MERCURY

THE JOURNAL OF THE ROYAL SIGNALS AMATEUR RADIO SOCIETY

NUMBER 37 AUTUMN 1971

ROYAL SIGNALS AMATEUR RADIO SOCIETY

(Affiliated to the Radio Society of Great Britain)

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HEADQUARTER STATION W.A.B. AREA
SIERRA TANGO NINE ZERO

RSARS/RAIBC STAMP SECTION
Please send all used or unused
British or Foreign stamps to :
Mr. A. Herridge. G3IDG. RSARS 024
96, George Street,
Basingstoke, Hants.

ACTIVITY DAYS
G4RS operates on 3720 khz (± 10khz)
every Tuesday and Thursday Evening
commencing at 1900 hrs GMT
The last Sunday in each month is also an
activity day.

HEADQUARTER STATION CALLSIGNS

Normal call:	G4RS
Special Event Station	GB3RCS

MEMBERSHIP FEES
Annual fee : 50p
Life Membership : £5.00

MERCURY WILL NORMALLY BE PUBLISHED QUARTERLY, AT THE FOLLOWING PERIODS.

SPRING EDITION ..... APRIL ..... SUMMER EDITION..., JULY
AUTUMN EDITION..... OCTOBER ..... WINTER EDITION..... JANUARY

ITEMS FOR THE NEXT EDITION TO REACH THE EDITOR BEFORE END OF

NOVEMBER 1971 THANK YOU.

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Articles for publication should be submitted to the Editor, Mercury, RSARS, School of Signals, Blandford Camp, Dorset

RSARS nets operate on Tuesday and Thursday evenings around 1900 hrs BST, frequency 3720KHz approx. depending upon the QRM. Saturday morning net operates at 1000 hrs on 7050KHz plus, normally run by GW3ASW.

Come and join us……...

SOCIETY AFFAIRS

In the Spring the young and old "hams" fancy turns to the great outdoors. There appears to be a mass migration from the shack to the garden, the countryside and the sea-side. Only occasionally do some of us sneak into the shack when the XYL's back is turned.....15 metres is hopeless, the noise level on 80 is unbearable and the continental. QRM on 40 is unbelievable..... Ah well back to peace and tranquillity of the garden!

This attitude of mind could explain the poor turnout during the 10th Anniversary Activity Weekend.....on the other hand it could also explain the very good turn out at the rallies which are held throughout the country during the summer months.

The Longleat Rally is always well attended, it has all the ingredients of success. A number of attractions to keep the family happy whilst the OM is chewing the rag, handling the 'junk', or looking hard at that 'plug-in appliance' which has been marked down as bargain at £200! HQ Station will be there again next year and the staff are looking forward to meeting as many members as possible.

The Open Day held at Blandford Camp on 18th July was also a great success, and the 'do' that some of our members attended in the WOs & Sgts. Mess the night before was enjoyed by all particularly when G3XSN, Bert, borrowed the guitar and entertained us and the other members of the Mess with two highly amusing songs which he not only sang, but also composed!

We extend a welcome to our new President Brigadier A.J. Jackson B.Sc, C.Eng, FIEE, Director of Telecommunications (Army) who took the trouble to travel down to Blandford (on a Sunday) to take the chair at the Annual General Meeting, which this year was held in Princess Mary Hall at the School of Signals. The retiring President Brigadier Brindley OBE, FIEE, sends all members his 73, and tells me that he will watch the Society's progress with interest.

During August and September Ron Cox wiled away the weary hours keeping the Richmond Castle commemorative station GB3RCA on the air. Those who were lucky enough to work him will receive in the near future the QSL card reproduced below. This excellent card was produced by our printer Tony Tabberer G3WRY.

RICHMOND, SWALEDALE, YORKSHIRE. Station supplied and operated by the Royal Signals Amateur Radio Society Club Station. (Catterick Camp, Yorkshire)

If we can raise the money! We intend to start a technical library run by the HQ station manager. The object is to collect a number of books which will be useful to a broad cross section of our members, from the SWLs and G8s and the other SHF/VHF types, to the chap who potters about on Top Band, covering subjects ranging from operating procedures to constructional techniques. If you know of any good titles write in and let me know (have I left myself wide open! Tech books only Tnx). How much will it cost? You send the cost of the postage and we send the book. How long can I keep it? Normally the period of the loan will be one month.

Your comments on the proposed scheme for or agin will be much appreciated.

How does one define a disabled person? Normally a chap who keeps his socks up with drawing pins would be defined as being disabled, although if he is an amateur operator he suffers no disadvantage, from an operational point of view he is perfectly fit.

For the purposes of the RSARS Awards Scheme a disabled person is defined as follows:-

(a) A PERSON WHOSE AMATEUR RADIO STATION, OR PART THEREOF, HAS TO BE MODIFIED TO ENABLE THAT PERSON TO OPERATE THE STATION.

(b) A PERSON WHO, BEING DISABLED, HAS HAD A MECHANICAL AID MODIFIED IN ORDER TO ALLOW THAT PERSON TO OPERATE AN AMATEUR RADIO STATION.

A note to the Awards Manager stating a) That the application is in accordance with the above, and b) Details of the type of modification carried out is all that is necessary. Details of your disability are not required.

Have you a good memory for callsigns? Most amateurs start off by providing themselves with some sort of indexing system of the stations they worked, but alas, it usually breaks down and becomes discarded.

Last October the Society published a list of members callsigns put in order according to the members number. Unfortunately this list published in isolation proved to be completely inadequate.

This year the numerical list has been supplemented by an alphabetical index. If you know his callsign you can quickly establish his RSARS membership number. If you know his number you can find his callsign. Very useful during a QSO, the two lists compliment each other to provide a cross index.

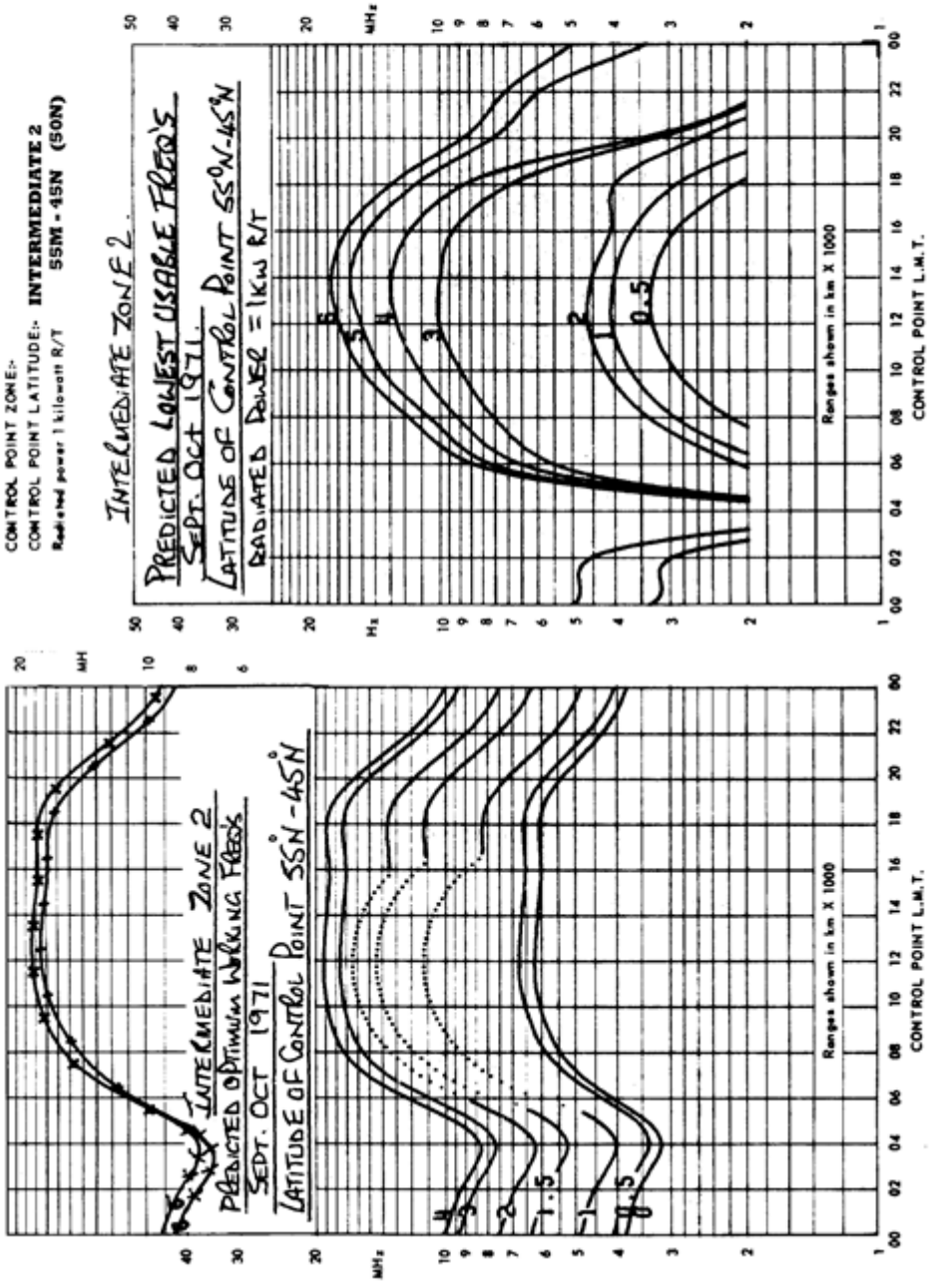
The 'operation' of the alphabetical list is straightforward, if you are in QSO with a station say G3KPQ and you require his membership number look under 'K' and find KPQ G3 331. Another example..... MP4TDA under 'T' find TDA MP4 046. The space provided against each callsign will allow you to enter the station ops. name and QSL information. Additions to the list can be made at the bottom of each section.

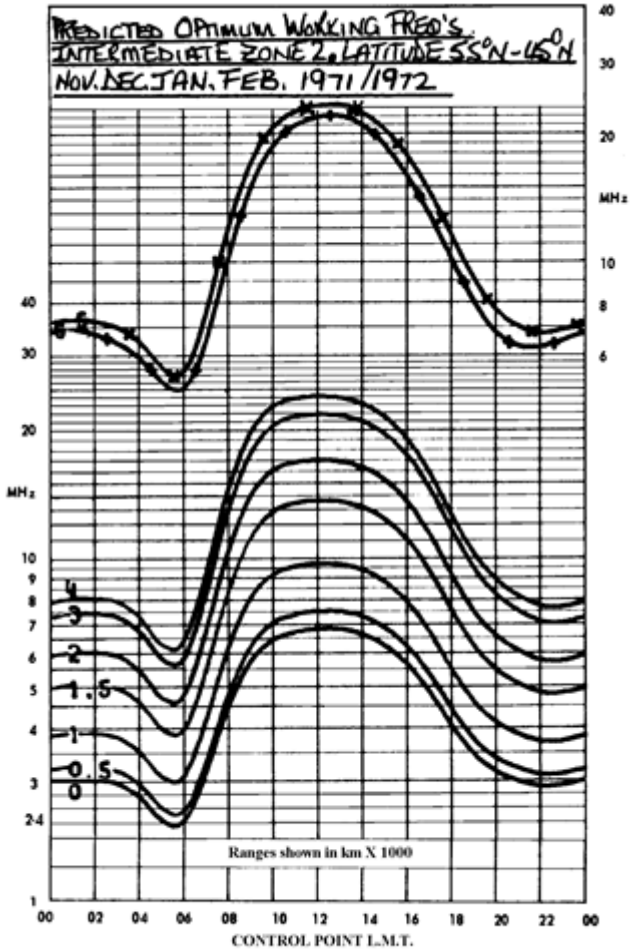
I hope that you will find the information a useful addition to the 'logistic support' material you have in the shack. The lists have been checked but the odd error is inevitable. If you spot an error please let me know so that corrections can be published in 'Mercury'. Tnx a lot.

Congratulations to John Hodgkins G3EJF (RSARS 004) on the award of the GW2OP Trophy. John has made a substantial contribution to the Society not only during the last year but also during the last ten years. To round off the year he has written an article for his fan club, namely G3NUT, which will be published in the next edition of Mercury. The subject is the direct conversion receiver.

For sometime past Sir Evan Y. Nepean, Bt. G5YN (RSARS 040) has been supplying HQ station with information on H.F. propagation conditions. Evan would like to see this information published in Mercury. The prediction curves for Oct, Nov, Dec, Jan, Feb, are published over the page. These cover a control point (Ionospheric reflection point) between latitude 55°N - 45° N, in control zone Intermediate two. If you consult a map you will find that that puts the Ionospheric reflection point directly above the U.K. This will be useful for 40 and 80 metre work.

The information presented is for commercial grade circuits, amateurs accept a lower signal to noise ratio therefore operation may be possible outside the times given. The curves should be regarded as indicating the best times to operate on a particular frequency band. When are they going to issue curves showing QRM condx?!!!??!! 73 de Bill Graham, General Secretary.



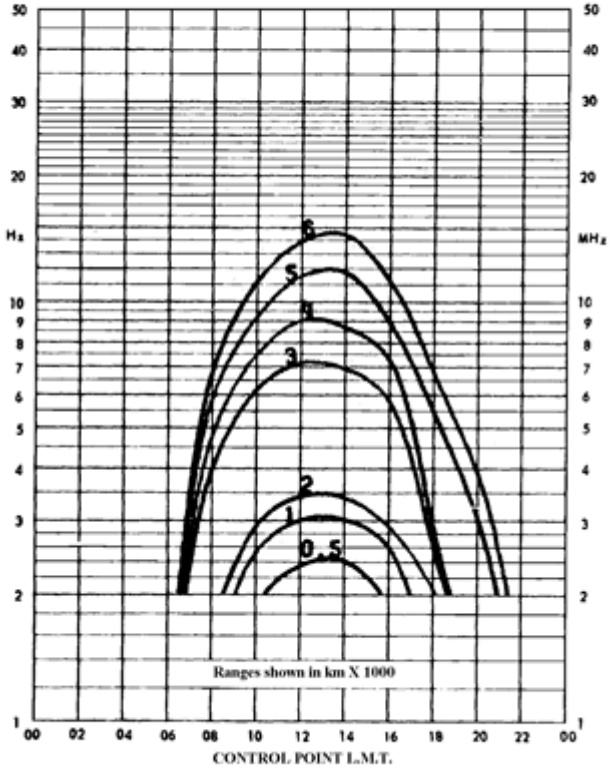


PREDICTED LOWEST USABLE FREQUENCIES FOR:-
NOVEMBER, DECEMBER, JANUARY AND FEBRUARY 1971/72

CONTROL POINT ZONE:- **INTERMEDIATE 2**

CONTROL POINT LATITUDE:- **55M - 45N (50N)**

Radiated power 1 kilowatt R/T



Notes on prediction charts

Bill Graham, G3KPQ RSARS 331

In the operation of skywave communications there is a band of frequencies called the operating range, suitable for use over a given distance which varies with:-

Time of day, season of the year, solar activity within the eleven year sunspot cycle, geographical locations of the terminals, ionospheric absorption, atmospheric noise level at the receiver site, transmitter power, antenna system characteristics, type of modulation, and signal to noise level required.

The upper limit of the operating range, the MUF (Maximum Usable Frequency) is determined by the physics of the ionosphere over which we have no control.

