



MERCURY

THE JOURNAL
OF
THE ROYAL SIGNALS
AMATEUR RADIO SOCIETY

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HEADQUARTER STATION - CATTERICK CAMP - GB3RCS/G3CIO

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**The Officers of Royal Signals Amateur Radio Society
and the staff of Headquarters Station G3CIO wish all members of the Society
A HAPPY, PEACEFUL AND PROSPEROUS NEW YEAR**

Editorial - G3EJF

This issue of MERCURY may be a little late reaching you, we have deliberately delayed posting until after the Christmas mails were cleared.

Our new style of presentation, is, we hope you will agree, a step forward in producing a journal worthy of the Society.

Several members have asked that the membership list should be in call sign order but to do this would raise a number of administrative difficulties. However, this issue contains a list of call signs of members and we shall publish amendments in future issues.

The appeal for articles in our last issue brought a good response for which your scribe is very grateful. If we are to keep MERCURY going we need your help, if only one in every ten members would write once a year we would have no worries. How about YOU, the other nine may be too lazy!!

As an experiment we are running a Society contest on 3.5 Mc/s, if you are in UK or BAOR get on the air and let the 80 metre gang know that Royal Signals Amateur Radio Society is going strong, G3CIO will be looking for you. If this experiment is a success consideration will be given to organising a contest open to members throughout the world.

This issue of MERCURY is being prepared amidst the preparations for Christmas and the time seems appropriate to say thanks to all those people without whose help this journal would never see the light of day. Your scribe's thanks go particularly to the typists of 2 Squadron 8th Signal Regiment, our friends of Training Brigade and School of Signals and to Major Beaumont and his staff at York who do all the work involved in producing and posting hundreds of copies and to G3JZP for her patient criticism and tolerance.

73 to you and yours
ECHO JULIET FOXTROT

SOCIETY NEWS

Visit of the S.O. in, C.

On Tuesday November 19th the Society's Headquarters station at Catterick Camp was visited by the Signal Officer in Chief, Major-General F.J. Swainson OBE and the Chief Signal Officer of the United States Army Major-General David P. Gibbs. Although the station was not on their official programme the visitors stayed for about 15 minutes discussing the operation of the station and the Society with the Field Secretary and L/Cpl Paul Scottorn G3RFI.

Retirement of John Clarricoats OBE

As members will know John Clarricoats OBE G6CL retired from the post of General Secretary of the Radio Society of Great Britain on December 31st, 1963. A donation of Five Guineas to the Presentation Fund has been sent by Royal Signals Amateur Radio Society. We feel sure that all our members will wish to be associated with this small token of gratitude for "Clarry's" magnificent contribution to the world of Amateur Radio.

The Society Purchasing Scheme

An agonised plea from our Treasurer:- "Does nobody in the Society ever buy any kit?" The success of our purchasing scheme depends on the amount of business it does. If you are thinking of spending some of the housekeeping money on a new piece of gear drop the Treasurer a line, he may be able to get you a discount, this way you can eat too!!!

WHO'S ON & WHEN

9M2EZ	Staff Sgt Doug Parker	14 & 21 Mc/s AM, afternoons GMT
9M2CF	WO II (F of S) Craze	14 Mc/s AM, afternoons GMT
G5YN	Lt Col (Retd) Sir Evan Y. Nepean	1.8 Mc/s AM or CW, 14 Mc/s CW, 1900-2030 GMT most days.
G3NVK	Richard Winters	14 Mc/s CW, evenings & weekends.
G3OKX	Jim Roberts	1.8 & 21 Mc/s AM evenings & weekends. DL2AM 21 Regt RA club 3.5, 7 & 14 Mc/s CW, Tuesday evenings & Sunday afternoons.
G3CIO:-	21 or 14 Mc/s at 1500GMT on Tuesdays, Wednesdays & Thursdays. 3.5 Mc/s SSB 2000-2100 GMT, Tuesdays and Thursdays. 1.8 Mc/s CW Tuesdays and Thursday evenings 2100 GMT onwards.	

Club Members - No. 39

G3ADZ is located at Havant Hants and activity is mainly CW on 1.8 14 & 21 Mc/s. A3 is also available at low power so skeds can be arranged for G QSO's on 7 & 3.5 if requested. Normal operating times are evenings after about 2330 GMT and weekends, but it is sometimes possible to get on the air either early mornings or on Tuesdays between 1330 and 1500 GMT.

The main items of equipment are an LG50 TX plus home made G2MA Linear, a KW160 TX, a modified HRO plus Codar preselector and Z-Match ATU's. Aerials an 8KW trap dipole, 136 ft end fed and a 14/21 Mc/s ground plane. There is also a fair amount of test equipment, especially for frequency measurement in connection with RSCG Intruder Watch of which he is organiser.

G3ADZ joined 2nd London Div Sigs TA as an OWL in 1938 and until commissioned in 1942 served with that unit and "Phantom" as an NCO. Commissioned service was with 53(W) Div Sigs, HQ 12 Corps (as a G3 SD and wireless instructor at a temporary signal school in Kent), 165 Special Wireless Section, TAC HQ 21 Army Group (as wireless Reserve Squadron, later to become 2 Press Communications Signal Squadron for the Suez operation and now 404 Signal Squadron (Press Comms) AER.

AMATEUR RADIO IN DL2

Further to the article in our last issue we now learn that the Morse Test may be taken in Germany through B.J.C.E.B.. Even if you do this you must still obtain a G licence before you can apply for a DL2 call.

Although radio shops catering for the amateur are rather few and far between we learn of two in Brueckstrasse, Dortmund; one in Froebelstrasse, Düsseldorf and one in Bismarckstrasse, Gelsenkirchen.

Talking of radio in Germany, the weekly magazine "Stern" reported in 1925 that the Chimney Sweeps Organisation protested to the Ministry of Posts that radio aerials were adding considerably to their occupational hazards!!

Agony - If you've built a new piece of gear or modified an existing equipment, write to Mercury about it. Give us the gen, don't worry about style, we'll knock it into shape.

A Letter from Catterick

The Ham Shack

Vimy Road

Dear OM,

Quite a lot has happened at G3CIO recently. The first gales of the winter blew down the 2 Metre 5 over 5 array, the skeleton slot was the first thing to hit the roof looked like a chunk of modern sculpture when we picked it up. Apart from this we came off lightly, the rope holding one of the dipoles broke but it was soon replaced. Funny how these young Signalmen seem so keen to climb the 60 ft tower, we even had one who used to arrive early of an evening and sit at the top watching out for someone with a key.

The Racal receiver came back from the manufacturers all nice and shiny and working so well that any other receiver we touch seems poor by comparison. Together with the LG300 it forms our AM/CW bay on one side of the room. Opposite the Viceroy and Eddystone 888A give us SSB whilst at the far end of the room the Vanguard (on low power of course) and an AR88 enable us to fight the "fishfone" on 160; a Hamobile transceiver on 144 Mc/s completes the station. An aerial patching panel gives us the choice of 3 band beam, 7 and 3.5 Mc/s ground planes or dipoles whilst the Top Band rig uses a 400 ft end fed slung to a convenient tree. Experiments show that we should be able to operate the bays simultaneously on most combinations of bands. Since you gleefully gave us T8c on 160 the other week we've had the Vanguard in bits and think we have found the trouble. Hope the note sounds better next time, if it isn't we'll have to think again.

