, this showing up as a variation in the zero level as plotted by the pen recorder. Some stabilization of the supplies is therefore essential for consistent results, and they must be capable of delivering 150 mA without significant variation. A suitable circuit of a stabilizer is shown in Fig. 7, two of these being required in order to provide both supplies.

Results

From the onset of the observations it was realised that the use of a broadcast station would restrict the amount of information available due to the limited number of hours that such stations are allowed to operate. This proved to be more of a nuisance than was anticipated since the station is often

off for ten hours or more at night, but as a substitute cannot be found which transmits continually it was decided to continue the tests.

Originally, recordings as shown in Fig. 8 were obtained, and the information as to the hourly rate of meteors obtained

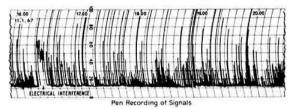


Fig 8. Pen recording of signals.

by counting all the pen strokes above a certain level. While this method did provide the required information it was very time consuming and often inaccurate because several strokes of the pen could be superimposed if bursts of signal came within a few seconds of each other. To resolve these individual strokes it would be necessary to increase the chart speed by a factor of about ten, which would consume an enormous amount of paper. The decade counter could be used to provide the hourly rate but this would mean continuous monitoring, which is impractical except for short periods.

The change to automatic rate plotting resulted in a much clearer picture of what was happening, as can be seen in Figs. 9, 10, 11 and 12.

Fig. 9 shows the graph plotted during a period of normal meteor activity where the maximum rate does not exceed

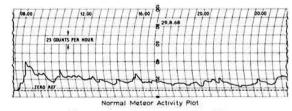


Fig 9. Normal meteor activity plot.

50 per hour and falls to about 15 in the middle of the day. Fig. 10 shows the graph taken during a meteor shower when the rate is much higher, approaching 150 in the morning, a dip to about 75 during the day and a build up to 200 in the evening. Both of these illustrate the lower rate of meteors

during the day which is due to the rotation of the earth and its motion through space.

Meteor showers can occur so that they produce a maximum count rate either at night or during the day. Fig. 10

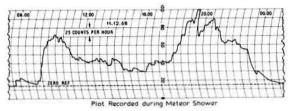


Fig 10. Plot recorded during meteor shower.

was the result of a night-time shower with the rate still building up when the transmitter shut down and a rapid rise to a high level on the resumption of transmitting the following morning. The equipment takes a finite time to build up to a maximum again after the overnight shutdown, and information before the peak can largely be ignored. Fig. 11

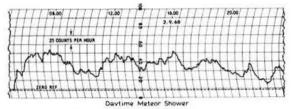


Fig 11. Daytime meteor shower.

is the result of a daytime shower where the effect of a minimum during the day is lost; a peak may occur sometime during the afternoon and a falling off during the evening.

Fig. 12 shows an evening maximum, the fall to zero during transmitter shutdown and the rise to a maximum after start

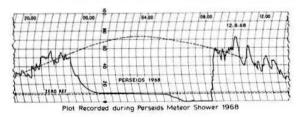


Fig 12. Plot recorded during Perseids meteor shower 1968.

up the next morning. The dotted line joining the two is a "guess" at what happened during the night, and it is interesting to note that at least one QSO was successfully completed on 2m via MS during this time, that between G3CCH and OK1VHK.

Most meteor showers are repeated annually and are therefore predictable; the characteristics are so well known that it is possible to predict the time at which the maximum count rate will occur. If the maximum rate is plotted on a graph for each day of the year a picture will be built up showing peaks and troughs, the peaks usually coinciding with a meteor shower. Some peaks are much better defined than others because some showers are very active for one or two days, while others are not so active for a longer time. In fact, two graphs have been kept (Fig. 13), one for morning rates and the other for mid-afternoon rates in an attempt to show more clearly night-time and day-time showers, and this to some degree has been successful.

There are inevitable gaps in the graphs, owing to factors which cannot always be overcome, interference from various sources being the usual cause. This can originate from local power lines, thunderstorms, extended tropospheric propagation and sporadic E, all of which have been noted at various times. These manifest themselves in one of two ways. Power line noise being mostly of a continuous nature saturates the receiver so that signals cannot be separated from it, and this results in the graph falling to zero for its duration. Thunderstorms cause a count to be added for every lightning strike within about a 15 mile radius, while sporadic E, by its very nature a variable thing, causes a signal which fluctuates rapidly. Both of these cause spurious counts to be added and are shown up by the pen as a sudden rise in the count rate; often going right off the scale until conditions return to normal. Extended tropo, can be more difficult to detect as it can produce either a continuous signal or a rapidly fading one.

A secondary use of the equipment has been for the early warning of sporadic E or tropo, especially the former, purely by keeping an eye on the recorder when there is likely to be this mode of propagation. When a rapid rise is seen on the recorder coupled with much clanking from the decade counter, the signal can be monitored on the speaker to determine the cause of the disturbance and appropriate action taken. Many days of recording were lost in 1967 because of sporadic E but this did, of course, produce the right conditions for QSOs between G (and others) and ZB2VHF on 4m.

During early observations using this equipment it was found that it had apparently failed during a meteor shower, although a check proved that all was in order. Listening to the signals at these times showed that it was possible for the bursts of signal to merge together to form what appeared to be one continuous signal. This is especially true during some showers which are capable of producing very long bursts which can sometimes last for minutes, and no real cure can be found for this.

Listening also shows that there are a tremendous number of very weak, short duration bursts which are too near the noise to be easily separated except by ear. While it is unfortunate that these have to get away uncounted, some realistic level has to be set between used and unused signals.

Conclusions

The equipment seems to be capable of counting and recording the rate of meteors entering the atmosphere, within the limits imposed by the necessity to keep it relatively simple. Tests carried out periodically have shown that the recorder circuit has maintained its accuracy while the oscillators have needed only minor adjustment in two years of operation.

Without doubt the main disadvantage is the transmitter closing down at night, since many of the showers have maxima in the early hours of the morning. So far no station is known which fulfils the requirements of power, direction and distance and also transmits for 24 hours a day. The possibility of using GB3GM has been considered, but this has the disadvantage of transmitting to the south for only

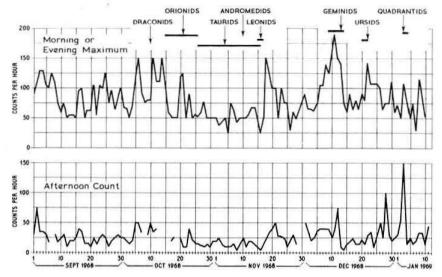


Fig 13. Graphs obtained by plotting morning or evening maximum and afternoon counts.

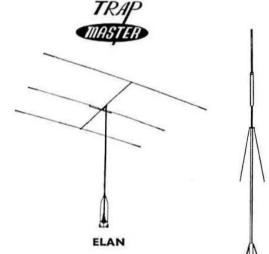
half the time and being low powered, circumstances which would reduce the amount of information received. All of the beacons for amateur use are low powered, which would mean working with lower signal levels, resulting in very few useful signals. Results obtained during the first two years of operation have been encouraging, with a few notable omissions in recordings, which it is hoped to fill in during the forthcoming years with the reduction of sporadic E activity and improvements in recording techniques.

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TECHNICAL TOPICS

By PAT HAWKER, G3VA

THERE has been remarkably little discussion in Radio Communication about the seemingly inevitable effects on the future of Amateur Radio of the present Post Office licensing arrangements. For although the number of "B" licences is currently increasing at a rate of over 70 per cent per annum, the traditional form of "A" licence is now showing only a modest 3 per cent increase. In absolute terms, "B" licence totals are rising at over 600 a year; "A" licences, despite the far broader base, at under 400.

To be meaningful, these figures should also be related to new issues and cancellations. The Amateur Licensing Branch of the Post Office has kindly provided me with figures relating to the period 1 June, 1968 to 31 May, 1969. During this period 1421 main licences (A plus B) were issued; 423 were cancelled. These figures strongly suggest that in rough terms something like as many new "B" licences are now being issued as new "A" licences. Already "B" licences amount to some 10 per cent of the total of main licences, with every sign of this percentage soaring far higher in the not too distant future.

In other words, many newcomers are attracted strongly towards the "B" permits, and then seem perfectly content with these facilities, and clearly see no reason why they should "waste their time" at the grind of learning Morse.

Disincentive Licensing

The real significance of this trend is not perhaps the obvious one that Morse will rapidly become the mode of a small minority (it has for long been that on vhf); much more important, or so it seems to me, might be a growing belief, reflected in the journals, that operation on hf is strictly for the birds; that the real techniques and challenges of amateur radio begin at 144 MHz (or just possibly at 70 MHz).

If present trends continue for a few more years, then only a minority of British amateurs is likely to be actively concerned with the hf bands, making it seem unimportant if these are lost to other services. The European hf operator cannot count on the support of any powerful lobbies, and may find that he is in a vulnerable and exposed position.

Whereas Jack Hum, G5UM, not unnaturally, writes often of the danger of under-occupancy of vhf bands, in reality there is this often unnoticed, in-built bias in present licences to turn amateur operation away from hf towards vhf. What Amateur Radio needs is a balanced and active occupancy of all our allocations (using all modes) with the recognition that all such activities can still contribute to the "advancement of radio communication". The division of

the spectrum at 30 MHz (originally on the basis that this corresponds to the approximate limit of ionospheric reflection) has far less relevance today with the growing awareness of new modes of propagation which can best be investigated by a combination of both hf and vhf work.

So while the Americans have now moved firmly back to incentive licensing, over the past 20 years the British system has progressively emerged as disincentive licensing—what with the ending of the compulsory Morse period, the coming of "B" licences, and the still-in-the-air "beginner's licence." Now individually a good case can be made for all these changes, but we must recognise that the licence regulations inevitably shape the future of the hobby. And judging by present trends that seems to be summed up as "vhf/phone" only.

Without disparaging either vhf or phone operation, it is alarming to think what this means. While I certainly hope that these remarks will not offend holders of "B" licences, (many of whom are doing most useful work on vhf and uhf), it seems high time that somebody should point out that such a situation is fraught with danger. Unless some means are found of inducing more operators to regard a "B" licence as only the first step towards a full licence, we shall find ourselves with a permanent drift away from hf and cw—and one day will be left wondering how we came to be so short-sighted as to lose 1·8, 14 or 28 MHz!

As for the incredible situation in which, in March 1968, the Post Office officially announced, without full prior consultation with the Society, its intention to implement a "beginner's licence" (and so provided a disincentive to studying for either the RAE or Morse), and yet almost 18 months later has made no further public announcement—well just how illogical can you get?

Long-delay "Cosmic" Echoes

As a notable example of the still unsolved mysteries of hf propagation, it is most interesting to see that workers at the Radioscience Laboratory of Stanford University—where so much work has been carried out on round-theworld echoes, tilts and chordhal hop (TT, June)—are now turning their attention to the baffling, 40-year-old puzzle of long delayed echoes (delay times measured in seconds) that have been reported only extremely rarely. And an appeal has been made in QST (May) for amateurs to report any instances of this curious phenomenon which is sometimes written off as one of the "unidentified flying objects" of

radio—possibly because of the vast distances represented by an 8-second echo.

These strange "cosmic" or long-delay echoes (LDEs) were originally noted in a series of experiments by Stormer and Van der Pol. To quote an excellent summary from Ya. L. Al'pert's book "Radio Wave Propagation and the Ionosphere": "The first cosmic echo was observed at the end of the summer of 1927. Searches were organised on 31-4-metres from March 1928 but it was not until 11 October that a large number of echoes was received in Oslo near noon with delay times between 3 and 15 seconds (most about 8 seconds)... during the same night 120 echoes were observed at Eindhoven... in 1930 echoes were reported in Indochina... in 1934 more than 70 echoes were observed between 30 May and 8 July."

But just after the war, a year of tests at Cavendish Laboratory in the UK failed to yield a single positive result and many radio physicists seem to have concluded that it was all just a mistake. The QST article however indicates that there are a number of apparently authentic amateur reports on the strange echoes, dating back to 1932 and including 1965, 1967, and two in 1968 and two already in 1969, on many different hf bands. The original 1932 report by W6ADP is described as follows: "I was calling ON4AU on 28 and switched over to listen and heard on my own frequency 'ON4AU DE W6ADP K'—was very weird and never will forget it. Signal sounded like it was coming a long way but was S6 or so,"

The Stanford team believe that an active amateur might expect to encounter such conditions perhaps once in a year, and indicate that the echoes are not unduly weak or highly distorted. Because of the rarity, it is not considered worth initiating special transmission tests but the team would like to know of any instance of an amateur experiencing an LDE -the most important single piece of information to write down is the exact time of occurrence, and to try to log at the time all the circumstances including frequency, aerial heading, and careful description of the observed effect. Reports to W6QYT, Radioscience Laboratory, Stanford University, Stanford, California 94305. The Stanford team believe that a possible explanation of the echoes may be found in recent work by Professor F. W. Crawford on plasma physics. It is felt that amateurs may not always have recognised the effect as a true echo. As with W6ADP, the usual form is to hear the final words of one's own transmission coming back when changing over to listening. The effect has never been observed on other than hf.

BCI/TVI and NBFM

On a number of occasions reference has been made in TT and elsewhere to the apparent lower susceptibility of television receivers to narrow-band-frequency-modulated signals (nbfm) compared with amplitude modulated signals (am and ssb). But it is difficult to recall anyone having seriously attempted by detailed comparative measurements to quantify the improvement, or to evaluate the precise mechanisms involved.

It was therefore particularly interesting to come across a new *BBC Research Department Report* (No. 1969/9 "The susceptibility of portable Band II FM receivers to interference by services operating in adjacent frequency bands" by C. R. G. Reed). This strips away a good deal of the mystery still surrounding this matter as well as highlighting the considerable advantages of nbfm. I am most grateful to

BBC Research for permission to refer to the findings of this report.

The report is directly concerned only with interference to small vhf/fm portable broadcast receivers arising from the operation of mobile/base two-way communications stations on either side of the vhf broadcast Band II. But basically similar conditions would apply to amateur stations having fundamental or spurious emissions in the vicinity of broadcast and/or television bands.

The report confirms beyond question that with typical broadcast receivers a 10 to 20dB higher level of interfering signal is tolerable when the interfering signal employs nbfm than with am modes. In fact the improvement in interference suppression ratio is generally of the order of 20dB, provided that the interfering signal is below the receiver overload level.

This may well seem surprising since, theoretically, one would expect that an fm receiver (which after all is designed to accept fm and reject am) would be more susceptible to fm than to am interference.

Another factor that emerges vividly from the report is the wide variation in the susceptibility of different receivers (in this case nine different portable receivers at prices ranging from under £9 to over £25). The cheaper receivers were usually found the more susceptible to interference, particularly where, as in some models, the tuning arrangements were not good enough to allow the set to be tuned accurately to the wanted broadcast station.

In some cases it was found that interference could usefully be reduced by reducing both wanted and unwanted signals by partial retraction of telescopic rod aerials (in a TV context this would be equivalent to fitting an aerial attenuator). Few of the receivers were found capable of tolerating an interfering signal equivalent to more than 50 mV at the receiver input, even when this was more than 3.5 MHz away from the wanted station (this is basically because of the ease with which typical vhf front-ends can be driven into non-linearity).

One of the mechanisms found to be a significant factor in producing interference is the frequency-modulation (i.e. "pulling") of the local oscillator of the receiver by a strong am signal. Another basic deficiency is the lack of i.f. selectivity of many of the receivers. In all cases, it should be noted, the BCI resulted not from any wrongful operation or spurious emissions of the interfering signal but rather as a result of the receiver design practices. The report, in fact, suggests that it is important for the public to be informed, preferably by the local dealers, that the cheaper receivers may not be satisfactory when operated in close proximity to transmitters of the mobile services, also that receivers of reasonably good selectivity should be available to the public.

It would be interesting to see the results of a similar investigation using television receivers—but there seems little doubt that such tests would come down equally heavily in favour, in similar circumstances, of nbfm.

In view of the present efforts to encourage the much greater use of vhf/fm broadcast receivers—portable, car and domestic—we may also be faced with a growing problem of BCI, affecting particularly 70 and 144 MHz operation. In this connection, the BBC, following tests with circular polarized transmitting aerials, have recently been trying the effect of using 45° polarisation, in an attempt to improve pick-up of vhf signals in cars or by portable receivers close to the ground.

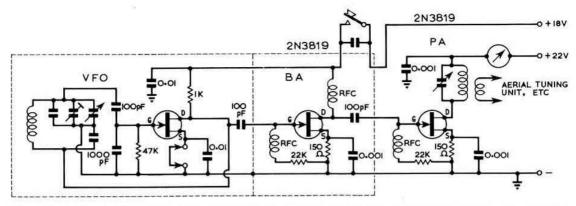


Fig 1. G3DOP's low-power 3-5 MHz all-FET transmitter. The Vackar vfo is based on the W1DTY oscillator (TT, July 1968).

TVI-Suppression Tape?

David Gibson, G3JDG, draws attention to two new "pressure-sensitive conductive tapes" which have been introduced recently by the 3M ("Scotch") company and which appear to have considerable possibilities for improving or repairing the shielding of many types of enclosures and cables. These tapes are available with a base of copper foil (Scotch X-1181) or aluminium foil (Scotch X-1170) having an electrically conductive adhesive. This provides what is virtually a sticky tape which makes good conductive contact with the material on which it is pressed or bound and so is conductive in three dimensions; in other words the exact reverse of insulating tape. A one inch wide segment of the tapes is capable of carrying about 3 amps and has a resistance measuring less than 0.003 ohms/sq in. It is claimed that there is no corrosive reaction between the tape and the metal to which it is applied, and that the adhesion actually improves with ageing.

Among the many possible applications in connection with TVI would be to ensure good electrical continuity of screening between doors or lids of cabinets, improving the shielding of braided cables, providing the ability to make a good contact to a metal surface without soldering to the surface (the lead is soldered to a piece of the foil which is then pressed on the surface regardless of its shape or soldering properties), providing a quick means of checking whether offending radiation is leaking from a particular enclosure or cable, etc.

The tapes are supplied by 3M in 18-yard rolls in widths from \(\frac{1}{2}\)-in. upwards. G3JDG does not give any indication of the price range (one imagines that this might be a useful club purchase which could then be sold in short lengths to members), although he is now making tests with a sample roll.

Referring to G3HCT's appeal for a transmitter "pulser" while carrying out TVI tests (TT, May 1969), J, W. Paddon, G2IS comments that kitchen clockwork timers with one-hour scales often put out a "thunderous" tick. He simply rests a microphone on top of the timer and has a useful signal while checking for TVI on his Viceroy transmitter. We recall using an alarm clock in this way back in the 'thirties in conjunction with some 56 MHz tests and can confirm that the technique provides an effective signal source!

FET Transmitter

A single-stage, 7 MHz push-pull crystal "power" oscillator using two MPF106 FETs and providing W2SMR with a miniature transmitter appeared in TT, August, 1968. More recently we have been trying to find space to squeeze in a more ambitious three-stage vfo 3·5 MHz transmitter, based on the Vackar oscillator, which has convinced J. McDonnell, G3DOP, that the FET has distinct possibilities in transmitter design. G3DOP's circuit is shown in Fig. 1 and, as might be expected, has a similar appearance to valved transmitters. He reports that it is capable of an efficient 179 mW input—sufficient to bring him plenty of 579 and 589 reports on 3·5 MHz cw, and some 30 out of his 36 contacts in the March QRP Contest.

FET Round-up

One explanation of the fact that some amateurs seem to find it easy to puncture MOSFETs while others claim there is really no need for precautions may possibly be found in the audible "spark" and "shock" I sometimes receive when touching the metal window frame in my office—whereas my colleague never has this experience. Body static can easily be built up by moving around on a chair, particularly when wearing rubber-soled shoes. It was reported some years ago that one manufacturer was puzzled at the low yield of transistors until it was appreciated that his production line of girls were unknowingly discharging themselves through the transistors. I am told that a lot depends on the material used for the unmentionables. It would still seem to be wise to take the simple MOSFET handling precautions recommended by the makers, on the grounds of better safe than sorry.

By just walking across a nylon carpeted floor it is possible to build up a static charge of sufficient energy (5,000V across 200pF) to destroy the gate oxide.

Walter Schreuer, KIYZW/G3DCU points out that the recent letter by G3SL (Rad. Comm. May, 1969 and also noted in Wireless World) highlights a fact about FETs that needs more publicity. He writes: "G3SL is disturbed at the inconsistency of the labelling of drain and source of FETs. I do not know why this is done—but with most FETs, and some MOSFETs, these two electrodes are interchangeable. This is certainly the case with all the types listed by G3SL.

Since the majority of FETs are geometrically and electrically symmetrical, it is just a matter of biasing, which becomes the drain and which the source. I use the MPF107 as a universal device never making any distinction between drain and source, but just ensuring that the lead marked with a dot is used as the gate.

"Reversing drain and source may not lead to identical performance, but any difference is no more than the variations normally observed between samples, and will be well within maker's performance limits. With the non-symmetrical units, it is not permissible to reverse the drain and source terminals, since the change in performance could be quite drastic. However, I do not believe that it is possible actually to damage these units by terminal reversal as inferred by G3SL."

As further support for the view that FET devices are a natural choice for receiver oscillators (see TT, February 1969), Walter Schreuer has been investigating the oscillator noise power (see TT, May and August, 1968) of these useful devices. He reports: "My 'rule of thumb' based on general experience rather than rigorous analysis, is that the noise associated with low power oscillators is 6dB higher for bipolar transistors than for thermionic valves, which in turn are more noisy by 6dB than field effect transistors." Although now some years old, K1YZW still finds that Edson's Vacuum Tube Oscillators, referred to previously in TT, is still a good reference for estimating the absolute noise levels associated with valve oscillators. The evidence certainly is that the FET family of devices can be recommended for oscillator applications.

Modulating Transistor Transmitters

Rf negative feedback has long been almost standard practice for the large commercial ssb transmitters but has only seldom been applied to amateur equipments. Now Peter Martinez, G3PLX has come up with an interesting and novel use of the technique to overcome some important problems often encountered when trying to amplitude modulate an all-transistor transmitter. He writes as follows:

"Fig. 2 shows a typical transistor transmitter designed to provide an output of about 10 watts cw. The buffer stage has a p-n-p transistor in its supply line, which would normally be used to key the transmitter. The following stages operate class C so that varying the base current to the keying transistor would normally result in extremely distorted modulation. My system consists of modulating this point, but applying heavy negative feedback to linearise the modulation characteristic.

"A n-p-n transistor provides base current for the p-n-p

modulator transistor, and the base of the n-p-n device is fed from two resistors, one of which goes to the modulator input voltage, and the other to the output of a diode rectifier connected to the rf output of the transmitter. This rectifier provides a negative voltage, and the modulator input is positive. Modulating this voltage from zero up to twice the quiescent value provides 100 per cent modulation of the transmitter output. With a 10-watt transmitter, it is possible to obtain 2.5 watts of am.

"The supreme advantage of this system is realised if the rf detector is fed directly from the collector of the pa transistor. The feedback system accurately defines the voltage at this point, so that if the load becomes open circuit, the circuit will automatically reduce the drive to prevent the rf voltage from rising. This gives built-in protection for the pa transsistor.

"I have tried this system in a transmitter with a frequency multiplier chain between the modulated stage and the pa, and the resulting modulation is just as good, despite the added non-linearity of the multiplier stages."

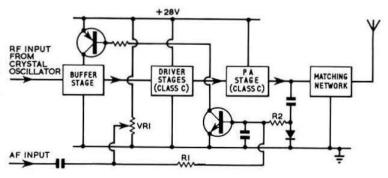
Miniature Active Receiving Aerials

Quite a number of references have been made in recent years in TT to the miniature "active" or transistorised receiving aerial technique being developed in West Germany by Prof. Hans Meinke. This work has caused a lot of controversy, particularly in the United States, and some pretty bitter attacks on the concept have been published. At the recent Montreux international television symposium therefore, I was particularly interested to listen to Meinke and his colleague Dr H. Lindenmeier describe some of their latest results.

They showed how the combination of a transistor and compact dipole structure results not only in amplification of signals by the transistor (this can be done with a conventional mast-head amplifier) but also can result in considerable improvement in signal/noise ratio because of the very accurate noise match that can be achieved. They listed very low noise temperatures achieved with compact vhf aerials under a foot in length, and many slides were shown of various forms of compact active aerials, of which they have now built over 100. Many of these are for normal television reception on Bands I, III and IV/V in typical urban areas; easily mounted on a roof or balcony edge or in loft spaces, and claimed to be very effective in overcoming multipath ("ghost") problems.

Single-channel, wideband and wideband/bandstop (for instance to cover Band I and III but reject Band II signals) active aerials all appear to have been tested successfully.

Fig 2. Block outline of G3PLX's method of modulating the buffer stage and linearising characteristic by heavy negative feedback. R1 and R2 define the gain of the modulator. VR1 sets the quiescent carrier level.



They could do much to eliminate the roof clutter (and inefficiency due to interaction) of television receiving aerials—though apparently there is still no immediate industry plans for marketing such aerials and the economics remain to be ascertained.

All the aerials use a single active arrangement and Dr Lindenmeier told me afterwards that he felt that this is the right approach to active aerials (ie one should not attempt to incorporate active devices in a whole series of separate elements).

Despite what some critics have suggested, the miniature arrays are claimed to have very good cross-modulation performance, partly because the actual signal pick-up on the compact elements is relatively small. Personally, I found the explanations pretty convincing, though I am not too sure whether the principles could be applied to benefit amateur radio, mainly because this is a receiving-only system. But certainly this is a fascinating subject, well worth keeping an eye on.

Temperature-compensated SIC VOX

Voice-operated switching systems have useful applications not only in communications but also for tape recording and other fields. A novel design for a temperature stable VOX based on the use of a μ A702C linear integrated circuit has been published recently by M. J. Keen (*Electronic Components*, May, 1969).

The VOX is shown in Fig. 3 and the original article goes very fully into questions of variation of trigger level with temperature and shows how this has been reduced to a minimum by circuit design and matching. Although a 24-volt relay is used in the original design, other voltage relays, it is stated, could be used provided that the value of the "on" current is not exceeded, and the use of a different relay may necessitate some change in the value of C5.

In effect, this arrangement eliminates the usual Schmitt trigger in favour of temperature compensation in conjunction with a time delay independent of transistor parameters. It is claimed that the total change of trigger level is within 2 per cent for a 40° change in temperature. The circuit is designed to the premise that for a successful VOX the relay contacts must close quickly at the beginning of a word and remain closed after the end of the word until the beginning of the next word in a sentence. All the semiconductor devices are SGS-Fairchild types.

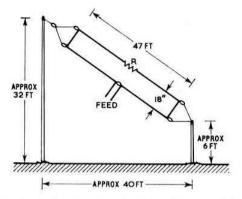


Fig 4. The T2FD (terminated tilted folded dipole) omnidirectional multiband aerial as originally described in 1949 by W3HH. For details of R see text.

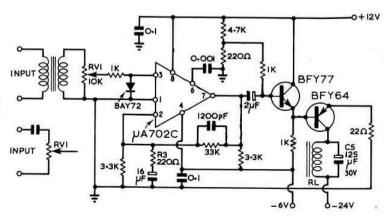
More on the T2FD Multiband Aerial

Some 11 years ago (TT, July 1958) a few brief notes were given on the "T2FD" (terminated tilted folded dipole) multiband aerial originally described by G. L. Countryman, W3HH in QST, June 1949 with subsequent additional coverage in CQ (November 1951, February 1953, June 1957). This aerial, even from the beginning, was always a controversial design with sceptics and supporters coming forward in roughly equal numbers—and it never made the Handbooks. However, we felt it worth including in TTftRA and more recently in Amateur Radio Techniques, and as a result have received several requests for more details, particularly on the terminating resistor.

A dig back into the W3HH articles has resulted in some additional information on this aerial, although frankly 1 still find it difficult to decide from the available evidence whether to be a sceptic or a supporter.