The ionosphere not only varies according to the factors above, but also from day-to-day within the month. Therefore the MUF will vary up and down, to ensure operation throughout the month it is necessary to base the curve on the average frequencies according to the movement of the MUF (normally called the MEDIAN FREQUENCIES) during the month, or period covered. This average is termed the O.W.F. (0ptimum Working Frequencies). In general higher frequencies than this will be workable for 20% of half the days in the month, but where the E or F_1 is controlling there will be no variation.

At those hours during which the E layer or F layer is 'controlling' the circuit, the OWF is shown as a dotted line. No account is taken of sporadic E propagation.

All LUF (Lowest Usable Frequencies) are calculated for an antenna radiating one Kw on SSB.

Statistical evidence suggests that CW can be received in a radio noise environment which is 14 decibels worse than that required for SSB. That is another way of saying that CW operation is possible at a frequency below the LUF given the same power output as on SSB.

That will do for starters! More detailed information will be given in next Mercury. If you don't understand them hang them up in the shack to impress the visitors ???!!!??.....

PS The range in km is taken to be the distance between stations. For 80m I suggest you use the 0·5km curve.

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WELCOME WELCOME

The Society extends a warm welcome to the following new members who have joined since the last edition of 'MERCURY'. Please bring your lists up to date.

RSARS No.	MEMBERS NAME, CALLSIGN AND ADDRESS
836	Peter Dennis Johnson, Christs College, Finchley, N3.
837	Sydney Gilson, 1, Waterloo Villas, Bellhall, Halifax, Yorkshire
838	Howard Gresley Cunningham, G8FG, 235, Station Road, West Moors, Dorset.
839	Allan Stewart, GM4ABO, 4, Lang Street, Paisley, Renfrewshire, Scotland.
840	Alan Pressley, BRS31182, 22, Springbank Avenue, Farsley, Pudsey, Yorkshire.
841	Geoffrey Howard Tibbey, 'Heathers', Hilton, Blandford, Dorset.
842	Jeffrey Denis Philpot, ESW, School of Signals, Blandford Camp, Dorset.
843	Alan J. Gibbs, VK6PG, 12, Munyard Way, Morley 6062, Western Australia.
844	George Pearson, Lamorna, 28, Jubilee Road, Street, Somerset.
845	Len. Pearson, G3JFE, 300, Scalby Road, Scarborough, Yorkshire.
846	Donald Francis Wilson, 19, Fishers Close, Blandford, Dorset.
847	Brian Ward, 34, Weatherall Street, Nr. Broughton, Salford 7, Lancashire.
848	H. Dennis Fennah, 14, Highfield, Hawarden, Deeside, Flintshire, Wales.
849	Leonard George Boswell, G4AEJ, 170,Kestral Avenue, Yardley, Birmingham.
850	Andrew Rattray Becket, 3, School Close, High Wycombe, Buckinghamshire.
851	David John Russell, A7354, 10, Hampshire Cross, Tidworth, Hants.
852	David Michael Ferigan, G3ZYV, 191, Gillingham Road, Gillingham, Kent.
853	Ambrose Francis Dowling, G3GUE, Laburnum, Clearway, Addington, Maidstone, Kent

==========PLEASE NOTE==========

You MAY have joined after SEPTEMBER 1st, in which case your details are not included here, as our copy date demands that material reaches the editor in good time for publication. Your MERCURY will include last minute copy and you may find details in the stop press. In any case, the details appear in MERCURY in NUMERICAL order, so watch for the next edition.

73 de 3TAN

==========PLEASE NOTE==========

CONGRATULATION TO:-

WOII Spike Bernard. RE RSARS 366 Ex DL5XW...……..just received his UK callsign G4AKQ.

Brian Lennon. RSARS 115…….who has acquired a new callsign G3ZUM his previous call was G8CCE.

Paul Leach. RSARS 832. .....….. got his ticket and is now GD4AMZ.

AMENDMENTS

The following changes in QTH have been notified

RSARS No.	Call	Amendments
028		R. Webester, 15, Drummond Avenue, Great Sutton, Wirral, Cheshire.
072	G5XB	S.A.G. Cook. Little Orchard, Gallows Tree Common, Reading RG4 9BP
076	G3ONU	Lt. Col. D.A. Barry, R. Sigs., 15, Bulbridge Road, Wilton Nr. Salisbury, Wilts.
302		D. Holman, Whitecliff House, High Street, Spetisbury, Dorset.
415	VE4AI	S.T. Chisholm, 371, Harcourt Street, Winnipeg, Zone 12, Manitoba, Canada.
596	G3PYN	J.A. Birley, 16, Sharman Avenue, Watton, Norfolk.
716	(Temp Address)	Main Address unchanged. A.H.B. Holmes St. John's College, Cambridge, CB2 1TP
823	Ex-MP4TDY	L. Stainton, 6, Eskdale Road, Dorman's Town, Redcar, Teeside TS10 5HA
832	GD4AMZ	Paul J. Leach, Walters House, King Williams College, Castletown, Isle of Man.

PLEASE NOTE

To all members intending to give notice of change of address, additional callsigns or any change of circumstances that requires a change to be made in our records system; Please PRINT THE CHANGE TO BE MADE IN BLOCK LETTERS

FROM THE MAIL BAG…… 

Andy Guest (721) has taken over from Sean Ryan running DA2YX at 229 Signal Squadron. New Heathkit to the value of £600 is on order (is that a misprint Andy?), should be hearing a potent signal from them in the not too distant future.

Julian Jablin. W9IWI. (798) Wrote in with a payment in sterling to cover his annual subscription. "The poor old dollar is apparently in bad shape, now we know how you felt when the pound was under attack, hence the payment in sterling" Julian is the late President of the Amateur Radio News Service. Having served the mandatory two years he has relinquished the job to W6LPJ Archie Willis.

Sgt. G. Mac Naught. (528) Ex VP5GM, G3WOV currently holding the call-sign DA2XN has rejoined the Sappers after nine months on the "outside" it must 'ave bin 'orrible. Anyway he is back amongst friends! He tells me he has been 'playing' with a Delta Loop antenna which he thinks originated in the U.S.A. He is thinking of 'writing it up' for Mercury. I know a number of people who would be delighted to read it.

Ray Webb. MP4TDA (046) OUT THERE IN Sharjah tells me that the MP4 prefix is expected to come to an end at the beginning of next year. In fact Ray will be the last of the RSARS members in the area with the MP4T……Allah will provide a new call sign in 1972 - Inshalla.

Peter Birley. G3PYN. (569) has moved QTH to Watton in Norfolk but will be at H.Q. Stanford Training Area, West Tofts Camp, Thetford. During normal working hours will be pleased to have an eyeball QSO with any RSARS members.

John Proudfoot. BRS31718. (658) RAIBC. During July helped to run a stand at a specia1 station GB2FON set up in the City of Nottingham. He provided the receiver, a Star SR550. John tells me that it did not stop him from listening to the Royal Signals net on Thursday evenings. That's what I call loyalty John.....I always forget to say gud nite to the SWLs.

Don Lomax. G8AHH. (829) Thinks that his first copy of 'Mercury' is "great stuff". His chief interest is mobile operation on Two Metres using a Heathkit HW17. The rig is installed in a Vauxhall 2000 S2 current model. He gets a lot of whine from the alternator when driving. The pitch varies with the speed. Anybody know of any special 'unkles" to "iron out the whine" (G3UAA) may be able to help. Ed).

Amateur Radio isn't the only hobby that Doug Brabner G3CXE (821) pursues, he has not been checking into the net because he is busy managing and coaching a senior league football team.

Those members who attended the Rally at Blandford may have seen a photograph of Harry Billard VE8CB, EX VE3EMQ, (708). Harry enjoys building Heathkit gear, his station now consists of SB303 (Solid state Rx), SB400.....SB403 on the way, SB600, SB610, SB630, SB220, and the new Heathkit watt meter HM102 to ensure he does not exceed the legal limit (He finds time to go on the air!). To beat the power failure problem which sometimes plagues him up there in the North West Territories (Inuvik) Harry has a standby Swan 270 complete with battery ready to go.....he is looking for RSARS members.

Bob Norcross. VK6WO (606) Was introduced to amateur radio by one Les Dicker (who is now serving at Catterick Camp after a spell in hospital) whilst serving in Aden in 1962. He is now a _member of the RAAF stationed in Western Australia, and will be there for a couple of years. He hopes to do a tour in VS6, and 9V1 land. Incidentally Bob has just purchased 1000 QSL cards so it looks as if he means to stay up-side-down for a long time. When the XYL gives him some time off he intends to get something up in the air that resembles an antenna..... be hearing you in the winter????

Sean Ryan. VK6JR (575) Hopes that his RTTY gear will arrive soon in VK land, Sean is one of those people who 'clanks' his way through life at 45·5 bauds! Poor chap. He will be listening out for G4RS and other RSARS RTTY Stations this coming winter. The Fone men can hear him on the VK6-Crawley net, AR International, on Tuesdays and Sundays 14·175..... times as per prediction...SSB and RTTY with VK6PG (another RSARS member) in control.

Gary Thomas. ZL2AZT (407) Is looking forward to the summer down there in New Zealand, and hopes that it will be a little better tempered than last summer when a cyclone hit New Caledonia and swung south. It struck the top of North Ireland creating havoc for camping holiday makers, and breaking the mooring lines of several yachts in Auckland Harbour, there's worse to come - some amateur antennas were blown down!

Jack Cooper. DA2XX (090 Ex. Gen. Secretary) Sends RSARS members greetings from DA land. He has been doing trials on equipment designed to work over 4000 MHz (no RSARS members up there Jack). He has been having a go on the HF bands using a Redifon rig on CW and SSB (upper side band only). Jack complains that RSARS CW men are as elusive as the Pimpernel. If you want to work the Fone men Jack you will have to get yourself another sideband! (Could it be that our CW men have joined the silent majority?)

Peter Dowdall. DA2XD (590) Resides at 7 Signal Regt. with another RSARS member Kevin Straw (811). Peter used to be a spotty faced junior op at G4RS back in the dark days. Both these gents are ex MP4's so they have seen a bit of service. Rumours which have circulated amongst German Amateurs that English Amateurs like their beer have now been confirmed "each club meeting seems to turn into a beerfest".

Bill Western. G3TDW (388) Visited Blandford Camp last Easter. He thought the Museum was a splendid show, but could not find H.Q. station. "What a bleak spot, give me Catterick Camp anytime...XYL agrees". It's a good spot in the summer Bill, next time you visit follow the ring road until you see the three element beam atop the sixty foot tower H.Q. station is near the bottom!

Allan Stewart. GM4ABO (839) Recently received his ticket. He has been off the air for twenty years! He was surprised to find that lots of amateurs could read his morse (Ex W/T Op Class II). Up to now he has made more than 200 CW contacts.....Congrats Allan.

Paul J. Leach. GD4AMZ (832) Is the only RSARS station active in GD land. Paul is a 16 year old student at the King William College. He passed the RAE in Dec 1970, and after four attempts passed the morse test. He is trying to flog his present range of kit to get a HW12A.

S.A.G. Cook. G5XB (072) Is very active in the A1 mode both on the domestic and DX bands. "strangely enough finds very few members using this basic means of communication. Is there still an A1 net, or have you all succumbed to the SSB bug? Incidentally I am now using an MSK4 squeeze keyer and find it very refreshing to be able to emit good if not impeccable code. I will be pleased to arrange A1 skeds with any member who needs another point for the awards

LETTERS

July

More on the sounder versus the Buzzer.

I fully agree with member H. Collins G3COL. I too was trained on the Sounder in the G.P.O. at 14 years of age and I found no difficulty in reading buzzer, spark, or musical note whatsoever. I also read double plate sounders I find single needle telegraphs the most difficult.

Yours sincerely, C.B. Minns RSARS/179.

****

Dear Sir,

CCF/ACF Radio Marlborough versus Oundle School O.T.C. Page 18/19 Mercury Summer Issue.

May I confirm the dates given by G3BID in regard to the licence held by 2CH, The Science Society, Oundle School, Oundle, Northants. I have a copy of the very first Call-book issued by Percival Marshall and Co of London and dated 25th October 1922. Other Schools listed are as follows: 2IH The Technical College Cardiff, 2IK County High School for boys Altrincham Cheshire, 2IY City School of Telegraphy Birmingham, 2PI and 2PJ The Loughborough College Leicester, 2TG and 2TM Sheffield University, 2NN was Brigadier-General Palmer of Epping, 2OY Capt. E.J. Hobbs, 4th Tank Battalion, Wareham, 2ON Major M.C. Parker of Walthamstow London, Scott-Taggart was also an army man during WWI and held the call 2LR. There may be others listed but in the absence of the rank I know them not. Marlborough was not listed at this time and I have no doubt the reference to them having a licence in the mid 30's may well be right. The little book is full of interest in that it lists:

Concert Broadcasting Stations, (2LO irregularly 360 metres 4.30-5.30 pm G.M.T.)

Nationality Call-signs (The original Berne List?).

Wavelength Table.

Time Table (Important Radio Stations working throughout the 24 hours).

Land stations. List of the most important Radio stations excluding High Power.

List of High Power Spark Stations with programmes.

List of High Power C.W. Stations.

$$f = \frac{1}{2\pi\sqrt{LC}}$$

General Aviation Wireless Telephony Stations.

List of Radio call-signs allotted to the most Important Steamships.

Name-index of Amateur Radio Calls.

Amateur Wireless Clubs of the United Kingdom with their addresses.

All for sixpence.

Yours truly
Bill Windle
RSAR 340

Current score worked 395 Confirmed 339.

****

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Bill Windle

RSAR 340

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W.A.C. PALESTINE W.B.E.

ZC6AQ

(G2KK. ex 9U1AQ)

QRA : No. 2 W/T COY., R SIGNALS, SARAFAND, PALESTINE.

To RADIO.....Acknowledging QSO ..... 193 ..
at ..... GMT. Ur..... Signals were R.S.T. .....
E.R.S.E. PSE QSL TKS. R.S.G.B.
73 fm K. J. COOK, Opr.

"ON THE AIR SINCE 1926"

VK-3AL

BALLARAT, VICTORIA, AUSTRALIA

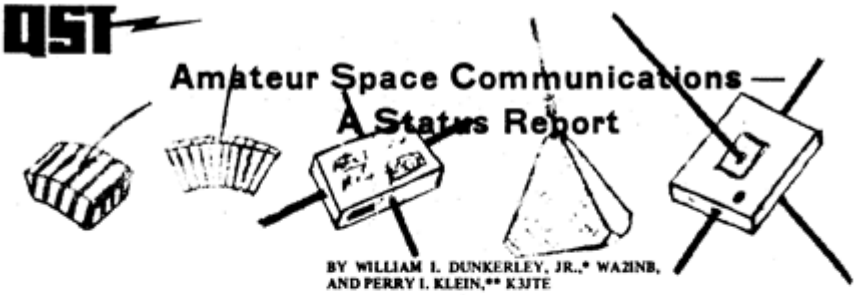
ZC6AQ ur QSA 4 R5 T4 Sigs QSO Here Jan 2 '37 at 0110 E.S.T.
Transmitter~ Crystal controlled on 14300 K.C. with 120 W. Input
Modulation ½ Wave 7 M.C. ~~Zepp~~ V.F. Antenna
Receiver~~SG.~~ ~~RF~~ - ~~Det~~ - ~~Two~~ National HRO. Audio. Dynamic Speaker.
Pse ad to QSO u om & to Contact agn soon.
Pse QSL. Vy 73

ALF. D. KERR
1214 Sturt Street, Ballarat

World Wide Communication

QST

Amateur Space Communications — A Status Report



BY WILLIAM I. DUNKERLEY, JR.,* WA2INB, AND PERRY I. KLEIN,** K3JTE

A DECADE WILL soon have passed since the first Oscar (Orbiting Satellite Carrying Amateur Radio), designed and built by West Coast hams, was launched on December 12, 1961. Now, in 1971, space communications still remains a new frontier for radio amateurs.