We've had quite a few visitors recently. On Tuesday Nov. 19th we were visited by the Signal Officer in Chief and the Chief Signal Officer of the United States Army Major General David F. Gibbs. The club was not on their official programme so we felt highly honoured. Major Desmond Barry DL2HO and Staff Sgt Terry Quinn G3RCJ, both here on short courses, have operated G3CIO and three gentlemen from E.I.D. all amateurs, spent an evening with us. If you're coming this way we're open every Tuesday and Thursday evening, most Wednesdays afternoons and Sundays, be very pleased to see you in person.

Although we have kept the afternoon skeds we published in Mercury we haven't worked many of our overseas members. Trouble is whenever we call CQ R Sigs we are usually called by a host of Eastern Europeans and of course the beam is pointing in their direction. In the evenings the DL2 gang come in well on 3.5 Mc/s SSB and we have worked quite a few of them, we generally look for them about 200 - 2100 GMT. Paul G3RFI often operates G3CIO on 3.5 Mc/s AM on Sunday afternoons so we do try to get on the air as often as possible. If you hear a Canadian accent over G3CIO that's Doug G3SJB, VE1ADQ; he spends a lot of time on 14 or 21 Mc/s trying to work back home.

Quite a character our Doug, first thing he did on landing in UK was to nip along to St Martins le Grand, put £2 and his Canadian licence on the table and ask for a G ticket. Having got this he booked in with the Canadian military authorities.

Funny how the odd contact sticks out in one's memory in these days of rubber stamp QSO's. We had one with HZ2AMS in the capital of Saudi Arabia the other day , despite the frantic calls of would be break in stations Angus chatted on about Catterick and Richmond in 1939 when he was with the School of Military Engineering. Real old soldier's lamp swinging QSO, wouldn't have surprised me if he hadn't burst into the CRE song. Guess it's this sort of QSO that makes amateur radio so enjoyable.

We took part in the RSGB 21/28 Mc/s telephony contest and made 130 contacts including quite a few choice bits of DX and some of our overseas members. Ever tried explaining the rules of a contest to a UA whose English isn't too good, we had to do it a number of times on 28 Mc/s. Some of the operators of Eastern European stations on 21 Mc/s who are taking the contest seriously were impeccable in their operating manners, in fact the way in which most of the 130 stations were operated restored one's faith in today's amateurs. A bottle of Canadian Rye supplied by Doug helped to make it a most enjoyable contest. We also had a go at the Short Wave Magazine Club Contest and the RSGB 1.8 Mc/s contest but our Top Band gear isn't too good for contest operation so we didn't do too well. Heard O.C. 92nd Signal Regt AER going great guns as GM3SIG.

Half a dozen members will have taken RAE by the time this reaches you, fancy fixing the exam for Friday 13th!! Hope they all pass, a few more operators would be welcome, might be able to run two NFD stations in 1964.

Hope you had a good Christmas and that 1964 will bring good DX and that we'll work many times. We've laid in a good stock of coke for the stove and plenty of coffee so whatever weather blows off the moors we'll do our best to be on the air regularly.

73

Jimmy

AROUND THE CLUBS

21 Regiment, Royal Artillery

This club was originally formed at Rhyl in 1960 with the call sign GW3ORM, the principal operators being, Cpl Dave Jack GW3OFV and WOII Arthur Milham GW3OPL. There were about ten members at this time and the station was on the air most lunch times and evenings using Eddystone 840 and BC348 receivers, a DX40 obtained from a Nuffield Grant and all bands were worked using dipoles on the lower frequencies and a home made beam on 10 and 15.

In 1961 the regiment moved to BAOR and at the same time lost its only Royal Signals member. It was soon on the air as DL2AM but found its operating time severely curtailed by the number of exercises the club members are called upon to perform. However the club is active most Tuesday evenings and Sunday afternoons, mainly on CW. A Vanguard transmitter and an occasional borrowed AR88 have been added to the club's equipment. The aerial farm consists of 20 and 40 metre dipoles, a half sized G5RV and a long wire for 80 metres, at present a jostick is being tried just to see what it will do.

DL2AM is probably unique in that it is composed entirely of Royal Artillery personnel. nevertheless the operators are always pleased to contact members of RSARS.

259 Signal Squadron (Comcan)

Located at the Transmitter site at Episkopi 5B4TX has a membership of seven but an intensive recruiting campaign is in progress. Most activity is on CW using a Minimitter TX and an AR88 and 92 countries have been chalked up in the struggle with the "mist of QRM and QRN that permanently veils the site". At present effort is concentrated on the Worked All States award and American QSO's are numerous.

A lot of DX is lost due to the Klub stations which are regularly over the S9 mark, T6 notes are not uncommon even on 7 Mc/s. Very little phone is worked due to the QRM, all but one of the operators being HF band brass pounders. In recent months more and more interest has been shown in 2 meter work. A lot of VHF gear is being built or modified and it is hoped to be able to ragchew without QRM for a change. Severe QRM from the nearby QRO transmitters often curtails operation on the HF bands at 5B4TX but as the new members are shift workers the station is often active.

Royal Signals ARS CW Contest

1. The Contest will take place between 1400 and 1900 hrs GMT on Sunday 19 Jan.'64.
2. Operation will be confined to A1 on the 3.5 Mc/s band.
3. Stations will call "CQ R Sigs" and will exchange a six figure group consisting of RST followed by the operator's membership number and the county in which he is located. Thus Member No 13 operating from Catterick would send "579013 Yorks."
4. Scoring:- The first contact with each UK county or overseas country (including EI) scores 10, subsequent contacts 1 each. Only one contact with a station will count for points. The HQ station G3CIO will operate but not compete and will score 10.
5. Logs should be kept on foolscap size paper in the following form and must reach the Field Secretary, R Sigs ARS, 2 Squadron, 8th Signal Regiment, Catterick Camp not later than 7th February 1964.

RSARS CW CONTEST

Callsign.....

Location.....

Time GMT	Callsign of Stn worked	My report on his Sigs and Membership No	His report on my Sigs and Membership No	County	Points claimed

6. Multioperator entries will be accepted provided each operator is a member of RSARS.
7. A Royal Signals Plaque will be awarded to the winning station.
8. In any dispute the Field Secretary's decision is final.

Royal Signals ARS Phone Contest

The rules of this contest will be similar to those for the CW Contest with the following exceptions.

1. Date Sunday Jan 26th, 1964, 1400 to 1900 hrs GMT.
2. AM or SSB on the 3.5 Mc/s band.
3. Stations will call "CQ Royal Signals" and will exchange five figure groups consisting of RS followed by membership number and county.

Rules 4, 5, 6, 7, 8 as for the CW Contest.

A list of RSARS members by callsign will be found elsewhere in this issue.

POINTS FROM YOUR LETTERS

"A new interest in RTTY, the snag being the shortage of suitable teleprinters. The Swedish Signal Corps are supplying the Swedish amateurs with teleprinters, can't Royal Signals do something for the poor G's!!!