The basic arrangement is shown in Fig. 4. With these dimensions it is claimed that the system is virtually aperiodic over about a 5:1 frequency span. The version with 47 ft. overall dimensions was claimed to be effective on 7, 14, 21 and 28 MHz (and according to some accounts not too bad on 3.5 MHz). The aerial can be fed by 600-ohm open line or 300 ohm twin feeder, but these different feeders require different

Fig 3. Voice-operated switch designed for low temperature drift. Value of R3 can be varied to change sensitivity. In original the relay RL is 1250-ohm Clare Elliott type HF. Diagram indicates alternative input arrangements.



terminating resistors, in each case somewhat greater than the feeder impedance (ie about 650 ohms for 600 ohm line; 390-400 ohms for 300-ohm ribbon feeder), and this value is stated to be fairly critical.

The wattage of this resistor was given as 35 per cent of the de power input to the transmitter (i.e. dissipating about half the power output), though presumably an appreciably lower wattage might be suitable for the low duty cycle of ssb. W3HH stated that the aerial was virtually aperiodic if a non-inductive resistor (i.e. carbon or graphite rod or using a transmission line made of resistance wire) he also considered that conventional wire-wound resistors could be used-"the difference is that with a wire-wound resistor it will be necessary to use some form of aerial coupler depending on your installation, and the coupling will probably be different for different bands." However he also suggested that a wire-wound resistor with slider provided a convenient means of adjusting the terminating resistor for optimum radiation. Angles of tilt can be anywhere between about 20 to 40 degrees with a preferred value of 30 degrees.

So there we are. The aerial stemmed originally from the US Navy, although at least one theoretical study by the Navy reported against it. But at one time quite a few amateurs found the T2FD useful. After the 1958 TT item, N. P. Spooner, G2NS commented favourably on his results with the aerial, saying that the 47 ft version radiated on all bands from 3·5 to 28 MHz, while a 94 ft version having about 3 ft spacing would include Top Band; he also said the resistor could conveniently be of the wire-wound type. So if anyone is looking for a compact, omnidirectional, all-band aerial how about trying a T2FD—and letting us all know how well (or how badly) it works.

Improving Cross-modulation Performance

Even at the risk of seeming to be unduly disparaging this year of modern equipment practice, some comment must be made on the question of the relatively poor cross-modulation performance of many current receivers. Previously, reference has been made to the suggestion of E. H. Conklin, K6KA for improving receivers by short-circuiting the grid capacitor in the rf stage. He considered this applied to such models as the Heathkit SB300, the Collins S-line, and the Swan 350, in order to prevent large voltages on the grid of the rf stage affecting the remaining gain-controlled stages (see TT February 1968 or page 69 of ART).

Now a note from Al Slater, G3FXB, similarly recounts his experiences on 7 MHz with the SB301, and his remarks probably apply to other receivers of this general type. He believes that many of the reports of commercial signals intruding into amateur bands can be explained by crossmodulation (and possibly intermodulation). In his own case, the real problem was the broadcasting megawatts and associated jammers on the remnants of the 7 MHz band. He supports the K6KA contention that a good deal of the trouble stems from feeding agc and manual bias into the grid of the rf stage. But he also suggests that the problem is further aggravated by gain controls common to both rf and i.f. stages, resulting in gain in the i.f. strip often being cut back at a faster rate than in the rf stage. This is sometimes done deliberately to maintain signal/noise ratios, although in practice this factor may be relatively unimportant (one reason why aerial input attenuators are often very effective).

On his SB301, G3FXB has fitted an additional rf gain control in the cathode circuit of the rf stage; removed the

age from the grid circuit of this stage; and short-circuited the grid blocking capacitor, so that the grid is now at de earth potential via the grid coil. He finds that cross-modulation has been very largely eliminated, and the rf tuning appears to have a much sharper feel about it. On the debit side, the modification has caused the s-meter reading to become "a bit optimistic". G3FXB thinks that perhaps American designers, not having to worry so much about 7 MHz megawatts, do not run into so much trouble on this account. However, I suspect that this type of modification has almost universal application, particularly where there are nearby amateurs or other local transmitters to consider.

Stable Sine-Wave Multivibrator

Relaxation oscillators, such as the conventional multivibrator, are seldom regarded as suitable for producing good sinewave waveforms. However, there have been several reports in recent years of work being done in this field by Professor P. Kundu and colleagues in India on transistor RC oscillators. These use emitter coupled circuits but with rather unusual component values and it is stated that these oscillators provide audio tones of fairly good waveform (distortion of the order of —35dB) with a high degree of temperature stability and with the possibility of changing the frequency by switching the two frequency-determining capacitors. References to these oscillators can be found in Proc. IEE, March 1969, pp 356–7 and an earlier account in IEE Conference Publication No. 31 "Frequency generation and control for radio systems."

Fig. 5 shows an arrangement claimed to provide an 802 Hz sine wave output with a waveform distortion of only -35dB and a frequency variation of only 0·1 per cent for temperature changes between 24 and 55 degrees C. Such oscillators might well have application for impedance bridges or for ssb tone generators etc.

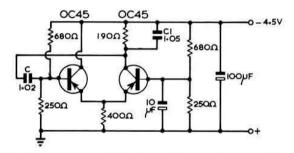


Fig 5. Temperature-stable RC transistor oscillator providing sine-wave output. Output can be varied by changing values of C and C1.

Here and There

A. G. Thorburn, G3WBT reports that he has significantly improved the stability of an HRO-MX receiver by putting a fairly large solenoid with adjustable core between the mains and the power supply unit. He says that by adjusting the core of this reactor to reduce ht and lt to the receiver, but not so much as to lower sensitivity, the following performance is achieved: from switch-on to full output 15 seconds; from full output to stable resolution of ssb signals 20 seconds.



IARU Region 1 Brussels Conference

By ROY STEVENS, G2BVN*

In the first part of this article, which appeared in the July 1969 issue, the background and organisation of the Conference were reported.

At the first Plenary Meeting held in the Hotel Metropole, Brussels on 5 May 1969, three main Committees were set up. This report deals with the work of these Committees and the decisions which were made.

Administrative and Operational Committee

This Committee was under the Chairmanship of Mr W. J. L. Dalmijn, PA0DD, with Mr Roy F. Stevens, G2BVN, acting as Secretary. The Agenda of the Committee consisted of 26 items containing more than 50 proposals, the majority of which were supported by papers distributed amongst Member Societies prior to the Conference.

Development of the Amateur Service

Under this heading there were several Agenda items which in a general way dealt with the defence of the amateur bands and the continuance and expansion of the existing facilities. The Executive Committee provided the information that a World Administrative Radio Conference dealing with the Space Service would take place within the next two years (it is now known that this will commence on 5 June, 1971). At the present time the amateur space communication facilities are limited to the band 144-146 MHz. In order to plan for the future it was considered necessary that additional frequencies should be sought and that the terms of the use of these frequencies should be widened. It is envisaged that observers from the Region 1 Division will be present at the Space Conference. In addition the Conference authorised the Executive Committee to pay the cost of a delegate, who is a radio amateur, for his inclusion in a national delegation.

It was reported that valuable liaison work with the ITU at Geneva had been effected during the period since the previous Conference in 1966 and this contact was essential to the representatives of the amateur service. The existence of an amateur organisation (the *International Amateur Radio Club*)

within the ITU was welcomed and for the first time observers from the IARC were present at the Conference.

In accordance with a decision of the Opatija Conference a booklet had been prepared setting out the policies of the Amateur Radio movement and the reasons for its continuance and expansion. This booklet was now available in English and French editions and had been widely distributed throughout the Region.

SSA introduced a paper which stated the desirability of introducing amateur radio to representatives of the developing countries. Ways and means of distributing this information were suggested. It was agreed that newspaper articles, radio programmes and films were eminently suitable. It was emphasized that co-operation with Regions II and III of the IARU in this type of work is essential.

Intruder Watch

RSGB tabled a paper dealing with harmful interference to the amateur service and the functions of an Intruder Watch. So far relatively few European countries had set up their own Intruder Watch and expansion of this activity is highly desirable.

It was agreed that there should be an exchange of information amongst Societies with an Intruder Watch and the RSGB will act as the coordinator.

It was reported that in a small number of countries the national administration is unwilling to accept the reports from the Intruder Watch. It was agreed to press the IFRB for recognition of the Region 1 Intruder Watch as an organisation with authority to report directly to Geneva. This will enable countries to submit reports independently from their national administration.

Beacons

DARC submitted a paper which dealt with a proposed world-wide network of amateur radio beacon transmissions. In addition to proposals regarding the location and frequencies of the beacon stations the paper provided recommendations for the operation of the network and evaluation of the results. The Conference considered that propagation research on the hf bands was a method of showing that valuable work could be done by the amateur service.

Secretary, Region 1 Division.

DARC proposed that existing beacons and projects should be brought within the framework of the WAB and it was agreed that a working party would be set up to coordinate the efforts being made by Societies in Region 1.

Whilst the WAB project will have the responsibility for coordination in the setting up and operation of beacon transmitters DARC proposed that a world-wide observation programme (WOP) should be set up. This project would be responsible for long and short time observations and for the reporting of irregularities in propagation modes. Standard-ised reporting forms will be available throughout Region 1 for the easier evaluation of results.

It was considered essential to publish the results and conclusions obtained from beacon station observations. In this way work carried out by the amateur service will be widely known.

Band Plan

NRRL introduced an amendment to the Region 1 Band Plan, this proposed to set aside a 10 kHz segment at the top of the 80m band for DX working.

After our discussion it was agreed that the portions of the 80m band between 3500-3510 kHz and 3790-3800 kHz shall be used exclusively for inter-continental working. The Region 1 Band Plan is now as follows:

Frequency Band	Types of Emission
3.5 - 3.6 MHz	Cw only
3.6 - 3.8 MHz	Cw and phone
7·0 - 7·04 MHz	Cw only
7·04- 7·1 MHz	Cw and phone
14·0 -14·1 MHz	Cw only
14·1 -14·35 MHz	Cw and phone
21·0 -21·15 MHz	Cw only
21-15-21-45 MHz	Cw and phone
28·0 -28·2 MHz	Cw only
28·2 -29·7 MHz	Cw and phone

Note 1: RTTY operation is recommended to take place around 14,090 kHz.

Note 2: 3500-3510 and 3790-3800 kHz reserved for intercontinental working.

Contests

Papers were tabled by EDR and RSGB. The view was expressed by many Societies that a further increase in the number of contests was undesirable. The Conference agreed to make the following recommendation to Member Societies:

Maximum periods for each type of contest should be as follows-

World wide Contest—48 hours Continental Contest—36 hours Country Contests—24 hours "Closed Shop" Contests—No time limit

Contests in the two latter categories to be restricted to certain segments of each band.

The RSF proposed the creation of a Region 1 Sports Commission. To consider this proposal an ad hoc Working Group was formed and submitted the following recommendations which were approved by the Conference:

- (i) A Working Group be set up to administer an annual Region 1 IARU Contest on the bands between 3.5 and 29.7 MHz.
- (ii) This Working Group shall consist of three permanent members together with a fourth member from the Society organising this Contest for a particular year.
- (iii) Rules for this IARU Contest shall be first drawn up in correspondence by the Working Group. The contest shall replace a National Contest in each year.
- (iv) It is proposed that the permanent members of the Working Group shall be RSF, DARC and RSGB. RSF shall act as convenor of the Working Group.
- (v) If there is no action by 1970 then an existing appropriate national contest shall be adopted.
- (vi) Medals or trophies shall be paid for by Region 1, except that RSF offer to present the trophy for the leading station.

To assist in the coordination and planning of Contests all Societies were asked to notify the Secretary of Region 1, as soon as possible, the dates of their Contests for the following year. This information will be published in the Region 1 News.

Region 1 Bulletin

The Conference received a report that had been prepared by the late John Clarricoats. It was agreed that the Region I Bulletin had fulfilled its purpose of providing Region I Societies with news and information of common interest. Unfortunately, a number of Societies had provided little or no assistance in this work and the late Secretary had obtained a great deal of published material from correspondence or Society journals. Despite this, extracts from the Region I Bulletin had appeared regularly in journals throughout Region I. An appreciation of the work that had been carried out was agreed and the Conference recommended that production of the Region I Bulletin should be continued.

Reciprocal Licensing

DARC and UBA tabled papers seeking an improvement in the application of reciprocal licensing. From verbal reports made during discussion it seemed that there was a steady increase in the number of countries granting reciprocal licence facilities. Delegates expressed the hope that, in due course, this would lead to a unified form of licence available throughout Region 1. For the present the Conference recommended:

- (a) That all subscribing Member Societies be requested to check up with their licensing authorities to ascertain whether all the privileges set out in the Radio Regulations, Geneva, 1959, for the Amateur Service have been made available to the amateurs of each country.
- (b) That Subscribing Member Societies in these countries where reciprocal agreements relating to Amateur Radio do not exist be urged to increase their efforts in this matter. It is not absolutely necessary to make a diplomatic agreement between Governments. In most cases an exchange of correspondence between telecommunications authorities is sufficient to settle a reciprocal agreement.

(c) That Subscribing Member Societies in these countries where short term reciprocal agreements do not exist be urged to increase their efforts in this matter drawing the attention of the authorities to the regulations in other countries.

Radio Amateur Emergency Networks

RSGB introduced a paper which was received by the Conference. Delegates of other Region I Societies reported on the facilities available to them. Delegates from twelve societies expressed interest in the development of emergency networks and the RSGB was asked to act as the convenor of this group for the exchange of information.

HF Operating Certificates

Following the discussion of a paper prepared by EDR, the Conference recommended that all Member Societies of Region 1 shall issue operating certificates on the production of a signed declaration by their QSL or Traffic Manager. This recommendation is intended to avoid the difficulty and expense of sending overseas the QSL cards necessary to claim operating certificates.

Foxhunting

An ad hoc Working Group with DARC as convenor was set up to consider suggested amendments to the Rules for European Foxhunting Championships. Their recommendations were subsequently agreed and a revised set of the Rules would be available to all Member Societies. DARC offered to hold the next European Foxhunting Championships in Germany in 1970 or later.

Amateur Radio and the Handicapped

NRRL introduced a paper which dealt with the methods by which amateur radio could assist handicapped persons. Examples of the work carried out in various countries (including the RAIBC in the UK) were mentioned.

The Conference agreed that an extension of existing activity was highly desirable. An approach to the International Boards of such organisations as Lions and Rotary would be considered. Information on this subject would be exchanged through the medium of the Region 1 News.

Other Matters

The Conference also dealt with a variety of other matters, including the adoption of the Sports Code, prepared by RSF; the suppression of interference to available entertainment equipment (VERON); slow-scan TV (SSA); an amateur radio journal abstract service (SSA); contest QSL service (SSA) and several proposals concerning amendments to the Region 1 Division Rules.

VHF Committee

The Committee met under the Chairmanship of Mr C. Van Dijk, PA0QC, with Mr F. G. Lambeth, G2AIW acting as Secretary. The Agenda comprised 20 items all of which were supported by papers distributed before the Conference.

Band Planning

Papers on this subject had been submitted by a number of Societies and after discussion the following recommendations were agreed:

1. All existing beacons shall be placed in the frequency band 145-950-146-000 MHz.

- 2. The following frequencies to be adopted for the purpose stated, within Region 1.
 - (a) 145.000 MHz mobile calling frequency
 - (b) 145-300 MHz centre frequency RTTY
 - (c) 144-090-144-100 random MS contacts.
- 3. The following band plan to be adopted for 432 MHz: 432:00-432:10 MHz cw only
 - 432-10-433-45 MHz all modes of transmission 433-45-433-50 MHz beacons and special services

The region from 433-50 to the authorized upward limit of the band is reserved primarily for TV stations.

- 4. 432.15 MHz to be adopted as centre frequency for ssb.
- 5. The following band plan to be adopted for 1296 MHz: 1296-1296-15 MHz cw only 1296-15-1297-95 MHz all modes 1297-95-1298 MHz beacons.

Region 1 Oscar Project

There had been considerable delay with the satellite transponder constructed by DJ4ZC. This had been partly due to the requirements of the launching agency. It was agreed to approach the Radio Amateur Satellite Corporation (AMSAT) concerning future plans and also to approach the USSR, via RSF, in order to obtain launch facilities in the Soviet Union.

Space Communication

In conjunction with the Administrative and Operational Committee, it was agreed that Member Societies should approach their national administrations in order to obtain additional frequencies for amateur space communication use. In view of future development the present term "artificial satellites" should be replaced by a definition allowing wider possibilities, e.g. lunar translators.

Contests

Various aspects concerning VHF-UHF-SHF Contests were discussed and four recommendations were made to National Societies. Operating details will be published nationally in due course. It was agreed that an addition should be made to the Contest Rules so that stations contravening the Region 1 Band Plans were liable to disqualifica-

Grid Locator Systems

The merits of the Georef and QRA Locator systems were debated and it was agreed after discussion that the ORA Locator System should be retained for use in Region 1. Additional maps based on this system will be made available.

Operating Modes

Papers were introduced by SSA; UBA and RSGB. The Committee agreed that the use of nbfm was desirable and the following recommendations were made:

- 1. The CCIR system to be adopted as the standard transmission system for amateur television.
- 2. To adopt for nbfm within Region 1 a Modulation Index of 1; audio band width restricted to 3 kHz.
- 3. For random MS contacts two minute working periods should be used commencing at even minutes, and the standard reporting procedure should be adhered to.

SSB on VHF

RSGB introduced a report which was received with interest by the Committee. All agreed to give publicity to the information and recommendations made in the paper.

UHF-SHF Bands

The importance of retaining the use of amateur bands in this part of the frequency spectrum was recognised and Member Societies were recommended to encourage the use of these frequencies by publicity and the organisation of suitable contests. Where a national administration does not issue a VHF-UHF-SHF only licence, not requiring a cw examination, then the National Society concerned should approach their administration with a view to obtaining the issue of this type of licence.

Beacon Station Reports

REF introduced a report covering the operation of F3THF. RSGB reported on the information available following the operation of ZB2VHF on 70 MHz. In order to make the maximum use of beacon transmissions, details of the stations should be available to all Member Societies. A list of all beacon stations and their characteristics should be available later in 1969.

VHF Working Group

The VHF Working Group was formally reconstituted for the period 1969-1972. PAOQC and G2AIW were re-elected to the offices of Chairman and Secretary respectively.

Credentials and Finance Committee

The Committee met under the Chairmanship of Mr N. Caws, G3BVG, with Mr E. G. Ingram, GM6IZ, acting as Minuting Secretary.

Proxies

The Committee approved the appointment of seven proxies made in accordance with the requirements of the Rules of the Division.

Financial Matters

The Treasurer presented the accounts for the past year and the proposed budget. The Chairman of the Executive Committee reported that the accounts had been approved by his Committee and that loans to Funds I and 2 from Fund 3 had now been repaid. The Conference approved a recommendation that the annual contribution per licensed member should be reduced to 60 Swiss Centimes. It was reported that the Executive Committee had examined the method of computing the contribution from Member Societies but they did not now recommend any change in the present procedure. (It should be noted that the reduction in the annual contribution from 75 Sw. cts. is effective from 1.1.1970).

The Conference agreed that the present transfer of 10,000 Sw. frs. per annum from Fund 3 as decided in 1966 should be reduced to 2,500 Sw. frs. per annum for the 3 years ending 31 December 1972.

Further, it was agreed that any surplus above the figure of 60,000 Sw. frs. held in Fund 3 on 31 December 1969 should be transferred to Funds 1 or 2 for normal operations of the Region 1 Division.



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Bringing the Lafayette

HA350 on to Top Band

and Medium Wave

By R. F. PILKINGTON, G3IAG*

THIS conversion does not require any extra front panel switching for 160 metres as the WWV position of the wavechange switch is used. It is still possible to receive a standard frequency transmission as the second channel range of the 3-5 to 4-1 MHz band is 4-41 to 5-01 MHz. Thus MSF or WWV on 5 MHz comes in at 4090 kHz on the dial.

To receive 160 metres, double conversion is used as on 40, 20, 15 and 10 metres. A crystal Xa of between 5500 and 5900 kHz is needed. The former will give a tuning range of 2000 to 1400 kHz for a dial reading of 3500 to 4100 kHz. Of course intermediate crystals will give tuning ranges between the two extremes. 5900 kHz will give a tuning range of 2400 to 1800 kHz. Alternately a crystal of 1700 or 2100 kHz may be used. Other frequencies will give a signal in the tuning range.

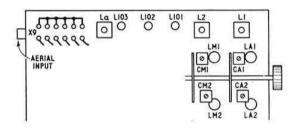
Supposing a 5 MHz crystal is used the quickest way of getting on 160 metres is to switch fixed capacity across the twin gang RF preselector so that it will tune down to 1.8 MHz. I found that 700pF was needed, VC1 then just tuning the band. A miniature dpdt switch was fitted into the VC1 tuning box to switch 700pF across each section of the variable. There is room for another crystal socket at the back of the original five sockets. The crystal will oscillate using the 11 MHz coil LO3 as used for 40 metres. This conversion may easily be carried out in an hour or so. However the receiver didn't seem to have quite as much kick in it on 160 as I felt it should. I decided that this was due to tuning double the crystal frequency and not obtaining sufficient oscillator injection, also the large swamping capacity across VCI.

Considering this problem I thought of the method used in some transistor receivers to get LW reception by switching in a series coil in rf and oscillator stages. This is the method finally used.

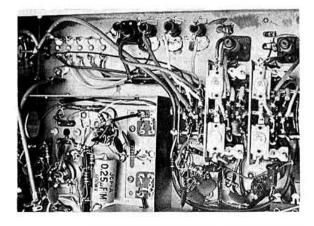
First a coil La tuning to 5.8 MHz is needed. I used a crystal on this frequency. There is room for this coil between L103 and the crystals. This coil is 30 turns of 30 swg wire on a \(\frac{1}{2}\) in dia former with iron dust core. I used a type of coil former that was formerly used in TV sets. Two more coils are needed. L1 in series with LA1 and L2 in series with LM1. These were wound on the same type former and consisted of 90 turns of 30 swg wire close wound, as was the oscillator coil. Two dust cores were used in each coil to get the lowest possible frequency coverage on MW. Room will

be found for L1 and L2 under the chassis next to LA1 and LM1.

A word of warning! Don't drill through the chassis without removing VCI first, as the writer did. I drilled into VC1 and wrecked it! I then had to replace it with a twin gang 500pF. This will of course tune to a lower frequency than the original capacitor. With VCI set to minimum capacity the cores of L1 and L2 should be adjusted for maximum output at the highest frequency you wish to tune. This will be in the range 2000 to 2400 kHz depending upon what crystal you are using. In my case the frequency was 2300 kHz and the capacitor then tuned down to 600 kHz. I then used the miniature dpdt switch fitted in the VC1 tuning box to switch

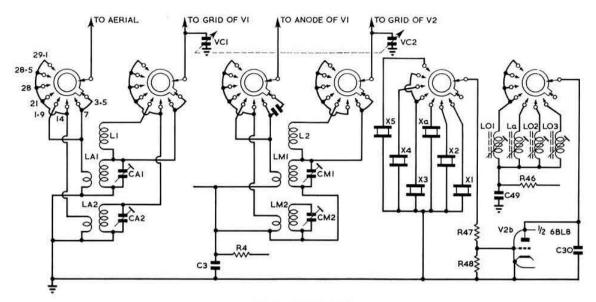


Chassis layout showing addition of components.



AND SERVICES AND S

^{· &}quot;Hamrest," 28 Ely Road, Littleport, Cambs.



Circuit as converted.

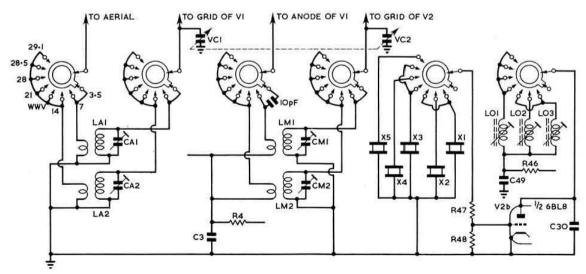
in an extra 585pF across each section of the twin gang. The tuning range when switched in is 600 kHz to under 300 kHz.

Medium wave coverage may be obtained with crystals between 5200 and 4400 kHz. I am using 5000 kHz to give a tuning range of 1500 down to 900 kHz. In fact as the receiver tunes nearly up to 4200 kHz the range on medium wave extends nearly down to 800 kHz. A crystal of 4600 kHz will give a range of 1100 to 500 kHz. 4300 kHz would extend the range down to 200 kHz. Bear in mind that the overlap at the 4-1 MHz end will extend the range nearly 100 kHz lower in frequency.

The only snag I have found with medium wave reception is that a strong station will also be heard 76 kHz higher. This was first noticed when listening to Manx Radio on

1295 kHz when I found Radio 1 coming through about S5 on 1291 kHz. With the preselector retuned to 1214 kHz it is up to S9 plus 40dB. I myself use an atu both for 160 metres and MW and find it well worthwhile.

In closing I would add that I have reduced the bass response when switched in the AM mode. This makes signals sound better although the frequency response is of course still restricted. I tried the Stenode circuit but this didn't seem any better than just a low value coupling capacitor. I used 100 pF between the AM detector and the switch. Incidentally crystals down to 4·3 MHz still oscillate well without retuning the coil in the oscillator circuit. It is possible to tune any frequency up to 30 MHz by use of a suitable crystal. Happy listening!



Circuit before conversion.

A Case of

No TVI-Now

By JOHN C. GRAHAM, G3TR*

THE problem at hand arose from a complete swamping of BBC 1 television on London's Channel 1 when operation took place on 14 MHz and 21 MHz. Both the ITA transmission on channel 9 and BBC 2 on channel 33 were clear.

The equipment in use is the Sommerkamp FL200B, the aerial on 14 MHz is a *HyGain* monoband 3 element beam at 62 ft about 90 ft from the television aerial. On 21 MHz the aerial is a Mosley Elan, 72 ft high.

All tests were carried out with the transmitting beams pointing directly at the television aerial. The television aerial is a dipole 30 ft high on top of the house and the television receiver is a Radio Rental 23 in console model with a transistorized front end. A GPO high pass filter (type 38A) was fitted in the television receiver aerial lead at all times.

The following tests were carried out:

- Transmitter into a dummy load with no low pass filter in the transmitter output lead.
 - Result: No tvi on any band.
- Transmitter connected to 14 MHz beam with no low pass filter.
 - Result: Complete wipe out of picture on channel 1 but clear on channel 9 and 33.
- As 2 but with low pass filter in transmitter aerial lead, Result: No improvement.
- Tests 2 and 3 were carried out on 21 MHz with exactly the same results.

It appeared that perhaps the cut-off of the GPO filter was not steep enough and not close enough to 41.5 MHz, the sound frequency on channel 1. The response of the GPO filter was examined on a *Polyskop* and it appeared to be very good. However it was felt that if the cut-off could be pushed a little closer to 41.5 MHz an improvement might be made. To this end it was thought that if an open ended quarter wave coaxial stub cut to a frequency below 41.5 MHz and connected across the tv aerial feeder between the filter and the tv receiver an improvement might be made.

A quarter wave stub was cut for 35 MHz and its effect was examined on the *Polyskop*. It produced a deep notch which was however fairly broad. The stub and filter response were examined together and it was found necessary to raise the frequency of the stub to 36 MHz in order to get the cut-off close enough to 41·5 MHz. The stub was fitted across the coaxial lead as shown in Fig. 1. Raising the frequency of the stub appreciably introduced too much loss at 41·5 MHz and 45 MHz. The losses introduced by the insertion of the 36 MHz stub were not sufficient noticeably to degrade

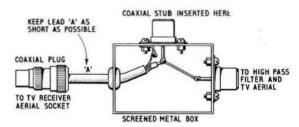


Fig. 1. Layout of the stub connection box.

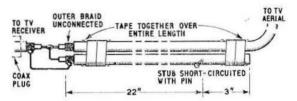


Fig. 2. The arrangement of the coaxial stub.

the sound or picture in an area where the tv signal is reasonably strong. In fringe areas the insertion loss might well be too high.

Now a few words on constructing the quarter wave stub. In my case this was done by using the *Polyskop* but not everyone has £2,000 worth of equipment available. Cut a piece of coax 53 in long and fit a plug to one end; fit this into the socket as shown on Fig. 1. Sound and vision reception should not be affected. Now test for tvi and if there is still evidence of this, prune the stub a very little at a time and notice the reduction in tvi. At the same time watch for any degradation of sound or vision. By trial and error a compromise can be reached.