Perhaps as a reflection of our changing times and an emphasis on reaping the benefits of space technology for the masses, the priorities of ham space activities are being reoriented. The trailblazing satellite experiments of the 1960s now give way to amateur hopes for satellites for everyday use by hams for DXing, contesting, traffic handling, rag chewing, etc. Here then is the current status of amateur space communications plans

Amsat-Oscar B

Amsat, the Radio Amateur Satellite Corporation (a non profit amateur organization), is giving high priority to the development of long lifetime, solar-powered satellites that can be used regularly and reliably by amateurs for routine communications. First in this series is Amsat Oscar B (it will receive an appropriate numeral in the Oscar series upon launch). At present, a late 1971 or early 1972 launch is hoped for.

Following designs prepared by its Project Manager, Jan King, W3GEY, the satellite's internal structural assembly and modules have been fabricated at the facilities of W2QJT in Ithaca, New York. This represents the beginning of construction of actual flight hardware. Several panels of solar cells left over from NASA and ESSA satellite programs have been made available, and some are being reconfigured for use in A-O-B. Rechargeable nickel-Cadmium batteries have also been made available. Together they are expected to make possible satellite operating lifetime in excess of one year.

Several pieces of communications gear are under construction. A selection will shortly be made from completed items for inclusion in the A-O-B flight unit expected to carry two repeaters and one or two telemetry systems. The gear under construction includes the following:

A four-channel, channelized, hard-limiting fm repeater is being breadboarded by members of the Wireless Institute of Australia's Project Australis who have been involved in the construction of Australis- Oscar 5, It is of the demodulation-remodulation type and employs 145.9 MHz for the uplink and 432.1 MHz for the downlink with a satellite transmitter power output of one watt per channel.

A linear repeater with a bandwidth of 50 kHz is under construction by the Euro-Oscar group in Marbach, West Germany. It's input is 432.1 MHz, and output. 145.9 MHz. with ten watts output. It is designed for use with ssb, cw, am, fm, RTTY or SSTV, with as many stations as can fit within its 50-kHz passband.

Also being breadboarded by Amsat members in the U.S. is a linear repeater having an input of 145.9 MHz and an output of two watts around 29.6 MHz, It will handle any method of modulation permitted in these two bands.

* Assistant Secretary, ARRL.

** c/o Amsat, PO Box 27, Washington, DC 20044

On a trip to the U.S., Wireless Institute of Australia (sponsors of Project Australis) President VK3KI met with Project Oscar officials, Shown from left are Project Oscar president K6LFH, VK3KI, Santa Clara Valley SCM W6VZT, and Oscar and ARRL board member W6ZRJ.

The WIA Project Australis group has developed an Oscar telemetry encoder which transmits directly in 850-Hz a.f.s.k. teletype format, for printout on an ordinary 60 wpm teleprinter. Any station having a tape reperforator will be able to send or retransmit the received data directly to Amsat headquarters for computer processing, or may decode the telemetry data using calibration information which will be made available prior to launch.

John Goode, WSCAY, has designed and breadboarded an Oscar telemetry encoder which transmits numbers directly in Morse Code, so that only pencil, paper and calibration information are needed for reception and interpretation of data from the satellite.

A breadboard of a command encoder capable of providing up to 35 separate command functions has been constructed by the Project Australis group. The command encoder is designed to provide a reliable and secure means of controlling the emissions of Oscar satellites to minimize any possibility of interference.

Project Oscar, Inc.

The pioneer organization in amateur satellites is the west-coast based Project Oscar, Inc. This group was responsible for the origination of the Oscar program and in particular for successes of Oscars one through four. Current Project Oscar activities include assistance with the A-O-B efforts. They have provided technical advice and aid in obtaining components, and also funds for necessary travel. Project Oscar headquarters is Foothill College, Los Altos Hills, California. The group is working with the College on plans for incorporating an Oscar station in a campus space science facility, In addition to the above activities, Project Oscar has begun preliminary work on the development of another amateur satellite.

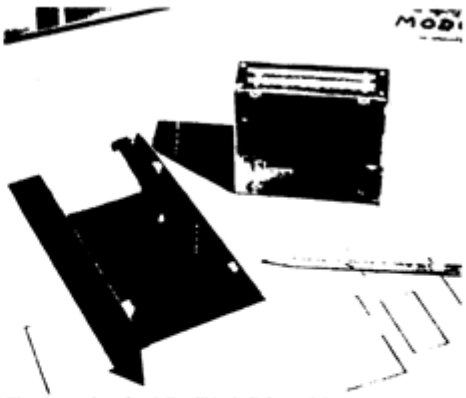
Moonray

Perhaps one of the most imaginative ham space projects to come along has been Moonray, a lunar-based amateur uhf repeater. Work on this project is under the direction of Nastar, K2SS. P.O. Box T, Syosset, NY 11791. When completed, Nastar hopes to have NASA carry Moonray to the moon on one of the remaining Apollo missions. A continuously-operational repeater with a one year or longer lifetime is the project objective.

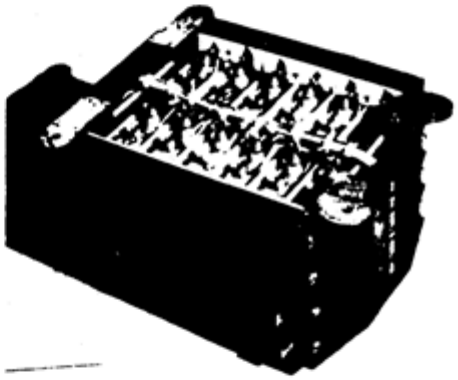
Moonray will contain a high-sensitivity, low-noise receiver, a signal processor, an identifier sending "SS" in Morse code, a timer-cycler-sequencer, six to eight channels of telemetry, and a laser receiver with optics. The up-link will be a 10-kHz passband centered at 439.9 MHz and the downlink will be a like bandwidth centered at 430.1 MHz. The repeater will be useful with all modes.

Count-down

As the time grows nearer for the operation of an amateur spacecraft, QST will carry full details and information on how to prepare your amateur station for use with a spacecraft repeater. Material is now being prepared in anticipation of a launch later this year or early next. QST



The electronics of A-O-B will be built in modular containers such as these.



Power will be supplied by this Nicad battery which will be recharged by solar cells.

The internal structure of Amsat-Oscar B.

10th Annual General Meeting

New President addresses anniversary AGM

The 10th Annual General Meeting of the Society was held in the Princess Mary Hall, School of Signals, Blandford Camp on Sunday 18 July 1971. Members present were:

Brig. A.J. Jackson.	President (Chairman)
WOI (F of S) W.F. Graham, MBE	General Secretary
Mr. G. Titchmarsh	Treasurer
WOII R. Vasper	Editor Mercury, G3VIY
Sgt. A. Grumbrill	Station Manager G3WXX
Capt. J.H. Lowe, R. Signals	MOD Secretary (Secretary)
Mr. A.C. Tabberer	Society Printer G3WRY
Mr. D.H. French	QSL Manager G3HSE
Mr. I. Currall	G3WBA
Lt. Col. (Retd) Sir Evan Y. Napean, Bt.	G5YN
Mr. R. Day	
Mr. G. Pearson	G3AWZ
Mr. R.L. Jenner	
Mr. C.H. Hussey	
Cpl. C.F.J. Harvey	G3YBT
Mr. A.W. Rix	G3RYF
Mr. W. Bigley	G2AUA
Capt. J.D. Chisholm, R. Signals	G2CX
Mr. R.H. McGill	G3WZQ
Mr. C.W. Stedman	G3XWS
Mr. S. Lowe	SWL G-13503
Mr. B. Donn	G3XSN
Mr. R. Arnold	G3AVH
Mr. G.J. Lewis	G3LAT
Mr. D.G. West	G3XVO
WOII M. Bernard	DL5XW
Mr. W.L. Hitchings	G3HWL
Mr F.Q. Cook	G3UZL
Mr. D.G. Holman	G8DEU
Mr.A.J. Button	G3YSK
Lt. I.B. Jolly, R. Signals	G8EOO
Capt. C.R. Mountjoy, R. Signals	GW3ASW
Mr. H.H. McNinch	A-701

Apologies for absence were received from the following:

Major Gen. E.S. Cole, CB, CBE	Vice President G2EC
Capt. (Retd) G. Courtenay-Price	GW2OP

CHAIRMANS OPENING ADDRESS

1. The Chairman opened the meeting by welcoming members, their wives and families to the 10th Annual General Meeting of the Society. He said it was a pleasure to be appointed President of the Society and that he had been most impressed on his recent visit to headquarters station G4RS.

2. The Society had had another successful year. Membership continued to rise and at the Society's accounts were in a healthy state. During the year there had been plenty of weekend 'get togethers'.

3. For the first time the Society had been represented at the West of England mobile rally at LONGLEAT and the 10th anniversary weekend had proved to be most successful. In addition the Society planned to mark the 900th anniversary of RICHMOND CASTLE by the operation for one month, by the Catterick group, of a station with the callsign GB3RCA and the issue of a special QSL card to mark the occasion.

4. Staffing the committee and HQ Stations continued to provide difficulties and plans to set up a permanent General Secretary were unsuccessful mainly because there were insufficient funds available. We were indeed fortunate that WOI FoS W.F. Graham, MBE had been able to step into the gap caused by the departure on promotion to commissioned rank of WOI J Cooper G3DPS. The station manager Sgt Gumbrill was about to leave on posting and a new editor for 'Mercury' would have to be found.

5. The Chairman closed by reiterating that he was pleased to be the new President and would do whatever was possible to further the cause of the Society.

GENERAL SECRETARY'S REPORT.

6. The General Secretary said that he had taken over in January 1971 to find the Society in good hands. G3VIY assisted by the rest of the committee had kept the Society running during the period that it was without a General Secretary for which we were most grateful. He had continued to edit 'MERCURY' throughout the year but due to official duties etc the time had come to 'hand over' so we must find a new editor. Many thanks G3VIY. The Secretary suggested that a member with a flare for this sort of activity might like to take the job on.

7. Intentional deletion.

8. Membership continues to rise due almost entirely to local publicity by members themselves. The growth of Life membership, however, from a future financial point of view was rather disturbing. He went on to thank those members of the Society who help to keep the services going by post and on the air.

9. The General Secretary said that he had two thoughts for the future: Firstly he would like to see a Technical lending library established at G4RS for the use of the members and secondly he would like to see the Society actively participate in a prestige project i.e. Moon-bounce, in addition we may have a go at working through UHF equipment that American astronauts plan to leave on the moon during one of the Apollo missions.

TREASURERS REPORT.

10. The Treasurer said that he was happy to report that the society's finances were up on last year and that we were in a relatively healthy position. A copy of the Auditors report was available for examination by the members and a copy would be published in the Winter edition of 'MERCURY'. In reply to a question he stated that the depreciation of property was calculated at 10%. G3RYF proposed that these accounts be accepted. G3LAT seconded the motion which was carried.

STATION MANAGERS REPORT.

11. The Station Manager G3WXX said that he had had a pleasant year in the post and that during this time the Headquarters Station G4RS had moved from the wooden huts to its present site in Medium Power Group. He would like to take this opportunity to thank Capt. J Dawe R. Signals OC Medium Power Group for his help in moving the station. Without this help the task of moving and setting up the station with only three members available for assistance would have been impossible.

A great amount of new equipment had been installed and the club was very active. One problem was lack of response to the twice weekly net. Only about six or seven members were normally on net and he asked for ideas from the members that may improve the situation.

OTHER BUSINESS.

12. Proposal 1: The General Secretary proposed that the number of members taking up life membership should be limited and that a member should fulfil a qualifying period of three years as an annual member before he could apply for life membership. After some discussion the meeting considered it was too difficult to administer any system of limiting the number of members taking up life membership. It was felt that in the present financial state of the Society, this matter could be safely referred to the following year. The proposer withdrew his proposition and in its place suggested that a member should have a qualifying period of three years as an annual member before applying for life membership. This proposal was seconded by G3VIY and carried by 21 votes to nil.

13. Proposal 2: G5YN proposed that a maximum grant of £50 be allocated annually to subsidise a DX-pedition by two or more members (or associate members) of the Society. The application with a detailed plan of the DX-pedition to be submitted either through the MOD Secretary or the General Secretary for approval by the President. The recommendation of the Headquarters Council should accompany the application. The proposer stated that he had ascertained previously that the financial state of the Society was such that it could withstand this expenditure. The treasurer stated that this was only so providing the annual grant from the Corps Finance Committee was received. The proposal was seconded by GW3ASW and carried 21 votes to nil.

14. Proposal 3: DL5YO's proposal read out by the General Secretary was that a series of leagues be formed to replace the present award scheme so as to maintain the competitive spirit among members of the Society. He proposed the introduction of four leagues, one for overseas members. Zone fourteen to be split three ways, CW only, CW phone mixed, and phone only. QSL cards to be abolished as confirmation of contact, as log book data, signed by two other amateurs is all that is required. The new league positions to be published every quarter in 'MERCURY'. The President asked the General Secretary whether he could cope with the increased amount of work involved. The General Secretary replied that it was feasible. The Station Manager G3WXX stated that the sale of QSL cards was a source of income to the Society and that he would be against them being abolished. There being no seconder for this proposal the meeting went on with other business.

15. Proposal 4: G2KK proposed that the rule requiring that a proportion of the 200 contacts necessary for the Special Award shall be in the A1 mode is cancelled forthwith. G3XSN pointed out that there are increasingly fewer persons outside Zone fourteen due to the run down of overseas bases, and it was getting more difficult to obtain the necessary overseas confirmations. GW3ASW suggested that the plaque for the Special Award remain as those four members who had achieved this should not have their award devalued. If necessary a Special Award Certificate could be introduced. The proposal was seconded by GW3ASW and the motion defeated by 15 votes to 2.

16. In response to a request for any other business GW3ASW suggested that a definition of a 'disabled person' was not necessarily a 'disabled radio operator!' G5YN suggested that an operator whose equipment had to be specially altered for him was a disabled radio operator. The General Secretary agreed to draft a new definition in the next issue of 'MERCURY'.

17. G3XWA asked whether the Society's equipment was adequately insured and whether the Society had insurance against accident to civilian members using the Headquarters Station equipment. The Treasurer stated that the Society was covered in both these respects

18. G3XWA suggested that proposals be submitted 21 days before the Annual General Meeting so that they could be circulated beforehand. The MOD Secretary stated that this was already in the charter of the Society and that members should take note.

PRESENTATION OF THE COURTENAY-PRICE CUP.