I would be most interested in contacting or corresponding with any member of RSARS who is interested in RTTY. "

G3OKX

"The beam is dismantled and will be re-erected when the sun becomes spotty enough for the ionosphere to support propagation on 28 Mc/s.

If any members of RSARS would care to contact me either at home or c/o CSO Southern Command, Salisbury 6222 Ext. 448 I should be delighted to take them along to the Salisbury and District Short Wave Club, G3FKF, which meets every Tuesday evening from 7.30 to 10pm in a Nissen hut in Wilton Park, or to my own station. "

G5YN

AGONY: Let us know when you change your address - our crystal ball has been BLR'd.

“GOTTA MATCH GUV?” . - Thomas C. Wylie M.I.R.E.

So you are getting along nicely without any means of checking the Standing Wave Ratio of your antenna system? If you think so, you are getting along just as nicely as a blind man without a cane or guide dog!

In bygone days, when SWR Indicators were rather tricky to construct, with long, simulated-line troughs and what-not, there might have been some excuse for doing without, but there is no excuse today for "getting along" without an instrument which, in the writer's opinion, is an absolute "must" for all amateur radio stations, particularly those using any form of multiband antenna, which includes most of them.

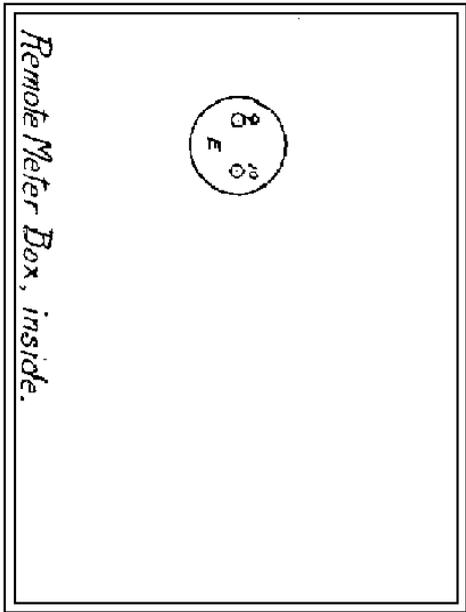
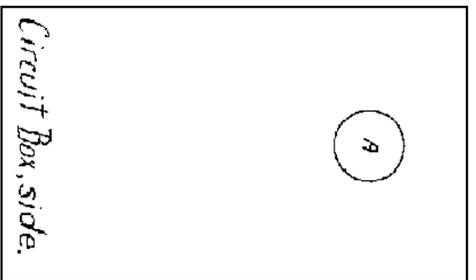
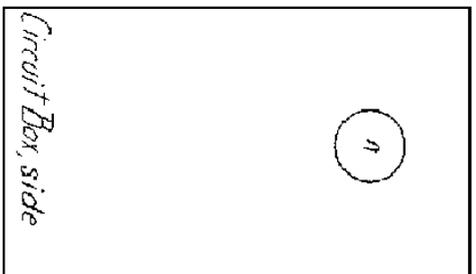
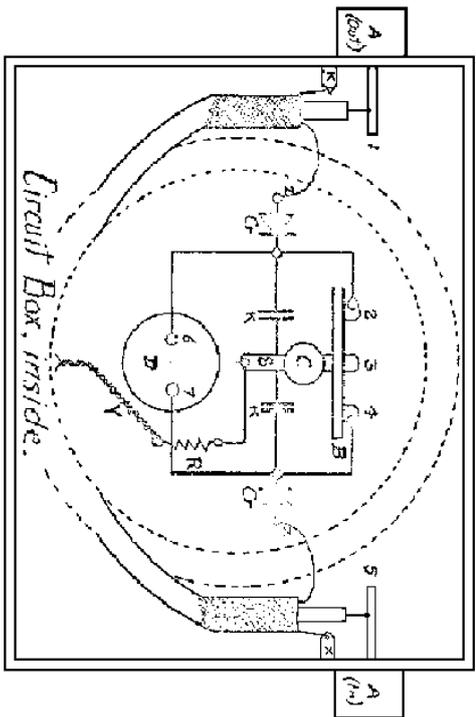
Apart from the function indicated by its name, the SWR Indicator is probably the most generally useful piece of equipment on the station. It will not make a match of a mismatch, or serve as a cigarette-lighter in emergencies, but it will indicate a match or mis-match and so give a good idea of the efficiency to be expected from the antenna and its matching network, and is the ideal instrument for tuning up. With the SWR Indicator, tuning up is accomplished with extreme exactitude without reference to the final anode milliammeter (except to guard against overloading), and obviates the great losses in efficiency due to mismatch and other grief attendant upon a high percentage of standing waves on the antenna system which, without the SWR Indicator, might not be observed. It is certain that anyone with a SWR Indicator, properly constructed and working properly, would never try again to "get along" without one.

So let us proceed with the construction of the SWR Indicator, and as it is seldom convenient to have an in-the-line instrument in sight let us make it two-piece, with remote indicating section which may be placed at any convenient spot in the shack.

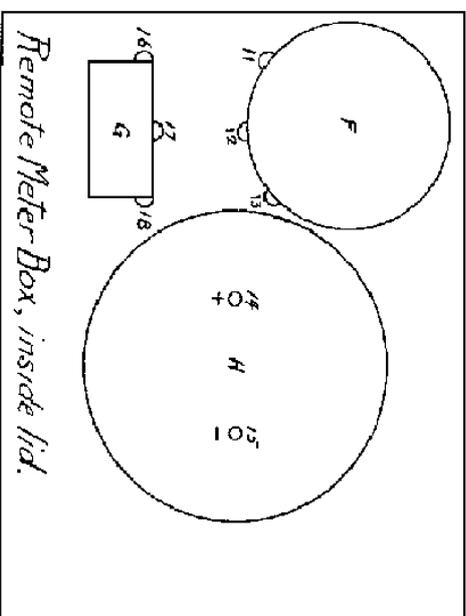
First, let us have a look at the schematic drawings. To the technically-minded, skip the schematic, spare yourself a headache, and take our word that it really does work!