In my case a complete cure was not effected but the interference was only very slight. It appeared that we were getting somewhere. The length of the coax lead "A" between the junction box and the tv set was some 6 in long. Possibly this could be the cause of trouble. The next step was to solder the stub directly across the coaxial socket on the tv set (on the inside) and the result was a complete cure on both 14 and 21 MHz. After the adjustments had been carried out the length of the co-axial stub was measured and found to be 51½ inches. TVI cases are essentially individual affairs and a cure for one will not necessarily have universal application. However in the case of the writer the work was well justified.

Introduction of a Linear Amplifier

After a trouble free period of operation a linear amplifier (the Sommerkamp FL1000) was brought into use and, you guessed—back to square one. Having read that many cases were caused by the pick up of signals on the outer braid of the tv coax lead it was felt that this should be investigated first. The 1:1 transformer wound on a ferrite ring could be the answer, but I had no ferrite ring.

The Faraday loops were tried without much success. Information on a device which had proved very successful in an area of very low to signal strength was given to me by a GPO engineer and this was tried with complete success.

^{*} The Willows, Church Road, Lowfield Heath, Crawley, Sussex.

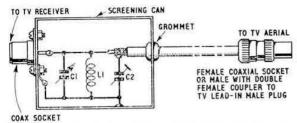


Fig. 3. C1 50 pF variable; C2 30 pF Philips trimmer; L1 6 turns of 18 swg enamelled, $\frac{1}{2}$ in dia, close wound and self-supporting.

The maximum licensed power could be run with the transmitting beams pointing directly at the tv aerial only 90 ft away. It is a very simple device and can be made up easily and at virtually no cost and the electrical and physical layout is shown in Fig. 2. Make up the device as shown and connect it in to the tv set. Make sure that you insert the pin through the short length of coax at 22 in and be sure that this pin short circuits the inner and outer of coax. Now switch on your transmitter and test for tvi. It is most probable that a complete cure will be effected. If not, the position of the pin

can be varied by an inch or two. The dimensions shown are for channel 1, for other channels the pin should be inserted closer to the junction of the coax leads. When the ideal position of the pin is found the coax can be cut and the inner and outer can be soldered together. It is very important to ensure that the pin does connect the coax inner and outer otherwise there will be little or no ITV picture. Finally, a GPO type 38A filter can be connected between the device and the tv set, this may be of assistance. The same sort of device was made up by Maurice Brown, G3BZO, using normal coils and capacitors instead of the coax stub. I have used this with complete success and details are shown in Fig. 3.

What happens is that C1/L1 tunes over the frequency range of the tv channel and the trimmer isolates any direct connection between the outer of the tv aerial coax and the receiver.

Plug in the device and tune C1 so that sound and vision come up on the tv set. Test now for tvi and if there is any residual interference adjust the two trimmers to eliminate this.

It is hoped that the two ideas described may be of interest. They certainly effected a complete cure for G3TR.

THE RSGB SHOW

INTERNATIONAL RADIO ENGINEERING & COMMUNICATIONS EXHIBITION

Where: Royal Horticultural Society's New Hall, Greycoat Street, Westminster, London, SW1. When: 1 to 4 October 1969—10 am to 9 pm.

This year's exhibition will be opened on 1 October by Colonel D. McMillan, CB, OBE, BSc(Eng), CEng, FIEE, Chairman of Cable & Wireless Ltd. The special exhibit on the stage of the hall will be provided by Cable & Wireless.

The John Rouse Memorial Trophy will be awarded for the best piece of equipment submitted by a member aged 16 years and under; the rules in (ii) below will not apply in respect of entries for this trophy.

All the usual Exhibition attractions will be present and correct, but in particular we should like to draw Members' attention to the display of Home Constructed Equipment. The Society invites items for display, subject to the following conditions:

- i All items submitted for exhibition will be subject to acceptance by the Exhibition Committee.
- ii Entries will be accepted (a) as items which have been the subject of published articles in the RSGB BULLETIN or Radio Communication during the period January 1967 to date. It should be made clear that only the member writing the original article will be allowed to enter; (b) from members who are prepared, if required, to write a constructional article for publication in Radio Communication featuring their entry, this article to be paid for at the normal rates.
- iii Entrants will be required to certify that their entries were constructed entirely by themselves from commonly available materials and components.
- iv RSGB members only will be eligible.
- v The Horace Freeman Trophy will be awarded for the most original piece of equipment on show.
- vi Additional prizes may be awarded at the discretion of the judging Committee.
- vii Members wishing to exhibit should write to the organizer of the Home Constructed Equipment Exhibition.
 - M. ELLIOT, G3VWS, 23 Filbert Crescent, Gossops Green, Crawley, Sussex.

THE MONTH ON THE AIR

By JOHN ALLAWAY, G3FKM*

FOLLOWING the mention of difficulties being reported in obtaining QSL cards from the 3V8AA expedition last August several correspondents have written to say that they have received theirs promptly. Just before last month's Radio Communication was published a letter was received from Renaud, F5QQ, who was one of the members of the expedition. He says that he is unhappy to hear that some stations have not yet received cards as they were under the impression that the more than 5000 cards received had all been answered. F2QQ and F5QQ were at the RSGB Exhibition last October and brought over replies to all the UK cards received at that time-some were despatched direct, and the remainder via the bureau. Since then all further cards received have been answered immediately. Renaud makes the point that the five IRC's requirement was an error and that in fact only three were asked for. Your scribe can confirm that direct cards have been received by those who only sent one IRC. Anyone still without a card is invited to reapply to Renaud Delcourt, Radio Club de Bois Colombes, 26 rue d'Estienne-d'Orves, 92 Bois Colombes, France. A repeat expedition will take place between 7 August and 30 August this year, and special emphasis will be placed on 40 and 80m operation for the benefit of 5BDXCC hunters. The party will consist of F5OJ, F5QQ, F2QQ and F2YZ.

G3TKX, who is ex-9H1AE, suggests that it is wrong for the Malta ARS to proceed with their intention to destroy cards received for Maltese stations who have left the island without leaving a forwarding address. It seems that cards for MARS members are collected by them from 9H1E who is the island's official QSL manager and it is strongly suggested that any collected for stations who are no longer in their Society be returned to 9H1E for his attention.

News from Overseas

A recent letter from W3HNK gives the information that in addition to the stations listed on page 742 of November, 1968 MOTA he has now assumed responsibility as QSL manager for the following: CR6KT, CR6LF, CT1MZ, CT1TZ, CT1UD, CT1UE, EL2BI, JA1IVV, JA6BEE, OY9LV (after 19/5/69), VK9BS (after 29/5/69), and VP2VY. Cards should be sent to the address in QTH Corner.

John Stratfull is now in Mauritius and says that anyone still needing a QSL card from him for a contact when he was using his previous call (VP2KR) should get in touch with him at VO8CV.

Having recently returned from a trip to the Caribbean G2FUU reports enjoying an interesting time and meeting a number of licence holders in Antigua and Barbados. Some

operating was done from VP2AW and 8P6CC with good contacts to the UK in spite of the European and S. American QRM which has to be heard to be believed. Tommy says that cunning was employed by repeating his call-sign only at the very last moment at the end of a transmission in order to reduce the number of "breakers" but this didn't always work! In any case it was all great fun, and the beaches and warm sea were even better than the DX.

In a letter to G3URX, W4RLN (who is now W5QKY) says that he is not now, and never has been QSL manager for AP5HQ. He has been receiving cards for that station during the last three years since the incorrect information first appeared in a US news sheet, and has been forwarding all of them to the AP OSL bureau.

Those fortunate individuals who are awaiting QSLs from John Macintyre, YJ8JM, will be interested to know that in a letter to G2FYT John says that he is unfortunately still without cards. Negotiations are taking place with a printer in New Zealand and although the delay may be very considerable John wishes readers to know that he will QSL all contacts in due course.

Eric Trebilock, BERS 195, says that his position of Australian Civil Aviation Frequency (Radio) Registrar brings him into close contact with members of the Australian PO Radio Branch. The latter have informed him that whilst industrial users have changed from cycles to Hertz, operationally the cycle is still valid. Only a full ITU meeting is able officially to make the change on behalf of all users, and since a full meeting has not been held since Geneva 1959 and no further get together has yet been fixed it may be years before the change becomes official.

Latest news from DL7FT is that he has asked (via G3HCL) that only three QSLs should be sent for in each envelope when appyling for cards from stations for which he acts as QSL manager. Logs from EA6BH have not yet been received and cards are being returned to senders. Frank also wishes to point out that he has acted as manager for 3A2CN only for contacts since 1 January, 1969.

MP4BGX closed down operations from Bahrein on 18 May and may now be found on cw on the If bands using his G3XHE call. Greg would like to thank all those who had contacts with him, especially on 10m, for making his stay in MP4B more enjoyable. He worked 203 countries during his 10 months and had some very fine (and sometimes hilarious). contacts. All QSLs received have been answered but Greg has been surprised at the considerable number of cards received for QSOs which are not in his log. He hopes to be moving on to another rare DX location before long, this time as a civilian.

Les Hickingbotham, VR2FT, is now using a tri-band vertical and a 20m dipole and is to be found around 14,180

 ¹⁰ Knightlow Road, Birmingham 17. Closing date for the September issue is 5 August, for the October issue 2 September and for the November issue 14 October.

kHz on ssb looking for European contacts at 07.00 every Monday. He looks particularly for Africa on the same frequency between 04.30 and 06.30 on Wednesdays and says that he gets a little cross when VE's, VK's and ZL's answer his directional calls. Barry, ZL1BCM, will be arriving in Nadi during September together with a KW2000A and quad elements and should have a VR2 call before long.

Pat, ZL4NH, is a Liverpudlian and can be found most days on 80m cw and ssb. He is anxious to work UK stations, especially those in Liverpool, and asks those who require direct QSLs to send them via G3YHB, 86 Max Road, Liverpool, LI4 4BJ together with a sae.

Jock Hammond, A6254, apologizes for the delay in despatching MP4TCQ QSLs due to his recent spell in hospital. Anyone wishing for a schedule with MP4TCQ is invited to write to 24087445 Sig. Hammond J., Radio Troop, 222 Sig. Sqdn., BFPO 64.

9VIOS is now back in the UK and once again using his G3VYT call. He has now QSLd all his 9VI contacts and also all those from his VR2FS log. G3VYT may be contacted via the address given in QTH Corner.

It would seem that HH9DLs call-sign is being pirated. In a letter to G2MI Don gives a list of more than 60 UK stations from whom he has received QSLs for contacts not in his log. Most of these appear to have taken place on 28 MHz.

Awards

The Worked All Birmingham Award.

Sponsored by the South Birmingham Radio Society, G3OHM.

Applicants need confirmed contact with at least 32 of Birmingham's 39 postal districts on 160m cw or phone (or mixed modes) since 1 June, 1969.

QSLs plus 4s should be sent to Mr R. Brice, 53 Leycroft Avenue, Tile Cross, Birmingham 33. This award is available to listeners on a heard basis.

The Pacifica Award.

Issued by the Coastside ARC, 812 Arguello Blvd., Pacifica, Calif. 94044, USA.

Requirements are two QSOs with CARC members between 6 May and 6 November, 1969. Send own QSL plus QSO data to above address with two IRCs. Listeners are also eligible. (This award is to commemorate the discovery of San Francisco Bay by Captain Gaspar de Portola in 1769.) CARC members will identify themselves by calling "CQ de... Pacifica."

Diploma for the Bicentenary of Napoleon Bonaparte.

Diploma and QSL manager F2WS, 9 rue G. Lambert Garches, Hts Seine 92, France.

Three classes—(European applicants) Class A need QSOs with five Corsican stations, one station in Moscow, and five in different DUF regions. Class B requires six FC stations (including at least one in Ajaccio) plus one each from DPF departments 75, 77, 06, and 83 (Seine, Seine-et-Marne, Alpes Maritimes, and Var) and one station in each city of Moscow, Berlin, Vienna, and Madrid, plus 10 DUF regions. Class C applicants need seven FC QSOs (one in Ajaccio), provinces as for Class B plus Alpes (Hautes), Marne, and Rhone (05, 69 and 51), cities as Class B plus St Helena, and 15 DUF regions. DX stations need three, four and five Corsican QSOs otherwise the same as European applicants. All contacts should be between 1 May, 1969 and 31 August, 1970. Send QSLs for all except the FC QSOs



Relaxing during their spell on the air from Tunisia last summer the crew of 3V8AA tried their skill at riding on a came!! Left to right are F5HN, F5QQ, F2YZ, and F5OJ.



Herb, W0VXO/KV4FZ, enjoying the sunshine in the US Virgin Is. He is of course a leading 160m DX operator but is to be found on all bands, especially at contest times.

Auckland - New Zealand

ZL1AO Y MOBILE IN AUCKLAND

TO MOBILE -HEW ZERLAND G 3 WRU DATE TIME FREO VOUR 0845 14.180 14/5/69 3/2 MOBILE NZT TRANSMITTER ANTENNA HI FT HELICAL ON REAR GUARD OF CHRISTER VALIANT HW 32 TRANSCEIVER HW32 TRANSCEIVER

Jan Young 211a St. Andrews Road, Epsam Auckland

What is thought to be possibly the first mobile to mobile ZL to G contact took place between ZL1AOY and G3WRU on 14 MHz recently. Grahame only needs S. America for his W.A.C. mobile to mobile.

(log data will suffice for these) plus 10 IRCs and sae to address above.

The Diploma "50-SRR."

Sponsored by Radio Club Station OK3KPN.

Issued in two classes—Ist (with memorial flag) for four QSOs with stations in Presov at least one of which is an OK5, and 2nd for two Presov QSOs. Stations may be worked on both modes (phone and cw) for credit. QSOs must take place between 1 April and 30 November, 1969.

List of contacts plus five IRCs (for 1st class) two IRCs (for 2nd class) or two IRCs (for SWL applicants) should be sent to OK3OM, ul. A. Dubceka 107, Presov, Czechoslovakia. A leaflet describing this award and listing Presov stations is available from G3FKM (sae please).

The SNP Award.

Issued by the Student's Radio Club, OK3KFV, PO Box 29, Martin 1, Czechoslovakia.

Requirements are 12 points for QSOs with stations in mid-Slovakia between 15 July and 15 September, 1969. Contacts on 160m count four points, those on 80, 40 and 10m count three points, and on 20 and 15m two points (for DX stations)—for European applicants the points values are 160m 3, 80 and 40m 2, other bands 1. Each station may only be worked once per band. Applicants should include cards for the OK3 stations worked and seven IRCs. Fully descriptive leaflets of this award are also available from G3FKM.

According to "QST" the ARRL is about to introduce a new five band Worked All States Award, no further details are available yet but this should prove to be extremely difficult to obtain from this part of the world as it will involve contacting all 50 US states (including KH6 and KL7) on 3·5 MHz.

Contests

The Scandinavian Activity Contest 1969.

15.00 20 September to 18.00 21 September (cw section). 15.00 27 September to 18.00 28 September (phone section). All bands 3.5 to 28 MHz.

Contestants work as many Scandinavian stations as possible and stations may be worked on each band for credit. For the purpose of the contest Scandinavia includes LA, JW, JX, OH, OH0, OX, OY, OZ, and SM/SK/SL. Entries may be single operator, and multioperator single or multi-transmitter. Exchanges consist of report plus serial number of QSO starting from 001. Each complete QSO counts one point, and a multiplier of one for each country listed above worked on each band is used in compiling the score. Leaflets on this contest are available from G3FKM, and entries must be mailed before 15 October to NRRL, PO Box 21, Refstad, Oslo 5, Norway.

Results of the 1968 Colombian Independence Contest are now available and show that top world score (331,600 points) was achieved by UP2NV. Top European was 4U1ITU with 127,594 points. UK scores were G3AIR (77,142 points), GM5AHS (55,862 points), G3ESF (31,766 points) G3XBY (11,040 points), and G3OCA (665 points—7 MHz cw only).

The WAE Contest (DARC).

00.00 9 August to 24.00 10 August (cw).

00.00 13 September to 24.00 14 September (phone).

All bands 3.5 to 28 MHz.

There are single operator, and multi-operator single and multi-transmitter categories and single operators may only operate for 36 hours. Their rest period may be taken in up to three periods and clearly shown in the log. Stations exchange

the usual report plus serial number of QSO, and a station may be worked on each band for credit. Each QSO counts one point except on 3.5 MHz where it counts as two. The multiplier is the number of DXCC countries worked on each band, Call areas in JA, PY, VE/VO, VK, W/K, ZL, ZS, and UA9 and UA0 are counted as multipliers. Stations outside Europe use the DARC WAE list of countries for multipliers. Additional points come from the "QTC" system. A QTC is a report of a QSO which has been made earlier and later sent back to a European station, it can only be sent from a non-European and an additional point can be obtained from each QSO reported. Not more than 10 QTCs may be passed to one station on any one band, and a QTC contains time, call, and QSO number of the station being reported ie 13.00/DJ3KR/134 means that the DX station worked DJ3KR at 13.00 and received no. 134. It is suggested that official DARC log sheets are used. These may be obtained from Walter Skudlarek, DJ6QT, An der Klostermauer 3, D-6471, Hirzenhain, Germany, Closing dates are 15 September for cw and 15 October for phone. Contest contacts may be used as credits for WAE certificate endorsements provided that the station worked submits a log. For award purposes the contest is split into three categories—(a) up to 200W input, (b) more than 200W input, and (c) stations licensed less than I year.

The 10th All Asian DX Contest. 10.00 30 August to 16.00 31 August. All bands 1.8 to 28 MHz cw only.

Non-Asians work as many Asian stations as possible, one point being gained for each QSO, and a multiplier of 1 for each Asian country worked on each band. There are two types of entrant—single band or multiband single operator. Exchanges consists of RST followed by two figures denoting the operator's age. YL operators are permitted to send "OO"! As this is the 10th JARL contest special badges will be awarded to all participants, and medals to continental high scorers. Certificates will be sent to the top single band entrant on each band and to the top three multiband entrants in each country. A few entry forms are available from G3FKM. Logs should be posted to reach the JARL Contest Committee, PO Box 377, Tokyo Central, Japan before 30 November.

Preliminary results of the 1968 CQ WW DX Contests (phone and cw sections) have now been received from WIWY. In the Phone section single operator multiband world winner was ZD8Z with 4,184,680 points, the highest European in this category being LA0AD who was world fourth with 1,828,503 points. In the single operator single band entries top scorers were as follows: 28 MHz YV1LA (664,560),-top European DL4PM (614,544). 21 MHz CX2CO (805,090)-top European PA0FM (613,816) and G3HCT world third with 576,007 points, 14 MHz YV5ANF (754,075)—top European UR2AR (609,440). 7 MHz YV4UA (97,605)-top European SM4CMG (61,473). 3.5 MHz W1FZL/KP4 (50,410)-top European being OM1BY (19,778). G3IAR and G3RHM are to be congratulated on being world 5th and 6th with 15,714 and 14,723 points respectively.

In the cw section the multiband single operator winner was KV4FZ (1,947,456) with LA0AD top European (1,035,188). Single band leaders were: 28 MHz K1JGD (158,510). 21MHz 21MHz CR6GO (530,550)—top European G3HCT (240,468) 14 MHz PY4OD (747,410). 7 MHz LZ1PKG (159,964). 3·5 MHz OM1BY (43,560). (On this band G3VMK was

PROPAGATION PREDICTIONS

The poor summertime DX conditions will continue during August, but will start to improve during September to reach their best in October and November.

North America and Japan will possibly not be heard in August on 28 MHz, but traffic with Africa will be certain in the afternoon.

On 21 MHz traffic with Central and South America as well as Africa and South East Asia will be assured. The prospect of contacts with North America improves as one moves further south in Europe. The propagation path to Western North America will also show some improvement on the previous month. As the nights lengthen in the Northern hemisphere and shorten in the Southern, traffic areas in the northern hemisphere (North and Central America, East Asia) will generally cease earlier than the previous two months, but to areas in the Southern hemisphere (South Africa and Australia) the opposite will be the case. As compensation for the continuing poor DX conditions this month, the sporadic short skip conditions will continue on the hf bands. 14 MHz will continue as a night-time DX band. The conditions to North America will, however, worsen slightly in the early morning. In the late afternoon contacts will be possible with South Africa, South East Asia, Japan and Australia, though badly affected by European QRM. tDuring day-time 14 MHz will still be an ideal band for European raffic and maximum contact distances will increase as autumn approaches. The latter also applies to 7 and 3-5 MHz. In the latter half of the night on 3.5 MHz the dead zone will only interrupt local traffic on rare occasions.

The provisional sunspot number for June 1969 from the Swiss Federal Observatory was 102-1. There was a period of high solar activity between 5 and 16 June. Indicating the wide variation during the month is the daily figure of 26 on 26 June and the figure of 186 on 8 June. The predicted smoothed sunspot numbers for October, November and December are 93, 91 and 89 respectively.

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world 4th with 35,316 points). 1-8 MHz DL1CF (2235), UK scores will be given in detail when they are available.

The QRP QSO Party.

20.00 16 August-24.00 17 August.

All bands 3.5 to 28 MHz, phone and cw.

Each QSO worth two points, multiply total by number of US states, VE provinces, and DXCC countries worked. Multiply by a factor of 1 if power input 100 W or more, by 1-5 if between 25 and 100W., by two if between 5 and 25W, by three between 1 and 5W, and by four if input below 1 watt. To work out figure on ssb halve pep ratings. Stations may be worked on each band for credit and should exchange RS/RST, country, power input. QRG's to work around are given as 3575, 7030, 7075, 14,075, 14,330, 21,075, 21,120, 21,430, 28,075, and 28,600 KHz. Send a summary sheet with log giving details of equipment and power and usual signed declaration to WA8MCQ, Route 3, Paw Paw, Mich., 49079, USA before 15 September.

A contest to commemorate the 20th Anniversary of the

present regime on Roumania will take place between 18.00 on 2 August and 24.00 on 3 August. This will cover all bands and the object is to contact as many YO stations as possible. Leaflets giving full details are available from G3FKM.

The Trinidad and Tobago Independence Anniversary QSO Party.

00.01 30 August to 24.00 31 August.

All bands 3.5 to 28 MHz, phone only.

The usual 5 figure number should be exchanged (RS followed by QSO serial number), A certificate will be awarded to any DX station working five or more 9Y4 stations on one or more bands, cross band operation not being permitted. A certificate with endorsement sticker and QSL cards confirming contacts will be awarded to DX stations working 9Y4 on five bands. Logs should show date, time, station worked, number sent and received, and if the five band certificate is required should also be accompanied by the applicant's own QSLs for the stations worked. There is a fee of \$1 or eight IRCs (or equivalent) and entries must be

posted before 15 October to STARC, PO Box 131, San Fernando, Trinidad.

The Jubilee International LZ DX Contest.

00.00 to 12.00 7 September.

3.5 to 28 MHz ssb and cw (separate sections).

Exchange RS(T) plus serial number. QSOs with stations in same continent count one point, with other continents three points, and with LZ stations five points. Stations in one's own country count for multiplier credit only. "Only countries from which contest logs have been received count as multipliers." The band score is number of QSO points on each band multiplied by the number of DXCC countries worked on that band and the total score is the sum of these. Entries may be single operator, or multi-operator single transmitter, and listeners may take part. They receive one point for correct reception of both callsigns in a contact and one number exchanged, and three for recording both calls and exchanges. European participants working a minimum of 25 different LZ stations, and stations outside Europe working at least 10 LZ stations will be awarded a special jubilee Diploma. A separate log of these contacts should be submitted. Logs should show time (GMT), band, station worked,

OTH Corner

CR8AJ ex-F08CG W5RBO, PO Box 416, Anna, Texas, 75003, USA. Edmond Ermiz, F5PE, Ferne Boulouch, 32 Lectoure, France via WA4GQM, 392 Byron Drive, Memphis, Tenn., USA GSVYT GC5AGA GSYYT GC5AGA GSANX GC5AOH GC5AOI GD3KDB, GD3LNS HBOXWS HBOXWS HL9UU HSAL W3RPQ, WM. French Jr., R.F.D. 2, Geneva, NY., USA. W2SRQ, WM. French Jr., R.F.D. 2, Geneva, NY., USA. W2SRQ, WM. French Jr., R.F.D. 2, Geneva, NY., USA. W3WNE, 1206 Woodlawn Blvd., South Bend, Indiana, 46616, USA. Via W9VNE, 1206 Woodlawn Blvd., South Bend, Indiana, 46616, USA. Via LA1SL, Geir Nilsen, Studentpost 139, Nth. Trondheim, Norway. Box 94, Ponape, E. Caroline Is, 96941. KX6HR L12B WP4BGX RE. Gregory, Danetree, East Close, Middleton on Sea, Sussex. PO Box 40015, Helsinki 40, Finland. (1968 opn.) via PY4AP, PO Box 484, Belo Horizonte, M.G., Brazil. via DJ4SK, Alfred Klein, Haldenstr. 21, 7411 Rommelsbach, Germany. DJ0UJ, Kastenbauerstrasse, 5-3, 8 Munchen 80, Germany. GDelas, PO Box 356, Libreville, Gabon. G. W. Brain, VK3AEJ, 5 Lomond Avenue, Kilsyth, Vic., 3137, Australia. q. F. Strathfull, Audit Dept., Port Louis, Mauritius. VQ9/A/BC VQ9/A/BC VQ9/A/BC W3HNK ZD9BM CW3HOR W4CI, 3103 4th Avenue S., Birmingham, Ala., 35233, USA. PO Box 14, Norwood, Pa., 19074, USA. via GB2SM, Science Museum, South Kensington, London, SW7. via G3TXF, Holt Cottage, Kingston Hill, Kingston-upon-Thames, Surrey. SV4DB 6W8XX R5RO, PO Box 416, Anna, Texas, 75003, USA. PO Box 14, Norwood, Pa., 19074, USA. via GB2SM, Science Museum, South Kensington, London, SW7. via G3TXF, Holt Cottage, Kingston Hill, Kingston-upon-Thames, Surrey. SV4DB 6W8XX R5RO, PO Box 146, Anna, Texas, 75003, USA. PO Box 140, Norwood, Pa., 19074, USA. via GB2SM, Science Museum, South Kensington, London, SW7. via G3TXF, Holt Cottage, Kingston Hill, Kingston-upon-Thames, Surrey. SV4DB 6W8XX		
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6W8XX BP 3013, Dakar, Senegal.	5V4DB	

number sent and received, points, and country multiplier and should be posted before 1 October to PO Box 830, Sofia, Bulgaria. A few rule sheets are available from G3FKM.

DXpeditions

HB0XVP, HB0XVQ, HB0XVW, and HB0XVX will be the call-signs used by DL4CE, DJ4WG, DL2MY, and DJ9MH during their visit to Liechtenstein between 6 and 13 August, K7ADO and W7GVA, whose visit to some of the rarer European countries was mentioned in June MOTA. may still be active in the first half of August. Their transmitting frequencies are given as 3505, 7005, 14,005 14,237, 21,005, 21,185, 21,302, 28,005, and 28,685 kHz and listening frequencies will be announced. QSLs should be sent via W7CRT, Call-signs known to have been issued include HB0XVR, HB0XVU, K7AAD/LX, and W7GVA/LX. A new prefix will be used from Andorra due to the fact that Brazil has complained to the ITU about the unofficial use of

1969 Countries Table

	1.8	3.5	. 7	14	21	28	
	MHz	MHz	MHz	MHz	MHz	MHz	Total
G3LNS	_	102	122	174	161	131	690
G3TZU	5	31	44	64	110	146	400
G3HCT	-	85	73	47	61	111	377
G3XYP	_	-	37	134	72	63	306
G3KS	1	17	14	66	58	62	218
G3VUM	4	4	8	70	51	57	194
G3XBY	2	36	37	51	51	43	221
G8VG	2 2 4	25	26	29	48	44	174
G4RS		21	10	61	65	21	182
G3PEJ	4	2	20	38	43	34	141
G3VGJ		2	19	5	6	50	82
G3IAR	2 3	23	21	25	23	26	120
G3VPS	3	15	15	61	27	20	141
G3UML	_	63	22	101	23	18	227
G3VLM	1	12	14	43	3	27	100
G3WPO	17	10	37	31	1	23	109
G3JVJ	12	70	24	81	18	2	207
G3PQF	6	13	12	30	8	5	74
A5390	ğ	87	69	170	163	104	602
A6254	6	24	15	125	148	80	398
A5662	18	31	31	127	114	86	407
BRS31164	4	52	47	127	107	81	418
A6148	8	60	55	109	93	79	404
BRS24529	4	55	80	153	94	75	380
A6003	5	25	24	46	93	61	254
BRS30694	8	26	30	81	100	52	297
A5154	2	35	16	103	73	62	291
A6553	1	13	8	34	73	59	188
A6431	9	34	31	92	83	46	295
A6337	4	38	25	89	70	35	261
BRS26870	5	30	24	66	54	49	228
A6242	1	8	7	80	58	35	189
A6278	1	16	27	118	67	16	217
A6023	4	32	15	67	54	28	200
	4					25	
A5489	-4	18	8	57	55		143
BRS25429		39	39	79	48	30	239
BRS27806	6	35	20	67	64	4	236
A6923	4	29	14	54	40	27	168
A5466	8	24	27	41	30	37	167
BRS31172	1	7	14	52	44	9	127
A6248	2	20	12	88	46	1	169
A4253	1	13	8	28	25	11	86
A6220	1	16	24	70	15	18	144
A6179	- 1	5	13	27	25	5	85
BRS28198	2	27	32	1	-	20	82
A6498	4	14	2	17	8	11	56
A6201	-	35	20	48	-	1000	103
A6144	-	4	15	62	=	-	81
A6098	5	9	16	30	-	-	60

(This month's table is in order of 21 plus 28 MHz totals. Congratulations to G3LNS on being the first entrant to reach 100 countries

on five bands.)

the PX prefix by stations operating from there, here the callsigns will be C31CK and C31CL.