19. The Courtenay-Price Cup is awarded annually to the member who has done most to benefit the Society. This year the award went to G3EJF John Hodgkins. In the past year he had distributed a large number of QSL cards and special notepaper to members acting promptly whenever requested to do so. G3EJF had been a keen supporter of the Society for the past ten years and was General Secretary from 1963 to 1966. The cup was presented by the President and collected on his behalf by G3XSN.

PRESENTATION OF A SHIELD FOR THE BEST ARTICLE IN MERCURY.

20. The MOD Secretary said that at the last Annual General Meeting it had been decided that a plaque would be presented to the writer of the best article in 'MERCURY'. The first presentation goes to G5YN who has contributed a substantial amount of material to 'MERCURY', not only in 1971 but also in previous years. The present technical series on test equipment won the award. The plaque was presented by the President.

21. There being no other business the Chairman declared the Annual General Meeting closed at 1635 hrs.

Signed Capt. J. H. Lowe,
MOD Secretary.

TREASURERS REFORT 1971

1. I am happy to report to you that in spite of rising prices, the Postal Strike and other difficulties the year 1970/71 has again been a successful one for our affairs. Although the Corps Grant was considerably less last year, £50:00 against £200:00 the year before, our audited accounts show an increase in assets over last year.

2. Cur board of Auditors were Capt. J. Dawe, BEM Royal Signals, Sgt. A. Gumbrill G3WXX and Mr. H. Johnson G3JIL. I am sure you will endorse my thanks to them for a job well done.

3. During the year the General Secretary and the Council took a long and hard look at our property, writing off junk and items damaged during the move to the new Headquarters and bringing to account attractive items of test equipment and other items. A KW2000A was received from 14 Signal Regt. and brought on charge at £160:00. A look at the Headquarters Stations revealed that certain items (microphones and headsets etc.) were required to render all stations capable of independent operation. These were purchased and are now in active use.

4. It will be noted by members that our overall profit on the Stock account is high this year (18%). This figure is entirely due to the efforts of Jack Cooper G3DPS, Tony Tabberrer G3WRY and Ian Scott G3SYW who negotiated some keen prices for us from our suppliers These we took advantage of by bulk buying hence the high stock figure of £137.05.

5. I must now strike a sour note. I note that a large number of annual members are still in the red with their 1971 subscriptions. I must remind these members that the Society depends upon members' subscriptions for its very existence. Will these members 'PAY UP' in fairness to the paid up members of the Society. This must be your last warning. Any member who has not paid his subscription by November 1st 1971 will no longer be considered a member and his number will be re-allocated.

6. Tony Tabberer G3WRY the Society printer complains quite rightly that certain members are asking for overprinting on their QSLs over and above that on which his charges are based giving him hours of work for nothing. It has been decided by your Council that in future he will refer these orders back to the General Secretary so that a fair price can be negotiated with the member concerned. Tony does a lot of hard work for the Society and we could not replace him.

7. A certified true copy of the Annual Accounts and Auditors report AFN 1514 follows:.....

ROYAL SIGNALS AMATEUR RADIO SOCIETY

Statement of Accounts for the 12 months ending 30 June 1971

Auditors: President : Capt. J. Dawe, BEM, Royal Signals
Member : Sgt. A. Gumbrill, G3WXX
Member : Mr. H. Johnson, G3JIL
Auditors comments : A difficult account well kept

BALANCE AS AT 21 June 1970		30 June 1971
10.40	Cash in Hand	47.49
176.55	Cash at Bank	188.50
305.50	Deposit Account	431.15
69.45	Stock	137.05
795.41	Property	873.49
40.55	Debtors	--------
1497.84	Total	1677.68
110.00	Creditors	----------
£1387.84	Total Assets	£1677.68

GENERAL PURPOSE FUND

Income and Expenditure Account for the period ended 30 June 1971

EXPEDITURE/LOSSES	1971	1970	INCOME/GAINS	1971	1970
HQ Maintenance	42.02	31.19	Profit on Stock	75.39	16.73
Society Maintenance	84.78	171.05	Subscriptions	316.97	307.65
Mercury	94.64	- -	Donations	53.43	46.53
Awards	7.50	9.77	Corps Grant	50.00	200.00
Special Events	23.07	.31	Interest on Deposit A/C	25.65	5.50
Property Depreciation	90.23	23.30	Creditors	17.98	
Property Write off	29.92		Debtors	40.55	
Grant to RMAARS	40.00		Property brought to account:		
			KW2000A ex 14 SR	160.00	
Nuffield equipment to QM			Test equpt.	90.50	
ledger	135.00		Deposit A/C	100.00	
Total Expenditure	£640.63	£255.99		£930.47	£576.41
Excess of income over Expenditure to balance sheet:	289.84	320.42			
	£930.47	£576.41		£930.47	£576.41

Percentage profit on trading accounts:	1971	1970	1969
Royal Signals Amateur Radio Society stock account	18%	5·5%	9·8%

Certified true copy of the AFN 1514 Signed 17 July 1971
Capt. J. Dawe, BEM, R. Signals President
Sgt. A. Gumbrill, G3WXX Member
Mr. H. Johnson, G3JIL Member

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10th ANNIVERSARY ACTIVITY WEEKEND

From all the accounts received the 10th Anniversary Activity Weekend was a great success although the general feeling was that a lot more members could have taken part. Out of a total of over 600 members 53 were active, of those 12 submitted logs, two of which were Short Wave Listeners.

In the Spring News Letter I indicated that a small prize would be presented to the station, or more accurately, the owner of the station scoring the maximum number of points, one transmitting member and one SWL. I am sure we will all admit that there is a clear distinction between a single operator station and a multi-operator station. The multi-ops can work and monitor simultaneously on a continuous basis and are therefore clearly in a better position than the poor chap who's XYL insists upon being taken to do the shopping just as he is about to bag an overseas member and 10 points. It was a gentle competition, there are no awards involved so we can be generous on this occasion and make it three prizes:- Individual Operator 1st, Multi-operator 1st and SWL 1st. So it is going to cost us a 'bomb' in ties and lapel badges - still it was well worth it.

Members comments.

Many wrote in to say that they liked the idea of the GB3RCS time and frequency schedule. "It gave us an anchor, a focal point". GW3ASW Cyril complained that the clock at GB3RCS was two minutes slow compared with his own clock. Cyril must be using WWV, we at GB3RCS were using Regimental Time at least that is our excuse. When we rang the Guard Room and asked for the Regimental Time, the reply was "the tiem sar is 1-23-1" that is why we were two minutes slow.

Cyril goes on to say - Bill and Colin at GB3RCS are to be congratulated upon the maintenance of their published schedules and my thanks to Ron and Les at G3CIO and Des, John and Norman at G3HKR for all the effort that they put in, - succinctly - a better pact, or support better given, than by the above three clubs. Thanks a lot boys.

General Observations...from Cyril.....

TOP BAND Condx during the early hours of 20th June appeared to be good and four GMs and a number of Europeans were worked but negative activity from RSARS members. A great pity, particularly as the band noise was very much down.

80 METRES Very good condx pertained generally and I am sure that if prior schedules had been made that contact could have been made across the 'pond'. I found the band, particularly after. midnight, very quiet (for 80 that is) with a max noise level of about 3 'S' points.

40 METRES Very disappointing with ducting very evident particularly at the commencement of the competition. QRM was much in evidence with propagation varying rapidly between domestic to 500Km I worked into 4 'W' call areas and 3 VEs after 0200hrs... but not the right ones unfortunately.

20 METRES During the period worked WAC including one KH6 on CW, so generally band was in good heart with the usual Saturday activity, again never managed to find the right ones. On Sunday I was standing by waiting for G3XSN to finish with DL5YO when the latter disappeared under a W2 in contact with a VE3.

15 METRES Very short skip was evident over the period of operation. I worked GB3RCS, on one occasion Dx was in evidence in the form of JAs and VS6 and at other times ZL and VK, but contacts generally were very poor.

10 METRES Band appeared to be completely dead at the periods tried. Cyril goes on to say that at times RSARS netting was not as good as it should have been but generally, operating was excellent with contacts short and to the point...,.....looking forward to the next one.

G3UAA Alf is also looking forward to the next activity period, but is wondering where all the overseas members were? Most of them are RHE Alf. By the way Alf, congatulations

BRS 31182 Allan Pressley also enjoyed the weekend hunting down those RSARS stn's, but had to go QRT at 1356 Zulu which may have cost him 1st place in the SWL list. Allan scored 53 points.

RSARS 624 William M. Begg won the SWL contest with a grand total of 58 points. Well done William. The GB3RCS schedule gave him a reference point. He is wondering where the DAs were. Heard plenty of DX but only bagged two RSARS members WA8TGA and 9H1BX (how did you miss MP4TDA).

G3CIO The Catterick Camp Club Stn run by Ron Cox (G3VIS), and Les Dicker (G3VYT) claimed a total of 59 points. Ron thought the poor turn-out was disappointing and was concerned about the lack of CW operation - "still they enjoyed themselves and that really is what it is all about.....Is CW a dying art???????

G3HKR The Club stn at the Boy's College at Harrogate showed us all a clean pair of heels by working no less than 51 QSOs clocking up a magnificent 80 points. RSARS stns that 'came up' for very short periods were sorted out from the QRM by this group and QSOed. Their band monitoring must have been excellent. Lt Col Des Barry/RSARS 076 who led the group remarked that 51 QSOs is not very many for over 600 members.....where were all the ZC4s....."all good fun".....give everybody a prize; (NOT PYGMALION LIKELY Ed.) but we will give your station operators RSARS 076, Des; 130 G3DBU; 131 GFMW a prize and Capt. (ToT) Norman Webb can claim his tie when he gets his callsign, nothing like providing a bit of incentive. Furthermore when he has reached 15 wpm C.W we will introduce him to G3XSN, Bert, our dyed in the wool, honest-to-goodness Charlie Willy man who has destroyed some of our members by rattling away at 35 wpm whilst smoking a cigar.....who said CW is a dying art.

Other comments from Des; WA8TGA was very interested in the contest but only worked G3HKR and 9H1BX after calling half an hour on 14280. After a QSOs he continued to call for another 15 minutes. The QRM on 14180 was bad……wonder what we are going to do if the US phone band is extended to 14150.

Eva PY2PE put in a 30 over 9 signal on Saturday evening (14125) but was only interested in working VK9MK. PY2PA (RSARS 595) her OM is one of our members. Ray MP4TDA told me that W3RX (RSARS 649) was on 21352 at 1430 on 19th June….."I put my beam around but he signed QRT with G3UML". VE8RCS (not one our members) sent his best wishes to all.

And that is it…….It only remains for me to say thank you for participating, and well done to the winners on your behalf. I would also like to thank those members who sent in comments and check lists, without their help my job would have been much more difficult. I have published G3HKR's log for your perusal, in addition GW3ASW has submitted a diagram and information on the top band Z match that he uses, in which some of our members have expressed an interest. When do we have the next competition? What about February next year VKs on 20, VEs on top band.....if you are keen we will have a go, I do hope that a few more will join in and that there will be more entries from our Short Wave Listeners.

THE WINNERS

1st (Individual)	G3UAA/454	43 Points
1st (Multi-op Stn)	G3HKR/AFF11 (RSARS 076, 130, 131)	80 Points
1st Short Wave Listener	RSARS 624	58 Points

2nd and 3rd place went to G3HWL/RSARS 400 with 42 points, and GW3ASW/RSARS 559 with 41 points

2nd Short Wave Listener went to BRS 31182/RSARS 840 with 53 points

WELL DONE ALL

GEN. SEC.

SHEET. 1.

EXTRACT OF G3HKR Log 19/20 June 71.

TIME	STATION	RSARS No	POINTS CLAIMED	Name. Frequency. Remarks.
N^a 1000	MP4TDA	046	5	Ray. 21.150 Kkg
1012	GB3RCS	003	1	Bill. 7.050
1014	DA2XF	794	2	Fred 7.050
1020	G2XSN	343	1	Bert 7.050
1031	G3UAA	454	1	Alf. 7.050
1036	G3RYF	599	1	Alston 7050
1040	GN3ASW	559	1	Lyn 7050
1042	G3DBU	130	1	Bill 7050
1043	G3OXE	821	1	Doug 7.050
1045	G5FA	654	1	Perky 7.050
1046	G3LIO	AFF43	1	Ron 7.050
1124	GI3BZG/A	005	1	Walt 7.050
1127	G3VBL	059	1	Chris 7.050
1150	G2AYQ	170	1	Ted 7.050
1215	GB3SKY	669	1	Dave 3.790
1420	G3YBO	386	1	Roger 3.720
1500	VS9MT	264	5	Dave 21.350
1520	G3ONU/A	076	1	Des 21.340
1533	G3NOB	613	1	Rita 3.715
1715	G3HWL	400	1	Les ~~QM306~~ 3.715
1825	9HIBX	443	5	Norman 21.305
1827	9HIBB	171	5	Ian 21.305
1829	9HIAA	—	—	Dick. Claims to be the original R Scots Club in Malta.
1851	G2KK	580	1	Ken 3.715
1906	G3UXH/A	172	1	Peter 3.715
1919	G3TKX	562	1	Les 3.710
1930	G3HSE	352	1	~~Hamish~~ 3.715
1954	G3HBE	262	1	Maurice 3.715
1955	G3XHR	750	1	Bert 3.715.
2006	VE8RCS	—	—	Bob 14065
2045	G3KAQ/A	331	1	Bill 3.715
2108	G3RNF	293	1	Mick 3.715
2132	G3HRJ	614	1	Tom 3.712
2157	G3WXX	108	1	Tony 3.728
2306	GM8AJO	839	1	Alan 3.715
2308	G2TT	219	1	Arthur
2333	WA8TGA	576	10	Ern 14.280 Worked just after 9HIBX. GB3RCS informed. 80 m. net.
	SHEET 1	POINTS	61	

SHEET 2.

TIME	STATION	RSGB's No	POINTS CLAIMED	NAME	FREQUENCY	REMARKS.
20th 0959	G3MKR	011	1	Bernard	7050	
1003	G3MCG	276	1	Dick	7050	
1006	G3VAN	543	1	John	7050	
1008	G3VYF	327	1	Mike	7050	
1304	G3UZL	411	1	Bob	3725	
1340	DL2YO	053	2	Gordon	14175	
1343	G4BLL	656	1	Dick	3723	
1351	DL2VR	AFF2	2	Gordon	14175	
1417	G3EBH	473	1	Cliff	3723	
1445	G3VDU	158	1	Peter	3722	
1710	G3FMW/A	131	1	John	3700	
1716	GI3TSR	602	1	Peter	3720	
1717	G3YHL	661	1	Tony	3720	
1718	G3YBT	123	1	Colin	3720	
1744	DA2XT	226	2	Mike	14225	
1757	GW3DRN	769	1	Dyson	3720	

SHEET 2 POINTS 19
SHEET 1 POINTS 61
GRAND TOTAL 80

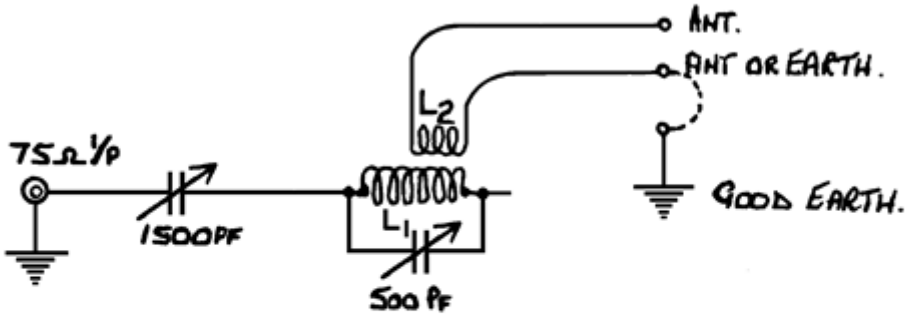
1x10, 4x5, 4x2 and 42x1 Total 51 QSO

Certified true & correct. R.B.Abbey G3OHU. 076.