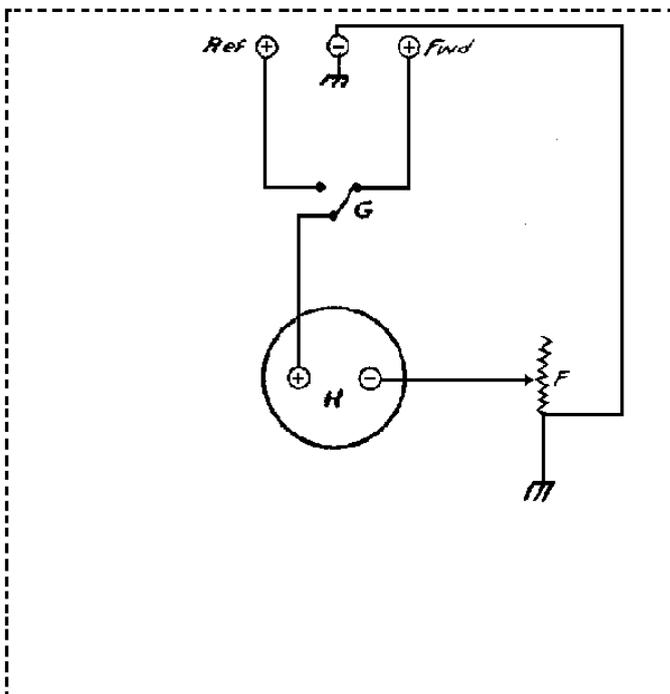
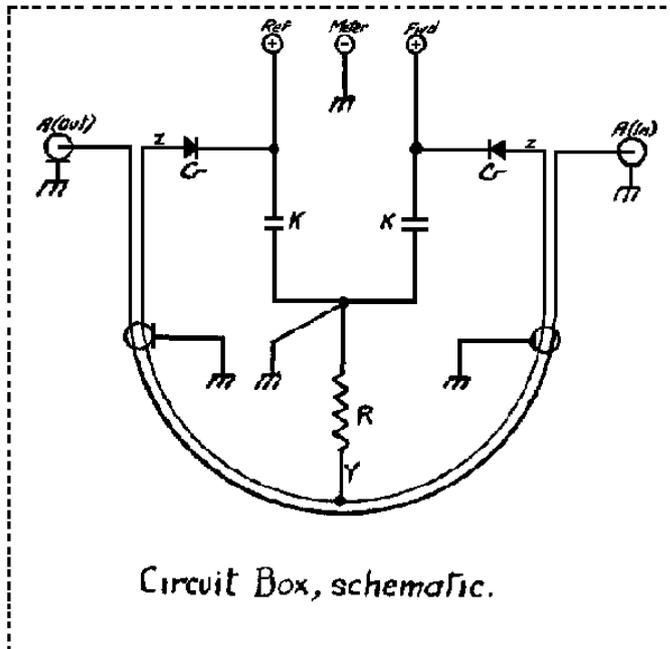
The SWR Indicator is made up in two Eddystone die-cast alloy boxes, 4½" x 3½" x 2" deep. These we will call the Circuit Box and the Remote Meter Box. See drawings.

Refer to the Circuit Box Drawing. Mount the two co-ax connectors "A", placing soldering tags "X" on each side of the under one of the machine screws holding the connectors, and screwing down tightly with nuts; and it might as well be mentioned here, at the start, that good tight connections, good solid soldering and first class "earthing" is absolutely essential in the construction of this instrument. Mount 3-way soldering tag-strip "B" at the main earth centre "C" by means of a machine screw and nut, with soldering lug "8" under the nut, as shown. At "D" mount the socket to take a two-conductor, polarised, shielded cable plug.



Scale 1/1 qpp.
 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3





LEGEND (All Drawings).	
A	0-ax connectors.
B	3-way tag-strip.
C	Main earth conn. centre.
D	Twin conductor con. socket.
E	" " " "
F	25K Ω potentiometer.
G	S.P.D.T. toggle switch
H	Meter (See text).
K	Capacitors, ceramic 11 μ F.
R	Resistor, 1Watt, carbon (See text).
X	Soldering lugs.
Y	Enameled wire (See text).
Z	" " " "
G	Germanium diodes (See text).

J. B. H. 15 III 63

("D" in the Drawing is the size of socket used in the prototype, but the socket used by the builder may, of course, be of different size, and must provide good contact and first class soldering). Mount the 1,000pF ceramic capacitors "K" between soldering tags "8" and "2" and "8" and "4" respectively, keeping the leads as short as possible and soldering both at "8" but not yet at "2" and "4" Run small insulated wires from tag "2" to terminal "6" and from tag "4" to terminal "7", soldering at points "6" and "7" but not yet at tags "2" and "4". Connect the POSITIVE ends of the germanium diodes (General Electric's Type GEX35, or practically any good general-purpose germanium diode) to tags "2" and "4", keeping the leads as short as possible and leaving the diode negative leads free. Solder all connections at tags "2" and "4", not neglecting to take precautions to prevent excessive heat from reaching the diodes. Now take a 24" length of co-axial cable of the impedance used to connect the transmitting equipment together (usually 72-80 ohms), remove the vinyl covering completely and cut back the braided shielding neatly at both ends, approximately as shown in the Drawing, taking care not to damage the inner insulation. Now cut back the inner insulation at both ends to expose about ¼" of inner conductor. Ease the braid off the inner insulation for its entire length, taking great care not to alter the lay or length of the braid. Lay the braided tube down gently on a flat surface, keeping it in a straight line. Take a 36" length of approximately No.31 BSWG enamelled copper wire and slip this carefully through the braided tube, leaving equal lengths protruding at each end. Keeping the portions of enamelled wire protruding at the ends the same length, gently replace the braided tube over the inner insulation. At the exact centre of the co-ax, and immediately above the enamelled wire now running beneath the braid, push the braid gently aside to form a small hole, and fish a 3" loop of the enamelled wire through this hole, taking great care not to damage the enamel: this loop is the wire shown as "Y" in the Drawing. Wrap a turn or two of bare copper wire around both braided ends, sufficiently tight to prevent movement of the braid; leaving about ½" of the bare wrapping wire free and spot soldering the wrap to the braid; taking care not to damage the enamel on the small wire protruding from under the braid. Form the prepared co-ax into a coil of approximately 2½ turns of approximately 3" mean diameter, as shown in the Drawing, wrapping the coil with two or three turns of small bare copper wire at three or four convenient points to keep the coil formed; spot-soldering all wrap turns together and spot-soldering wrap to each turn of braid it embraces. Carefully scrape all enamel off the protruding ends of the enamelled wire and its centre loop, but not far enough back to permit electrical contact with the braid. Twist the centre loop into a single loop. Fit the coil into the box, making it a tight fit but ensuring that it does not touch other components. Keeping all connections as short as possible, solder co-ax inner connector ends to points "1" and "5", braid end wraps to points "A" and enamelled wire ends "Z" to the negative end leads of the germanium diodes. (No we haven't come to "R" yet. Be patient. We'll get there in due course!)

Now refer to the remote Meter Box Drawing. Mount a socket "E" same as socket "D", approximately in the position shown, inside the box.

Depending on the dimensions of the components used by the builder, mount a 25,000 Ohm potentiometer "F", a meter "H" (we will decide the rating of the meter further on in the text), and a SPDT toggle switch "G" in approximate positions as shown inside the LID of the box; potentiometer shaft, meter face and switch manipulating knob projecting through the lid to the outside. Using about 5" of small twisted-pair lighting flex, connect "9" to "16" and "10" to "18", and solder. Connect "17" to "14" and solder. Connect "13" to a convenient "earth" point, such as a soldering lug secured under one of the nuts holding the meter in place, and solder.

Now for the choice of meter. The SWR Indicator is "frequency-conscious". The lower the frequency in use, the lower the comparative meter reading will be and, of course, the lower the power output of the transmitter, the lower the reading will be. It follows that if the builder is a "top band" and/or low-power merchant he must have a more sensitive meter than the fellow who runs higher power and/or higher frequencies. For, "top band" and/or low power, an instrument having a fsd of 250 or 500 Microamps might be the meter of choice but, generally speaking, the ubiquitous 0-1 Milliammeter is chosen even though its reading is extremely low on "top band". Approximate "forward" readings to be expected, with 50 Watts in the transmission line are:- 14-28 Mc/s., over 1 Ma; 7 Mc/s., 1 Ma; 3.5 Mc/s., 250 Microamps. The sensitivity control potentiometer "F" protects the meter against overload at the higher frequencies and/or high power.