Karl, VK2BKM, who visited Lord Howe Is. last year is hoping to make a return visit in October. This time he will have a HyGain TH6 Beam for 10, 15, and 20m. and an 18-AVQ vertical for 40 and 80m, and will be trying to help those working for the five band DXCC.

According to the DXers Magazine VU2DK and others are currently trying to get permission to visit and operate from the Laccadive Is. VU2DK himself is quoted as saying that they may be successful in about another month's time.

A trip to Portuguese Timor (CR8) has been organized by VK2BFI and a group of others variously given as VK3MO. VK6LZ, and ZL4OZ. Operations are scheduled to begin about 3 August and last for about a month. Frequencies to be used are given as 1805, 3505, 3530, 7005, 7030, 14,005, 14,030, 21,005, 21,030, and 28,005 kHz cw and 1855, 3605 (listening 3695), 7097, 14,195, 21,247, and 28,493 kHz ssb. The equipment is said to include a 402BA 2 element 40m beam and phased verticals for 80m and special efforts will be made to operate on these two bands. According to VR2FT a visit to a place with a name resembling "Pelican Reef" will be made between 4 and 11 September and the call-sign to be used on this occasion will be 2P1AA. It is also reported that the callsign in CR8 will be CR8AJ and that VK2BFI has received permission to operate from the Indonesian part of the island as VK2BFI/YB4 and hopes to use that call for about four days. Donations towards the cost of the expedition would be most welcome and should be sent to the Timor Dxpedition Fund, c/o R. E. Stone, W5RBO, at the address given in OTH Corner. This is also the address for QSLs.

The expedition planned by WB6KBK which was to have activated Roncador Cay and Bajo Nuevo has been cancelled on account of the difficult political situation at present existing in the area. No future dates have been given.

Following their successful visit to Wales G3SVK and G3VUE will be operating as GM3SVK/P and GM3VUE/P as follows: 30 August (Cumberland), 31 August (Kircudbright). 1 September (Angus), 2 and 3 September (Caithness), 4 September (Nairn) and 5 and 6 September (Kinross). Both cw and ssb will be used and VHF equipment may be taken to enable participation in VHF NFD.

TISWPE has been reported to have been heard discussing the possibility of a visit by himself and other Costa Rican amateurs to the Cocos Is. (T19) some time in mid August. Failing this an attempt may be made in December.

QSLs for contacts with GD3KDB and GD3LNS should be sent via WB2YQH and not to their home QTHs as stated previously.

DX Miscellany

TU2AP has now left Ivory Coast and is on the air from Togo as 5V4DB. Likewise TN8AA has been on the air from Gabon as TR8DG since 14 June. Robert, formerly FW8RC, is now in France and is using the call F0GL. F08CG leaves French Oceania in July also to return to France. Edmond was the operator of FB8XX between 10/1/65 and 12/12/65 and still has the logs for that period and some QSL cards.

According to W4ECI QSL cards for W4BPD's expedition contacts should have started to be sent out about 10 July. Some sources record actually receiving cards for the 6W/W4BPD operation.

SM5EAC who acts as QSL manager for HC8RS (Galapagos Is.) says that the mail from HC8 is very erratic and that logs are frequently delayed or even lost. He asks for patience from those awaiting cards. Information received last month indicated that this station was asking for QSLs to be sent via HC2HM. Further information would be appreciated.

Another net of possible interest to European stations is the VK9 net. This meets on 14,174 kHz every Tuesday at 09.30 and at 11.00 other stations are invited to join in. Interesting call-signs reported to have been heard on this net include VK9s KS, DH, DJ, and WD, C21JW, VR1L, etc.

The block of prefixes L2A to L2Z has now been allocated to Argentina and will be used in addition to the usual LU series.

A recent poll of most wanted "countries" conducted by Geoff Watts in DX News Sheet (taken before the recent sorties to KC4, VK0, and HK0) showed that those heading the list were KC4, FO8 (Clipperton), ZA, VK0 (Heard Is.), VU (Laccadive Is.), 3Y (Bouvet Is.), HK0 (Malpelo), VP8 (S. Sandwich), YI (Iraq), TI9, BY, CE0X, FO8M, XE4, AC3, ZM7, ZK2, AC4, XU, TZ, 9K3, AC5, IS, FR7/J, ZK1 (Manihiki), KS4 (Serrana Bank), and HK0 (Bajo Nuevo).

The S African Deputy Secretary of Transport is said to have disclosed that the Norwegian Government has given the go ahead for the construction of a South African weather station on Bouvet Island. He also said that the work would be very difficult since nearly all materials would have to be landed on the site by helicopter. When the station becomes operational there would seem to be a good chance of some amateur radio activity taking place.

JW2QK and JW9DL should have been on the air from Spitzbergen just before this copy of *Radio Communication* was despatched. JW6QL and JW7UH are expected to commence operating about 1 July and to remain on the air for a year. They should be joined by JW2XU in October.

The World DX Round Table meets on Wednesdays and Saturdays on 14,270 kHz ssb between 05.00 and 08.00. All QSLs for contacts with net members may be sent via WA5UHR, Scott Freile, 1610 Lynnview, Houston, Texas, 77055, USA and applicants are requested to send adequate return postage.

Contrary to the information given in June MOTA W6JFM is not going to Tahiti this year.

Your scribe is advised that the address given in July MOTA for QSLs for contacts with the raft "Ra" (L12B) although correct should in fact be replaced by "via LA5KG." Chris is acting as QSL manager and says that cards should be ready by the end of August. A charge of five IRCs will be made from those requiring QSLs via the bureau and six IRCs from those wishing for direct reply. The latter are asked to send a slightly larger than normal sae and it is pointed out that all profits from the IRCs will be donated to a Handicapped Children's Fund.

Band Reports

The outstanding feature of the period has been the continuing amount of good DX which is still being worked on the If bands—80m logs in some cases would easily pass as those for 20m. Summer propagation has resulted in short skip being in evidence, especially on 10m.

Many thanks to the following for supplying the information from which this section was compiled; G2BW, G2BOZ,

Continued on page 560

REGULAR FEATURE

FOUR METRES AND DOWN

By JACK HUM, G5UM*

Quickstarting at "13"

Recent requests by members for more information about equipment currently in use at 13cm have certainly turned the tap on. In "Tech Corner" this month there is a piece by G3EEZ about a waveguide feed for this band. And G3OAD and G8AGM have come up with some very practical ideas on transmitting and receiving equipment that should help the state of the art on "Thirteen," get more people thinking about this band—and most practical consideration of all, get more people on to it.

This last point has been very much in the mind of G3OAD for several months. He believes that the simplicity of design of pulse transmitters offers special attractions to intending newcomers to the band who wish to make a quickstart on it. A transmitter can be built for 2350 MHz using a single 2C43 triode modulated from a high voltage source chopped by a thyratron switch to hold the pulse recurrence frequency to a standard 1000 Hz.

This modulator presents to the 2C43 a short pulse (typically 1 micro-second) at an anode voltage of $3\frac{1}{2}$ kV, and the triode in turn offers to the aerial (almost certainly a gainy parabola) something like $2\frac{1}{2}$ kW peak rf.

Clearly, this design of transmitter is primarily for telegraphy; its development for telephony offers an interesting challenge, in the opinion of G3OAD. Its signal, occupying a bandwidth of 2 MHz, is readily found by a conventional superhet with a tunable local oscillator (some uhf tuner transistors can be made to operate quite well at 13cm, says G3OAD). And for portable working pulse offers economy in psu requirements, e.g., 90 watts in contrast to about 300 watts for a crystal-and-multiplier set up.

The Crystal Controlled Approach

At G8AGM thoughts are already turning to "the next band up," 9cm, where wideband pulse operation is contemplated. Where 13cm is concerned G8AGM ventures the opinion that techniques have advanced to the point where crystal controlled equipment should be the first choice. From various locations he has worked since last year's VHF/NFD stations out as far as 80 miles as follows: G3FP, G3FP/P, G3BNL/P, G3MCS, G3OBD, G3OBD/P, G3THQ/P and G5FK, using c.c. equipment.

The G8AGM receiver for 13cm is unusual by dispensing with the orthodox crystal controlled chain of multipliers, and has instead a self-excited transistor oscillator directly on 2280 MHz to provide mixer injection. This oscillator, mounted in a solid brass cavity (ex-glide path) is so stable, reports G8AGM, that it will hold a stable incoming signal almost indefinitely in a 5 kHz bandwidth, after 15 minutes' warmup. A hybrid ring balanced mixer is used to prevent pulling of the local oscillator by aerial or feeder variations.

The FET head amplifier, a recent modification, is "a vast improvement on the 2N918 bipolar previously used."

The converter draws 12 mA at 18V from a pair of dry batteries. Tuning is done in the usual way by varying the if strip frequency.

The use of a self excited local oscillator necessitates some form of crystal marker for calibration purposes, the tuning range of the converter being 2150 to 2500 MHz. A harmonic generator is a permanent part of the G8AGM/P set-up. It gives an output on precisely 2304 MHz at a level of about minus 40 dbm; this signal can be detected up to 60 feet away, using only a quarter wavelength of wire in both the marker and the converter aerial sockets.

Precept into practice... the above equipment showed what it was capable of doing by working F1RJ/P at Trouville from G8AGM/P sited near Portsmouth. The path length was 126 miles, and S9 signals were exchanged both ways. The date was Tuesday 1 July. Success nearly came on 23 June when the G8AGM/P signal was R5 and S4-8 in France, but no sign of F1RJ/P could be detected on that occasion.

At G3WKL John Gould is giving top priority to finishing a 13cm rig in time for VHF National Field Day. Already completed is a wide band receiver with an seo local oscillator, a CV2154 mixer and a threshold detector suitable for receiving pulse at 1000 Hz pulse recurrence frequency. It is hoped to adapt the receiver to resolve narrow band emissions in the 2304-2306 MHz range. On the transmit side an F2FO pulse device to give $2\frac{1}{2}$ kW peak at 2360 MHz is on the way. Its prf will be what is now the virtually standard 1000 Hz, this at a pulse width of one microsecond. A 27-turn helix aerial with double stub tuner completes the set-up.

Schedules in advance of VHF/NFD would be most welcome; a good site near Tunbridge Wells is available. Letters direct to John Gould at 48 Long Meads, Rusthall, Tunbridge Wells, Kent.

Using the Microwaves on Field Day

By the time this piece gets into print VHF National Field Day will be no more than five weekends away. From what has been heard on the bands over the *last* five weeks it seems that not many people will be caught napping with arrangements incomplete on the night before. Next weekend, 10 August, offers a special opportunity to those who intend to mount a dummy run of VHF/NFD equipment, for it is the weekend of the 70cm Open Contest with its promise of plenty to be worked on that band. As for 4m, if there are any groups keen enough to stay out all night the 70 MHz Telegraphy event (midnight to 8 am 17 August) is the one to go for if both equipment and operators' key pounding prowess are to be put to the test.

Which reminds us to add that a Morse key will be an

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essential part of every VHF/NFD kit, together with a few Class A licensees at every site to work it. The pattern of recent contests has shown that there is a tendency to run out of phone contacts as the event wears on; going over to the key has helped keep the scoring rate up.

As part of the pre-Field Day exercise the rules printed here last April will by now have been given a good going-over. An important change in them allows entrants on 23cm and down to use a lower frequency transmitter (nearly always a 70cm one) to set up contacts on the microwave bands. Commenting on this change G3WKL says: "It seems that on 70cm there will be two types of station, one for working inter-70cm contacts, the other only interested in non-contest QSOs for contest microwave contacts. To alleviate interference to other 70cm stations on the same contest site it is suggested that the non-competing ones put their transmitters between 434 and 435 MHz, while the competing ones stay within 432-434 MHz."

This plan has already been widely discussed by 23/13cm operators and finds favour. An important Field Day tactic therefore would seem to be: Look above 434 if you want to initiate QSOs on 23 and 13.

The DX Side

All congratulations to G3JVL and G8LY who, in that order, broke down the UK to Iceland path on 4m on the morning of 27 June—and of course to TF3EA at the other end of the circuit, who helped to make this new record possible. From Hampshire to Reykjavik is something like 1200 miles, or nearly 200 miles longer than the UK to Gibraltar path, hitherto the ultimate in 4m two-ways so far as most operators are concerned.

It was as long ago as last September that G3JVL and TF3EA began the planning which was to culminate in the success of 27 June. In the ensuing months brief bursts from the automatic keyer which G3JVL had sent to Iceland were heard at the Hampshire end.

By early June the Thurso and Cork beacons were being heard in Iceland along with much miscellaneous non-amateur activity in the lower vhf region. By 25 June, when arrangements had been made to turn the Thurso aerial on to TF, the GB3GM beacon laid down an S9 signal there. The auguries were good for a two-way contact, and next day the auto keyer at TF3EA gave S6 signals by meteor scatter at G3JVL. A schedule fixed via 14 MHz with the Icelander produced no immediate result that day, but it did the next: and there was TF3EA pounding out "G3JVL G3JVL..." at RST 569. And so the record was hoisted. Quickly, Mike Walters alerted Constance Hall, G8LY, on the national calling frequency of 70-26 and she too established contact with TF3EA.

At the other end of the 4m axis, way down south in Gib, ZB2BO has a distinct impression that 1969 has produced rather less in the way of DX than 1968 did. Over comparable periods, 4m has been open to the UK on 11 instead of 14 occasions. Last year's contacts on "Four" to the UK were to the extent of 80 per cent on am telephony. This year 75 per cent so far have been on the key.

Both ZB2BO and ZB2BC are now equipped to check the BBC Channel 2 transmitters, which although somewhat lower in frequency than the amateur 4m band nevertheless

FLASHBACK to WOLVERHAMPTON



MIDLANDS VHF CONVENTION, 14 June: Interested inspection by G3BNL (right) of the 2m, 70cm and 23cm receiver described by G3NNG at the afternoon lecture session.



MIDLANDS VHF CONVENTION, 14 June: Eight from (broadly) the north-west, all ardent 70cm men (one wore a badge "Hands off 432"). They are left to right: Bob Brooks of Rhyl, G3UQK, G8BCG, GW8ACG, G8AWS, G8AZO, G3UBX and GW8AHI.



MIDLANDS VHF CONVENTION, 14 June: Four Convention organisers and two columnists. The latter are G3DAH (left), chairman-for-the-day at the Wolverhampton convention, and G5UM (third from left). Second from left, G6FK, one of the Convention Organising Committee, in company with fellow committee-men BRS30717, G8AEV and G3THW.

Missing: Committee-man G6UI.

Four Metres and Down-continued

provide a good guide to its potentialities. An S9 video signal means to the Gibraltarians: "Take a look on 4m, now!"

For much of 1969 the maximum usable frequency noted in Gibraltar has just about reached 70 MHz and has rarely gone higher. Somewhat similar findings come from Ron Ham, BRS15744, in Sussex, whose monitoring of ten metres and down has produced much commercial activity up to about 80 MHz but little beyond it. During the June sporadic-E season there were signals between 30-50 MHz on 16 days but on only eight days did 60-80 MHz come to life.

Since the appearance of last month's story of the HG5AIR breakthrough into the UK via 2m sporadic-E, more information about this Club station has come through from Hungary via HG5CJ. It seems that this station is the old HG5KBP of ten years ago, notable at that time for its feat of working 19 countries on "Two," many of them by meteor scatter (including G3HBW, G3LTF and G5YV).

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Today meteor scatter is a prominent part of activities at HG5AIR. The Lyrids of April this year gave them a contact with SM5BSZ that lasted from 01.30-03.30 GMT on 21 April; during the Piscids of 10 May patience was rewarded after a two hour vigil by the first HG-OZ contact when OZ9PZ was worked on pings and bursts that obligingly lasted for four seconds on occasion.

More recently the sporadic-E opening of 24 May gave the Hungarians that "can't believe our ears" feeling when G3IPV and G8AXC came booming in like locals, and as was reported last month were successfully worked.

Still apropos DX, on now to . . .

The DX Beacons

As has been said times enough, DX is relative. To any 4m operators in South Yorkshire, Caithness or County Cork the GB3SU, GB3GM and EI4RF beacons do not respectively rate as anything but locals. To the 99 per cent remainder of us they represent DX devoutly to be wished.



Two dozen members of the Leicestershire VHF/UHF Group were invited to visit the rooftop radio room of G3SDC, the station belonging to Leicester Polytechnic. Here are seven of them, left to right, G2DCI, G3GXN (the Group's treasurer), G8CNA, member of the Polytechnic staff and operator at G3SDC, G8BBY, one of the best known and most consistent operators on "Two," then G8BNP, hon sec of the Leicester Radio Society, old timer G5VH, and G3ORY, another member of the Polytechnic staff and chief operator of G3SDC.

The Group meets next on 18 September.

So to most 2m men does GB3GW in South Wales, and few can equal the feat of Ron Ham, BRS15744, in logging it day after day at right angles to its north westerly line of shoot. During June, in fact, the Storrington listening post made 90 observations on it (30 days three times a day at 08.00, 13.00 and 20.00 GMT), and detected it on 48 occasions. At best it was RST569 on 13 June; the average was RST539.

What is extraordinary about the new beacon in County Cork is that although it puts out only a modest 2 watts on 70·325 MHz its north headed 3-element beam has fired a signal off the back down as far as ZB2BO in Gibraltar, and as far north west as TF3EA. The 2000 ft site undoubtedly helps. The location is 51 degrees 59' north by 09 degrees 08' west.

As for Iceland itself, Mike Walters, G3JVL, reports that there are high hopes that a TF3VHF beacon may appear on 4m before long, pumping 25 watts into a 4-element aerial made by TF3EA. The photo-electric sensor type keyer designed by G3JVL will be à la ZB2VHF and should reach Iceland any moment now.

Says ZB2BO of the Gibraltar beacon: "The ZB2VHF beacon is at present running reduced power on 50 and 70 MHz and has been reported recently from UK as being weaker than ZB2BC and ZB2BO. Indeed, G8LY worked ZB2BC on 5 July when she could not hear the beacon. So when conditions appear to be favourable we at this end continue to bash out plenty of cw COs."

Nearer home, the once small signal from GB3SU startled everybody on "Four" over the weekend of 12 July by being heard over an enormously increased radius. The explanation was not the good conditions prevailing at the time (or only partly so) but simply because the poorly sited aerial had been removed to a higher spot in another building—and it's still only a dipole. Remember: it is operating on an experimental basis only, to permit the Sheffield University sponsors to gain experience with 24-hour a day beacons.

Later it may be given even more favourable siting; its service area then should truly be nation-wide under any conditions. Check 70:695 MHz to see how it's doing.

The B/C Stations on "Four"

Operators who have wondered at the source of those fm broadcast stations which roar up in the 4m band and disappear as quickly as they came may like to know who they are. The following information about them appears in the 1968 edition of World Radio TV Handbook, published in Denmark and available in many public libraries in the UK. (The 1969 edition is available from RSGB Headquarters price 43s post paid).

70-01 Poland 5kW 70-07 Czechoslovakia 8kW 70-33 Poland 5kW 70·49 Poland 5kW 70·58 Czechoslovakia 4kW 70·67 Poland 5kW

Both Poland and Czechoslovakia have large numbers of fm broadcast stations below our 70 MHz band and a dozen or so above it. Their audibility in the UK is made possible generally by Sporadic-E, sometimes by meteor trail. So far as is known no other European countries have fm services in this particular spectrum.

Specific Activity on "Seventy"

Four members of the north western octet who are pictured on the second page of "Four Metres and Down" this

continued overleaf

Four Metres and Down-continued

month have decided to provide some specific and regular activity on the 70cm band. They are G3UQK and G8BCG of Manchester, Merseyside man G8AWS and GW8AHI of Prestatyn. From now until the end of the Autumn (and may we hope beyond that) they will make a practice of turning their beams south from ten to ten-thirty clock time nightly. The object: to work as much as possible of the west of England, South Wales and perhaps even the Channel Islands. Any operator in these areas who wishes to fix a schedule within the above times should write to one of the quartet (QTHR).

Needless to say, they would cordially welcome any other "seventy centimentals" in the north west who cared to join them on what should be a valuable activity promoting enterprise.

A fifth member in our earlier picture, G8AZO, of Hull, continues his nightly schedule with GW8AHI across country which many might think too difficult for 70cm but which these two have shown isn't: since the series began last October they have missed hardly a contact, sometimes at S9 plus, at other times at a bare S4.

Someone who is well placed to enjoy the northerners' south-directed activity is G3PWU of Reading. He is operational evenings on 433·35 MHz, with a 25 watt driven Three Twenty, and specially asks for reports.

Contesting on "Four"

Noting that the RSGB 70 MHz Portable Contest would be on while he was away holidaying in Kirkcudbrightshire, BRS28005, T. M. Cooper from Storrington in Sussex, took along his transistor converter and EC10 receiver, plus the collapsible 3-element beam and sectional mast. From this sylvan site 1100 ft up he logged most of the GW portables



The 4m Portable Contest as enjoyed by BRS28005 in South West Scotland.

BEACON STATIONS

DEMO	on oraliono	Nominal I	Emis-	Aerial
Call-sign	Location	Frequency	sion	Direction
GB3ANG	Craigowl Hill, Dundee	145.950 MHz	A1	S
GB3CTC	Redruth, Cornwall	144.13 MHz	A1	NE
GB3GW	Swansea	144.250 MHz	A1	ENE
GB3GM	Thurso	144.995 MHz	A1	N/S
GB3GM	Thurso	70.305 MHz	A1	N/S
GB3GEC	W. London	434.000 MHz	F1	N/W
G3SUT	Sutton Coldfield	433.8 MHz	A1	N/SE
GB3SU	Sheffield (temporary location)	70-695 MHz	A1	Omni
GB3SX	Crowborough, Sussex*	28.185 MHz	A1	E/Omni
GB3VHF	Wrotham, Kent	144.500 MHz	F1	North-West
	* Not open	ational		

GB3VHF

The Society's vhf beacon transmitter frequency at Wrotham, Kent, measured by the BBC Frequency Checking Station (nominal frequency 144.50 MHz):

Date	Time	Error	
25 June	1325 GMT	1130 kHz	low
10 July	0850 GMT	-110 kHz	low

ZB2VHF is now operational on 50.092, 70.311 and 145.1298 MHz. Reports to G3JHM.

who were out that day, and of course GM3VPK/P just along the coast at the Mull of Galloway.

Farther west, in Northern Ireland, there was intense activity during the "Four Metre Portable." Hugh Irvine, of Bangor, Co. Down, in putting G13TLT/P on the air, worked no fewer than 40 G1 stations, which, as a proportion of the total licensed amateur population in the province, "... gives some indication of the popularity of 4m over here," as he rightly says. He would like it to be known that from his home station he operates nightly from 10.30 pm clock time using a 20 watt transmitter and a jumbo size ten-element Yagi aerial up at 50 ft.

As for contest operation in general, old timer Eric Johnson, G2HR, of Chingford in Essex, offers a few words of warning which may usefully be read in conjunction with last month's piece headed "Communications Today." With a feeling of foreboding that unethical conduct is creeping in, he remarks: "We don't want hf band spivvery to show up on the 2m band, which has always been such a friendly one," and goes on to add that if a non-existent DX station is called, it is amazing when one goes over to "receive" to find how many people will also be calling the non-existent station!

He voices the timely reminder that although zone jumping is quite ethical, as is co-channelling on to the other man's frequency, it is important to move back to one's home zone afterwards if chaos is to be avoided.

Expeditionaries

Right now—the first week of August—Peter Cleall of Maldon, Essex, is operating as G8AFN/P in Northumberland, as he did last year. He will be on 145.8 MHz at a 1200 ft site.

In late August and early September G8CFF will be going home to Ireland and can offer E12VBB from Counties Tipperary, Kilkenny and Waterford—which of course are Republic of Ireland counties and do not count for the "Four Metres and Down" awards, as has been notified here before. He will be active over VHF/NFD. He invites anyone travelling in S. E. Ireland during the above weeks to drop in for a "cupper" at "Coombe Down," Ballylynch, Carrick-on-Suir, Co. Tipperary.

Listen for GW2CUZ/P from Cardigan every evening 12-19 August. Members wishing to arrange schedules from 21.45 BST onwards on either 2m or 4m should write to Norman Horrocks, 34 Sandbrook Road, Ainsdale, Southport.

Until 10 August a 2m signal signing F0PV may be heard from the Brittany and Normandy direction. It comes from the HW17 rig which G8CEA has taken to France with him. He has a 4-element Yagi and is picking some good sites in order to work back across the Channel on "Two."

With countries hard to collect on 4m for that "Four Metres and Down" 70 MHz certificate, the Blackpool and Fylde Society's expedition to the Isle of Man from 2-8 September will be a welcome one. Look for GD8NJN/P. It will be operative over VHF/NFD. So will GB2GD (the "GB2GC Group"). Says informant G3SEK: "... must mention that GD3FOC has been very helpful in arranging sites for both our groups."

Another difficult one, Hereford on "Four": you may be able to collect it if you work the Southdown ARS Four Metre Group over the weekend of 19-21 September. Five frequencies will be in use, cw and am. Requests for schedules at any time over the period should go to G3VPS, P. J. Lennard, 2 Court Lodge Cottages, Wartling, near Hailsham, Sussex.

XTAL Xchange

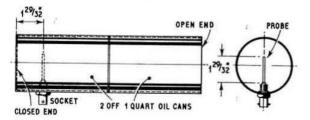
"Having completed the RSGB Snowflake transistor transmitter I am unable to obtain a 24 MHz HC6U overtone crystal suitable for the London area zone." Thus G3WRT. He offers in exchange an 8014-58 and a 200 kHz crystals. Letters to I. J. Dilworth, 4 Bovingdon Heights, Spinfield Lane, Marlow, Bucks.

And way up in Yorkshire Peter Madagan, G3RQZ, urgently needs a crystal for the cw end of 2m. He offers 8036·25, 8040, and 8050·59 (all 10X), and an 8050 kHz (FT243). He could also use a crystal for 145·5-145·8 (any type). Write him at 19 Cavendish Drive, Eldwick, Bingley, Yorks.

Tech Corner

From G3EEZ (Alan Wakeman, Wolverhampton):

The accompanying illustration shows a waveguide feed for the 13cm band. It affords a useful improvement in performance over the disc-dipole feed hitherto used, and is very easy to construct. It is made from two quart oil cans (Castrol XL, Duckhams, etc) 3\(\frac{1}{6}\) inches inside diameter seam



soldered together. The probe has a diameter of $\frac{1}{8}$ in and the socket is a BNC or N-type.