Certify that the Station was operated in accordance with the rules of the licence eg. only one QSO made at any one time on any one band.

R.B.Abbey G3OHU 076.

The following diagram of a Top Band Z match has been in use at the station operated by GW3ASW for some time. A number of members have expressed an interest in it.



L1.....40 Turns of 18 SWG enam., close wound on a 1□ inch former.
L2.....25 Turns of 18 SWG enam., close wound on top of L1 with suitable insulation.

Match sticks suitably doped with Durofix, or similar dope was used as insulation by GW3ASW. The match sticks were placed ■ to □ an inch around the outside of L1, and then wound with L2. Dope well and leave to dry. Trim off the surplus match ends and you will have neat coils.

Both capacitors must be above ground and for correct tuning a SWR meter is imperative. No difficulty should be experienced in tuning virtually anything with this tuner. Balanced antennas use both sides of L2. If the antenna to be fed is unbalanced (endfed, ■wave, etc.) one side of L2 is takes to ground.
The complete assembly should be built into a screened box.

****

WHAT ARE THE WILD WAVES SAYING

Many of us older 'Hams' have heard about long-delay echoes with periods up to five seconds occurring on the short wave bands. The mystery of the origins of these echoes has been under investigation (on and off) for the last forty years. They were first observed in the 1920's.
A team at Stanford University, California, is to re-open the investigation. With the help of radio amateurs they hope to find out more about this strange phenomena. Do they exist? Could it be that that the echoes are deliberately induced by space probes coming from outside our solar system!????

****

ROLL OF HONOUR

Congratulations to D.A.(Alf) RAMSEY, G3UAA, RSARS 454 He received the Special award on 27th July having worked 200 member stations on CW and SSB.
How he did it:-

	III	II	I	SPECIAL
SSB Europe				81
CW Europe	25	25	50	02
SSB Overseas				15
CW Overseas				02
			TOTAL	200

****

Some useful wire lengths

Dave Llewellyn. Assoc.IOM., G3TAN. RSARS 268

Those of you who have ever done any trials or research and experimental work will have appreciated maths tables, log tables, lists of worked examples and so on. In my professional capacity as the Yeoman in Trials Squadron, here at the HQ location, it very often happens that i have to quickly organise a trial on LF and VHF equipment which calls for the use of many different frequencies, and consequently a constant adjustment of antenna length. This entails cutting the antenna exactly for the frequency as the directive may well state that the only antenna to be used for the experiment is a dipole or a quarter wave. To make life easier all round, I wrote and ran a simple computer programme to print out the exact lengths of quarter waves from 1MHz to 60 MHz in 100 KHz segments.

This run produced a very neat print and has proved very very useful not only to me personally in my work, but also on the ham shack rig, and to many other trials teams who use it quite often. The frequencies covering the amateur bands are covered from top band to ten metres. The printout is reproduced on teleprinter paper and it is my intention to tape this and hold the tape at the HQ station. If anyone would like a FULL PRINT COPY of ALL THE 100 KHz lengths for TOP BAND, EIGHTY, FORTY, TWENTY, FIFTEEN AND TEN METRES, please send a STAMPED ADDRESSED ENVELOPE to Bill Graham, at the HQ address, and he will ask me to run the tape for you.

For those of you who are lazy devils however, or cannot find a three-pence stamp, I have included here an extract for TWENTY, FIFTEEN AND TEN METRES. Included in the print out of the full run is a COMPLETE TABLE of driven element, reflector, first director and second director of all TELEVISION CHANNELS , BOTH BBC and ITV, for the production of yagi antennas. Included with the ham freqs. in the same SAE.

REMEMBER TO SEND A STAMPED ADDRESSED ENVELOPE

FREQUENCY	ANTENNA LENGTH IN FEET
1·800	130·00
1·900	123·16
3·500	66·86
3·600	65·00
3·700	63·24
3.800	61·58
3·900	60·00
7·000	33·43
7·100	32·96
14·000	16·71
14·100	16·60
14·200	16·48
14·300	16·36
14·400	16·25
21·000	11·14
21·100	11·09
21·200	11·04
21·300	10·99
21·400	10·93
28·000	8.36
28·100	8·33
28·200	8·30
28·300	8·27
28·400	8·24
28.500	8·21
28·600	8·18

All lengths are for quarter wave 7 strand "R4" copper wire.

WHAT DID THE XYL SAY WHEN A QRO WAS REQUESTED DURING THE OM's QSO????

(From the Summer Edition of Mercury)

There were a number of entries, some were not suitable for publication, one chap rambled on about a 'super alpha pair' Hi!

The following is a selection of the clean ones:-

G3SIM (835) "I shall certainly sleep to-night John".

9H1CV (564) "I'm reducing the tension because he is wireless".

G3DHB (377) "OK will QRO but QRX while I get the whip out".

G3COP (681) "No opening for you to-night dear".

BRS 31718 (658) "I wish I had taken up having a family And then I might have a rest from all this".

GM3PIP (051) " Give me a quick break when your whip is loaded".

Now we come to the bit where the man says all the entries were so good that he finds it difficult to select the winner.....and all the rest of the drivel. There'll be none of that 'ere. The best of the motley selection printed above is the nice clean one submitted by Dereck Baynham G3DHB (RSARS 377).
Congratulations your lapel badge is in the post.

FOR SALE

AR88D. PERFECT INSIDE AND OUT. GOOD PERFORMANCE ON ALL BANDS.....£28.50

APPLY: C. HUSSEY (RSARS 816). 24, FROME RD. TROWBRIDGE, WILTS.

****

AR88D, R107, AND SPHINK TX RE-ALIGNED 160, 80, 20. 80 WATTS PEP WITH SPARE VALVES.....FIRST OFFER OVER £90 COMPLETE WITH THE REST OF THE CONTENTS OF THE SHACK (PSU, XTL. CAL. 2 X 807 LINEAR AMP. 80 TO 20, 27MHZ WALKIE TALKIES ETC.

APPLY: PAUL LEACH, (GM4AMZ RSARS 832), 20, MERSEY RD., HEATON MERSEY, STOCKPORT, CHESHIRE. SK4 3DE., TEL. 061 432 2985.

WHEN WRITING TO HQ ALWAYS MENTION YOUR RSARS NUMBER.....TNX'S.....

THE ROYAL MILITARY ACADEMY SANDHURST
ADVENTURE TRAINING EXPEDITION TO SWITZERLAND 1970
EXPEDITION 'EUROPA RADIO'

INTRODUCTION

1. Aim

To maintain communications on the high-frequency Amateur Radio Bands:

a. Studying the effect, on communications, of the propagation from various antennae with regard to local conditions of terrain, climate and ionisation.

b. Carrying out a long-range patrol using a low-power portable station to demonstrate the value of Morse as a mode of operation.

c. Commemorating the 50th Anniversary of the Royal Corps of Signals by establishing communications with other member stations of the Royal Signals Amateur Radio Society (including the International Radio Engineering and Communications Exhibition Station from 19 to 22 August 1970).

2. Composition

P L MALONEY	Rhine	46 -	Leader
C J DURHAM	Burma	46 -	2IC/Treasurer
P J GREY	Burma	46 -	Administration
S F BARTON	Dettingen	46 -	Navigator/Medical
A H GOLDSACK	Ypres	47 -	Photographer
G R MUAT	Gaza	47 -	Mechanic
G M S TALBOT	Alamein	48 -	Power Supply Engr
L J USHER	Ypres	48 -	Antennae Engineer

SUMMARY OF EXPEDITION

Phase I (30 Jul - 8 Aug)

On leaving the RMA the party proceeded to AACHEN on the first stage of the journey to Switzerland. In Aachen it was observed that the trailer lights were intermittent, so it was decided to proceed to JHQ in Rheindahlen to have the fault corrected. In fact, some further minor faults were discovered and the party had to wait six days for spare parts. However, the party looked up a number of acquaintances and spent some time with the RAF Amateur Radio Station at Rheindahlen. The repairs were finally completed and the party proceeded to Rheinfelden in Switzerland, arriving early on 8 August.

Phase II (8 - 11 Aug)

A suitable site was found at first light just outside the village of Mohlin, and the camp established. A number of promising contacts were made including one with Japan, and the equipment proved to be none the worse for the journey. However, the party had to make up for the lost week and it was decided to operate from Liechtenstein with the main station whilst a less ambitious patrol was mounted in the mountains nearby. Therefore the party proceeded to Liechtenstein, arriving late on the 11th.

Phase III (12 - 18 Aug)

After a 'recce' had established the lack of dry land in the Rhine Valley around Vaduz, due to heavy rain, the party proceeded to Steg, about 6000 ft above sea-level, in a valley running parallel to the Rhine, which is accessible only by a tunnel or an arduous drive over an 8000ft ridge. The main station was established, and on the 13th a party of four left for a small-scale version of the patrol. Other amateur radio stations were keen to contact this rare country, and there were a number of very interesting contacts in spite of electrical storms. After successful operation, the party left for Lausanne, from where it was hoped to operate back to the Radio Society of Great Britain's Exhibition station.

Phase IV (19 - 23 Aug)

After some difficulty a site was found late on the 19th. On the 20th, when the station was set up in daylight, it was discovered that the voltage supplied by the generator varied from 190 to 250 volts. This was certainly unsuitable for transmission and the fault was found to be in the governor. Several attempts to repair the fault proved fruitless. Attempts at using the local power supply proved equally fruitless as this was mysteriously 65 cycles per second instead of he usual 50. It was consequently decided to remain in Lausanne until the Sunday and then return home.

Phase V (23 - 25 Aug)

The remainder of the equipment was packed on Sunday, and the party proceeded to JHQ at Rheindahlen, arriving early on Monday the 24th. After collecting the 'duty-free' the party moved to Zeebrugge and caught the ferry to Dover, Having arrived back at the RMA early on the 25th, the kit was unpacked and the party dispersed.

Expedition Log

Thursday 30 July

After the Sovereign's Parade, all members descended on the Radio Club and proceeded to prepare for the departure later in the evening. The party left the RMA at 2300 hrs and arrived in DOVER at 0345 hrs on Friday.

Friday 31 July

The ferry left at 0630 hrs, and the party was clear of Zeebrugge by 1100 hrs, making for the border at Eynatten, where customs formalities held it from 1700 to 1800 hrs. The party eventually got into Germany and left the autobahn and proceeded to Aachen where the night was spent in a German Army barracks.

Saturday 1 August

The gearbox oil in the Corsair was changed at a local garage, and it was decided that a REME workshop should be approached since the trailer lights were not working properly.
The workshop at Joint HQ Rheindahlen was closed when the party arrived at 1700 hrs, so the party booked into the transit camp.

Sunday 2 August

After a late awakening the party proceeded to the swimming pool and remained there until late evening. After supper all went to bed early, anticipating quick repairs and an early start after the workshop opened on Monday.

Monday 3 August

Talbot and Maloney went to the REME workshop at 0730 hrs whilst the remainder began to vacate our room and prepare breakfast.
The vehicle was checked and an additional fault found in the steering box, which meant a long delay. Arrangements were made for a longer stay, and the party soon made themselves part of the furniture in the Visitors' Mess.

Tuesday 4 August

The party split into two groups, one of which put new tyres on the Rover while the remainder carried out a 'recce' of the local area, switching roles at lunchtime.

Wednesday 5 August

The Corsair was given a through 'wash and grease up' and the technical equipment checked.
In keeping with the local military tradition all work ceased at 1230 hrs and the party went off to the HQ Annual Swimming Gala. In the evening the party were the guests of the very hospitable Radio Club at the Garrison.

Thursday 6 August

News arrived that spares were now available for the steering box, which caused a drop in morale as it was realised work would soon have to begin in earnest.
The transmitters were checked against local military sets, and the Power Supply and Antennae layouts prepared so that no time would be lost on arrival in Switzerland.

Friday 7 August

The Land Rover and trailer were collected and packed very quickly.

Soon after leaving at 1130 hrs, a puncture was sustained in the face of a darkening sky. It was exchanged by an RCT Squadron we had just passed on the road, and as we set off again torrential rain soaked Maloney and Muat in the cab of the Rover.
A swift journey of 400 miles was made to Rheinfelden in Switzerland, via Cologne, Frankfurt, Karlsruhe and Freiburg, arriving at 0300 hrs.

Saturday 8 August

After the remainder of the night had been spent under the trees in a wood near Mohlin, Durham and Maloney went into the village to barter for a field next to the wood.
Approval was granted by an intrigued farmer, and the camp established by lunchtime.
By 1600 hrs an array of aerials was established and the usually busy local bands were found to be obscured by an electrical storm.
At 1725 hrs, came the first contact, and after that they came in thick and fast. Interference cleared and by 2000 hrs Scandinavia was workable, and at 2230 hrs a contact was made with Japan and later America.
Operation continued until 0300 hrs.

Sunday 9 August

Full use was made of the activity on the Amateur Bands over the week-end but the station closed early due to an electrical storm.

Monday 10 August

Provisions were purchased and the day was spent at a local swimming pool.
In the late afternoon, the station was one of the first to get on the air as people came out of work.
Numerous European contacts were made, although atmospheric interference prevented trans-Atlantic contacts.

Tuesday 11 August

The camp was hurriedly packed in heavy rain and the party proceeded to Vaduz via Zurich.
Arriving after midnight the party spent the night on the verandah of a woodsman's lodge rather than site and establish a camp at night.

Wednesday 12 August

The party went back into Vaduz and Maloney, Talbot and Usher left on a 'recce' of the local area, but were unable to find a suitable site, due to flooding following heaving rain.
Consequently the party went over an 8000 ft ridge and into the Samina Valley, and by 1600 hrs operation had begun from a site 6500 ft above sea-level.

Thursday 13 August

Maloney, Durham, Talbot and Usher had a narrow escape when the Corsair's brakes failed going down the mountain road to Vaduz. The repairs were beyond the scope of the party, and the first garage able to effect repairs was in Switzerland. They eventually returned to the base camp at 1600 hrs after 'hitching' back.
At 1730 hrs Maloney, Grey, Talbot and Usher set out with portable equipment on foot to establish stations on some of the surrounding peaks.
By 2300 hrs the first site had been established, and test transmissions to base were begun, using a portable transceiver and supply, coupled to the crudest of antennae.
Soon the station was operating to outside stations and a shift system of operation was established; the height of the site proved to outweigh any disadvantages imposed by the crude equipment.

Friday 14 August

Durham and Goldsack collected the Corsair, and crossed the Buchs-Vaduz bridge over the Rhine at 1530 hrs. At 1630 hrs it was washed away by flood water.
The patrol moved during the day to a new site near the Austrian border and began operation in heavy rain.
Operation continued through the night once again, in spite of the whole station being among the clouds, which caused numerous problems with the antennae.
At the same time the base station was operating on other bands, and had similar success.