Next step is to make up the cable to connect the two boxes. This is simply a length of best quality vinyl covered, copper braid shielded, flexible 2-conductor cable of the length required by the builder, with polarised, shielded plugs at each end to mate with sockets "D" and "E". The importance of good shielding and bonding cannot be over-emphasised.

The final job is the determination of the value of resistance "R". The transmitter is generally used as a source of power in this job, and the prime requisite is a dummy antenna having the same Z_0 as the transmission line. Let us say that Z_0 is 75 Ohms; then a suitable dummy can be made from four non-linear 300 Ohm, 1 Watt resistors connected in parallel but, of course, the transmitter must be kept down to 4 Watts output. If the transmitter power cannot be reduced to less than about 50 Watts, a 40 Watt lamp may be connected in the line between the transmitter and the SWR Indicator. The dummy antenna should be connected across socket "A(Out) " with shortest possible connections, and making good contact at either end; then with power applied from the transmitter into socket "A(In) ", preferably at 30 Mc/s., or highest available frequency; switch "G" being in the "reflected" position. Starting with a non-inductive 1 Watt resistor of about 100 Ohms, soldered in lightly between "Y" and "8", substitute resistors of lesser value until the meter reading is Zero. It is quite probable that Zero cannot be obtained with a single resistor, in which case experiments must be made with resistors in parallel until a good Zero is obtained. This may take time, and a good bit of experimenting, but it is time well spent when a good null is obtained. Null having been obtained, plug the dummy into the "A(In)" connector and connect the transmitter output to the "A(Out) " connector, still at low power, but with switch "G" now in the "forward" position. If the instrument has been properly constructed, and "R" correct, the meter should again read Zero. Remember, this

instrument is essentially an indicating "bridge" and readings should be exactly the same either way if it is properly constructed. If not, the instrument will not be accurate. "R" for a 75 Ohm line may approximate 60 Ohms, but the exact resistance can be determined only by "cut and try". During experiments to determine "R", the sensitivity control "F" should always be set to obtain maximum possible reading, while protecting the meter against overload.

After the correct value of "R" is finally determined, connect all wraps to centre lug "8" by shortest possible lengths of bare copper wire, spot-soldered to the wraps and well soldered together at "8".

In use, the SWR Indicator is inserted in the transmission line between transmitter and ATU, its "A(In)" connector connecting with the transmitter output connector and its "A(Out)" connector connecting with the ATU input connector. The "forward" reading is kept within the scope of the meter by means of potentiometer "F". Perfect match is indicated when the meter reading is Zero, with switch "G" in the "reflected" position, and in this condition the SWR is said to be "Unity". A standing wave ratio, where it exists, is calculated from the formula

where V_o is the "forward" voltage and V_r the "reflected" voltage. In the case of our SWR Indicator, our meter readings may be considered Volts for the purpose of computing the SWR, the greater the ratio, the greater the mis-match.

It will be obvious that, working on the same general principles, many other versions of this Indicator are possible, such as making up the entire instrument in one box; using two jacks in place of the meter and switch, and making use of one of the station's general purpose meters to take the "forward" and "reflected" readings (In which case the leads and meter should be well shielded against RF), etc., etc., ad infinitum et ad nauseam!

Did you know??

The following are Royal Canadian Signals:- VE1AIC, VE3ATU (ex G3GSK), VE3AHU, VE3ARZ (ex G3NVA), VE3BGV, VE3BSG, VE3BZW, VE3FJV (ex G3BCT), VE3RCS is the Corps club station and VE8TU is a club at Alert, Ellesmere Island.

Spreading the Gospel

(An open letter to Unit Commanders from G3RUS)

If anyone really needed convincing that there is something in Amateur Radio, then a visit to the RSGB Radio Exhibition at Seymour Hall, London, in November would readily have dispelled their doubts.

As a worthwhile hobby it can scarcely be equalled; as aid to increased efficiency in technical trade training it cannot be surpassed.

Certainly, within the Army, the licensed Ham operator is twice as competent a tradesman as is his counterpart, the operator or technician who merely practices his trade when called upon to do so in the line of duty.

There are now, world-wide, over 250,000 licensed ham operators, with a share for Britain of some 20,000. And still over 1,000 candidates sit for each examination held twice a year under the auspices of City and Guilds.

Proof positive if you were still unconvinced that there is something in Amateur Radio.

Which brings me to the point. Why are we, in the Royal Corps of Signals, seemingly so loathe to accept the fact that the passing of the RAE examination and ultimate practice in Amateur Radio is a very necessary adjunct to better and more efficient signalling.

Is there an Amateur Radio Club within your unit? If not, there should be. If there is one then is it affiliated to the Corps Amateur Radio Society? If not, then it certainly should be.

Do you pray for more efficient technicians, more efficient operators who are budding Yeomen. Ask yourself if you are really doing all you can to promote, by example and advice, technical and operating skills within your unit.

Communication is the business profession of Royal Signals.

We will become better business men by being members of the Royal Signals Amateur Radio Society.

The Society has grown in numbers from 80 in November 1961 to 240 in November 1963. The gospel is indeed spreading, but still not fast enough.

At the moment only 14 units/estb have Affiliated Club membership and of this number only 7 are regular Royal Signals Sqns/Regts. A pretty poor response after two years judged by any standard.

We look forward to your early efforts to remedy this situation and welcome your enquires.

Membership is open to all ranks who are serving or have served in Royal Signals on an Annual or Life Basis:-

Life Member	..	..	..	..	£2 - 2 - 0d
Annual Member	..	..	..	..	2 - 6d
Affiliated Club	..	..	..	..	10 - 0d

NEWS OF UNITS

A recent issue of BAOR Liaison notes gave the news that 13th Signal Regiment has formed an Amateur Radio Club. Your Editor would be glad to hear more details if this should catch the eye of anyone in the Regiment.

We learn that our Eastern Command representative has secured a.£90 grant from the Nuffield Trust to establish a club station.

AND OF INDIVIDUALS

Capt. Ted Philp is active as VS1MB and is working regularly into UK on SSB, he reports a lot of ham activity in Singapore these days.

Staff Sgt Ron Briggs 5N2RSB intends to operate from Tchad (TT8), Dahomey (TY2), Niger (5U7), and Cameroons (TJ8) shortly, he returns to Catterick in March.

GM3KLA's first QSO with his 100ft Top Band Vertical was a daylight one with OK, well over 1000 miles. The mast is the radiator and has an earth system consisting of eleven 65ft, fifty three 72ft and two 212ft radials. The top loading coil, ten feet long, shows up well on photos giving a good idea of the scale of the monster joystick.

One Man's Joystick - Richard Winters G3NVK

Not everyone has the room to erect a 100ft vertical like GM3KLA (see last issue), some of us in fact have to put up with a garden about the size of a 19 set and in order to stay on the air a "Joystick" was purchased.