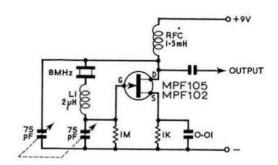
As shown, the device is designed for 2360 MHz but if required for narrow band operation on 2304 MHz the dimension from the closed end to the probe should be increased from the $1\frac{30}{16}$ inches shown to $2\frac{1}{16}$ inches and the probe length to $2\frac{1}{16}$ inches.

The item shown is in effect a coaxial-line-to-waveguide transition and can be used as an aerial by itself, giving 120 degrees included angle of propagation and useful gain over a dipole. Horizontal polarization is achieved with the probe horizontal, and vertical propagation simply by turning the guide through 90 degrees. With the 120 degrees angle it becomes ideal to feed a parabola, the open end being set at the focal point of the parabola. If the guide is shortened it becomes critical to adjust for correct illumination; with the length shown adjustment is quite easy.

The dimensions may seem unusual, but represent a quarter guide wavelength, which of course varies with the diameter of the guide.

From G3UCM (Steve Gall of Coulsdon, Surrey):

Further to the Tech Corner note showing my VXO circuit in the May issue, there might possibly be some interest in an FET version which has now been developed. It is shown herewith.



As in the valve version a 75 plus 75 pF capacitor provides the frequency swing, while the inductor L1 has a value of 2 μ H. The crystal is in the 8 MHz region, and the FET can be an MPF105 or 102.

The output voltage is of the order of 5 volts rms, and the circuit will provide a frequency variation of about 75 to 100 kHz at 2m.

Here and There

"French reciprocal licence valid three months, no fee, issued without question in ten days"—G8CEA, also F0PV.

"I see that the Apollo voice frequency is quoted as 246.8 MHz...somewhere along the line a 4 has become a 9, for both NASA and the magazine *Spaceflight* give it as 296.8"—G3VUD.

"Why in vhf contests do we say kilometres, accent on the second syllable? Ought we to say centimetres? Perhaps we may come to microfarads!"—G2HR.

VHF Personalities: No. 11 Bill Browning, G2AOX, of Hendon, London



Last month's announcement about the formation of AMSAT (the Radio Amateur Satellite Corporation) makes the choice of G2AOX for "VHF Personalities" specially timely. Bill Browning has had much to do with amateur radio satellite activity almost since its conception.

It was when the first "Oscar" satellites were placed into orbit from the United States that the G2AOX imagination was intrigued by the possibilities these devices held for extending amateur vhf horizons. A practical consideration which registered with him straight away was that if a lot of time and frustrating searches for "Oscar" were to be avoided, the course of the satellite would need to be accurately predicted. So began the G2AOX satellite prediction calculations, which were done first of all on a personalinterest basis. It was not long before this work became more widely known among the British vhf fraternity, and by the time "Oscar 4" was encircling the world in 1965-6 Bill Browning found himself the centre of a satellite tracking service much in demand by would-be HI-searchers (the simple telemetry character of H and I being the radiated signal from the device).

G2AOX was well equipped to provide this service by reason of the fact that being retired he had time available to undertake the work. An old injury received during his motor racing career 39 years ago, and spinal arthritis, had compelled him to accept retirement rather earlier than he would have liked (he is now in his upper sixties).

Thanks to the regular flow of "Oscar" orbital predictions that came from the Hendon home of G2AOX many British amateurs were able to make full use of the satellites during their various passages over the UK. Many were also on his list to receive regular postal information about further projected "Oscar" activities.

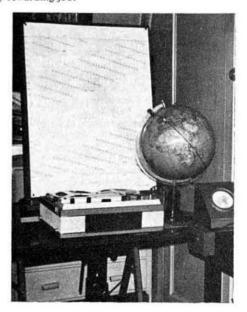
In one of the accompanying illustrations may be seen the set-up at the vhf end of the G2AOX radio room at the time when Bill Browning was copying "Oscar 3." On the table is the audio signal generator for resolving the telemetry, and between this and the globe is the beam indicator. Another aerial indicator is on the left of the top shelf. The main "Oscar" plot is on the board; behind is a Pye base station receiver which fed a tape recorder all the time. Two other receivers were used for resolving telemetry, providing predic-

tion fixes and listening for DX (" No time for trying for DX mvself" remarks G2AOX).

In the other illustration all the equipment at the left hand end is for 2m and 4m. At the right hand end are the ssb and am rigs. The whole of the top shelf takes test gear. There are two systems for 2m and another two for 4m, enabling some complex duplex operation to be initiated if required.

G2AOX emphasizes that although the station as shown in the illustrations has a rather permanent look about it, changes are being made constantly. A picture taken this week could well be out of date next.

Having functioned for many years as "Oscar" anchor man Bill Browning now finds himself filling the same role for the new AMSAT organization. He brings to the job years of experience built up in the "Oscar" days. There could not be a better man for this voluntary, demanding but very rewarding job.



G2HKU, GW3AX, G3HB, G3AAE, G3IGW, G3TZU, GM3VAA, G3VIE, G3WNT, G3YHB, G8VG, BRS2098, BRS25429, BRS26870, BRS30386, BRS30694, BRS31164, BRS31172, A5390, A5662, A5812, A6098, A6148, A6167, A6248, and A6254.

Stations listed in italics were on cw, the rest ssb (unless otherwise stated).

3·5 MHz. 03.00 LU8DCA, WB2NCS/VP9. 04.00 K41A/KC4, YV4QG. 20.00 9K2BL. 21.00 FL8MB, MP4TAF, VS9MB. 22.00 CR6IV, EL8J, PY7ASQ, PY0RE, VP8s FL, KO, ZC4MO, ZS6AK, 5A2TR, 5Z4KL, 9J2s BR, DT. 23.00 PY7AWD (Fernando de Noronha), ZD9BM, 8P6AH, 9Q5EP.

7 MHz. 03.00 LU8ACC. 06.00 K4IA/KC4. 20.00 OD5FA. 21.00 PY0AM (QSL via PY1AM), VS5MC, 3V8AC. 22.00 CX2AM. 23.00 G3BHT/LX, PY0RE, ZP5CF, 5A1TN. 24.00 CE6DP, HI3MPW, 9Y4KR.

14 MHz. 01.00 9N1MM. 05.00 HR1AA, TI8WPE, XPIAA. 06.00 KL7MF, VR6TC, YK1AA, 5V4DB. 07.00 FO8s AA, BY, HK0BIS, VK9XI, YS1BB. 08.00 *K41A/KC4, KH6AG*, 9H1M (Gozo). 09.00 FK8BK. 11.00 KX6BU, VK9KS. 15.00 VS5MC. 16.00 AP2MR. 20.00 FL8MB, *KL7MF, VQ8CR*. 22.00 VQ9/A/D. 23.00 CR3KD, JW1CI, 6 Y55R, 9K2AA (PO Box 4743, Kuwait).

21 MHz. 01.00 PJ2VD, VK5MS, VP2MA. 09.00 FO8BO, KH6CD, UA1KAE (Antarctica). 10.00 TJ1JJ, VQ8CR. 11.00 AP2MR, KL7USA, 9J4BB, 9N1MM. 12.00 OY9LV, 9L1JP (am) 15.00 VS5MC, VS6AA, 5R8AX, 9M2DQ. 16.00 VS9MB. 17.00 HC2HM, JT1AK, KH6BB, KR6JV, PY0RE, VK9XI, VP8KO, YB1AK. 18.00 CE0AE, HR1KS, HS3ML, VQ9/A/D, VQ9/A/BC etc., 3V8AC, 4S7MB, 5H3MA. 19.00 KH6COB, MP4TAF, ZD8AB. 20.00 HK0BKW, OA4MS, PY0RE. 21.00 CE8AA, FG7EB, HM1DH, VP2AW. 22.00 CE7DW (am), K4IA/KC4, KR6USA. 23.00 FY7YN, OA8AO.

28 MHz. 12.00 A2CAQ, O Y2Z. 14.00 VQ9EP, 5R8AX. 16.00 ZP5CN, 7P8AB. 17.00 JX4EJ, ZD9BM, ZE1AA, 5H3MA. 18.00 TU2CF, VP8KF, VQ9/A/D, VQ9/A/BR, 9G1GE, 19.00 KV4AD, VQ9/A/EC. 20.00 LG5LG.

Many thanks to all correspondents and especially to the following for permission to reproduce items from their publications: The DX'ers Magazine (W4BPD), Florida DX Report (K4GRD), CQ DX (ARI), NARS Newsletter (5N2-AAF), Long Skip (VE3HJ), QUAX (SM4DXL), On the Air (ON4AD), the West Coast DX Bulletin (WA6AUD), DX'press (PA0TO), DX News Sheet (Geoff Watts), and the Ex-G Radio Club Bulletin (W3HOO).

Please send all items for October issue to reach G3FKM no later than 2 September, and by 14 October for the November issue.

Bridge Balun for the 80 and 40 Metre Bands

At many stations dipole aerials are used for these bands with transmitters having a low impedance unbalanced output. It is not advisable to feed a balanced aerial like a dipole with an unbalanced line such as a coaxial cable. Apart from the weight of the coaxial cable at the middle of a dipole there is also the cost and possible tvi being caused by radiation from the coaxial outer sheathing. The alternative is to use an unbalance to balance tuning unit or some form of balun.

A bridge balun is cheap and easy to make and does not need tuning when changing bands. Coaxial cable is used between the transmitter and the balun and light 75 ohm twin feeder can then be used between the balun and the dipole aerial. The impedance of 80m and 40m dipoles at the sort of heights which can be used at most stations will vary between 50 and 90 ohms which will not present too serious a mismatch at these frequencies when 75 ohm flat twin is used. What is needed then is a broad band balun with an input/output ratio of 1:1 and of sufficient band width to cover 3·5 to 7·1 MHz.

A simple bridge balun can easily be made to do just this and the circuit is shown in Fig. 1. A suggested physical layout is shown in Fig. 2.

By John C. GRAHAM, G3TR*

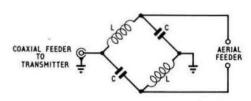


Fig 1. Circuit diagram of the Bridge Balun. L = 27 turns, 18 gauge en wire, close wound on ½ in former, C = 470pF, 500 V silver mica for powers up to 100w.

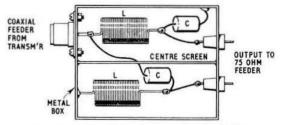


Fig 2. Component layout as used by the Author.

^{*} The Willows, Church Road, Lowfield Heath, Crawley, Sussex,

SOCIETY AFFAIRS

AND

NEWS SUPPLEMENT



Paul Barassano, I1RBJ DX Manager of the Italian National Society ARI chatting with Clive Woodley, G3XPU a new member of our Editorial Staff.

A Brief Report of the Council Meeting held at Society Headquarters on Friday, 13 June, 1969

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

Apologies for absence were received from Messrs B. Armstrong,

J. Etherington, E. G. Ingram and D. M. Thomas.

Membership and Affiliation

Council resolved:

- (i) To elect 127 Corporate Members and 43 Associate Members.
- (ii) To grant Corporate membership to 11 Associate Members.
 (iii) To waive the subscriptions of six members due to blindness or other disability.

The following applications for affiliation were received and approved by Council.

Wirral DX Association. Sec: J. A. Share, G3OKA.

Radio and Electronics Society, University of Wales. Sec. I. G. Medlicott.

Sully and District Short Wave Club, Sec: J. Sugden, GW3SLA.

Radio Communication

A discussion took place on the content of Radio Communication.

A number of criticisms were noted.

Council was of the opinion that Radio Communication was pleasing most of the members most of the time.

Metrication

Mr Stevens reported on the introduction of metrics to Radio Communication. It was agreed that the matter be dealt with by the Technical Committee.

REF Meeting at Dijon

The President reported on his visit, at short notice, to the Dijon Meeting on 8 June. He had addressed the Meeting and conveyed greetings and good wishes from RSGB to REF. Representatives from DARC and the Presidents of UBA and USKA had attended the Meeting.

Pirate Operation

The General Manager reported that he had been unable to obtain copies of Hansard in order to confirm statements reported to have been made in Parliament on pirate operation. It was expected that copies would be available after 18 July.

Stratford-upon-Avon Celebrations

Council was pleased to approve the acceptance of the Stratfordupon-Avon Amateur Radio Club's invitation to the President to open their station to be set up in conjunction with the "Seven Hundred Years Anniversary" of the town on 11 July.

Minutes of Committees

Council approved the adoption of the Minutes of various Committees as presented to Council.

Recommendations of Committees

Council approved the Contest Awards as recommended by the VHF and HF Contests Committees.

Council was in session for $4\frac{1}{2}$ hours.

Special Event Stations

Edinburgh International Festival

The Lothians Radio Society will operate a demonstration amateur radio station (call-sign GB3EIF) during the second and third weeks of the Edinburgh International Festival 1969 (1 to 12 September, 1969 inclusive).

The station will be located at the Heriot-Watt University, Mountbatten Building, Grassmarket, Edinburgh, 1 and will be operational on the hf bands using ssb equipment. An additional station may also be operational on 144 MHz. A special QSL card will be issued to confirm all contacts and there will also be an exhibition of members' equipment and a demonstration of closed circuit television equipment

Reports from listeners will be acknowledged by QSL card via the RSGB Bureau.

High Wycombe

GB3WRA will be operated by a group of local radio amateurs from the annual Wycombe show on the Rye, High Wycombe, Bucks, on Saturday, 6 September. Operation will be on all bands from 160m to 4m using am, ssb and cw. Visiting amateurs will be welcome. Further information from G3FSN, 70 Hughenden Avenue, High Wycombe, Bucks.

South Shields

GB3SFS will put the South Shields Flower Show on the air during the weekend of 8, 9 and 10 August. The show will be held in the Bents Park, Coast Road, South Shields. Operation will be on all bands from 160m to 2m using ssb on the hf bands and am on 2m.

Swindon Mobile Rally

This rally, largest in the South West, will take place on 24 August in the grounds of Lydiard House (off the A420 4 miles west of Swindon). Routes to Lydiard will be well marked. There will be talk-in stations on 160m and 2m with a prize on each band for the furthest talk-in. There will be competitions, raffles and side-shows as well as several commercial stands. In case of rain all stalls will be inside a giant marquee. Light refreshments will be available. Car parking space is adequate. Lydiard House will be open to the public. It is also hoped to have a bell ringing display (church bells not decibels!).

Torbay Mobile Rally

This rally will be held on Sunday, 24 August at the Newton Abbot Recreation Ground. (Head for the gas holders.) Talk-in stations on 160m and 2m from 10.30 am, signing G3NJA/A. Refreshments will be obtainable on the ground and various entertainments will be offered to the XYL's and jnr ops.

August 144 MHz SSB Contest

Owing to an error on the part of the Secretary of the VHF Contests Committee, the rules for this event were not published in the June issue of Radio Communication as had been intended. Information was sent to the entrants in the January SSB contest and details were also given on GB2RS. Entries should be sent to G2XV at 165 Cambridge Road, Great Shelford, Cambridge. It was intended that the rules should be the same as those for the January SSB Contest.

@bituaries

F. Richardson, G3LBR

It is with great regret that we mourn the loss of Frank Richardson, G3LBR, who collapsed and died on Friday, 6 June. A lover of the out-of-doors and the countryside, Frank was a keen mobile operator and his cheerful greetings will long be missed on top band. He operated other bands as well and had a happy turn of phrase. Frank leaves his wife Helen to whom he was devoted and his daughter Cynthia. He had been retired for a year from his work on the electrical installations at a chemical plant. A. E. M.

W. K. Miller, G6QF

W. K. Miller, G6OF passed away peacefully on 15 June, just after his sixtleth birthday, after an illness of three months. He leaves a son, Geoffrey and wife. He was a very keen experimental amateur and always ready to help others in amateur radio. He will be greatly missed by us all. W. A. G.

J. E. Carkes, G3IYK

With deepest sorrow we record the death of James Edwin Carkes, G3IYK, who was most tragically killed, aged 47, when the glider he was piloting crashed near Evesham on 8 June.

His cheery voice and happy disposition will be sadly missed by his many friends and members of the Stourbridge and District Amateur Radio Society. Memories of his associations with past field days will long be with us. Jim leaves a widow, Elaine, a daughter and two sons to whom we extend our deepest sympathies.

J. Cookson, BEM, G6KK

It is with regret that we have to report the death of Jack Cookson, BEM, G6KK, on 24 June. He served in the RNAS during the first world war where his interest in wireless was generated. He was a founder member of RAOTA and was active from the 440m days and he helped to pioneer the short waves. Since World War 2, his chief interest was in top band and latterly in 2m. The cremation took place at Blackpool Crematorium and the amateur fraternity was represented by G2NY, G3FIF and G3GEE. Our sympathy is extended to his widow and daughter.

J. N. C. B./H. G. N.

E. G. Bright, G3JW
It is with sorrow that we record the death of Ted Bright, on 28 May, 1969, at the age of 65.

He had suffered ill health for many years since his retirement from the Post Office but maintained his interest in amateur radio and occasionally was active on the bands until very recently. To the G4's and many GC's he will be remembered as their QSL manager in the 1950's.

Ted was first licenced in Brentwood and after the war settled in Exeter where, with his son, now G3TJW, was very active and well known on the DX bands.

He was an amateur in the finest tradition and will be sadly missed by a large number of his friends in the amateur world. To his family we extend our deepest sympathy.

J. D. F

J. H. McEwing, GM2DPW

It is with regret that we report the death of J. H. "Curly" McEwing, GM2DPW. He will be sadly missed by amateurs in Scotland and many overseas. He had been very active on 2m 15m and 20m until a severe heart attack which took him from us on 19 November, 1968.

Our sympathies go to his son and daughter and other surviving relatives. W. J. M.

C. S. Lewis, GM6UV

It is with sorrow that we report the recent passing of C. S. "Vic" Lewis, GM6UV of 6 Belvedere Crescent, Aberdeen. He was an old-timer with a variety of interests and he will be missed at the Aberdeen Amateur Radio Society Club-A. W. S.

Looking Ahead

13-14 September-IARC Convention, Geneva.

1-4 October-RSGB International Radio Engineering and Communications Exhibition, Royal Horticultural Society's New Hall, Greycoat Street, Westminster, SW1, 10 a.m. to 9 p.m.

Contests

10 August-August 432 MHz Open Contest (page 493, July).

17 August—August 70 MHz CW Contest (page 496, July).

6-7 September—VHF National Field Day* (page 276, April). 14 September—3:5 MHz Field Day (page 572, August).

21 September—Rugby D/F National Final.

21 September-September 144 MHz Fixed Station Contest.

5 October—October 1296 MHz Open Contest. 11-12 October—28 MHz Telephony Contest (page 350, May).

25-26 October—7 MHz CW Contest (page 421, June). 25-26 October—October CQ WW DX Contest—Phone. 3 November—November 144 MHz SSB Contest.

8-9 November-7 MHz Contest-Phone (page 421, June).

15-16 November—November 1:8 MHz Contest. 29-30 November—November CQ WW DX Contest—CW.

6-7 December-Tops CW Club 80m Contest

7 December-December 70 MHz CW Contest. * To coincide with an IARU Region 1 Contest.

Mobile Rallies

10 August-RSGB National Mobile Rally, Woburn Abbey.

17 August—Derby Mobile Radio Rally at Rykneld Schools, Bedford Street, Derby, Talk-in stations-G3ERD/A 160m and G2DJ/A 2 and 4m. A first class programme has been arranged to uphold the tradition of this great annual event. There will be a mammoth prize draw with up to 40 prizes, including a deep-freeze cabinet that will take up to 4 cu ft of your own frozen food. Also the usual Derby Junk Sale, children's games, model exhibits, trade stands, model aircraft flying, etc. Musical entertainment will be supplied by the Riddings, Somercotes and Leabrooks Silver Prize Band. There will be numerous surprise items and competitions. Refreshments, minerals and ice-cream at the usual reasonable charges, will be available. Admission and parking is free. Come early to avoid the after-dinner congestion.

Any further details from: Tom Darn, G3FGY, 1 Sandham Lane, Ripley, Derbys, DE5 3HE—Tel. Ripley 2902.

24 August-Torbay ARS Mobile Rally.

24 August-Swindon Mobile Rally organized by the Swindon and District Amateur Radio Society at Lydiard Park, near Swindon, Wilts. As last year a large marquee will house all trade stands and allow cover for all in case of rain. Refreshments will be liquid only. Talk-in on 160m callsigns G3WEF/A and 2m G3LTZ A. Contest for best installations, furthest distance worked and travelled. Lucky programmes, children's raffles and side shows. Signposting will be on all major roads. Organizing member: G3LTZ, 3 Westhill Close, Highworth, Swindon, Wilts.

24 August—Torbay Mobile Rally, Recreation Ground, Marsh Road, Newton Abbot, next to the SW Gas Board Gas Holders. Talk-in stations on 160 metres and 2 metres, both on the call G3NJA from 10.30 BST. Refreshments will be on sale. Entertainments for XYL's and Junior Ops. Details from Derek Webber, G3HLJ.

31 August-Bromsgrove and District ARC Mobile Picnic. Call G3VGG, at Hartlebury Castle near Kidderminster. Talk-in on 2m and top band. Details from Hon Sec 44 Hazelton Road, Marlbrook, Bromsgrove, Worcs.

31 August-Preston Amateur Radio Society Mobile Rally at

Kimberley Barracks, Deepdale Road, Preston.

28 September—Harlow Mobile Rally, Magdalen Laver Village Hall

near Harlow, east of the A11. Open from 10 a.m. Talk-in station on 160m and 2m. Further details from: Hon Sec B. G. King, G8CHC, 36 Upper Park, Little Parndon, Harlow, Essex. Harlow 20812.

October-RSGB Scottish Mobile Rally, Beach Ballroom, Aberdeen. Details from GM3AEL

12 October—Peterborough Mobile Rally, starting at 2 pm, at Walton County School, Mounsteven Road (off the A15, Lincoln Road), Peterborough. Talk-in stations on Top Band 2 and 4m plus HF DX. Free admission, parking and entertainment and refreshments will be available on the site. There is plenty of indoor accommodation, even if it rains. Further information from Hon Sec D. Byrne, G3KPO, Jersey House, Eye (351), Peterborough.

RADIO AMATEUR MERGENGY NETWORK

By S. W. LAW, G3PAZ*

T is sometimes said that one cannot see the wood for the trees; the application to RAEN in this instance is that many wellintentioned Groups spend a great deal of time in perfecting their message-passing technique (and rightly so!) but quite overlook the problem of how the messages are to be handled. Now, before the brickbats start to fly, let us see what we mean by this. Regional dialects aside, one man's everyday conversation is complete jargon to another (What is a megabit store, Old Man?). As messagepassers we should be able to cope with the odd medical terms without turning a hair; our NATO phonetics take care of that. But what of the busy operator who has only time to get the message down correctly? Somehow the message must be passed along to the correct person and a record kept so that a subsequent reference to the contents may be understood. Signals Office Procedure is well understood by many people who have no connection with our own hobby, and we should be only too pleased to enlist their help and try to understand the problems involved. In turn we should try to get across the essentials of our techniques so that a smooth dovetailing of effort results in an efficient flow of information. It is not always safe to assume that because a certain organization has been in being for many years with proved efficiency they will automatically fit in at a moments notice. This was exemplified during a recent exercise when a fine body of young men were asked to handle RAEN messages and found that their traditional messagehandling methods were so widely different from ours that a bottleneck soon built up. Naturally, this will be ironed out in due course but it does show the need for a lot of spade-work outside the sphere of pure radio-communication. Seek out the willing helpers and get together.

Down South

Things seem to be quite lively from the Thames to the South Coast where there is an excellent spirit of liaison between the Groups and the User Services. The latest meeting at the time of writing was held at the British Red Cross HQ at Crawley in Sussex on 6 July. All three User Services were represented and Controllers and members from Surrey, Lewisham (GLC), Kent and the Sussex Groups made up a goodly gathering. The meeting was opened by Inspector Sherwood, Communications Officer Police HQ Lewes, Sussex who commented on future exercise procedure. Questions were put by Mrs Hastings, BRCS Director for Sussex and some interesting points were raised. The Chair was then taken by Peter Balestrini G3BPT, Chairman RAEN Committee assisted by Eric Yeomanson in his treble capacity of RSGB Council, RAEN Committee and member of Lewisham GLC Group. Lengthy discussions took place, leavened by the excellent refreshments lavishly prepared and served by local BRCS members and the meeting finally broke up at about 1800.

Quod Erat Demonstrandum

Those who visited the excellent Mobile Rally at Maidstone, Kent in June were no doubt impressed by the very slick talk-in operation. Was it only coincidence that members of the local RAEN Group were in evidence in the shack?

RAEN members who may chance to holiday in the Channel Islands may be assured of a warm and hearty welcome from the Jersey amateurs who are trying to solve the special problems of emergency operation in the Island.

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

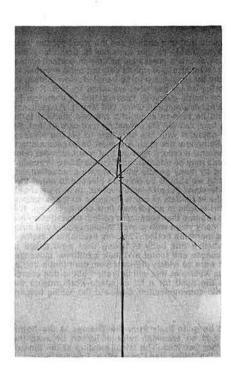
Honorary Registrations Secretary:

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

Honorary Secretary, RAEN Committee:

Mr. E. R. L. Bassett, 57 Upper St. Helens Road, Hedge End, Southampton, SO3 4LG.

NFD 1969—RESULTS



NFD Trophy

Guildford DRS 2375 points

Gravesend Trophy

Cannock Chase ARS 2365 points

Bristol Trophy

Durham City ARS 1371 points

Frank Hoosen (G3YF) Memorial Trophy

Maesteg Contest Group 1063 points

Scottish NFD Trophy

Glasgow City Group 1261 points

Leading scores on Individual Bands

1.8 MHz Coventry ARS	214 points
3.5 MHz Cambridge DARC	671 points
7 MHz Cannock Chase ARS	652 points
14 MHz Maesteg Contest Group	1063 points
21 MHz Cannock Chase ARS	443 points
28 MHz Croydon RSGB Group/SRCC	187 points

Overseas Station giving most Points to NFD Entrants

5B4FD/P Nicosia, Cyprus.

FROM all over the country the weather report was "marvellous" for this year's NFD; many groups seemed to think that the RSGB deserved some credit for this, but we must modestly decline!

This year the three members of the HF Contests Committee who checked NFD were on to a real cliffhanger right from the start, with a battle for the NFD trophy which was only resolved after

extremely careful re-checking.

As a result Guildford DRS win with a score of 2375, only ten points in front of Gravesend trophy winners Cannock Chase ARS with 2365. The fact that the first five groups in the two station table have over 2000 points helps to emphasize the general trend of increasing scores over the past few years.

Durham City put in a tremendous effort, improving on their 1968 21st place to win the Bristol trophy with a score of 1371 points. "Runners-up" were the Billericay group with 1317 points.

The Scottish NFD trophy has been won by the Glasgow City group with 1261 points; again, it is of interest to note that last year's winners scored 1074 points.

1-8 MHz

62 logs were received for 160m, and the checkers had quite a job to resolve the Band leader, Coventry ARS with 214 points.

G2ASF/P used four operators during two major operating sessions, 17.00-01.00 and 07.20-17.00, to make 125 contacts during their "one-band" stand. The aerial was a dipole, driven by a Codar AT5; an EC10 and transistor invertors for the AT5 completed the station, operated from 12V batteries. No real DX worked, just everything that moved on 160m in G, GD, GM and GW.

The second highest checked score of 210 points was keyed by the paragraphs of the Station of the S

six operators at G3DBY/P from Chorley in Lancashire, with 102

contacts over the contest period. Again, a dipole aerial, but supplemented by a long wire. The transmitter was home constructed with a 5763 PA; and the RX, in their own words, a "very much modified PCR."

Third in line with a checked score of 209, were East Molesey (G8SM/P) with 76 contacts made by two operators between 22.15 and 02.25, plus four more QSO's at odd times during Sunday. dipole driven by a modified KW2000 made up the station, operated from Kempton Park Racecourse.

Conditions on 160m appeared to be "only fair"; although many stations worked PA0 and a few OK's, contacts were mainly "inter-G".

We reproduce below a vitriolic comment from the Guildford log: "Our activity on this band—and enjoyment—spoiled as usual by the loutish behaviour of Gxxx."

It appears that Guildford felt they were being "blocked" by another local station. We cannot comment, other than to invite cap-wearers to check for size!