Saturday 15 August

The patrol returned to base at 1100hrs after ceasing operation at 0730 hrs in order to 'dry out' after everything had been soaked during the night in the clouds and rain.
The party reorganised all the equipment and six members went to Vaduz to help the locals celebrate their Crown Prince's birthday. However, disaster almost struck since the site they chose to watch the fireworks from was the place the sticks were landing. They missed being maimed by a very close margin.
The party returned at 2330hrs to relieve the remainder and once again operation continued throughout the night.

Sunday 16 August

At 0900hrs Maloney, Barton and G.oldsack left on another patrol to a ridge above the base. They were joined at 1500hrs by Durham and Muat, who had been checking out their respective vehicles.
Both stations made full use of the activity on the bands, and some surprising ranges were achieved on 80 metres- Iceland and Northern Norway being easily contacted.
The patrol set up camp for the night and it alone continued operation throughout the night, due to a faulty generator at the base camp.

Monday 17 August

Durham and Muat returned to the base camp to effect repairs on the generator whilst the remainder of the patrol walked along the ridge, encountering some difficulty with a scree slope which had to be traversed carefully, not wishing to risk the set.
The planned site was not as expected - there wasn't a tree in sight for the antennae, and some aspersions were cast on Maloney's map-reading. However, it was the right peak, although it was far from the lush forest the map predicted it to be.
Eventually an antenna was erected on two rather short, dry poles, and operation began using the last of the 'A 13' batteries which were used for their small size and weight.

Tuesday 18 August

After a hectic night of operation, the patrol returned to the base camp at 0900hrs after being picked up by the Land Rover. The RV was not as expected since a track had been destroyed by a landslide and the Rover had to be driven along the bed of a stream and across the top of a waterfall.
At the base, all enjoyed a hearty meal prepared by Barton while the kit was packed for the move. The generator was repaired but weak governor springs still caused variations in voltage output.
The whole party left at 1400 hrs and proceeded to Vaduz for a souvenir buying spree. At 1630hrs the party left and proceeded to Lausanne, via Chur, Andermatt and Interlaken.

Wednesday 19 August

After arriving in a suburb of Lausanne at 0330 hrs the party slept in the vehicles due to heavy rain.
Exhaustive enquiries were made from 0700hrs onwards to find a camp-site and at 1700hrs the party moved into an official camp-site since in this Canton 'rogue camping' was forbidden.
The kit was hurriedly unpacked and the station set up, but the exhaust fell off the generator and was irrepairable at that stage, and the batteries for the portable set were not charged.
Consequently the party proceeded to bed early to make up for the loss of sleep in the previous week.

Thursday 20 August

The generator was found to be practically useless since the silencer was repaired the variation in voltage was too great to work the Power Supply Unit. No replacement springs could be found for the governor, so the party's efforts were now directed to the charging of the batteries.
Attempts at charging the batteries were fruitless at first, due to the hammering they had sustained in the mountains, and eventually at 1830hrs one was tried out in the portable kit. A fault was located in the battery Power Supply Unit, which later proved beyond repair without an Oscilloscope and Signal generator, which the party did not have.
The Police came to check the licence but could not understand it and sent down some soldiers who further complicated matters and told the party not to operate at night.

Friday 21 August

The problem was solved by the Swiss Post Office, whose records showed that everything was legal, and that they had a copy of the schedule issued before the party left UK.
The mains power supply was not suitable for the equipment so the radio equipment was packed away.
Swiss licensing conditions did not permit the use of any other transmitters so a signal was sent to the Royal Signals Headquarters Station (G4RS) by civil means stating the party's predicament.

Saturday 22 August

The party spent the day sightseeing and buying final presents before final packing in the evening and had an early night.

Sunday 23 August

The party left Lausanne at 1000hrs as it had arrived - in heavy rain. At 1600hrs the party returned to Germany at Basle and followed the outward route back to Joint HQ in Rheindahlen, arriving at 0430hrs the following morning.

Monday 24 August

POL and 'duty free' were drawn, and the party left at 1200hrs crossing back into Belgium again at Eynatten, and finally reaching Zeebrugge at 1830hrs.
The places were reserved for the midnight ferry and a substantial meal was prepared in the car park at the terminus before boarding at 2315hrs.

Tuesday 25 August

The party was clear of customs by 0500hrs and proceeded back to the RMA, the Land Rover sustaining another puncture on the way.
On arrival at the RMA at 1100hrs the equipment was unpacked, cleaned, and the MT stores and Adventure Training Store equipment returned.
By 1500hrs everything was finished and the party dispersed to various other activities for the remainder of the leave.

CONCLUSION

All members learnt a great deal from the expedition and gained some invaluable experience.
Failures due to equipment faults were remedied as soon as possible, and were not allowed to hold up operation too long.
The results achieved on the radio side were far better than anyone expected, especially by some old 'hands' of this type of expedition.
The party made full use of the facilities and were quick to remedy faults, and as a result achieved a high standard of success.

T MALONEY

Officer Cadet

Annex 'A' to
Adventure Training Report
'EUROPA RADIO'

AMATEUR RADIO OPERATION

1. The station was limited in performance by Swiss licensing conditions to 100 watts PEP output. In addition, power variations from the generator and relatively simple lightweight antennae added to the problems, particularly with no antennae tuning or matching gear.

2. In spite of this, the KW 2000B transceiver proved its worth, and the expedition achieved results, which compare more than favourably with those mounted by far more experienced operators.

3. Throughout the day and early evening contact was maintained on the 40 and 80 metre bands with North Africa and every part of Europe.

4. Late evening and night brought contacts from the United States and Japan, and later still saw Canada, Australasia and SE Asia coming in towards early morning. For some reason, South American stations seemed to be on at all times and easily workable. Bands in use: 15 and 20 metres.

5. The station was a rare one of course, and other amateurs were keen to operate with us as soon as the call was given. Word soon spread that we were operational and many contacts were made as a result of schedules arranged on the air by amateurs who wanted their friends to work us.

6. The publicity given to the expedition by radio magazines also helped considerably to ensure the success of operation.

7. Of particular interest were the following contacts:

a.	JAZYT	-	Okazaki University, Japan.
b.	LA7PN	-	US Army expedition to Stavanger Fjord, Norway.
c.	PI1PTI	-	Phillips Industrial Station, Netherlands
d.	GB3FRC	-	Whitby Regatta
e.	GB2USA	-	Mayflower Anniversary Station, Plymouth
f.	F9RM	-	American expedition in French Alps
g.	G3VCG	-	Marconi station at Chelmsford
h.	WA3CKC	-	US workship in N. Atlantic
i.	MB0AMY	-	Only permanent station in Liechtenstein

8. 473 contacts were made and there was a great variety of countries among them (53 in all). 25 Royal Signals stations were contacted, ranging from Singapore to Catterick.

9. In spite of many problems the party pressed on with operation and achieved a great deal of success, not only with the quantity of contacts but also the quality, both in variety and standard of reception.

A STUDY IN TEST GEAR By G5YN Continued from the Summer Edition.....

==========

Frequency

By the terms of our licence we must have equipment in the station to measure the frequency on which our transmitter is operating to ensure that it is within our own bands. The simplest form of frequency measuring device is the absorption wavemeter. (This by the way does not by itself satisfy GPO requirements). It consists in its simplest form of a coil and condenser parallel tuned circuit as at Figure 15a. This is used by coupling it to a tuned circuit carrying power. When the absorption wavemeter is tuned to resonance it absorbs power from the tuned circuit. This is indicated by a change in anode or grid current of the valve supplying power to the tuned circuit. To make this a little more sophisticated an indicator of resonance can he included in the absorption wavemeter. In its simplest form this can be a flashlamp bulb in series with the tuned circuit as at Figure 15 b. An alternative method is to couple the lamp through a link coil as at Figure 15 c. To take things a stage further the lamp is replaced by a silicon diode and galvanometer as at Figure 15 d. Provision is also made for jacking in a pair of telephones so that AM telephony can he monitored.

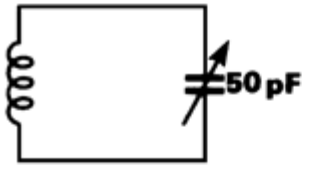


Fig. 15 (a)

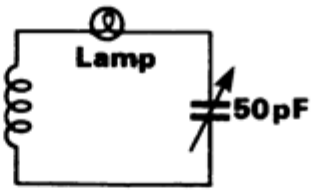


Fig. 15 (b)

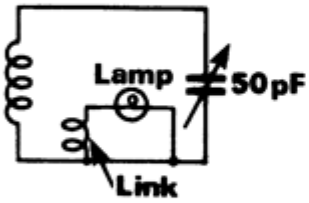


Fig. 15 (c)

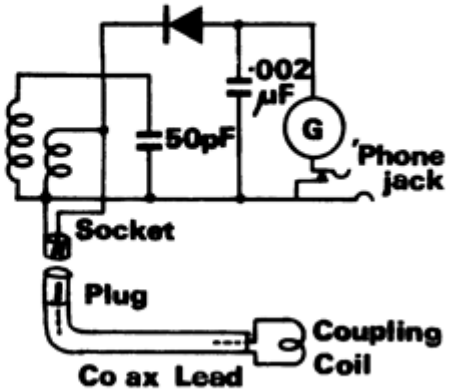


Fig. 15 (d)

To supplement these devices a Secondary Frequency Standard is necessary. This most usually consists of a piezo electric quartz crystal oscillator operating on 1 Mc/s or 100 Kcs. This enables the band edges to be accurately located and meets GPO requirements. Such an oscillator usually develops harmonics of sufficient amplitude to be identifiable up to at least 30 Mc/s. However, if the higher harmonics are unduly weak the oscillator may be followed by an amplifier tuned to the harmonic which it is required to strengthen. A simple 100 Kc/s oscillator circuit is given at Figure 16. The 100 pF capacitor in series with the crystal is to adjust the crystal frequency exactly to 100 Kc/s. It may be compared with MSF Rugby which radiates standard frequency transmissions on 2·5, 5 and 10 Mc/s. Alternatively the BBC long wave light programme transmitter at Droitwich on 200 Kc/s may be used. Many modern communication receivers have such a check oscillator built into them. They are normally switched on by a third position on the send/receive switch marked "Calibrate". The circuit of such an oscillator built into a well-known American communication receiver is shown at Figure 17.

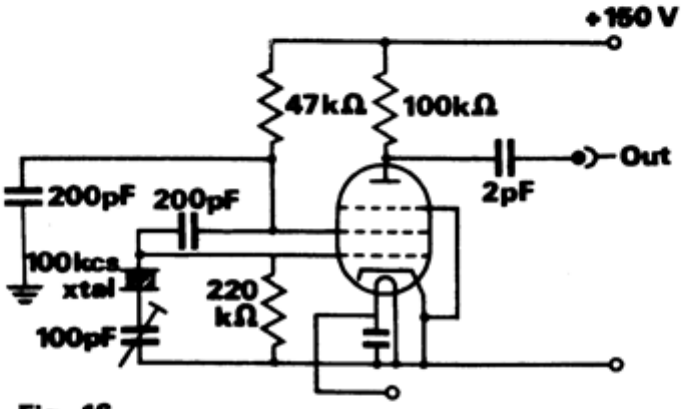


Fig. 16

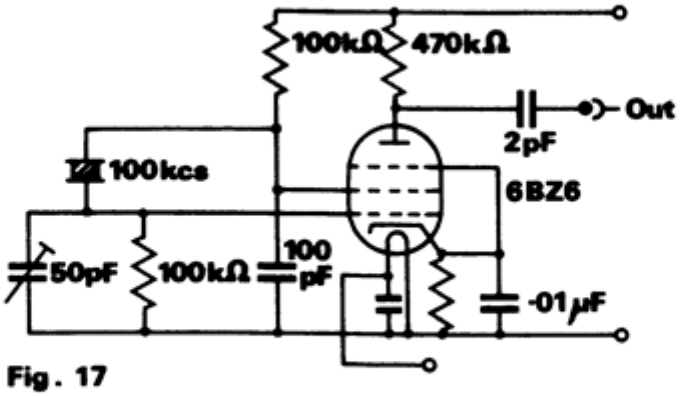
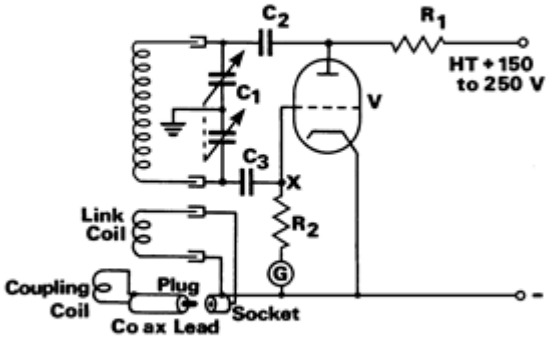


Fig. 17

When it is desired to measure the resonant frequency of a tuned circuit which is not carrying RF power the absorption wavemeter will not serve. An active device, i.e. one that generates power, is necessary. The device which performs this function most simply and which should be available in every amateur's station is known as a grid dip oscillator or G.D.O. for short. When a valve is oscillating hard the grid potential will swing alternately positive and negative.

On the positive half cycles grid current will flow. The amount of current depends on the amplitude of oscillation. If a circuit resonant to the frequency of oscillation is coupled to the tuned circuit of a valve oscillator the resonant circuit will draw power from the oscillator. The strength of oscillation and with it the amount of grid current will fall. A galvanometer is therefore placed in series with the grid circuit of a simple valve oscillator of variable frequency to act as an indicator of resonance. A simple circuit is given in figure 18.



Cct. Diagram of GDO
R_1 = 1kΩ
R_2 = 47Ω
C_1 = 50+50pf
C_2 and $_3$ = 100pf
G = 0 to 0·5 mA
V = 6C4, or Triode connected RF Pentode e.g. Z77, 6AM6, EF91.

Fig. 18

In order to cover a wide band of frequencies a number of inductances must be provided. These maybe change by switching or by plug and socket. At HF switching is satisfactory. At VHF plug in coils are more efficient due to the stray inductance and capacitance introduced by the switch mechanism and its leads. When plug in coils are used they maybe arranged to project from the GDO case in such a way that they maybe coupled to the tuned circuit under investigation. When switched coils are used then a link and coupling coil system must be used as indicated in figure 18. In any case this system has much to recommend it as the link coil can be introduced into a tight corner which may not be reached by the GDO itself. When using the link coil system at VHF care must be taken that the link coil and coaxial lead do not resonate at the working frequency causing spurious dips on the galvanometer.