The shack at G3NVK is a garden shed quite close to the rear of the house and the Joystick was placed vertically in the roof space of the house and a feeder 30 ft long consisting of TV coax with the inner and outer conductors strapped together was brought out under the eaves and down to the shack. The earth is a three foot length of 1½ inch copper tubing bashed into fairly hard soil just outside the shack where by subtly arranging the eaves drip of the shack the soil is more or less permanently damp.

The earth lead is a five foot length of stout copper wire.

The location of G3NVK is about 250 ft above sea level on the western edge of Melton Mowbray with no high hills nearby and the roof of the house is tiled.

The Joystick is tuned by a 19 set variometer which has been tidied up by replacing the old coax plugs and sockets with the normal TV type. This makes a really good aerial tuning unit for all bands 160 to 10 metres despite what the pundits say.

The rig at G3NVK consists of an Eddystone 840A receiver and a KW Vanguard run at 50 watts input. A Low Pass Filter is connected between the TX and the ATU and no TVI trouble has been encountered.

Results for the first six months of 1963 are tabulated below.

G3NVK is Coroner's Officer and Deputy Superintendent of Births, Marriages and Deaths for the Melton Mowbray area with over 400 sudden deaths and over 380 Weddings in the log. Royal Signals service was as a Radio Mechanic with 7th Armoured Div where he spent his time repairing 19 sets and operating DL2LC.

Licensed in 1959 operation was at first spent DXCC chasing and operating on Top Band. Now married and with so little aerial space activity is mainly 14 Mc/s CW although contacts have been made on the other bands using the Joystick. You can't break records without a really good aerial but G3NVK is still a happy ham and is always glad to work other members.

JOYSTICK used at G3NVK - Figures for the 1st Jan to 30th June, 1963

Using K.W. Vanguard (50 Watts input)

set Variometer as A.T.U.

Eddystone 840A receiver.

Joystick permanently on the 160m tap

Operation mainly C.W. (bug key)
Operation about
1½ hours most
evenings 2000 - 2130 local time.

<u>BAND</u>	1-8	3-5	7-0	14-0	21-0	28-0
No. OF QSO's	52	6	4	201	1	4

Total QSO's = 268 Of which 50 were with W/VE All reports either 569, 579 or 589

During this period 38 countries worked including IT, M1, LU, PY, UD, UF, VE2 and 3, VP8, VQ4, VS9, and W/K1234568 & 9, plus most of the normal Europeans.

CLANG

In common with one of our contemporaries, mistakes occur in our circuits!!

In the circuit diagram of the Transistor Dip Meter in our last issue the switches were incorrectly shown ganged. In fact they are separate, the right hand switch applies power to the D.C. amplifier enabling the instrument to be used as an absorption frequency meter, whilst the left hand switch must be closed if the oscillator is to be used.

Agony - We want articles on receiver modifications, test equipment, amateur station control circuits etc. etc. etc. can YOU help?

OSCAR SPACE SATELLITE PROGRAM OF THE INTERNATIONAL AMATEUR RADIO UNION

The International Radio Union (I.A.R.U.) is an affiliation of 60 national societies of amateur radio operators in as many administrations around the world.

The I.A.R.U. and member societies believe that the Amateur Radio Service can contribute most usefully to the communications art when maximum freedom for experimentation and communication exists in the Service, with minimum restrictions imposed on the activities of the radio amateurs. In addition, the belief is held by the I.A.R.U. that radio amateurs should be free to undertake within their allocated bands whatever experimental programs that may challenge their interest and ingenuity, without creating interference to other Services.

OSCAR is such a program. Oscar stands for "Orbital Satellite Carrying Amateur Radio". These unique electronic devices are space satellites built entirely by radio amateurs, and launched by administrations having launch facilities. The home-made satellites are used by radio amateurs world-wide for experimental purposes, or for random communication between themselves in the bands of the Amateur Service. Among the administrations that have the national amateur society belonging to the I.A.R.U. are two that presently have satellite launch facilities: the U.S.A. and the U.S.S.R.

To date, two amateur radio satellites have been successfully launched into orbit and a third satellite is being completed and is expected to be launched in 1964. In each case the entire electronics package - internal assemblies, shell, power supply, and fabrication and testing thereof - was purely radio amateur in concept, design, fabrication and execution. The two satellites (Oscar I and Oscar II) were almost identical in appearance and had the following electrical and mechanical characteristics:

Description of Oscar I and II radio amateur space satellite

Physical Configuration

Approximate size:	12" x 14" x 6"
Approximate weight:	15 pounds, of which 11 pounds is battery weight.
Material of construction:	Case - aluminium and magnesium. Insulation - epoxy foam.
Antenna:	Monopole whip, 19" long.

Transmitter:

Frequency: 145.5Mc/s

Power Output: 0.1 watt

Identification Signal: Morse Code letters H I (the friendly international radio amateur greeting)

Radio Circuitry: Transistor oscillator (72.5 Mc/s) crystal controlled, transistor amplifier, diode frequency multiplier (145.0)

Keyer Circuit: Transistorised timing generator (multivibrator), five "scale-of-two" transistorised dividers, diode matrix pulse selector.

Telemetry Circuitry: Timing generator is temperature sensitive and keying rate is a function of internal heat of the satellite. The ground observer determines temperature by counting time (seconds) it takes for the satellite send ten (10) H I's.

Satellite Life: Determined by battery life (about 28 days, maximum)

Environmental Test Conditions:

Temperature test range : -35° C to +65° C

Shock : +50G (gravity)

Acceleration: +50G (gravity)

Altitude: Over 200,000 feet

Orbital Data: (Typical for Oscar I)

Life : Approximately 300 orbits

Orbital period : 92 to 89 minutes

Perigee : 153 miles. Apogee : 268 miles

Inclination to equator : 81.2°

Maximum satellite temperature : 53°C

Maximum radio tracking range : 1400 miles (2400 km)

The cost of construction of these satellites is difficult to estimate, as all work was voluntary and on a trial-and-error basis. Cost of electrical and mechanical components was less than a 100 dollars each - far less than the cost of a good amateur short-wave receiver.

The result of the first two radio amateur space experiments has been to create an intense interest in space communication among radio amateurs and citizens throughout the world. Observations made of the two satellites were carried out by radio amateurs in over 30 countries. A total of more than 950 radio amateurs in all continents provided 7,000 individual tracking observations, which are made available to all radio amateurs on a world-wide basis. A survey shows that an additional 10,000 radio amateur observers intercepted the satellite transmission, but did not submit formal reports.

Results of the two OSCAR radio amateur satellites show that amateurs can extract scientific data from their satellite, can generate orbital data from observations, and can put this information to use in a self-educational program covering space techniques.

OSCAR experiments are in keeping with the definition of the Amateur Service, which imposes no restrictions upon the techniques and equipment, but which encourages experimentation and ventures into new communications fields. OSCAR is not an exclusive U.S. program, although the U.S. contributed the first two launch vehicles. Other OSCAR satellites are now being designed and built by European amateurs, and preliminary plans are under way by an Australian amateur group.

The purpose of the first two radio amateur satellites was to introduce amateurs to techniques of outer-space signals and to provide data for the forthcoming OSCAR III "active repeater satellite", described herewith.