Everybody was on 80, and we had 102 entries to prove it! Once again the single-band-entry stations fought out the band award. Cambridge (G3IIT/P) made 254 contacts resulting in a checked score of 671 points. Seven operators drove the modified SB101 and inverted V aerial. No DX, only Europeans, gave Cambridge a 200 point lead over their nearest rivals at Loughton.

G3TUM/P scored 466 points with 192 contacts made by six operators. A home constructed TX and an HRO used with a dipole and inverted V aerials formed an effective combination together, we suspect, with a site behind the "Rainbow and Dove"

TWO STATION ENTRIES

Posn	Band Group	Notes	Group	A Station Call	B Station Call	1·8 MHz	3·5 MHz	7·0 MHz	14·0 MHz	21 0 MHz	28·0 MHz	Total
1	a		Guildford DRS	G8GS	G3KMO	164	385	395	1034	360	37	2375
2	а		Cannock Chase ARS	G4CP	G3ABG	137	409	652	668	443	56	2365
3	a		Croydon RSGB Group/SRCC	G3BFP	G6LX	163	403	485	725	356	187	2319
4	a		Maesteg Contest Group	GW3LEW	GW3SSK	175	199	515	1063	333	12	2297
5	b		South Birmingham RS	G3OHM	G3LNS	122	412	437	724	325	62	2082
6	а		Oxford DARS	G2DU	G8PX	193	360	564	542	199	40	1898
7	e		Ariel Radio Group (BBC)	G3GDT	G5SX	141	345	463	569	297	32	1847
8	a		Crawley ARC	G2DP	G3TR	159	404	353	550	234	47	1747
9	a		Leyland Hundred ARG	G3XII	G3GGS	160	270	424	512	267	58	1691
10	h		Bristol	G2ATU	G4UZ	140	303	433	616	192	6	1690
11	a		Torbay ARS	G3LHJ	G3NJA	203	331	365	429	231	55	1614
12	C		East Molesey (TVARTS)	G8SM	G2NH	209	400	341	425	137	101	1613
13	a		Radio Society of Harrow	G3EFX	G3HBR	145	370	355	457	145	44	1516
14	a		Wirral ARS	G3NWR	G2AMV	161	273	244	476	227	18	1399
15	a		Sutton and Cheam RS	G2XP	G8DF	150	350	456	228	72	20	1276
16	a	+*	Weston-s-Mare/RAF Locking	G5DV	G8FC	171	323	324	312	132	_	1262
17	f		Glasgow City Group	GM3SSB	GM3PHB	122	77	98	561	273	130	1261
18	ſ		Pontypool	GW3RNH	GW2BG	161	258	436	254	_	12	1121
19	a		Aberdeen ARS	GM8AT	GM3BSQ	95	84	201	521	211	_	1112
20	а		Chester DARS	G3GIZ	G3EWZ	136	269	276	410	_	3	1094
21	a		Dundee Group	GM4HR	GM3WPA	21	_	358	355	300	-	1034
22	a		Grimsby ARS	G4GX	G2AJB	161	301	278	169	76	39	1024
23	ï		Southampton RSGB Group	G3WZ	G3SOU	144	266	333	124	118	12	997
24	a		Chiltern ARC	G3BZM	G3BXS	143	273	124	284	43	118	985
25	a		Moray Firth ARS	GM3UKG	GM3TKV	95	186	173	258	175	46	933
26	d		Portsmouth DRS	G6NZ	G3TVI	196	304	268	127	13	-	908
27	g		Clifton ARS	G3GHN	G3JKY	128	386	181	64	119	19	897
28	a		Addiscombe ARC	G3UFY	G3VYI	177	282	267	103	37	20	886
29	a		Purley DRC	G3WRR	G3TWJ	133	331	150	151	47	45	857
30	a		Lothians RS	GM3HAM	GM3UM	80	192	174	297	69	10	822
31	a		Derby DARS	G3ERD	G2DJ	208	358	48	168	3	14	799
32	a		Ayrshire ARG	GM3NPR	GM3NZN	94	147	153	240	164	_	798
33	b		Eccles DRC	G3GXI	G8VF	3	193	280	20	6	-	502
34	C		Wessex ARG	G3WZP	G3WGV	74	118	_	200	_	-	392

Notes: Band Group: a, 1-8, 7-0, 21; b, 1-8, 14-0, 21-0; c, 1-8, 3-5, 28-0; d, 1-8, 7-0, 28-0; e, 1-8, 3-5, 7-0; f, 1-8, 14-0, 28-0; g, 1-8, 21-0, 28-0; h, 1-8, 3-5, 21-0; f, 1-8, 3-5, 14-0.

near Harlow. Loughton lost nearly 1i hours during the early part of the contest; the log entry at 19.40 says "Inspection by RSGB Inspector followed by mysterious explosion in transmitter!" No, Gentlemen, the HF Contests Committee did not authorize sabotage.

Billericay found time to make 158 contacts in six sessions; over half of these being made between the start of the contest and 20.20. Four operators used the modified HW100 transceiver and inverted Vee aerial. Contacts were again G/Europe, although W3XY was worked at 01.46 as the sole DX contact.

worked at 01.46 as the sole DX contact.

Conditions? "Good for Europe" with the very occasional W; 9H1BL appears in the logs of those stations who dug below the first three layers!

7 MHz

"Forty" produced 88 logs from contestants this year; an indication of the high level of activity on the band during NFD. As usual the going was fast and furious; the large numbers of European portables enabled the band leaders to score 60-70 points an hour over long periods. Very little appears to have been worked outside of Europe, except for the occasional North American.

Cannock Chase (G4CP/P) take the 1969 band leaders award with a score of 652 points from 210 contacts. Their equipment was a modified Vespa, a Drake 2B, and two half-wave dipoles running NE/SW and NW/SE. A quick analysis of their log reveals that they worked 80 British Isles portables, 85 European portables, and 9 North Americans. Cannock Chase were on 40m during the following periods: 19.40-20.40; 21.36-22.30; 23.47-07.48; 08.57-09.41; 10.36-13.45; 15.45-16.14.

Second place is taken by Billericay (G3OIT/P) who made 186

QSOs worth 580 points. They had a modified HW100 transceiver, and a sloping dipole. Oxford (G2DU/P) are in third place with 564 points: they had a home-made transmitter and receiver, a dipole, and a 264 ft centre-fed aerial. Maesteg (GW3LEW/P) take fourth place with a score of 515 points: their equipment was a Vespa with a 2E26 pa, an Eddystone EA12, a 67 ft Zepp, and a 267 ft Zepp.

14 MHz

A high level of activity and a good transatlantic path has produced record breaking scores on 20m this year. After a good start with many European portables in evidence, the band opened to the States at around 20.00. Although the path was rather patchy for the first couple of hours, the band eventually opened up and during the early hours of Sunday morning the leading stations worked Ws at around 25-30 contacts an hour. The band closed to North America at about 06.00, and soon after a few VKs appeared, but then the Europeans began to dominate the scene and this state of affairs lasted until the afternoon when the stronger North Americans reappeared.

The band leader, and winner of the Frank Hoosen (G3YF) Memorial Trophy, is the Maesteg Group (GW3SSK/P) who made 338 contacts to produce the highest score yet gained on 20m-1063 points. Apart from a session on 80m between 06.40 and 11.15, Maesteg's operators—GW3BQY, GW3MOP, and GW3SSK—hammered away on 20m for the whole of the contest. They used a modified Vanguard with a 2E26 pa, an HQ170A, a cubical quad, and two dipoles.

Close behind comes Guildford (G3KMO/P) with 1034 points from 317 QSOs. A KW Vespa with a 2E26 pa, a home-brew receiver, Continued on page 566.

^{*} Indicates inspection carried out.

⁺ Late entry.

SINGLE STATION ENTRIES

				1.8	3.5	7.0	14-0	21.0	28.0	Total
Posn	Note		Call-sign	MHz	MHz	MHz	MHz	MHz	MHz	4074
1	-	Durham City ARS	G3TAK	-	277	450	644	_		1371
2	2	Billericay	G3OIT	_	419	580	318			1317
3	8	Stourbridge DARS	G8GF	-	362	427	413	202	-	1202
4		Cardiff RCC	GW3XEJ	_	196	348	613	_	-	1157
5	•	Reigate ATS	G3REI	-	366	396	374	- 500	-	1136
6-{	•	Leicester RS	G3LRS	_	416	453		206	-	1075
	*	Stockport RS	G3NBN	-	314	379	382	-		1075
8	*	Spen Valley ARS	G6LD	-	355	226	465		-	1046
9		West Kent ARS	G3WKS	-	329	364	276	-	_	969
10	*:	Maidstone YMCA ARS	G3TRF	_	209	488	262	-	-	959
11		Cheltenham	G3CGD	205	345	398	_			948
12	*	Wolverton DRC	G4CK	_	286	372	247		_	905
13		Blackpool and Fylde	G8GG	_	362	-	310	224		896
14		Verulam ARC	G3VER	180	352	358			-	890
15		East Barnet ARCC	G3RPB	-	285	_	391	197	_	873
16		Caterham	G2AJS	-	265	371	231	_	-	867
17		Bangor DARS	GI3XRQ	_	204	240	416	_		860
18		Norwood and S London Group	G3IIR		287	287	281	_		855
19		Belfast and District	GI3PSO		197	130	525	100		852
20	4	North Riding ARG	G2KK	137	340	370	J23	- 22		847
21	7.7	Gloucester	G3MA	202	330	308	_	200	1500	840
22		Cornish ARC	G3OHB	_	200	225	410	_	_	835
23		Barnsley DARC	G5IV	_	402	413				815
23			G3VW		280	344	185	_		809
24		Edgware	G3KAA	-	312	318			777	809
		Luton ARG		400			179	-	7	
26		Reading ARC	G3PGM	123	254	430		-	-	807
27		Chelmsford ARS	G4VF		264	273	267	-	-	804
28		East Surrey Contest Group	G3OVL	_	366	356	53	-	170	775
29		Stevenage DARS	G3SAD	- 	237	285	230		4.75	752
30	5429	Glenrothes ARC	GM3PFQ	203	3 	159	381	_		743
31	•	Chingford RSGB Group	G4GA	74	377	288	_	_	-	739
32		Cheltenham ARC	G5BK	-	282	274	182	_		738
33		Scarborough ARS	G4BP	_	162	414	131	_	_	707
34		Nottingham ARC	G3EKW	_	320	320	66	-	777	706
35		Cambridge DARC	G3IIT	-	671	2-2	33 3			671
36		Shefford DRS	G3FJE	154	294	221	2-2			669
37		Liverpool DARS	G3AHD	200	261	153	252	_		666
38	+*	Cray Valley RS	G3RCV	_	281	237	131	7	3.50	649
39		Salisbury	G3FKF	166	345	127	(V=1)	_	255	638
40		Worcester DARC	G3GJL		224	260	153		-	637
41		Nailsworth DARS	G3VVV	140	310	_	169	99-09		619
42		Bradford RS	G3NN	194	191	219	_	-		604
43		Southgate RC	G5FA	-	365	195	38	-	_	598
44	+	Chippenham DARC	G3VRE	_	319	-	115	158		592
45	41	Conway Valley ARC	GW3RUA	125	202	242			===	569
40		Connay valley And	CHUNCA	120	LUL	242		-		303

and a 4 wavelengths per leg rhombic beamed on the USA is their recipe for success—ably administered by G3KMO and G3SYM. Guildford were on the band during the following periods: 18.20-19.10:00.212.26: and 13.08.17.00.

19.10; 00.02-12.26; and 13.08-17.00.

The Croydon RSGB Group/SRCC (G6LX/P) take third place with 725 points: they used a home-brew transmitter and receiver, a quad, a dipole, and a 10 wavelengths long wire. Very close behind is the South Birmingham Radio Society (G30HM/P) who scored 724 points. They had a modified KW2000 and a quad.

21 MHz

Cannock Chase (G4CP/P) topped the 38 entries for this band with 124 contacts gaining 443 points. Operation was under the personal touch of 4CP in seven sessions; 18.00-19.34, 20.50-21.10, 22.39-23.32, 08.00-08.47, 09.50-10.30, 13.50-15.27, 16.20-16.59. DX worked included KR6, W1-5, 8, 9, VE2, V56, VP9, ZE, 4Z4, 7Q7, 9H1, 9J4. G4CP used a two element quad with a modified "Vespa" TX and a Drake 2B.

Croydon (G3BFP/P) were second on this band with 356 point from a quad aerial, home constructed transmitter and an AR88 receiver. Four operators made 102 contacts with, amongst others, ET3, VS6, ZE4, ZS5, 4Z4, 5B4 and 9Y4.

Guildford, operating G8GS/P, had 94 contacts for 360 points to come third in line, using a modified KW2000 and a two-element

An analysis of the entries on this band revealed that, of 38 entries, 17 used quad aerials. On the equipment front: 10 entries used modified KW2000 transceivers, seven entries used various com-

mercial combinations, and 21 entries used home constructed equipment.

28 MHz

For the third year in succession, the Croydon RSGB Group/ Surrey Radio Contact Club (G6LX/P) are the band leaders. Their score of 187 points comes from 49 contacts made during the following periods: 17.18-18.15; 07.19-08.06; 09.35-09.42; 10.28-11.06; 11.46-12.40; 14.02-15.00. Most of Croydon's contacts were with Europeans —including nine with G portables—but they also worked AP2, CR6, MP4, JA, VQ9/A, VU2, 5N2, 5Z4, 9E3, 9K2, and 9J2. They used a cubical quad, backed up by a dipole, a vfo/mixer transmitter, and a home-brew receiver.

In second place is the Glasgow City Group (GM3SSB/P) with 130 points from 40 QSOs. They used a modified KW2000 and a dipole: all but one of their contacts were with Europeans. The Chiltern ARC (G3BXS/P) take third place with 30 QSOs worth 118 points made with the aid of a home-brew transmitter using a QVO4-7 pa, an 888A receiver, and a quad. East Molesey (G8SM/P)—last year's runner-up on 10m—are in fourth place with 101 points from 28 contacts.

Comments

"Please—when are we going to have a realistic scoring system on the HF bands? We thoroughly disagree with the wire-aerials rule"—Ainsdale.

"This year we experienced a disastrous fire on Sunday morning

Posn	Notes		Call-sign	1·8 MHz	3·5 MHz	7·0 MHz	14·0 MHz	21 0 MHz	28·0 MHz	Total
46	Notes	Greenock DARC	GM3HZN		MITZ	121	251	195	MH2	567
47		Echelford ARS	G3UES	144	254	121	161	193	02-03	559
48		Harlow DARS	G6UT	-	298	194	34	_		526
000		Garendon School RC	G3MKX		253	145	115		-	513
49		North Kent RS	G4CW	124	231	145	158	_		513
51	3556	Chesterfield RS	G3VKK			135	69	306	3.7	510
52		Nunsfield House ARG	G3EEO	177	255		74		3-3	506
53	100					0.75	16	S3	8 10 6	503
		Bury St Edmunds	G3IRM	_	212	275		-	-	500
54		Fareham DARC	G3VEF	-	231	168	101	-	Ξ	
55	+	Lincoln SWC	G3IXH	150	_	301	38	-		489
56		Loughton DRS	G3TUM	-	466	_	22		-	466
57	190	Wimbledon DRS	G3WIM	_	_	-	427	17	-	444
58		Basingstoke ARC	G3TCR		364		48	25	_	437
59		Swindon DARC	G3HS_	108	255	-	69	-	_	432
	*	Havering DARC	G3TTB	75	357	5V33V2	77	-	-	432
61		Rugby	G3BXF	-	227	128	69	-	-	424
62		South Dorset RS	G3SDS	98	239	-	81	-	-	418
63		llford	G3XRT	96	214	95		3.5	-	405
64		Bury and Rossendale RS	G3BRS	_	245	59	85	-	-	389
65		Pudsey DRC	G3XEP	179	192	-	-	-	-	371
66	*	Worthing and District	G3WOR	-	271	38	55	-	_	364
67		Bromsgrove DARC	G3VGG	-	129	136	92	_	-	357
68		Ainsdale RC	G2CUZ	_	-		165	149	40	354
69		Mansfield ARS	G3GQC	172	180			_	_	352
70		Vange ARS	G3YCW		15	-	295	-	-	310
71		Sunderland ARS	G3IV	_	64	156	49	_	-	269
72		Sheffield	G8NN	203	-	20	12	()	-	235
73		Coventry ARS	G2ASF	214	-		-		-	214
74		Chorley RSGB Group	G3DBY	210	-		****	-	-	210
75		South Shields DARC	G3DDI	_	99	50	34	_	-	183
76		Fulford DARS	G3XLH	80	73	_	_	-	_	153
77		Great Yarmouth RC	G30EP	31	114	5320		-	-	145
78		York ARS	G3HWW	40	3	15	=	_	_	58
10		TOTA AND	Sortivit	40	3		7E	(===)		30

Entries Disallowed

The following entries have been disallowed for non-compliance with General Rule 8b (Separate logs for each band).

Insp	Group	Call-sign	MHz	MHz	MHz	MHz	MHz	MHz	Total
****	Mid Lanark RG	GM3UCI	3	28	_	404		-	435
	Hull and District DRS	G3LIQ/G3AMW	177	258	218	225	259	7	1144
The scores of	uon above are claimed figure	e only							

when our petrol alternator supplying power to both stations became a charred ruin—standby Honda also damaged"—Wirral.
"Would like to see more two station entries"—Leyland Hundred.

(So would the HF Contests Committee!)

"Sorry about moth-eaten log sheets—but the Labrador latched on to them when nobody was looking!"—Maidstone YMCA.
"Owing to the heat the white metal bearings on the bug keys were in danger of melting"—Maesteg.

. encourage those who like 160 to stay on it by giving them a few bonus points"-Cheltenham.

"A smashing do, much enjoyed by all. Same again next year please!"-Sunderland.

"We find the present rules very fair. We do not ask for bonus points on Top Band, but find it rather hard going to make an impression"—Aberdeen.

"Borrowed ex-land line straight key of 1920 vintage—slightly larger than the Codar AT5!"—G3WZP.

"To me personally, NFD means ham and eggs at 5 in the morning, a day the XYL has notice of months in advance!"-GM3HGA.

"The only comments we can make are that the weather was perfect, the generator didn't break down, the aerials didn't fall down, and the equipment didn't blow up; and we were inspected at 1 am"-Stockport.

"We would like to be able to use metal elements"-Clifton.

"This is the last year that G2AJS/P will be operating from Caterham School as G2AJS is retiring and moving away"-Caterham.

"What happened to the inspector? We kept the kettle on for him (boiling the oil of course!)"-East Molesey.

'NFD Rule No 1—Tea on the hour, every hour"—Rugby

"Someone forgot to order the beer-but we survived!"-Verulam. "... the Rules should be altered to encourage as many clubs as possible to run two stations... to allow the use of modern equipment without modification"—Verulam.

"Please—a ban on el-bugs being used by bods who haven't passed their driving test yet!"—Billericay.

"Where were all the Africans on 10m?"—Croydon.

"How about making 160m more attractive?-perhaps a multiplier for the band"—Fareham.
"The aerial was held up by a 40 ft mast at one end and a cricket

stump at the other"-Fulford.

"Magnificent weather-how do you arrange it?"-Bury and Rossendale.

"The rhombic paid off at last-FANTASTIC!"-Guildford.

"Can we have a better write-up on NFD... apart from the Exhibition it's the biggest RSGB event"—Maidstone YMCA.

"Please arrange slightly higher night temperatures to avoid operator frostbite"—Harrow.

Station Inspection

A large number of station inspections were again carried out, and the Committee is grateful to the many Regional Representatives, Council Members, and others who assisted in this respect. Readers might be forgiven for assuming the Committee had "fore-



Cambridge Club member G2XV operating his 34th NFD



Operators at 5B4FD/P, Nicosia, Cyprus.



John Farrar, G3UCQ operating the Cornish Club station at Portkerris, near Lizard.



North Kent RS members, Frank G3UST right and Mike G8AXA left clearing up after NFD.

cast the result" when looking at the list of groups inspected. Once again, however, the list came "out of the hat" at a meeting.

Comments from the Contest Committee

Once again we have to draw the attention of many groups to the rules! A number of entries are marked as "late" in the tabulation. All have been accepted on this occasion, but please chaps, try and be on time! We have to work to a very tight schedule, next time you may be too late! Many groups said that we didn't publish a closing date. Try General Rule 8f, page 55, January Radio Communication.

Some six entries were received that did not comply with General Rule 8b, which requires that separate logs be submitted for each band. This is not just a whim of the Committee, we cannot check consecutive logs. Entries are split into bands for checking and adjudication. A number of entries were returned for re-submission, unhappily the two disallowed entries both arrived on the closing date, allowing no time for return.

A common misconception appears to be that operators have to sign the logs. Not so! For many years it has only been necessary to give names and call-signs, and to indicate the call of the operator against each QSO. The reasons for this are twofold: (i) to enable us to check that operators are RSGB members and (ii) to enable us to locate and allow for consistent bad sending of call-signs, etc, by individual operators.

The usual quota of logs written in foreign tongues reached us; we did try to translate! Please try and type logs or (just as acceptable) rewrite legibly. We often wonder if the originators of some of the coffee-stain covered, crossed out "genuine originals" can read them!

Another point requiring attention is the duplicate contact phenomena. Two or three logs had so many unmarked duplicates that we wondered if they were keeping check logs. We don't guarantee to find every one, but we find most of them and adjust the scores appropriately.

The Rules? Well controversy still reigns, and the differences of opinion about power, etc, are as strong as ever. We can only say again that the Committee tries to steer a middle path. We don't all agree with all the rules even amongst ourselves, but we have tried to follow the majority wish. Rest assured that the Committee do consider all your comments.

Check Logs

Check logs are gratefully acknowledged from the following stations: G3NKR/VE3/P, G3IOR, G3XNG, G3XYF, G5AO, HA5DI, HA5KFZ, OK1AVG, OK3CIR, SM2ALU, SM2COR, SM6DSW, SM0DER;7P, 5B4FD/P.

5B4FD/P gets the certificate for giving most points to NFD entrants. We were also pleased to get a log from G3NKR/VE3/P.

FIN

Once again we have fought our way through a sea of paper to produce NFD results for the August issue. Many people have suggested that we do not write up NFD fully enough. We can only plead time and restrictions on space in this journal. We have to compute and tabulate the results, plus write this offering, in around three weeks. And how about the complaints from the people who don't approve of Contests anyway!

Many thanks to all contestants, we hope to see you all, and more, in 1970.

ATTENTION CLUB SECRETARIES!!!

We have been asked by a Regional Representative to mention some points regarding submission of copy.

Many secretaries are forgetting vital details when they send in their information. Please check your copy carefully. Apparently some secretaries are assuming that the copy that they submit on the first of a month will appear in the magazine of that month. Gentlemen. our printers are pretty good but they can't convert copy into a magazine in three days! Notes submitted by 1 August will be included in the September magazine and so on.

It would be helpful if the senders of notices would indicate their exact positions, ie secretaries, Area Representatives, etc. Finally, please do not expect a programme of your club's events for the next six months to let you out of sending further copy. It is not practical for a regional representative to survey a mass of programmes to glean out what is applicable for a particular month. It is up to you to submit your club's events monthly to the RR (never direct to RSGB HQ). Of course, it is a courtesy to let him have your long-term programme as well, as a confirmation. Your co-operation will be greatly appreciated.

Region 1 RR B. O'Brien, G2AMV.

Merseyside Luncheon Club-Meets on the first Monday in every month, HMS Landfall. 12.30 for 12.45 meal. If you wish to attend please advise G3VQT or G2AMV beforehand.

Ainsdale (ARC)—6 and 20 August, 3 September, 8 pm, "Morris Dancers", Scarisbrick,

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

Blackburn (East Lancashire ARC)-7 August (Your Questions Answered), 4 September (Surplus Equipment Sale), 7.30 pm, Edinburgh House, Shearbank Road, Blackburn. Further details from G4JS.

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

Bury (B & RRS)—12 August (to be announced), 9 September (GPO Microwave Links, G3RSM), 8 pm, George Hotel (Private Room), Market Street, Bury. Club Secretary, G3VVQ, 411 Holcombe

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

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

Crewe and District—Local interest is being kept alive by R. Owen BRS26847, the local representative. He welcomes calls at his home from local enthusiasts and is searching diligently for a new meeting place. His address is 10 Circle Avenue, Willaston, Nantwich, Cheshire.

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

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

Leyland Hundred (ARG)-The Thursday night net at 20.00 hours GMT on 1-915 MHz

Liverpool (L & DARS)-Tuesdays, 8 pm, Conservative Associa-tion Rooms, Church Road, Wavertree. Secretary, H. James, G3MCN, 448 East Prescot Road, Knotty Ash, Liverpool 14.

Liverpool (NLRC)-Meetings are alternative Fridays. In August the dates are 15 and 29 at 8 pm, Labour Party Headquarters, 13 Crosby Road South, Liverpool 22. The club now has 45 members about 20 of whom are active on VHF. The club's previous call-sign G3JQA has been re-issued to it and may be heard in 2m and 4m contests. A club project is under way to build 40 VHF converters. Secretary, Peter Jeffs, 38 College Road North, Liverpool 23. Telephone: 051-924 3020.

Macclesfield (M & DRS)-12 and 26 August, 9 September, 8 pm, The George Hotel, Jordangate.

Manchester (M & DARS)-Wednesday 7.30 pm, 203 Droylesden Road Newton Heath, Manchester 10. Hon Secretary, G. Tillson, G3TJK, 95 Kelverlow Street, Oldham, Lancs.

Manchester (SMRC)-Fridays, 8 pm, Conservative Association Divisional Office, 449 Palatine Road, Northenden, Manchester 22. North West VHF Group-Please note new address. Meetings will take place every Monday at 8 pm in the Club Caravan, Greeba, Shady Lane, Manchester 23.

Shary Lane, Mancnester zo.

Preston (PARS)—7 and 21 August, 4 September, 7.30 pm (Private Room) "Windsor Castle", St Paul's Square.

Salford (Dial House Radio Society)—Wednesday evenings at Dial House (1st Floor), Chapel Street, Salford 3. All members of the Society are GPO engineers. Anyone interested should contact the Club Secretary at the address given above.

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

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

Stockport (SRS)-6 and 20 August, 3 September, 8 pm, The Brookfield Hotel, Wellington Road South, Stockport. New members are always welcome. Further details from the secretary who is

Ders are always welcome. Further details from the secretary who is D. I. Lunn, G3LSL, 4 Farnham Avenue, Macclesfield (Tel 7903). 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. Secretary, G3UEC, 9 Castle View, Sedgwick, Kendal. Wirral (WARS)—First and third Wednesday each month, 7.45 pm, at former Civil Defence Headquarters, Upton Road, Bidston, Birkenhead. The club has been active recently in VHF events and are pleased to see themselves reasonably well placed in the recent 2m contest. Discussions are continuing regarding the replacement of the club's generator destroyed by fire during NFD.

Region 2 RR K. Skethaway, BRS20185.

Bradford (BRS)-No meetings during the month of August. In July, a talk on "Low power transmitters", by David Pratt, G3KEP, was up to the standard we have come to expect from him. The "Surplus Equipment Sale" was also to a standard we have come to expect-or accept! G3HJP.

Hartlepools (HARC)—Meetings every Monday at 7.30 pm, rear of 42 Murray Street, Hartlepool. G3NWU/G6ACI/T.

Middlesbrough (TARS)-First and third Fridays, 8 pm, Settlement

House, 132 Newport Road, Middlesbrough. G3JMO. Scarborough (SARS)—7.30 pm, Thursdays, c/o RAF Associa-

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

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

Sunderland (SARS)—Annual Meeting was held on 1 July and officers elected were: Chairman, G3RDI; Treasurer, G3YJG; Secretary, G3XID, 32 St Aidans Avenue, Grangetown, Sunderland. Club now in recess for the summer, starting up again on Tuesday, 2 September, when old and new members will be welcome. Meetings held on first and third Tuesdays of each month at the Technical College, Sunderland. G3XID.

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

Region 3 RR R. W. Fisher, G3PWJ.

Birmingham (MARS)-19 August, 7.45 pm, Midland Institute, Margaret Street, Birmingham 3.