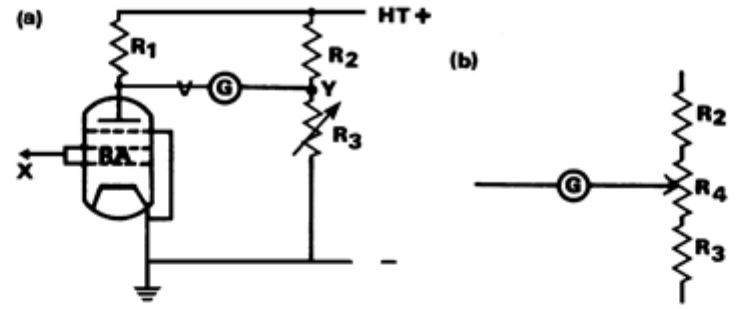
The change in reading on a 🗁 mA meter in the grid circuit of such an oscillator is small and can be tricky to observe. To increase the sensitivity of the indictor the galvanometer maybe included in a simple valve voltmeter type of circuit as shown in figure 19a. The grid of the valve is connected to point X in figure 18 and R3 adjusted until the bridge circuit consisting of R1, R2, and R3, Ra is balanced and the galvo reads zero. Any change in the strength of oscillation will cause the negative potential at point X to change. This will change Ra, unbalance the bridge and cause the galvo to read. There is a price that has to be paid for the increase in sensitivity. The strength of oscillation varies throughout the tuning range of the GDO. Every change in frequency will therefore call for an adjustment of R3 to rebalance the bridge.

If it is desired to measure frequency accurately then a heterodyne frequency meter is necessary. One can build but if a worthwhile degree of accuracy is to be obtained then first grade components must be used and a high degree of constructional skill will be demanded from the builder. An outline of a suitable instrument is given on page 470 of the RSGB Amateur Radio Handbook.

Cct. Diagram of a simple valve voltmeter.

R_1 = 1kΩ, R_2 = 300Ω, R_3 = 14kΩ, V = Triode connected EF50, G = 0·5mA FSD.
The components given are for a practical case where V was part of a simple valve voltmeter. The ratio of R_2 to R_3 will depend upon the average potential of point X. It is usually more convenient not to have R_3 variable but to insert a variable resistance R_4 of a few hundred ohms at point Y. This is shown in fig.19 (b).

FIG 19

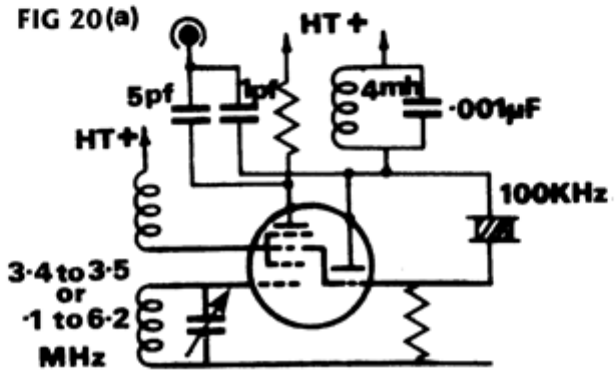


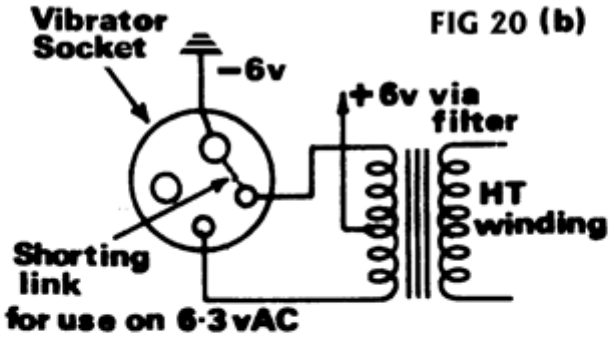
NOTES ON TEST EQUIPMENT.

The majority of Amateurs purchase an ex-service instrument on the surplus market. There are two instruments which are particularly popular. One is the ex US Signal Corps BC 221 also known as the "Bendix" wavemeter. The Naval version is the LM 14. This is a high quality instrument covering 125 Kc/s to 20 Mc/s with two oscillators and their harmonies. There are numerous check points where the oscillator or its harmonic is synchronised with the harmonics of a 100 Kc/s crystal oscillator. Five figure readout can be obtained and an accuracy of ·01% is claimed. The frequency is read from a calibration book. They were originally built to operate in the field from dry batteries. For a few years just after the war they were obtainable with calibration book and without batteries for about £9. A similar instrument in used condition now fetches about £25. One in as new condition with calibration book and mains power supply built in is being advertised for £45.

The more popular of the two by reason of its more reasonable price is the "Class D" wavemeter. It has built-in 1Mc/s and 1 Kc/s crystals and hence meets GPO requirements. There are a few on the market at a cost of £6 to £7. It has two oscillator ranges 3·4 to 3·5 Mc/s and 6·1 to 6·2 Mc/s. These are modulated by the 100 Kc/s crystal oscillator and its harmonies in a triode/hexode circuit to give continuous interpolation between the 100 Kc/s points in two ranges 1·9 to 4 Mc/s and 4 to 8 Mc/s. A simplified diagram of this is given in Figure 20a. As supplied they are designed to operate from a six volt accumulator through a vibrator and bridge connected metal rectifier.

FIG 20(a)





They are normally operated by the amateur from the mains through a 6·3 volt LT transformer. The vibrator is removed from its socket, the leads which normally went to the 6 volt accumulator are connected to the 6·3 volt winding of the transformer and two of the vibrator sockets bridged so that 6·3 volts a.c. is applied not only to the valve heater but also to half the primary of the H.T. transformer. This connection is shown in Figure 20b.

The tuning scale is calibrated every 200 Kc/s and can be read to 1 Kc/s by interpolation. The oscillators are trimmed to the 100 Kc/s crystal oscillator by a zero adjuster but unfortunately there is no provision for trimming the 100 Kc/s crystal into synchronism with a standard frequency transmission. In my own instrument the 100 Kc/s crystal is definitely a few hundred cycles out and 1 zero my interpolation oscillator against the 100 Kc/s crystal in my receiver which has been synchronised with MSF.

Inductance and Capacitance

For those who build and, particularly, design their own equipment it is often necessary to be able to measure with reasonable accuracy values of inductance and capacitance. Even if this only amounts to checking whether the value of a capacitor is in accordance with the value marked on it or whether it is faulty it is of importance. The most accurate means of measuring is by bridge methods. The bridges used are developments of the Wheatstone bridge. The type used for measuring inductance is known as the Maxwell bridge, see Figure 21. P is the ratio arm into which can be switched alternative values in decades e.g. 100 ohms, 1000ohms, 10,000 ohms or 100,000 ohms. Q is the calibrated variable resistance which is adjusted for balance. K is a standard capacitor in terms of which the known inductance is measured. A large inductance is likely to have an appreciable series resistance, the simple D.C. resistance of the winding. This will cause a phase shift in the circuit and prevent a clean "null" being obtained and hence the point of balance will not be sharply defined. This can be eliminated by causing an equal and opposite phase shift in the capacitance arm by placing a variable resistance S in parallel with the standard capacitor K. This is adjusted in conjunction with P until a clean, sharp balance is obtained. This can be calibrated to indicate the effective series resistance of L.

You cannot energise a reactance bridge with D.C. as is done when using a Wheatstone bridge to measure resistance. The simplest way of energising a reactance bridge is to apply a 1000 c/s tone from an audio oscillator across points AB, Figures 21 and 22, and connect a pair of telephones across points CE as a balance indicator. It is most important that the tone should be a pure sine wave if a clean null and a sharp balance is to be obtained. In a more sophisticated arrangement an amplifier and valve voltmeter could be used as a null indicator.

To measure capacity the bridge is rearranged as at Figure 22. Unless the capacitor being measured is very lossy as in the case of an electrolytic capacitor the phase balancing resistor will not be required.

FIG 21

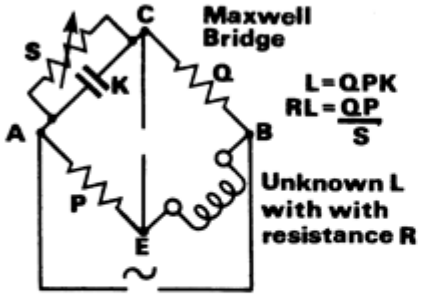
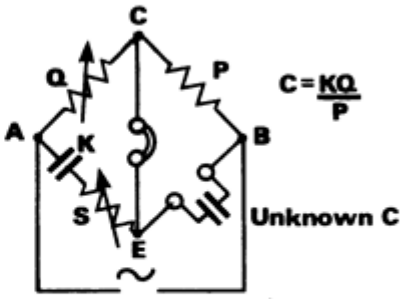


FIG 22



The usual requirements for the measurement of inductance and capacitance can be met by much simpler equipment than the above. The items required are a calibrated GDO, a capacitor of known value e.g. a 1% tolerance silver mica capacitor of 100 pF capacity and a small inductance of known value. The coil and capacitor should each be mounted on a terminal strip. The capacitor can easily be purchased. The coil can be constructed and adjusted to a convenient value say 5 micro henries by "cut and try" using the GDO and standard capacitor. The coil and standard capacitor are connected in parallel and coupled loosely to the GDO which is adjusted to resonance. The value of the unknown component is obtained by substituting in the formula:

Where f = frequency in cycles per second
L = inductance in Henries
C = capacity in Farads

remembering that 1 Mc/s = 10^6 cycles per second
1 μH = 10^6 H
1 μF = 10^6 F
1 ρF = 10^{12} F

$$f = \frac{1}{2\pi\sqrt{LC}}$$

π = 3·142
π^2 = 10 (near enough)

By transposition $$L = \frac{1}{4\pi^2F^2C}$$

$$C = \frac{1}{4\pi^2F^2L}$$

According to the ARRL handbook a 17 turn coil 1 inch in diameter and wound 16 turns per inch has an inductance of 5 μH.

(To be Continued)

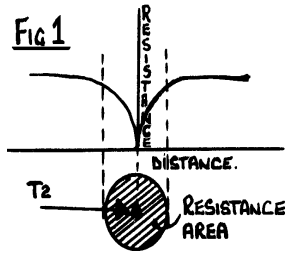
EARTHING

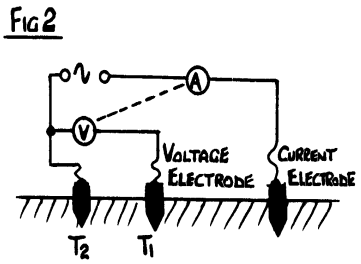
Those of you who use vertical antennas or any antenna which requires an earthing system may find this article helpful in providing a better earth than might normally be obtained.

Earth electrodes or counterpoise earths rely on the capacity between the electrode or electrodes and the general mass of earth. Since it is unlikely that many of you reading this article has access to an earth electrode test instrument the following explanation of the theory may be of guidance to the provision of a good earth.

The instrument provides a fixed voltage of variable frequency supply to avoid false readings due to stray earth currents.

The procedure requires a series of tests, which involve the measurement of the resistance of the soil between a test electrode T1, and a "consumer" electrode T2. Fig.2. As the test electrode is moved further away from T2 the results are plotted, and as can be seen in Fig.1 the resistance increases up to a point from which it levels off and no further increase can be measured.





If this test is repeated in several directions and markers placed at the limit of resistance increase it is found that when completed, the markers show a circular pattern. This area is known as the resistance area of the electrode.

If this test could be carried out beneath the surface and plotted it would show a figure which is hemispherical. It is the capacity between this hemisphere and the general mass of earth that provides us with our earth good or bad. The greater the hemisphere the greater the capacity and the better earth. To achieve a large capacity, enlarging the electrode in size or depth will not effect much improvement, so in practice it is usual to provide another earth some distance away and then to connect the two earths in parallel. When doing this care is taken to ensure that the resistance areas of the two electrodes do not overlap.

Providing they do not overlap and providing both electrodes are similar in size and depth, one can expect to halve the resistance of one electrode. By doing this one has doubled the total resistance area and doubled the capacity. In my experience the only areas in Britain where this does not apply are rocky areas of Wales, Lake District and parts of Scotland, where due to the lack of depth of topsoil, good earths are hard to achieve.

Alternative earth electrodes can vary from 6ft to 8ft copper rods or large plates, but by far the best for our use are radial wires buried 12" to 18" beneath the surface. As our earths are never called upon to carry breakdown currents in the event of an electrical earth fault, our radials can be of very light gauge wire. The normal requirements are 16ft long from the centre electrode, - easy with a new house and a new garden. If you're not this lucky the only alternative is a well trained mole.

G3 Big Indian Chief
ERIC LAWRENCE (402)

LATE EXTRA…….. FLASH……..

REFERENCE THE NET ON SATURDAY MORNINGS FREQUENCY 7050 PLUS.

GW3ASW reports that since the Saturday 40metre net was started last Easter he has worked 30 new members, of these 22 members do not for various reasons work on 80 metres, and therefore do not operate on the Tuesday/Thursday night nets. Percentage of QSL cards received from these contacts are 29 out of 30 (96.6% Ed!). So far as I am concerned the time and effort in trying to form the net has been well worth while. Come and join us!

P.S. We want another volunteer to do net control when I am working!!!!!

????? .....ANY TAKERS?

DE CYRIL.

****

OVERHEARD AT THE HEADS (With apologies to the RNARS)

ROYAL SIGNALS AMATEUR RADIO SOCIETY
APPLICATION FOR MEMBERSHIP

I wish to apply for membership of the Royal Signals Amateur Radio Society, and, if elected, agree to abide by the Rules of the Society as published and/or amended. I understand that, if elected as an Annual Member, Membership fees are payable on joining and thereafter on the 1st January each year, except in the case of members joining on or after 1st September when Annual Membership is free for the remainder of the current year. I also understand that current membership fees are as follows :-

Annual Membership : 50p per Annum

Life Membership : £5-0-0

Club Affiliation : 50p per Annum or £5-0-0 Life Affiliation

I enclose CHEQUE/MONEY ORDER/POSTAL ORDER/CASH* (Cheques and Orders crossed and made payable to "The Royal Signals Amateur Radio Society" and cash Registered) to the value of £ . - ., in respect of ANNUAL/ LIFE* Membership.
The Society reserves the right to publish details of all members unless any member expressly wishes otherwise.

I DO/DO NOT* object to my membership details etc., being published by the Society.
(Failure to delete will be taken as the applicant having NO OBJECTION).