The Proposed OSCAR III Space Satellite

OSCAR III will receive a 50-kc/s segment of the internationally-assigned 144-146 Mc/s band and instantly retransmit this segment at the opposite end of the same band. Thus an amateur station transmitting to the satellite on (for example) 144.1 Mc/s and listening to the satellite on 145.9 Mc/s may communicate with a second radio amateur via the satellite. The second amateur, who may well be beyond the "radio horizon", transmits near 144.1 Mc/s and receives near 145.9 Mc/s.

OSCAR III is a "free access" random communications satellite. All licensed radio amateurs world-wide will have access to the satellite and to information derived therefrom.

In addition to the translator equipment, OSCAR III will carry a 0.01 watt beacon transmitter on 145.85 Mc/s to assist observers in acquiring the satellite as it comes over the horizon. Estimated life of the satellite is about 3 weeks. The output power is about 1 watt peak, divided between the number of signals passing through the equipment. With one ground signal, maximum satellite output is achieved when the ground signal delivers 500 watts into a +13db. antenna, producing 40db. over 1.78 microvolts into the satellite receiver at a distance range of 1000 km (20db. over internal noise of satellite).

Practical amateur stations, therefore, of 50 to 250 watts run no danger of overloading the satellite. Minimum satellite receiving level is adjustable within the equipment.

A preliminary version of the OSCAR III satellite is in operation, and radio amateurs are experimenting with this ground-based equipment, using a.m., s.s.b., and c.w. signals in communication through the equipment.

OSCAR III will enable radio amateurs of all administrations to co-operate in a joint communication and experimentation program. It is a tool and a catalyst that encourages participation in space communications by the younger generation of radio amateurs in particular, who will be the scientists and leaders of tomorrow. Self-education and advancement in the newest science among radio amateurs is the philosophy of OSCAR and I.A.R.U.

As amateur radio is a hobby of communication, it seems proper that radio amateurs keep abreast of this art as they have in the past. Space communications stand today where radio communications stood in the day of the spark transmitter and the crystal detector.

Two-way radio amateur communication via radio amateur satellite may open new fields of experimentation and answer scientific problems yet unposed. Radio amateurs are capable of fulfilling an important role in this great adventure. Numbering over 350,000 scientific-minded, naturally curious individuals, radio amateurs have left their mark on the history of communications to date. Further work devoted to the peaceful use of space will benefit not only the radio amateur, his country, but all of mankind as well.

The above is taken from a report to the I.T.U. Space Radiocommunication Conference passed to us by a friend at War Office. (Ed.)

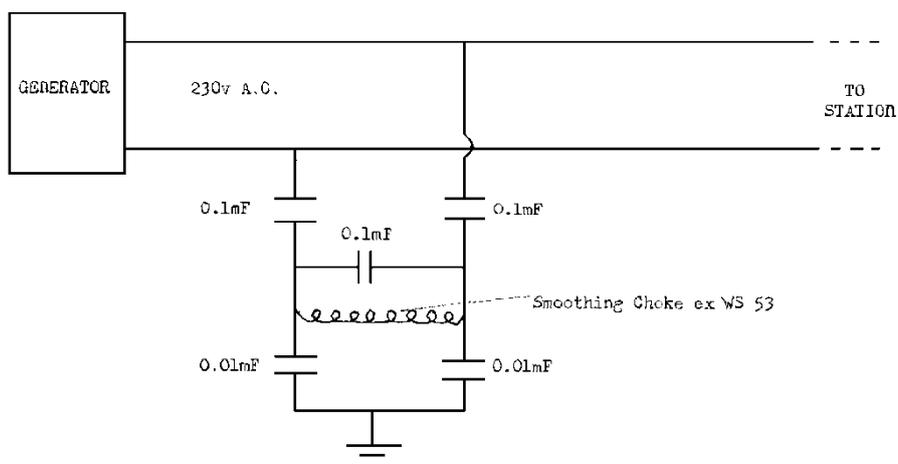
A generator hash filter - S/Sgt. D.C. Pocock

Some petrol driven A.C. generators although completely filtered and suppressed at VHF cause considerable hash at the lower frequencies. The 500 V.A. generator used at G3CIO/P on National Field Day was found to be producing an S8-9 noise level on 3.5 and 1.8 Mc/s, removing the receiver aerial made no difference showing that the hash was coming in on the power cable. This was confirmed with the aid of a transistor receiver on medium waves held close to the cable.

N.F.D. operation was due to start in under the hour so something had to be done quickly. A hurried trip to the clubroom produced a smoothing choke from a 53 set power pack and a pocket full of capacitors.

By this time G3CIO/P was active on 14 Mc/s where the noise level was much less so the transistor portable was used to check results.

After some experiments the circuit shown below was connected across the 230v A.C. supply close to the generator resulting in the complete suppression of the hash on both lower frequency bands.



Agony -- Being posted?? Drop us a line & we'll tell you of any activity in your new QTH

ON THE AIR LAST SUMMER

Late reports on Princess Royal Day activity have been received from Cyprus and Liverpool.

At Episkopi the gang at 5B4TX erected a 7Mc/s dipole to augment their 14 and 21 Mc/s aerials. The problem of finding 100ft of coax to reach into the shack was solved by joining three odd lengths together but alas the Megger showed a distinct lack of continuity in the inner conductor. By this time the sun was blazing down so the aerial had to be dragged indoors for work to proceed. After fixing three breaks it was decided to forget 7Mc/s and concentrate on 14. By this time it was 1400Z and the nearby QRO TX was scheduled to QSY. This it did planting a barrage of SSB telegraphy over 14 and 14Mc/s putting paid to 5B4TX operation on PR Day.

In beetle-land G3PMZ the callsign of 3/343 Squadron, 42(L) Signal Regiment TA, was used with great success. As their OC was in Australia at the time a Rhombic for 14Mc/s was decided upon together with a dipole for 3.5Mc/s.

The sandy soil of Altcar Rifle Ranges soon troubled the mast erectors as guy pegs were pulled out of the ground but after much cussing four 48ft masts supported the 1400ft of wire. Meantime G3PMZ/A had been active on 80m and the QSY to 20 produced a good response from the "Red Army Choir" but little in the way of DX. One or two of the Far East gang were heard but could not be raised. The terminating resistor was removed from the rhombic as it was still hoped to work VK the long way round. Quite a number of South American stations were worked but the extra 3000 miles across the Pacific was just too much. When the weekends contacts were plotted on a great circle map they formed a line from South America to Siberia amply demonstrating the directive properties of terminated and unterminated rhombics.

A number of Reserve Army units make a point of operating amateur stations during their annual camp.