(South)—6 August (Open night—2m Equipment), 3 September (RSGB Matters by G3PWJ), 8 pm, The Scouts Hut, Pershore Road, Stirchley, Birmingham 29. Worked All Birmingham Postal District Award, full details of this award available from South Birmingham RS, can be obtained from R. A. Brice, 53 Leycroft Avenue, Tile Cross, Birmingham 33. G8BHE.

Coventry (CARS)-8 August (Night on the Air), 15/17 (Week-end Expedition to N. Wales), 22 August (Night on the Air), 29 August (Visit to CEGB Generating Station).

Dudley (DARC)-12 26 August, 8 pm, Central Library, St James's Road, G3PW.I

Hereford (HARS)-First and third Fridays of the month, Civil

Defence Headquarters, Goal St, Hereford. G3RJB. Leamington Spa (MWARS)—Every Monday, 8 pm, 28 Hamilton Terrace, Leamington Spa.

Lichfield (LARS)-The first Monday and third Tuesday of each month, 8 pm, The Swan Hotel, Bird Street, Lichfield. G3NAS.

Redditch (EWARG)-14 August (Junk Sale), 8 pm, Old Peoples Centre, Park Road, Redditch. G3EVT.

Solihull (SARS)—Third Tuesday each month, 8 pm, The Old Manor House, 126 High Street, Solihull. The Club has been kept active recently arranging and operating a one-day stand on the 14 June from the local Carnival using GB3SOL. G3VXV.

Stourbridge (STARS)-5 or 19 August (Informal Meeting, "Shubbery Cottage", Heath Lane) Headquarters Longlands School, Stourbridge

Sutton Coldfield (SCRS)-Second and fourth Monday every month, 8 pm, SCTFC Clubhouse, Coles Lane, Sutton Coldfield. G8AVH.

Worcester (W & DARC)-Meetings are held each Wednesday and Saturday evening at 7.45 pm, 35 Perdiswell Park, Droitwich Road, Worcester.

Region 4 RR T. Darn, G3FGY

Chesterfield (C & DRS)-Second and fourth Wednesdays,

7.30 pm, Observatory, Newbold, Chesterfield. G3VDI.

Derby (D & DARS)—13 August (Preparation for rally at Ryknield School), 17 August (Mobile Rally), 20 August (DF Practice Night), 27 August (Atmospheric Electricity-Illustrated Lecture by C. W. Stone, PhD, MSc, ARIC), 7.30 pm, Room No 4, 119 Green Lane, Derby. On 27 June a special occasion dinner was organized by Tom Darn, G3FGY and Bill Mead, G5YY to honour the secretary and his wife. This commemorated 21 years in office and coincided with their silver wedding anniversary. Mr and Mrs Ward were presented with a stainless steel tea set and electric coffee percolator. Over 100 members and friends were in attendance at the Regency Rooms, Ilkeston. Being unaware of the event until the last moment G2CVV would like to thank all those who helped make this such a momentous and wonderful evening. G2CVV

Derby (NHCAARG)-Fridays, 7.30 pm, Rooms 8 and 9, Nunsfield House, Boulton Lane, Alvaston, Derby. 3 August (DF Practice Run, start Nunsfield House, 3 pm). Film shows and tape lectures throughout August and September, including open evenings with the club's KW2000A on the air. See club notice board for further details. G3LCV.

Mansfield-First Friday, 7.45 pm, New Inn, Westgate, Mansfield.

South East Derbyshire (RS)-The club has been going through a lean spell but is now revitalized with a new secretary and treasurer appointed and a new programme issued for the winter season which commences in September. There are no meetings during August. The new Secretary is T. W. Clarke, 94 Lacey Fields Road, Langley, Heanor, Derbyshire DE7 7HL.

Region 5 RR S. J. Granfield, G5BQ.

Reports are conspicuous by their absence, so presumably all Club Secretaries are taking a well-earned holiday!

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

Bishop's Stortford (BS & DARC)-Club meets once a month at the British Legion Club, Windhill, Bishop's Stortford, Herts. Further particulars from P. J. Toynton, G3RGA at "Wildhern"

Old Mead Lane, Henham, Herts.

Cambridge (C & DARC)—Meetings on Fridays at 7.30 pm at Club HQ, Corporation Yard, Victoria Road, Cambridge.

Dunstable Downs (DDRC)—Meetings on Fridays at Chew's Road, Dunstable Redicables

House, Dunstable, Bedfordshire. No organized programme during August, but further particulars from A. C. Don, G8BWZ, 51 Manor Park, Houghton Regis (Dunstable 67349).

Luton (L & DARS)—Meeting at 8 pm on first Thursday in the month at Club HQ, Putteridge Estate, Luton, Bedfordshire. March (M & DRAS)-Meetings on Tuesdays at Old Police HQ,

High Street, March, Isle of Ely.

Peterborough (P & DARS)-Meeting on first Friday in the month at 7.30 pm in the Electronics Section, Peterborough Technical College, Eastfield Road. On other Friday evenings meetings are held at Club HQ in the Old Windmill behind the Peacock Inn, London Road, Peterborough at 8 pm. Further particulars from Douglas Byrne, G3KPO, Jersey House, Eye, Peterborough. Shefford (S & DARC)—Meetings on Thursdays, 8 pm, Church

Hall, High Street, Shefford, Bedfordshire.

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

Region 6 RR L. W. Lewis, G8ML.

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

Gloucester (GRC)-Have lost their meeting place due to demolition, meetings restart on Thursday, 11 September at RAFA Club, 6 Spa Road, Gloucester and thereafter on the second and fourth Thursdays at 7.30 pm.

Region 7 RR P. A. Thorogood, G4KD.

All members of the liford Group are requested to contact F. Jarvis, G3HIW or J. Hooper, G3PCA immediately. This concerns urgent decisions that must be finalized to determine the Club's immediate

RR G4KD reports club of the region for the month: Civil Service Radio Society for their fine amateur radio show GB3CSR with a visit by HRH The Duchess of Gloucester to the stand.

Acton, Brentford and Chiswick (ABCRC)—19 August (All band ATU by G3CCD), 7.30 pm, Chiswick Trades and Social Club, 66 High Road, Chiswick.

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

Ashford, Echelford (ARS)-Last Thursday 7.30 pm, St Martins

Court, Kingston Crescent, Ashford, Middlesex.

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

Bexleyheath (NKRS)-28 August (Wine Making by Len Randall). Last meeting was an NFD inquest and it decided to enter two stations in next year's event. A new contest committee was elected and 28 of the 34 present were RSGB members. 7.30 pm, Congregational Church Hall, Chapel Road, Bexleyheath.

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

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

Civil Service (CSRS)-First and third Tuesdays. Informal meetings during August, 6.30 pm, Civil Service Recreation Centre, Monck Street, Westminster.

Croydon (SRCC)-Third Tuesday, 7.30 pm, Swan and Sugarloaf, South Croydon.

Crystal Palace (CP & DRC)-16 August (Test Equipment Evening with G3OOU, G3XCB, G3FZL), 8 pm. Last meeting Frank Bennister, C3COX, described his aerial mast erection experiences for SVS masts, including the latest Thames radar system for the Port of London. Emmanuel Church Hall, Barry Road, SE22.

Dorking (DR & DRS)—Second and fourth Tuesdays, 8 pm, Star

and Garter, Dorking.

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

East London-A new programme is being considered at present. Wanstead House, The Green, E11.

Edgware and Hendon (E & DRS)-11 and 25 August, St Georges Hall, Flower Lane, Mill Hill, NW7.

Farnham, Bucks (Burnham Beeches RC)-Fortnightly, 11 and 25 August, Farnham Common Village Hall, Victoria Road

Gravesend (GRS)-Third Wednesdays, 8 pm, RAFTA Club, Overcliff Road

Guildford (G & DRS)-8 and 22 August, Guildford Engineering Society, Stoke Park

Hampton Court (TVARTS)-First Wednesday, 7.30 pm, Three Pigeons, Portsmouth Road.

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

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

Havering (H & DARC)-Fortnightly, 6 and 20 August, 8 pm,

British Legion House, Western Road, Romford. Hemel Hempstead (HH & DARS)—First and third Fridays. The club has now amalgamated with the Addressograph Multigraph Club and will meet at 7.30 pm, at the "Addmult" Sports Club, Hemel Hempstead.

Holloway (GRS)—Mondays (RAE), 7 pm, Wednesdays (Morse), 7.30 pm, Fridays (Club), 7.30 pm, Monten School, Hornsey Road. Ilford—See heading. Contact G3PCA, 50 Mortlake Road, immedi-

Kingston (K & DARS)—Second Wednesday 8 pm, Penguin Lounge, 37 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-Fortnightly, Fridays, 8 and 22 August, Loughton Hall (near Debden Station).

Maidenhead (N & DARC)-Third Tuesday, 7.30 pm Victoria Hall, Cox Green, Maidenhead.

New Cross-Wednesdays and Fridays, 8 pm, 225 New Cross Road, SE14.

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

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

Reigate (RATS)-First Wednesday, 7.45 pm, George and Dragon, Cromwell Road, Redhill.

Scouts (ARS)-21 August, 7.30 pm, Baden Powell House, Queensgate, South Kensington, SW7.

Sidcup (CVRS)-7 August ("The Investigation of Radio Interference by W. E. Thompson, G3MQT), 8 pm, at the Congregational Church Hall, Eltham, 21 August (Natter Night), 8 pm, All Saints Church Hall, Bercta Road, New Eltham.

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

St Albans (Verulam ARC)-6 August (Phil, G3OFH, puts G3VER on the air at Salisbury Hall), 20 August (Homebrew Talk by G3MED), Town Hall, St Peter's Street. Cavalier Hall, Watford Road, St

Sutton and Cheam (SCRS)-Third Tuesday, 8 pm. The Harrow Inn, High Street, Cheam.

Welwyn (Mid-Herts ARS)-14 August (VHF-NFD Planning), 8 pm, Welwyn Civic Centre, Welwyn.

Wimbledon (W & DRS)-Second and last Fridays, 8 pm, St John Hall, 124 Kingston Road, South Wimbledon, SW19.

Wembley (GECARS)—Thursdays, 7 pm, Sports Club St Augustin Avenue, North Wembley. This Club is open to non GEC employees by invitation. Telephone ARN 1262 for details.

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

Canterbury (EKRS)-Details of future meetings from Hon Sec, D. N. T. Williams, G3MDO.

Eastbourne (SARS)-Meetings held at the Victoria Hotel, Latimer Road, Eastbourne

Maidstone (M YMCA ARS)-Meetings held every Tuesday and Friday, 8 pm, at "Y" Sports Centre, Melrose Close, Loose, Maidstone.

Mid-Sussex (Mid-SARS)-Meetings held at Marle Place Further Educational Centre, Leylands Road, Burgess Hill.

Worthing (W & DARC)-Meetings held every Tuesday at The Rose Wilmot Youth Centre, Littlehampton Road, Worthing, 8 pm.

Region 9 RR J. Thorn, G3PQE.

Bath, Keynsham, Batheaston Areas. It has been requested that an Amateur Emergency Network be set up in the North of Somerset under the RAEN organization. Are there any public spirited

amateurs in these areas operating mobile who will get together to cover these areas? Please contact the RR.

Bristol (BARC)—Every Monday and Thursday, 7.30 pm, Club HQ (G3TAD), University Settlement, 41 Ducie Road, Barton Hill, Bristol 5. 21 August ("Data Acquisition Systems" by G3OLB).

(RSGB Group)-18 August (Home Constructed Equipment. Bring along your latest construction gem), 7.30 pm, Becket Hall. St Thomas Street, Bristol 1. G3ULJ.

Burnham on Sea (BOS RS)—G3GIW.

Cornish (CRAC)—7 August ("Simple Test Gear" by G3OCB, "30/- Quad" by G3UCQ), SWEB Clubroom, SW Electricity Board,

Pool, Camborne. G3NKE. (VHF Group)—Third Thursday in each month, 7.30 pm, The Peoples Palace, Pydor Street, Truro. G3XC.

(Falmouth Group)-Meet alternate Tuesdays, Laburnham Drive Mission Hall. G3OJN.

(Newquay Group)—Meet alternate Wednesdays, Treviglas School, G3THT.

Exeter (EARS)-First Tuesday in each month, 7.30 pm, St Sidwell's Methodist School Hall, Sidwell Street, Exeter. G3HMY

Plymouth (PRC)-5 August ("SSB by Ron Daw, G3OIQ), 10 August (Picnic), 7.30 pm, Virginia House, Bretonside, Plymouth. G3YDU.

Saltash (S & DARC)—8 August (Barbecue, Kit Hill from 7.30 pm, mobiles active), 17 August (Trip to Westward Ho!—mobiles and portables active) 22 August (Visit to Plymouth Power Station,

Power Rock. Meet 7 pm). G3XWA.
South Dorset (SDARC)—1 August ("Electronic Music and Music Concrete" and Special General Meeting to discuss alternative places to meet), 7.30 pm, Labour Rooms, West Walk, Dorchester. G3RZG.

Taunton (TARS)-Every Friday, 7.30 pm, SEVO HQ, The Taunton Barracks, The Mount. G3DTB.

Torbay (TARS)-Every Tuesday and Friday evenings, Club nights. Last Saturday in month Business meeting. 30 August (Tape by G3CKQ), Club HQ, G3NJA, Bath Lane, Rear of 94 Belgrave Road, Torquay. 24 August (Mobile Rally, Newton Abbott Recreation Ground, Marsh Road, Newton Abbott (next to Gas Holders).

Weston-super-Mare (WSMARS)-First Friday, Westhaven School, Ellesmere Road, Uphill, WSM. Congrats to Alan Bailey in getting his call, G3YNI. G3GNS.

Yeovil (YARS)-Wednesdays, 7.30 pm, Park Lodge, The Park, Yeovil. G3NOF.

Welcome to our newest Club, St Lawrence's Amateur Radio Club, St Lawrence's Hospital, Bodmin, Cornwall.

Region 10 RR C. H. Parsons, GW8NP.

Blackwood (ARC)-Fridays, 7 pm, Blanche Cottage, off High

Street, Blackwood, Mon. G6BK.

Barry College of Further Education (ARS)—Meetings will not be held during the summer months, the next being on Thursday, 25 September, at the College Colcot Road, Barry. The AGM will be held on 9 October. GW3VPB.

Cardiff (RSGB Group)—11 August (Final VHF-NFD Arrangements), 7.30 pm, TA Centre, Park Street, Cardiff. GW3GHC.

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

Hoover (ARC)—Mondays, 7.30 pm, Hoover Social Club, Hoover Factory, Merthyr. An active Club station is available, and all interested amateurs are cordially invited to meetings. Secretary, Mr F. B. Tribe.

Port Talbot (ARC)-Meetings at Trefelin Club and Institute, Port Talbot. Further details from GW5VX.

Pontypool (ARC)—Tuesdays, 7 pm, Educational Settlement, Rockhill Road, Pontypool, Mon. GW3JBH.

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

Rhondda (ARS)-Meetings at Pengelli Hotel. Treorchy, Rhondda, Glam. Details from GW3PHH.

Swansea Telephone Area (ARS)—Meetings held at Swansea Telephone Sports and Social Club. Morse practice, RAE course and constructional projects are catered for. Details from the Secretary, M. D. E. Connor, 54 Talley Road, Penlan. Swansea, Glam.

University College Cardiff (ARS)-This Society has had a most successful year, and a number of members have qualified for licences. Students entering College next Session are advised to contact the Secretary, Students Union, Dumfries Place, Cardiff as soon as possible.

Region 11 RR M. Williams, GW3LCQ.

Conway Valley (CVARC)-At the AGM the following officers were elected. Chairman, J. S. Owen, GW3QN; Vice-Chairman, R. Jones, GW3JI; Treasurer, C. J. Watson, GW3CW; Secretary, L. J. Marshall, Tel Abergele 2532. During the meeting M. Williams, GW3LCQ, announced that he was only serving temporarily as Regional Representative and he would be grateful of any volunteers who would be willing to take over from him.

Region 12 RR A. W. Smith, GM3AEL.

Aberdeen (AARS)-Fridays, 7.45 pm, 6 Blenheim Lane, Aberdeen. GM3HGA. Aberdeen 33838.

Lhanbryde (MFARS)—Mondays, 7.30 pm, St Andrews School, Lhanbryde, By Elgin, Morayshire. GM3UKG. Clochan, Buckle 225. Dundee (RSGB Group)—Thursdays, 8 pm, 3 Magdalen Place (off Roseangle), Dundee. GM3KYI.

Region 13 RR I. W. Sheffield, GM3VEI.

Nothing received from this region.

Region 14 RR N. G. Cox, GM3MUY.

Ayrshire (Ardeer Recreation Club ARC)-5, 7, 12, 14, 19, 21, 26, 28 August, 7.30 pm, Ardeer Recreation Club, Amateur Radio Section, Stevenston, Ayrshire, details J. F. McCreight, GM3DJS,

10 Auchenharvie Road, Saltcoats, Ayrshire, details 3. P. McCreight, GModOS, 10 Auchenharvie Road, Saltcoats, Ayrshire.

Ayrshire (AARG)—24 August, 7.30 pm, ATC HQ, Kilmarnock.

Glasgow University (GURC)—Refer C. Weston, GM3VAP, 46 Manchester Drive, Glasgow, W2. Tel 339 2074.

Greenock (G & DARC)—1, 8, 15, 22, 29 August, 7.30 pm, Watt

Library, Union Street, Greenock.

Mid-Lanark (RSGB Group)-15 August, 7.30 pm YMCA, Brandon Street, Motherwell.

Region 15 RR J. Thompson, GI3ILV.

Belfast (City of Belfast YMCA Radio Club)—Wednesdays and Saturdays, 8 pm, City YMCA (Third Floor), 12 Wellington Place, Belfast BT1 6GE. Information from YMCA General Office. 10 September (AGM, 7.30 pm).

Mid-Ulster Group-Meetings will resume on Friday, 5 September (Talk by L. Lyske, GI3CDF on EP2GI), 8 pm, Temperance Hall, Portadown. Further information from Area Representative GI3WFM.

Region 16 RR W. J. Green, G3FBA.

Chelmsford (CARS)-First Tuesday in each month, 7.30 pm, Marconi College, Arbour Lane, Chelmsford, G30ZF.

Colchester (CARC)—DF Hunts, details from G3VAG or G3OZF.

Gt Yarmouth (GYRC)—Last Friday in each month, 7.30 pm, at 98 South Market Road, Gt Yarmouth. G3HPR.

Ipswich (IRC)-27 August (VHF Night), 7.30 pm, Red Cross HQ,

Gippeswyk Hall, Gippeswyk Avenue, Ipswich. G3UJR. Norwich (NARC)-11 August (Ragchew evening), 18 (Discussion and formulation of future programme), 25 August (Radio Astronomy Techniques-lecture by Robert Porter BSc, of Jodrell Bank). All meetings 7.30 pm, The Clubroom, Brickmakers Arms, Sprowston Road, Norwich, Nr. Ring Road roundabout. GRPTR

Southend (SDRS)-Normal Meetings fortnightly, details for August from G8BSB.

Region 17 RR C. Sharpe, G2HIF.
Chippenham (C & DARC)—8 August (Mini D/F Hunt starting at 7.15 pm). The Club net is now operating on 2m each Monday and

on 160m each Thursday at 8 pm. G3UTO.

NW Berks (AERE, Harwell, ARC)—Meetings on the third Tuesday in each month, 7.30 pm. Social Club, AERE, Harwell, Berks.

Reading (R & DARC)-Meetings fortnightly at the HQ, The Victory PH, Tilehurst. The constructional competition was won by G3PGM for his NFD Tx; G3XOW was the runner-up with a G2DAF Rx. This year the annual picnic will take place on 27 August at the Child Beale Trust near Pangbourne. Access to the site is off the A329 Oxford to Reading road. G3TEB.

Salisbury (S & DARC)—Tuesdays, 8 pm, Sawmills, Pembroke Park, Wilton, Salisbury, Wilts. G3HCL.

Southampton (RSGB Group)—Meetings on the second Saturday

in each month, Lanchester Building, University of Southampton, at 7 pm. G3GOY

Swindon (S & DARC)-24 August (Mobile Rally at Lydiard Park, Nr. Swindon. Talk-in by G3WEF/A on 160m and by G3LIZ/A on 2m). G3LTZ.

Contest News

Section A Call-sign	Posn	Score	QSO	County	Best QSO	Dist	Power
G8AUE	1	261	6	DY	G3BNL/P	126	20
G8BAV	2	85	3	DY	G3BNL/P	110 c/b	30
G8AEJ	3	77	5	LD	G3GDR	41	50
G8ARM	4	65	4	LD	G3GDR	40	14
G8AYN	5	23	2	SY	G8ARM	15	15
Section C							
G3BNL/P	1	376	7	GR	G8AUE	126	10
G3NNG/P	2	300	6	BE	G3EEZ/P	114	10

80m Field Day 1969

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

 2. When: 10.00 GMT to 17.00 GMT on Sunday, 14 September,
- 1969
- 3. Multi-operator entries: will be accepted. A maximum of two operators per station will be allowed.
- 4. Contacts: CW (A1) only in the 3-5 MHz band. The location of the station must be sent.
- 5. Power: the maximum power input to the pa stage must not exceed 10 watts. The power for all parts of the station must be derived entirely from dry batteries or accumulators. The practice of "float" charging the batteries or accumulators is not permitted.
- 6. Trophy: the Houston Fergus Trophy will be awarded to the winning station.
- 7. Logs: column (5) should be headed "Location of station contacted". Entries must be addressed to RSGB HF Contests Committee, c/o D. Thom, G3NKS, "La Collinette", 6 Bracken Close, Copthorne, Crawley, Sussex.

Report on the First 1296 MHz Open Contest 25 May, 1969

Only five fixed and two portable stations submitted logs for the First 1296 MHz Open Contest held on 25 May, 1969. Although the event was made an independent contest in response to the popular request, most of the comments from stations contained a plea for the rules to revert to running future events simultaneously with 432 MHz.

All other comments referred to the futility of taking part in a four hour event, or of holding a contest at a holiday weekend. The poor propagation and weather conditions, which carried over from the 70cm Open, and which dominated the comment column in that contest, received no mention on 23cm. It must be concluded, therefore, that either the 23cm enthusiast is a hardier species, or

In Section A, the winner, G8AUE, is to be congratulated upon gaining an indisputable victory, and although one QSO over 120 km contributed heavily to his commanding score, it was not the deciding factor. The points gained from the remaining contacts were more than sufficient to ensure his position.

The runner-up, G8BAV, made only one QSO with strong signals in each direction. The other contacts were concluded with difficulty either through equipment trouble at the remote station, or through a deterioration of the propagation path, but the points so gained were sufficient to ensure second place.

The only entries in section C came from two seasoned campaigners who have crossed frequencies many times before. This year victory went to Les Sharrock, G3BNL/P, who with one extra cross band contact, forced G3NNG/P to accept the role of runnerup.

From every point of view, this was a disappointing contest. With so few stations participating, and with no more than 33 QSOs shared between seven stations, it is obvious that if the competitive spirit is to be kept alive on 23cm, not only must the rules be amended to encourage greater activity, but more time must be allocated to accommodate the experimental nature of the contacts.

A check log from G8AFA/P is gratefully acknowledged.

MEMBERS' ADS

These advertisements are free to members and limited to 32 words, discounting the name, address and telephone number. Ads must be typed or printed on the form, or on a post card similarly laid out. They should be accompanied by a recent Radio Communication wrapper. No trade advertisements can be accepted

Entry period for Sept. .. 5 Aug. to 11 Aug. Entry period for Oct. .. 1 Sept. to 5 Sept.

in this section, although these and others requiring immediate inclusion should be sent to our classified advertisements department. Inclusion is NOT guaranteed and unused advertisements are NOT held over to the following issue.

Entry period for Nov. ... 6 Oct. to 10 Oct. Entry period for Dec. ... 7 Nov. to 12 Nov.

KW2000 G line and ac psu, immac and little used £145. 400W lin amp with sep ac psu £29 delivered 50 miles free. R. J. Hughes, 102 Harlands Rd, Haywards Heath. Tel 0444-50961.

Fm transistor radio-mike, b'cast quality, complete inc rx £18. CR150 6 with psu £30. Ex-GPO spectrum analyzer 20-170 MHz £25, all exc cnd, exch why. A. Speight, G3PYW, 10 Lodge Rd, Maldon, Essex. Tel Maldon 2041.

Valves 6CH6, 12AH7GT, 3B24, 6BE6, EL91/N77 5/- EF92/W77, EF91/Z77, 1R5, 1S5, 1A3, 1L4, 1T4, 3V4, N18, 1D8GT, N14, IC2, DK91, 2D17, DL94, 4/- 9S7, 7C6, 7S7, 1291, 3/- VR92, RK34/3B24, DK1/DF1, 2/- J. Casson, 14 Station Rd, Upper Poppleton, Yorks. Tel Upper Poppleton 4366.

SB-34 tcvr, mic, pre-amp £125. 4 Mark Heliwhips, 80-40-20-15 with £15. Lin amp, professionally hb, fan-cooled 4x811A, sep lt/ht trans, solid-state 2000 V ht, 2 rlys, engraved panel with 3 flush meters £45 ono. N. Jacobs, G3OGB, QTHR. Tel 01-550 1697.

AR88LF hb, spare valves £25. Pair new 6146 50/- Chokes 0.2 H 800 mA, 2 H 0.15 A, 2 H 0.4 A 10/- each. M. Osborne, G3YGM, 73 Cherrytree Ave, Cowplain, Hants.

Sommerkamp FR100B rx in fb cnd, with 160m conversion, cw, am, ssb detectors £90 buyer collects. Jason vhf tuner, works but needs adjust £2. MK46 walkie-talkies with connectors offers. S. Turner, G3UJI, 51 Hilton Rd, Harpfields, Stoke-on-Trent ST4 6QZ. Tel 0782.64570

DX40 and VF1U, two xtals, £15 ono. BC221 with charts and mains psu £9 ono, buyer collects. J. Jarvis, G3VUG, 48 Queens Rd, Hinckley, Leics. Tel Hinckley 4348.

Paros 22TR tcvr, 80, 40, 20m, £100, would send hb first. G3LRO, 68 Caulfield Rd, East Ham, London, E6. Tel 01-472 8479.

CR100 with hb £12 10s, buyer collects. F. Richardson, G3MYX, 7 West View, Canterbury Rd, Folkestone. Tel (office) 55221.

Electroniques QP166 coilpack £8. Geloso 4/102 vfo £3. Eddystone dial 70/- B44 rx/tx new £8. Kokusai mech filter 455 £5. 70 cm 4 el slot £4. R. Barnes, G8CJQ, 5 Prospect Drive, Hale Barns, Cheshire. Tel Ringway 2415.

Heathkit OS2 scope, factory built new and unused £22. Also GD1U grid dip meter as new all coils £8, carr extra. Lee, G5FH, 17 Knottsall Lane, Oldbury, Warley, nr Birmingham. Tel 021-552 1338. Modified HRO, exc cnd, psu, 8 gc coils, SX27 needs slight attention for 144 MHz £40 ono or sep offers. Buyer collect. A. Green, 93 Langstone Rd, Warstock, Birmingham 14.

Pen recorder, Elliott 6 in chart, 1 mA movement, also 5, 10 and 25 V switched. Mains synchronous clock, 2, 4, 8, 16, 32, 64, 128, 256 cm per hour £11. T. Brook, G3WBQ, Saxonhome, Orestan Lane, Effingham, Leatherhead, Surrey. Tel Bookham 4210.

HP 13 Heathkit mobile psu £22 10s. D. Wright, 42 Warwick Ave, Tuffley, Glos. Tel Gloucester 23329.

AR88LF in case, gd cnd, prod det, s meter £35. 2m nuvistor converter, psu, 4-6 MHz i.f., fb cnd, £8 10s. W. Lindsay-Smith, G3WNI, 22 Kingswood Cres, Copthrone, Shrewsbury. Tel Oswestry 2895.

DX100U, SB10U, HRO with sep case for psu and speaker, nine coils, total £50, prefer buyer insp and coll. J. Targett, G3NUP, Rectory Terrace, Pulham Market, Diss, Norfolk. Tel Pulham Market 219.