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(* = delete where inapplicable)

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Membership if approved, becomes effective from the 1st of the month in which application is made. When completed, please return this form, with membership fee, to :-

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PUBLISHED BY THE GENERAL SECRETARY OCTOBER 1971

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001	G2EC	049		097	VK3ET	145	
002		050		098	GW3GHC	146	G2WH
003	G3DSS	051	GM3PIP	099	G5KW	147	
004	G3EJF	052	G5VO	100	Not issued again	148	G2BPW
005	GI2DZG	053		101	GM3NXA	149	G3RWM
006	GM3GFO	054	G3UMI	102	GM3AWF	150	
007	G3NJM	055	G8BEI	103	G3WME	151	G3SGH
008	G3OKX	056		104	G3GVV	152	G3RPL
009	G3RB	057		105	G2CPM	153	G3SMV
010	G3EMO	058	GI8AYZ	106	G3ORY	154	
011	G3MKR	059	G3VBL	107	GM3IAA	155	G3RAQ
012	G3IRP	060	G3WEQ	108	G3WXX	156	G3UOL
013		061	G3MJK	109	WA6HAI	157	G3RCJ
014	GI3HXV	062	G5XL	110	G3DOJ	158	G3VDU
015	GW2OP	063	G3CIV	111		159	
016	G3HCM	064	G6RC	112	G3OMH	160	G3RLM
017	G4JT	065		113	G3BEC	161	G8JU
018	G2TP	066	GW3PDD	114		162	G3LXP
019	G3RAZ	067	VE3CQH	115	G8CCE	163	G3UTI
020	G3WQH	068	G3FGN	116	G3XAV	164	G3OEK
021	G3OAZ	069	G3VSF	117	BRS 31625	165	G3MUU
022	G3HN	070	G3PQF	118	5Z4IR	166	
023	G5HZ	071	G8APT	119	G3VDR	167	GM3PFU
024	G3IDG	072	G5XB	120	G3JZP	168	VK2PF
025	G3LMX	073	G3PPK	121	G3TUM	169	G3TBP
026	G8PG	074	G3XBR	122	G3RUS	170	
027	G3PGM	075		123	G3YBT	171	9I1BB
028		076	G3ONU	124	G3WBL	172	G3UXH
029	G3DMK	077	G3IUH	125	GM6RI	173	G3VYZ
030	G3OHJ	078		126		174	
031	G3OFV	079	G3PNE	127	G3FDU	175	G3TXJ
032		080	G3XCS	128	GM3OJC	176	G3EBO
033		081	G3BOE	129		177	G3NXB
034	G8ANQ	082	GI3IWD	130	G3DBU	178	G2AYQ
035	G3AGO	083	G3PC	131	G3FMW	179	G3YSZ
036		084	G3WUT	132	G2ATM	180	G3RBS
037	G2CX	085	G3PNF	133	G3RFI	181	
038	G3JFW	086	G3UUG	134	G2JF	182	G5TV
039	G3ADZ	087	GM3KLA	135	G3RGF	183	G3SYW
040	G5YN	088		136	G3NXM	184	G6MA
041		089	GM3LWS	137		185	G3DNF
042	G3HZW	090	DA2XX	138	G3NVK	186	G3EHZ
043	G3CRP	091	G3NZY	139	5N2AAF	187	GW8MQ
044		092	G3NOL	140	G3NUI	188	
045	G3NWZ	093	G4QD	141	VE3ZH	189	G3OUF
046	G3EKL	094	G3KYU	142		190	G3JVD
047	G3PCV	095		143	G3ADS	191	G3LOV
048		096		144	G3PHK	192	G3NQV

No.	CALL	No.	CALL	No.	CALL	No.	CALL
193	GM3SAE	242	G3RPJ	291	G2TT	340	G8VG
194	G3XBU	243	G3WBA	292	G3VSA	341	G2AVR
195		244	G3JDJ	293	G3RWF	342	
196	VE3GFX	245	5N2NAS	294	G3UPY	343	G3XSN
197	G3DWW	246		295	G2HKU	344	G8TK
198	G3SAX	247	G5GH	296		345	
199	GI3ALT	248		297	G3LNC	346	GI3TZX
200	G3SJF	249		298		347	G3YCN
201	G3BGR	250	G3LLJ	299		348	
202		251	G3RGE	300	9M2DQ	349	
203	G3NKR	252	G3HBE	301		350	G8BOF
204	G3SIQ	253		302	G8DEU	351	
205	G3RII	254	G3RPV	303		352	G3HSE
206	G3KLX	255	G2TN	304	G8AQT	353	G3TTH
207	G3RFP	256	G3RYV	305		354	
208	G2FAS	257	G3HZP	306	G3YBK	355	G3DCA
209	G3SNN	258	G2FHF	307	G3FWD	356	G3UOT
210	G3VNN	259	G3JXL	308	G3WTJ	357	G8CDQ
211	G3WGD	260	G8RF	309	G3FPC	358	
212		261		310		359	G3LHJ
213		262	GW3MSY	311	DL5ZC	360	G3GBS
214	GW3TMH	263		312	G3YRT	361	G3WZQ
215	G8AFT	264	G8BHL	313	G3WOD	362	G3UUA
216		265	G5PX	314		363	G3OKM
217	G3UDX	266	G3SZQ	315		364	G6VQ
218		267	G3RNR	316	G2WQ	365	G3SKL
219		268	G3TAN	317	G3KBN	366	G4AKQ
220		269	G4CJ	318		367	G3FTV
221	G3BJA	270	G2CVY	319	VE3DDR	368	G3XUC
222	G3ARM	271		320	G3AES	369	GM3FIZ
223		272	G3IV	321	G3HS	370	G3UTX
224	G3VIR	273	G3YQK	322	G2DRT	371	G3AKF
225	G3XBA	274	G3ENE	323	G3EDW	372	G2TA
226	G3UCT	275	VP1DW	324		373	
227	GM3NKO	276	G3MCG	325	G3DCZ	374	G2BTO
228	G3URG	277	G3OMT	326	G3BGP	375	G2INA
229	G2HNL	278	G3WPW	327	G3VYF	376	
230	G3YZO	279	G3KKU	328	G3TKI	377	G3DHB
231	G3FQN	280		329		378	G3UDU
232	G3XHJ	281	G3BSW	330	G2UV	379	DL6AA
233	G3VZP	282	G3NWQ/DA2YW	331	G3KPQ	380	G3UEV
234	G3SJZ	283	G3LAT	332	G2CAV	381	G3BID
235	G6ZY	284	G3SQB	333	GM3SZK	382	G3DAQ
236	G3RQN	285	GW3SVY	334	G3XTL	383	
237		286		335	G3OLE	384	G3IFM
238		287	G2CDN	336	G3XHA	385	G3OSY
239	G3GLQ	288	GI5DX	337	GM3TDS	386	G3YBO
240	G3NDJ	289	G2FRY	338	G3SWO	387	G3FOP
241	G3RBB	290	G3GEJ	339	G2IO	388	G3TDW

No.	CALL	No.	CALL	No.	CALL	No.	CALL
389		438	G3RKD	487		536	DL5YA
390		439	G3SRH	488	GW3DIX	537	G6ZO
391		440	G8ARZ	489	G4PX	538	G2OC
392	G3VDF	441		490	G4DR	539	G3VVE
393	G6LL	442	G3VIS	491	G6TQ	540	G3WRY
394	G3WTA	443	G3JPU	492	G2NJ	541	
395	G3TKL	444	G3ZDP	493	G3AMR	542	GW3QN
396	G3ABM	445	G2HDO	494	G3LQC	543	G3VAN
397	G2QB	446	G3WEO	495	ZB2BC	544	G13JEX
398	G3PNH	447	MP4TCV	496	GW3AX	545	G3FK
399		448	G3KYF	497	G8PL	546	
400	G3HWL	449		498	G3XT	547	G3WHS
401		450		499	G4LO	548	
402	G3BIC	451	GW3POD	500	GM8SQ	549	G2DPQ
403		452		501	GI2BZV	550	G3BKK
404		453	GM3VIO	502	G2AUA	551	G3IOI
405	G3XEE	454	G3UAA	503	G6ZT	552	G6HB
406	G3XMZ	455		504		553	G3IUD
407	ZL2AZT	456	G3VBE	505	G5FG	554	G3JGH
408		457	G3GWD	506	G3WMZ	555	G3WCP
409	G3BA	458	G3AJP	507	G3BG	556	G3BEZ
410	G3PNM	459	G3UNC	508		557	WA6CEB
411	G3UZL	460		509	G2ZZ	558	VE3GNM
412	G3BTM	461	G2BQ	510	G6QM	559	GW3ASW
413	9H1BX	462		511	G3EYD	560	G3IR
414	G5RY	463	G3KWN	512	G2HLL	561	G3YOS
415	VE2ZM	464	G2UZ	513	G3BY	562	G3TKX
416	G3MBQ	465	G3KAM	514		563	G3RCO
417	G8TP	466	GM3FSV	515		564	G8SC
418	G3VIY	467	GM3VUM	516		565	G3IGI
419	GM3HGA	468	G3WQQ	517	GM3JOA	566	G8DK
420		469	G3VTU	518		567	G3VVH
421		470	G3WNG	519	G3XVO	568	G2CKQ
422	G3UJW	471	GM3JIG	520		569	G3PYN
423	DL5XG	472	G2YS	521	G3WNI	570	G8RB
424	G8CIX	473	G3EBH	522	G8BBP	571	G3IRR
425		474	G3XFV	523	ZL1ACL	572	G3YNB
426	G3XUR	475	G2ANG	524	MP4TDX	573	G3OOD
427		476	G3BHC	525	G8ARA	574	G4BC
428	G3NQT	477		526	G3VNX	575	G3ZFD
429	G3NCZ	478	G2FYT	527		576	WA8TGA
430	G3PQ	479	G3SDD	528	G3WOV	577	G3LO
431		480	G2UX	529	G3PMC	578	G8CQZ
432		481		530	G2KK	579	G3IZP
433	G3NET	482	G3KBQ	531	G6UC	580	G3RNL
434	G3VGN	483	G3LNS	532		581	
435	G3VPM	484	G3FNK	533	G8TN	582	G3JIL
436	G2HHD	485	G3WNH	534	G3POY	583	GM3AVA
437		486	G8NY	535	G3UTW	584	G3WET

No.	CALL	No.	CALL	No.	CALL	No.	CALL
585		634	G3HMY	683	G3EDG	732	
586		635	G3YIF	684	G3BWV	733	VK2BEL
587		636	G3MVT	685	G3OOQ	734	G3XRY
588	G3RKN	637		686	G3LZN	735	
589	G8KW	638	G3ENG	687	GM2CQI	736	DL0AA
590	G3YOB	639	G3BZO	688	G2DJM	737	G3UZB
591		640		689		738	G3ZDM
592	ZC4JH	641	G3IAR	690	GW3HUM	739	
593	G3YSD	642	G3XWI	691	9J2BC	740	
594	G3LZR	643	G2DHV	692	G3YSK	741	G2BIM
595	PY2PA	644		693		742	G3XAJ
596	G4QX	645		694	G3LPS	743	
597	G3WGM	646	G3JIY	695	G3DWS	744	
598	G3XGT	647	G3WEB	696	ZL2BBT	745	9M2DL
599	G3RYF	648	G3KJW	697		746	G3YOZ
600	G3VRK	649	W3RX	698	HB9AMS	747	G3ZWS
601	MP4TCW	650	W5VA	699	GW3RVG	748	G6XM
602	G3TSR	651		700	G3OFB	749	G3JBA
603	G3FD	652	G3RVO	701		750	G3XHR
604	G3TLV	653		702	ON8GB	751	
605		654	G5FA	703	G3IMI	752	
606	VS6AF	655	G3FWR	704	G3AVH	753	G3XWY
607	G3YBP	656	G4BU	705		754	ZS3MS
608	G3YRQ	657	G8CIA	706		755	
609	G2DTO	658		707		756	VK2OV
610	G3YJU	659		708	VE8CB	757	G3YZQ
611	G3UPT	660	VQ8CR	709		758	G3OLV
612	G3XZT	661	G3YHL	710	GW2HIN	759	
613	G3NOB	662	G3IES	711		760	
614	G3HPJ	663	G3VA	712		761	
615	G3COL	664	G3KKI	713	G4KG	762	
616	G3SYT	665	G3YNT	714	K2QPS	763	
617		666	G2CVV	715		764	
618	G8KL/W6	667	G3GHE	716		765	
619	G3RSV	668		717	GW3YPF	766	
620	G3BWX	669	G3XIP	718	G3RWS	767	VU2MD
621	MP4TDD	670	G3YOY	719	G3VUC	768	G3AHB
622		671	GI3KVD	720	G3YHB	769	GW3DRV
623	G3XYF	672	G3PUW	721		770	
624		673	ZL1AUI	722		771	G3YQQ
625	G3YEU	674	VE3CIM	723		772	G5YY
626	G3ECV	675		724		773	
627		676		725	K4OO	774	G3PQY
628	G4AH	677		726		775	
629		678		727		776	G3JMO
630		679	G3XWE	728		777	G3GUV
631	G3WRU	680	G3YMR	729	G2KI	778	GI3ZKT
632	G8BKU	681	G3COP	730		779	G3STM
633	G3WDG	682	G3OPL	731	G3YYD	780	DL5AA

No.	CALL	No.	CALL	No.	CALL	No.	CALL
781	G3WZS	830		879			
782	G3ZKA	831	ZS1KZ	880			
783	G6DV	832					
784	G3VSD	833					
785	GM3LYI	834	GM3ZHG				
786	G3ZDB	835	G3SDM				
787	G2CFI	836					
788	DL4UV	837					
789	G3KAE	838					
790		839	GM4ABO				
791		840					
792		841					
793		842					
794		843	VK6PG				
795		844	G3AWZ				
796		845	G3JFE				
797		846					
798	W2QPQ/W9IWI	847					
799	GM4AEA	848					
800		849	G4AEJ				
801		850					
802		851					
803	G3NT	852	G3ZYV				
804		853	G3GUE				
805	G3VXE	854	G3ZEE				
806		855					
807		856					
808		857					
809	G3NL	858					
810		859					
811		860					
812		861					
813		862					
814		863					
815	G3ZOJ	864					
816		865					
817	DL4MI	866					
818	G3YYU	867					
819		868					
820	G2AZW	869					
821	G3CXE	870					
822		871					
823		872					
824		873					
825	VE3GUN	874					
826	G3ZVD	875					
827	G3NOF	876					
828		877					
829	G8AHH	878					

ROYAL SIGNALS AMATEUR RADIO SOCIETY MEMBERS SUPPLIES

Members Notepaper - Approximately 6½" x 8" good quality notepaper, headed "ROYAL SIGNALS AMATEUR RADIO SOCIETY, "Members Correspondence" and a figure of Mercury in Blue. Also space for Call-sign and Membership Number. New series but no increase in price.

Members QSL cards - THESE ARE A BETTER QUALITY CARD AT THE OLD PRICE. All cards have a "Jimmy" with "Royal Signals Amateur Radio Society" and "Member Station" on the front and printed details on the reverse permitting the card to be used as a) a QSL for a QSO b) a SWL report and c) to acknowledge a SWL report. This is the basic card which can be overprinted with your membership number, call-sign, name and address etc., in RED, BLACK, GREEN or BLUE at a small extra charge. Minimum order quantities : Basic = 100, Overprinted = 500.

Members Lapel Badges - In light blue, dark blue and green, with "RSARS" initials in black. All brooch fitting. Plain at 12p or with your call-sign or membership number on an attached scroll - 37p

RSARS Ties - In good quality Crimplene and Terylene, dark Blue, with alternate angular rows of "Jimmy" and RSARS badge. Manufactured by a leading London Colour House at £1. 28p post free.

Log Books - By N.W. Electronics. Good quality white paper, with over 100 pages. "Q" Codes, Reporting systems etc. 37p post free

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R.S.A.R.S.
School of Signals
Blandford Camp,
Blandford Forum,
Dorset.

From : _____
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Date : ___/___/19___ Call-sign : _____ RSARS No. : _____

Please supply the following goods :-

			£ s d
_____	Sheets of Members headed Notepaper	@ 42p per 100	_____
_____	Basic QSL cards	@ 50p per 100	_____
_____	Basic QSL cards	@ £1. 88p per 500	_____
_____	Overprinted QSL cards in (colour) _____	@ £2. 63p per 500	_____
_____	Plain lapel badge(s)	@ 12p each	_____
_____	Call-sign lapel badge(s) (_____)	@ 38p each	_____
_____	Society Tie(s)	@ £1. 28p each	_____
_____	Log Book(s)	@ 37p each	_____
1970	Annual Subscription	@ 50p	_____
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Signature : _____