School station G3GTD QRT. Offered complete, tx 5 ft rack G5RV 75 W am, nbfm, cw, HRO rx, Class C wavemeter to school, club or similar at nominal figure. Buyer needs van and must collect. G. Edwards, The Bungalow, Chapel St, Barford, Norwich, NOR 38 X.

Complete 50W 4m TX with modulator, psu and XTAL, just plug in and away, £12 carriage paid. Also Cossor 1035 double beam scope £8 carriage paid. Philips 4 track, 3½ ips tape recorder £12 carriage paid. Must sell by 13 August, J. J. Adey, 18 Mount Park Crescent, Ealing, London, W5. Tel 01-997 5429 (home) or 01-837 8688 (office).

KW2000A and psu/ls, recent, exc wkg order, first reasonable offer accepted, deliver 50 miles. G2CDN, 13 Wood Lane, Isleworth, Middx.

Star SR700A, months use only, mint £85, will take part exch rx. M. Snowden, Swainsea Lane, Pickering, Yorks. Tel Pickering 2560.

Going mobile. Sphinx tx and Delta control unit £45 ono. Electroniques front end plus Eddystone 898 dial in G3HTA ssb rx, needs completion £15 ono. Pair ten metre tcvrs £15 ono. R. Hadley, G3UWK, 302 Moor St, West Bromwich, Staffs. Tel 021-533 1705.

New Hallicrafter SX122 rx £125. Novatech Aviator 2 vhf, lw, mw, 160 80 df loop and whip aerials transistorized portable £40, prefer collect. New Micro standard mw only, mercury powered, miniature £10. K. King, G3ACB, 103 The Ridgeway, Cuffley, Herts. Tel Cuffley 3695.

Heathkit VTVM IM13U with rf and eht probes £14. 4X150 chimneys 1½ in long 4/- each. 160m tx/psu £6. Mains tran 10V, 10 A ct £1. RSGB hb 3rd ed, all pp. R. Martin, G3RWM, 76 St Pauls Cres, Coleshill, Birmingham. Tel Coleshill 2343.

Sale or exch fb PR120V and spare valves. Wanted good binoculars or will exch for fine collection of stone-age tools and weapons or why. G3HQU, QTHR. Tel Barrow 2303.

HRO, 9 coils, psu, ls, resprayed case, best offer over £15. DX4OU with vfo £15 ono. Fuller, G8CEZ, 45 Marley-field Way, Cheltenham Rd East, Churchdown, Glos. GL3 1JW.

Available shortly, owner emigrating. Collins 75A4 rx £195. Hallicrafters HT32B tx ssb, am, cw £165. Also G2DAF linear, 2 × 813 £25. Heathkit OS2 scope £12. All enquiries and offers answered. D. C. Dodd, GD3RFK, Somerset, Stanley Mount, Ramsey, Isle of Man.

Scope WM2TV needs attn with type 1 line selector, lab trolley, manuals, exch for Serviscope S52. 813 DAF linear 80-10, needs ht, exch for Avo 8 mk 2-3, G73 wavemeter £2 10s. Holiday till August 10. G. Morrison, G3MOU, 85 Sutton Rd, Heston, Mddx. Tel 01-570 6181.

Hammarlund HQ110A, hambands, mech filter £105 (new £142), hb. Hallicrafters SX28 fb £35 hb. Peugeot 404 mdl, 8 sw band radio, sun roof, lay back seats, roof rack, negative earth, £425. Nicol, 63 Marlpit Lane, Coulsdon, Surrey. Tel Downland 55868.

Berco variacs. 0-260 V new, 0-5 A £2 10s. 2-0 A £5 used. Exc cnd 8 A £10 ono. W. Kilner-Smith, 101 Oxford Rd, Marlow, Bucks. Tel (bus) 01-573 3888, ext 2826.

HRO with bs coils, Is and psu £15. M. Skelding, G3VHA, 17 Summercourt Square, Kingswinford, Brierley Hill, Staffs. Tel Kingswinford 4258.

GPO tower sections 12 ft 6 in 50/- Ex BR sections make selfsupporting 80 ft at cost. Good HRO ex G3MMJ £20. Professionally built Mark equipt 70 cm tx 24 W 320A, 2 x EL34 mod £35 ono. Hayward, G8BBY, Marina Cottage, Watford Locks, Watford, Rugby. Warks. Tel Long Buckby 596.

RA1, xtal cal, matching spkr and manual £28. 2m fet converter and nuvistor converter, 2 Pye Ranger tx strips, one working on 2 m, DM21 dynamic mic, offers. C. Powell, G8BPK, QTHR. Tel Aston Clinton 600.

Davco DR30 rx £110 ono. Collins 12 Vdc psu for KWM2, probably suit KW2000, SB100 etc £20 ono. Wanted 9 MHz filter. G. Wilson, G3NUF, Beggars Roost, Strete, Nr. Dartmouth, Devon. Tel Stoke Fleming 429.

Clearance of gear, including KW2000, Withers equipment, transverter, 4CX250B's, modulators, tx's, rx's, psu's, filters, etc. Please sae for long list or ring for viewing appointment. J. Butcher, 7 Barclay Close, Hertford Heath, Herts. Tel Hertford 6122.

70 cm tx Pye rf with 2m drive and power chassis 2-6 pa 4/5 W rf out, wkg on 70 cm with all valves and coax c/o relay £8. R. Chambers, G8BCA, 11 Thetford Rd, Mildenhall, Suffolk.

Tristao 70 ft crank-up tower price £85 ono, will exch for SB200 or similar, original cost £250 region. N. Hall, G3DRF, 8 Radnor Park, Corston, Malmesbury, Wilts. Tel Malmesbury 2281.

PTC2002N Ranger 4m tunable rx, 4 ch tx plus mounting, no xtals £9 plus carriage. R. Short, G3GNR, 3 Park Meadow, Princes Risborough, Bucks. Tel 5938.

AR88D, gd cnd, realigned 1965 with orig S meter, deliver 50 miles, £35. 19 set, brand new on purchase, with rf amp mk 3 and solid state psu. Scrap 38 set and 17 set 10/-, each. M. Simpson, G3UVM, Leagh Close, Crackley, Kenilworth. Tel 55457.

Heathkit RA1 rx with internal xtal cal, matching spkr and Q mult, fb cnd, £35. H. Gadsen, G3JZW, 4 Beechwood Ct, Dunstable, Beds. Tel Dunstable 64086.

Self-contained radar receiver/detector with battery, covers amateur band, clips on sun visor, new £10. Low band Pye Reporter (covers 4m) £6. L. Loveland, 73 Ogwen Drive, Lakeside, Cardiff CF2 6LJ. Tel 755309

KW2000 with matching mains psu, immac cnd serial 374, £120. Buyer insp by prior arrangement. Would deliver up to 50 miles. G3II0, 23 Ramsey Cres, Lewes, Sussex.

10-160m tx, am, cw, int psu, 100 W, Geloso vfo, grey hammer finish, fully metered, just plug in and go, immac, £25 ono. K. Manktelow, G3SKZ, 94 Ravenscroft Ave, Preston Rd, Wembley, Mddx.

Almost finished hb kilowatt linear comprising metalwork, two QY4-250's, anode choke, Airflow blower, filament tran, grid turret and grid bias supply, needs tank circuit and ht to complete £15. D. Abbott, G6TA, 13 Belltrees Grove, Streatham, London, SW16. Tel 01-789 1038

RA1 with int spkrs, swop for EC10 or similar with cash adjustment. G. Packer, GW3UUS, 3 Robertson Way, Newport, Mon NPT 6QP.

Eagle RX80 rx, gd cnd £20. KW160 tx gd cnd £17. Eddystone 680X rx with matching spkr, new cnd, £65. Prefer buyer insp and coll but would dispatch. G. Law, Lismoyne, Knowl Rd, Mirfield, Yorks. Tel. Mirfield 3771.

HRO 5T octal version, 4 bs colls, gc coll. HRO ps, hb, mint cnd, £25. H. Shelvey, G3WPI, 124 The Green, Welling, Kent. Tel

Swop WS38 mk 3 Murphy 7-9 MHz torr in gd cnd for portable 2m rx, must be in gd wkg cnd, buyer must pay carr or collect. R. Watts, 74 Belvedere Rd, Taunton, Somerset.

BCC69 converted for 2m with 12 V vibrator pack. Preamp for xtal mic. Two 9 MHz tx xtals 145-45, 145-72 MHz. Also mobile mounting bracket for tx/rx. Poor external cnd, good electrical cnd, offers, prefer buyer coll. C. Horrobin, G3TZW, 50 Fletcher Rd, Stoke-on-Trent ST4 4AJ.

US Army vfo M1-19467A 1-5 MHz new cnd with hb £4. Power amp Mo 2 mk 3, 12 V, 2-7 MHz £2 5s. Pye tx/rx, PTC116, 60-100 MHz with hb £3 15s. Tx 1 54N unmod £3 15s, carr extra. A. Stagles, G3RBY, 2 Blackthorn Close, St Albans, Herts. Tel 55-54009.

Swan 350, psu/ls, vox and 100 KHz cal fitted. Wkg well, £190 carr paid. W. Beattie, GM8AT, 43 Invercauld Rd, Mastrick, Aberdeen, Scotland.

Eddystone EA12, exc cnd, hardly used £125 buyer insp. Peers, G3BEZ, 3 Monks Brook Close, Eastleigh, Hants.

KW2000B with ac psu as new cnd £210. Will take HA350 or other good rx in part exch. P. Cooper, G3VMB, 42 The Osiers, Braunstone, Leicester, LE3 2XN. Tel Leicester 89621.

Panda Cub hf bands tx, 50 W, £20. Wavemeter no 10 should work £2. Carr or collect, B. King, G3SGK, QTHR, Tel (week) 01-937 1356, (home) Gerrards Cross 83346.

Prize winning mobile rig 160 m am, comprises tx 10 W, psu, mod, mic, transistor psu, Command rx, s meter, CF loading coil £22 10s. Can be seen by arrangement. M Niman, G3LGN, 9 Montgomery Drive, Unsworth, Bury, Lancs. Tel 061-766 2942.

DA-1 el keyer mint £12. HRO psu in gd order £1 10s, Metro-Vik thermocouple rf ammeters 0-350 mA plug-in, brand new in makers sealed cartons 11/6 each, all items pp. Stratton, G3XJJ, 14 Kingsthorpe Grove, Northampton. Tel Northampton 39196.

200 items, R107 £10, TS34A/AP scope £20, mobile radiotelephone £10, BC221 £16, W1191A wavemeter £10, many other items, valves, meters, components, etc, sae list or phone for full details. B. Bailey, 79 Weston Park, Crouch End, Hornsey, N8. Tel 01-478 5057 or 01-348 0406.

FRDX500 Sommerkamp, 6 months old, mint, offers over £100. Wanted Drake R4A or B. C. Stead, G2UZ, 2 Cliff Road Gardens, Leeds, LS6 2EY.

Eddystone S640, perfect cnd with atu £15. T. Kupicha, Red Gables, Great Mongeham, Nr Deal, Kent. Tel Deal 4276.

Fidelity playmaster twin track tpe rcdr and 4 tapes £15 ono. Empire Corona deluxe typewriter as new £15. Westmoreland Stereo record player, immac £20 plus 80 records. TW 2m converter, i.f. 4-6 MHz, spare valves, psu, £12, buyer must collect evenings. S. Phelan, 9 Lime Tree Gdns, Goole, Yorks.

Pair mint 31 set tcvrs, mk 2, 39-48 MHz, fifteen BG7 valves, double superhet, afc, slow motion tuning, 70/- each. Also pair 18 set mk 3 separate tx/rx in case 6-9 MHz, 1 newish 30/- used 20/- Carriage 15/-each. J. Page, 2 Beaulieu Ave, Christchurch, Hants. Tel Christchurch 5347.

Viceroy mk 3A, double lattice filter, 6146B tubes, recently checked, buyer collects, priced accordingly £75. H. Turvey, G3OH, 6 Pearce Ave, Parkstone, Poole. Tel Parkstone 4694.

American 4X150 cavity pa unit, film dials 100-225 MHz, needs blower £5. 12 V Pye Ranger 34 MHz comp unmod £4. G2DAF rx, Electroniques coils, Eddystone dial, filter xtals wkg but wired roughly £10. J. Anthony, G3KQF, 10 Manor Rd, Borrowash, Derbys.

Heathkit tower HT16 £30, ladder to fit Heathkit tower, galvanised, no drilling necessary £15. Would consider exch for good general coverage rx, ie, 750, 680X, etc, balance either way. J. Joslin, G3NPY, 13 Talbot Rd, Skegness, Lincs. Tel Skegness 4185.

Heathkit HW32 with GH12 ceramic mic, no psu, £35 ono. Also G-whip 160-20-15-10 £5. A. Mutch, G3XAR, Zodiac House, Porthcurno, Penzance, Cornwall.

HRO, Mod Front End, 10 coils, bs on 80, 40, 10, hb on 20, 15, no 20m gc coil, no psu £12 10s. Variac new 2A £4. Scope tube 20th Cent Electronics DGP/1 £1 10s, carr extra. G. Steele, GM3SIY, 28 Erskine Hill, Polmont, Falkirk, Stirlingshire. Tel Polmont 2025.

SWM 1946-66 (29 missing). RSGB 1953-66 (27 missing). QST 1962 (2 missing), 1965 (complete) £2 buyer coll. 813's with valve holders 10/- each. W. Scott, G31FG, Dudley, Anstey Lane, Alton, Hants. Tel Alton 3610.

Trio 9R59 for sale, offers please. Also Joystick. Brian Harrod, 7 Church St, Hingham, Norfolk Nor 23 X, Norfolk. Tel Hingham 371.

HRO5T coilpacks 180 KHz-30 MHz, bs 80-10 £22. Super-Pro SP400-SX with psu 1.25-40 MHz £25. Redifon RA10 isb/ssb solid state receiving adaptor with hb £35. 813 valves 10/- each. Prefer buyer coll, hb's for HRO and Super-Pro available. D. Nunn, G3JMJ, Fircroft, Station Rd, Edenbridge, Kent. Tel Edenbridge 3467.

Offers for about 1 ton surplus, rx's, tx's, valves, components, Bulletins from 1936, SWM from 1946, would swap lot for small, modern rig complete, suitable operation off petrol generator etc. Call or phone. A. Reeder, G3BOT, Northfield Farm Kennels, Malton Lane, Meldreth, nr Royston, Herts. Tel Melbourn 741.

XTALs 7055, 7160 5/- each. 10 A tran, 6-12-24 V 10/- WB speakers HF1016, HF 1012 £5 each as new. McMichael all valve rx 501 AC 50/- F. Ainsworth, G3KIA, QTHR, Tel Tottington 2297.

Kits for G3PDM directional wattmeters still available. See July p. 449. Martin, Oak Cottage, Witton Gilbert, Durham.

Unmodified R107 gd cnd, valves recently replaced, with hb, £13. Information wanted on radio astronomy and early period of amateur radio. P. Hyde, 8 Highgate Drive, Walsall, Staffs. Tel 22745.

Lafayette HA63 rx mint cnd £15. Tiny Tim 300 W 14 V generator £18. Silver plated cavities ok 70 cm. Details sae. EF183, 184 valves new 3/- Philips xtal mics new 17/6. Wanted Honda generator. R. Bastin, G3LHA, 40 Stamford Ave, Coventry. Tel Coventry 67133.

Professional microscopist's English Swift Microscope, choice of optics, absolutely mint cnd, mahogany case, £65 or exch gc rx. Prefer Eddystone 680X/940 or KW1000 linear or CSE top band mobile gear. D. Pike, G3WDY, 27 Cintra Park, London, SE19. Tel 01-653 4738.

Heathkit RA-1 rx in exc cnd £28. Codar PR30X pre selector £5, both units together £31 ono. Also 8 el 2m beam 25/-, 4 el 4m beam 25/-. Buyer collects or carriage extra. D. Poulter, G3WHK, 279 Aragon Rd, Morden, Surrey. Tel 01-337 0117.

Creed 6S5 tape auto tx mains mtr vgc 2 at £25 each. Wanted RAF compass no P10 or P11, also ATE TDMS SB/6B gd price paid. B. Cedar, G8BMQ, Cedarville, 2a Convent Hill, Upper Norwood. Tel 01-653 8489.

4m gear. 20 W tvi proofed rack mounting tx, 8 W xtal controlled tx/rx with transistor psu, RF27 tuner (7 MHz i.f.), unipole and 4 el yagi antennas £20 the lot. Will separate, demonstrate. J. Carter, G3OWB, 103 Kingsway, Petts Wood, Kent. Tel Orpington 29184.

DX100U £30. T28, AT5, 12MS, 12RC, Halson Whip with 160 and 80m coils £25. HW30 Twoer battery psu GP11, 4 el yagi and halo £20. BC221M £10, all in gd cnd. Maddox, G3JBA, Tel 01-643 2845 after 7 pm.

KW Victor tx, 80-10m, 120 W am, cw, table-top model, exc cnd £25 or exch for Codar 12MS psu and 12RC control with cash adjustment. Mr. P. Featherstone, G3XOP, 27 Court Close, Aylesbury, Bucks.

TR2002 ex RAF tx/rx, suitable 2 metres £3, also 30 ft copper tubing mast, complete with guys, anchor pins, hammer etc £4. Details (sae) to J. Reader, GW8AXN, 13 River View, Hundleton, Pembroke, Wales

TCS6 tx modified with large psu £12. TCS12 rx modified with psu £10. Manual £1. B44 mk 2 modified with psu, mic, xtal, dipole £7. Jap auto bug paddle 50/- Buyer insp coll. C. Linell, G3VLT, The Villa, Woodlands Rd, Orpington, Kent BR6 6EB. Tel Farn 54518.

Rogers Junior Amplifier, Pick-up booster and control unit (all monaural). Also Decca FFSS magnetic stereo pick-up mk 2, mounted on Collaro 4T200 transcriptor, work together well, £25 or exch 2m rig, hb considered. D. Durham, G3SIR, 3 Dobbin Close, Covingham Park, Swindon, Wilts.

NCL2000, 2 kW pep with pair spare 8122's £160. Heathkit SB300 rx £80. Swan 350 with ac psu £200. All good cnd. Carr extra. S. Donnelly, Gl3SLE, 48 Glenbank Rd, Londonderry, N. Ireland. Tel Londonderry 4369.

Saba tape rcdr, stereo, cost £95, £55 ono. 6 ft by 2 in masts, slot together 8/- carr extra. Wanted Command rx BC453. Please write giving details or offers. J. Donne, G3YKK, East View Cottage, Sutton Grange, Ripon, Yorks.

3 ft dia met balloons 10/- each. Hydrogen filled £1 delivered London area only. 275 ft reels aluminium wire 10/-. All ideal for erection of balloon supported aerial. R. Stratton, G3XKV, 15 Avenue Rd, Brentford, Mddx. Tel 01-560 8671 (after 6.30 pm).

80m ssb mobile torr with 12 V psu, speaker and mic, uses equivalent of 6146B in final. Offers to. Flt.Lt. C. Ledger, G3UBL, 9 Rampton Drift, Longstanton, Cambridge. Tel (9 to 5) Willingham 555.

Minimitter mobile tx 160-80-40 with control box £8. Wanted TCS rx or similar, also Natterbox or similar, ssb tx for 160m. R. Wilson, GW3DSV, Ty Du, Llanfechain, Montgomery.

G3IIR/FZL 4m converter, i.f. 1.5-2.1 MHz £3. Halina 35X Super 35 mm camera £5. Psu immac 1000 V 1 A, 350 V 500 mA, 30 V, 10 V, 6.3 V ac, ct 10 A-125 V, $7\times11\times15$ in £12. Buyer collect. Wanted KW160. C. Linnell, G3VLT, The Villa, Woodlands Rd, Orpington, Kent BR6 6EB. Tel Farn 54518.

Impedance bridge Muirhead type D197A, 1% accuracy on inductance, resistance, capacitance with internal galvo, hb, mains operated £8 plus carr. Wanted RAF push button controller type 4, RCA aircraft rx AVR15, BC463 tx. A. Cockle, 14 Leewood Way, Effingham, Leatherhead, Surrey. Tel Bookham 5439.

Heathkit DX4OU mint £17. R1155 rx £4. Two 38 walkie-talkie sets £2 pair. Prefer buyer collects. A. Wragg, G3WEX, 29 Eastern Rd, Sutton Coldfield. Tel 021-354 4265.

Nombrex 6R bridge, AVO LCR vtvm bridge, Canadian 58 set and 12 V psu, TW Mk 11 2m Communicator, ext coverage and squelch, int spkr. GEC 220 MHz tx, 6-40A, BC221 needs recalibration. Eddystone 830/2 £200 ono. 70 cm G & D Nuvistor converter 14-16 MHz i.f. Wanted Swan 14X dc module or exchange for 14XC. Dr B. Hutchinson, G3VGH, QTHR. Tel York 69245 (after 9 pm).

Tiny Tim petrol charger 300 W unused since recondition £16. Cavity wavemeter micrometer dial, directly calibrated 8-11.5 cm £6. T & R Bulletin vol 15 1939/40 complete, offers. Sae list other items. R. Norrington, G3IUD, 58 Kings Rd, Wilmslow, Cheshire.

R107 rx, gd cnd, wkg, s meter fitted £15 ono. R. Johnson, 14 Woodcock St, Wakefield, Yorks.

AR88D, gd cnd £40, call weekends or evenings. C. Cookson, G30SE, 62 Copsewood Ave, Chetwynd Estate, Whitestone, Nuneaton, Warks.

KW2000A, psu, Shure mic £165. 813 linear £25. Katsumi Electronic Keyer unused £6. Mosely TW3X antenna unused £6. Sae list other gear, valves, mags, books etc. Richardson, 50 Hayes St, Bromley BR2 7LD. Tel 01-462 5004.

Geloso G209 good performer £30 ono. Pye Mozart vhf tuner, 88-108 MHz, provision for diplex £10. D. Dix, 96 Winslow Close, Eastcote, Pinner, Mddx. Tel 01-868 0418.

Eddystone EC10 vgc, new, £30. Joystick deluxe with 4RF tuner £6. Cadell, 7 Osmund St, London, W12. Tel 01-749 1863.

2G308 ex equipment but new 10/- per doz, add post. R109 rx, plus 6 volt car battery, buyer collects, £4 ono. G Baraclough, 2 High View, Higham, Rochester, Kent. Tel Shorne 2297.

DX100 American covers 160-10m, requires 110 Vac input. Gd cnd £45, prefer buyer insp and coll. R. Henville, G3TPH, 34 Elm Grove, Orpington, Kent.

Swan 500C with ac psu, TA33 beam, 10-12U scope, Sony 2000 stereo tape rcdr. D. Jack, G30FV, Streatlam Camp, Barnard Castle, Co. Durham.

CR100 exc cnd, s, bfo etc £22 ono. M. Pelham, Tresco House, Ogbourne St Andrew, Marlborough, Wilts. Tel Ogbourne St George 220.

Codar CR70A and PR30 preselector, both in mint cnd £18. A. Burgess, 59 Laburnum Grove, Tobrex, Stirling, Scotland. Tel Stirling 4591.

Mobile rig. Tx 15 W, 80, 15, 20m, 10 W transistor mod, both compact constr £10. Transistor dc conv, 300 V, 100 mA commercial £5. Offers considered. Wanted HA350 rx. C. Tomkinson, G3MUT, 182 Chester Rd, Hartford, Northwich, Cheshire. Tel Northwich 74776.

Xtals for G2DAF filter. 8300 KHz (12), 6300 KHz (1), 10300 KHz (1), all unused £3. AR88 gearboxes (2) £2 each unused. Class D wavemeter, perf cond with spares £4 plus pp. A. Hitchcock, 38 West Rd, Spondon, Derby. Tel Brunswood 536.

Tiger 300 tx, 300 W am, as new, £35. M. Fereday, GW3VOW, 32 Highbury Cres, Cefn Glas, Birdgiend, Glam.

Mint SB1OU ssb adaptor, £24 ono. Minimitter mobile tx with psu and control unit. Details from M. Whitaker, G3IGW, Rose-Dene, Wood Lane, Hipperholme, Halifax.

Eddystone 750 500 KHz-32 MHz, double conversion, variable selectivity, checked by maker, as new sensitivity etc. KW Vanguard tx, best offers secure. Rayer, Reddings, Longdon Heath, Upton-on-Severn, Worcs. Tel Upton-on-Severn 2244.

Eddystone 358X, 30 KHz-30 MHz, all coils, psu, wkg but rough £4. 1200 V mains psu, (no 45 for 1154 tx), unused £4. R1392 96-150 MHz, works well, 50/- All ono, prefer collect (Derby rally) or pay carr. R. Smith, G3VKT, 178 Harlow Rd, Nottingham, NG8 1FN.

Eddystone 888A £65. Eddystone 770R 19-165 MHz £85. 2 UC2 mod trans. R. Ward, G2BSW, QTHR. Tel Axminster 3163.

Lafayette HA500 rx, 80-10m plus 6m, hb, mint £35 ono buyer coll. J. Lord, G3BIA, 38 Bucklands Rd, Teddington, Mddx. Tel 01-977 6705.

Trio model 9R59, offers please. Callers not on Sundays. B. Harrod, Mace Shop, Hingham, Norfolk, NOR 23 X. Tel Hingham 371.

Marconi rx type CR150, 2-60 MHz, gd cnd, £17 10s ono. SCR522 2m tx 20/-. Buyer collects. R. Dunham, 27 Hurst Way, Leagrave Luton.

DX100/SB10 with manuals, insp, coll £65. 9R59DE Q mult £30. Top band Natterbox with linear 5763 £10. 2m 4 nuvistor self pwrd converter, if 14-16 MHz £6 10s. AR88 spkr and cabinet 35/- LG300 rf valved £10. N. Hales, G2DTO, 4 Westbrook Rd, Thornton Heath, Surrey. Tel 01-653 7315.

Heathkit Apache £50 ono. P. Merriman, G3YJE, 36 Squires Lane, Finchley, N3.

WANTED

Trio rx 9R59DE must be gd cnd, also 2m converter. R. McInnes, GM3LNE, 37 Craiglockhart Cres, Edinburgh 11. Tel 031-443-5097.

Someone, preferably swl, wanted to hold money for purchase of small parts and catalogues and other items in England for Dutch amateur. Expenses covered and favours reciprocated. F. Mali, A/O FCM, Burg, Hogguerstraat 389, Amsterdam 1016, Holland.

Xtals. Any type. 1848, 2182, 2381 KHz, please state price. G. Dale, G3PZF, 18 Lezayre Rd, Green Street Green, Orpington, Kent. Tel Farnboro' (Kent) 54512.

Would anyone knowing the whereabouts of Douglas Woodcock, G5WK, please contact G5HB, QTHR, Tel Steeple Morden 315.

Antique wireless receivers, spkrs, catalogues, valves, books on radio for inclusion in radio museums. Collection can be arranged. D. Byrne, G3KPO, Jersey House, Eye, Peterborough. Tel Eye 351.

Joystick vfa and tuner for rx. Please give details of cnd and price and enclose sae for reply. M. Kenyon, 120A Boyds St, Accrington, Lancs BB5 2LH. Tel Accrington (0254) 31171 (7-8 pm).

70K1 vfo for Collins KWM-1 tcvr. A. Edwards, KR6TAB, 498 TMG Box 617, APO San Francisco 96239, USA.

Mech filter for ssb tx about 450 KHz. A. Pickup, G3XLF, 17 Middlehurst Rd, Grappenhall, Warrington, Lancs. Tel Warrington 63911.

Borrow or buy recording of Apollo Ten communications and any other manned space flight. L. Sapiets, 132 Horton Rd, Datchet, Bucks. Tel Slough 41501.

Handbook, circuits or any info on Cossor portable oscillograph type 1052, buy or borrow. D. Bemister, G30BX, 69 Woodfield Drive, Gidea Park, Romford, Essex.

CR100 in gd order, also 2m mobile. G. Spark, G3UOX, 13 Cardlidnack Close, Mawnan Smith, Falmouth, Tel Mawnan Smith 577.

Clean bound volume of RSGB 1966, also March, April, May 1968 RSGB. R. Berry, c/o FCO (New Delhi), King Charles St, London,

Manual and circuit diag for DX4OU and VF1U. J. Baker, G3YHB, 86 Max Rd, Liverpool, Lancs Ll4 4BJ. Tel 051-228 1321.

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