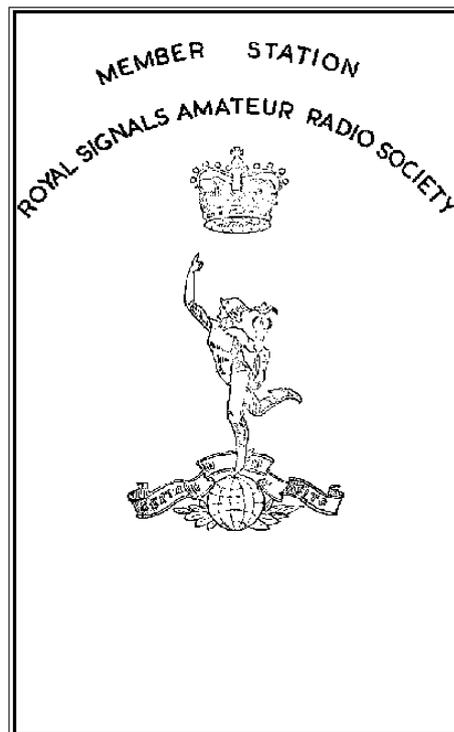
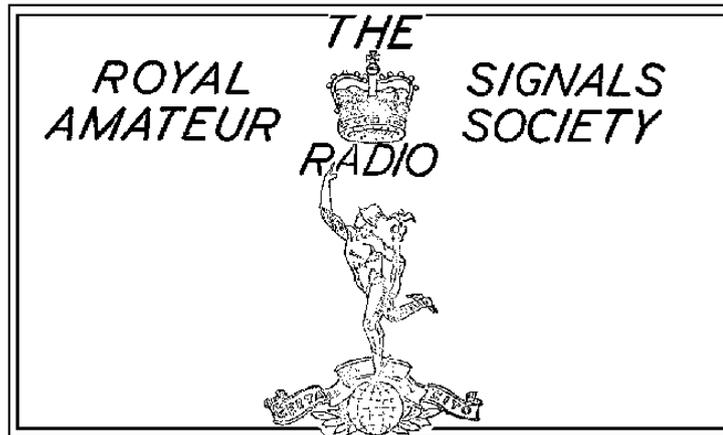
404 Signal Squadron AER with 15 licenced amateurs in its ranks found itself rather too busy to spend much time operating GB3AWR, the call it has used for many years. A number of the Squadron's amateurs found themselves using the D11/R230 for the first time and were so taken with this equipment that they were quite happy to stay on military frequencies.

92nd Signal Regiment AER have the apt call GM3SIG and operated from Kincardine and Angus the last two weeks in July. As both these counties are fairly rare they were in great demand. It is their proud boast that every member of the Regt1 Amateur Radio Club is also a member of RSARS. Since their annual camp GM3SIG has been active in various contests operated by the Commanding Officer, Lt. Col. Robertson GM6RI who is also Scottish Command representative of RSARS.

For the information of members in Royal Signals AER units we understand that HQ AER at Blandford intent to maintain a station for the use of amateurs attending annual camp.

A Society QSL Card

Of the suggested designs submitted the two shown below have been chosen by the members of the Society at G3CIO. Now it's up to you to pick which one you prefer and to suggest the colour scheme. Please write to the Field Secretary giving your choice. It would help if you would give us an idea of the number you would be likely to require. As stated in our last issue, the cost is likely to be about 35/- for 500. Printing of your call sign and address at your local printer should cost about 15/-.



RSARS CALLSIGNS

G2EC	Maj. Gen. E.S. Cole	G3JKO	M. Dransfield
G2JF	J.C. Foster	G3JNO	F. Buck
G2TP	Maj. C.W. Andrews	G3JZP	Mrs. Jean Hodgkins
G2WH	Lt. Col. W.D. Horniman	G3KLX	D.V. Richey
G2AHL	J.A. Rouse	G3KPQ	S/Sgt. W. Graham
G2BPW	Lt. Col. I.W.K. Smith	G3KYU	J. Ashford
G2HDY	J. Ballard	G3LMX	T.W. Mitchell
G2HNP	W. Short	G3LOV	M.J. Francis
G3HN	Lt. Col. W.W. Cock	G3LWQH	Hilton
G3ADS	R. Sawkins	G3LWS	E. Ross
G3ADZ	Major D.W.J. Haylock	G3MEF	T. Wylie
G3BEC	J. Clark	G3MKRB	Haywood
G3CIO	Headquarters Station	G3MLM	S/Sgt. D. Parker
G3CIV	Capt. F. Sweet	G3MUUG	E. Hathaway
G3CRP	J. Piegou	G3NJM	Capt. J.E.P. Philp
G3DBU	W. Bevan	G3NKR	2/Lieut. M.A. Rowlands
G3DMK	E.R. Frarey	G3NOL	Cpl. Brown Greaves
G3DNF	G.J. Bennett	G3NOT	Sgt. D. Tanner
G3DOJ	W.J. Omer	G3NUI	A.T. Dobson
G3DPS	S/Sgt. J. Cooper	G3NVK	R. Winters
G3DWW	G.E. Cripps	G3NWZ	Major J.L. Donne
G3EJF	J.E. Hodgkins	G3NZY	WOII R. Shelley
G3EKL	Lieut. R.A. Webb	G3OAZ	Sgt J. Akehurst
G3EMO	H. Ward	G3OEK	A.E. Knevet
G3FDU	Major J.A. Bladon	G3OFV	Cpl. D.A.C. Jack
G3FGN	Capt. A.C. Earl	G3OHJ	E.W. Ashley
G3FMW	J. Stockley	G3OKB	M. Ireson
G3GVV	Major R.J. Hughes	G3OKX	J.W. Roberts
G3HCM	D. Dumbleton	G3OMHD	F.S. Hayward
G3HJI	S/Sgt. B.A. Bennett	G3OOB	WOII L. Buckley
G3HKR	Club Station AAS Harrogate	G3OPL	WOII Milham
G3HZW	D.C. Mainhood	G3ORY	Lieut. R.G. Titterington
G3IBB	F of S R. Walmsley	G3OYP	J.K. Fidler
G3IDG	F.A. Herridge	G3PCG	D. Askew
G3IUH	Major P.S. Harris	G3PCV	Capt. P.C.V. Dolan
G3JFW	F.S. White	G3PDS	W. Lawrence
G3PFC	A.J. Rawlings	GM3AWF	D.F. Craig
G3PGM	E. Davies	GM3GFO	J.W. Blackery

G3PIC	G. McLean	GM3IAA	J. MacIntosh
G3PNE	Lieut. J.M. Passmore	GM3KLA	W.A. Sinclair
G3PNF	WOI D.A. Bowden	GM3NXA	P. Gordon
G3PNU	E.M. Clark	GM3NXM	Capt. W.G. Borland
G3PYZ	Club Station Jnr Ldrs Regt, Newton Abbot	GM3OJC	W. Whyte
G3RAQ	H.J. Powell	GM3PFU	W. Laughlin
G3RCJ	S/Sgt. T. Quinn	GM6RI	Lt. Col. W. Robertson
G3RFI	L/Cpl. P. Scottorn	GW2OP	Capt. G. Courtenay-Price
G3RFP	Capt. F.C.D. Taylor	GW3ONU	Major D. Barry
G3RGF	R.D. Young	GW3PPS	A.E. Cook
G3RII	H. Armstrong	GW8PG	Capt. A.D. Taylor
G3RLM	K.R. Belcher	DL2AB	WOI D.A. Bowden
G3ROY	Club Station 50(N)Sig Regt TA,Darlington	DL2AM	WOII Milham
G3RUS	Major L. Beaumont	DL2HO	Major D. Barry
G3RWM	R.W. Martin	EI3AH	Cpl. D.A.C. Jack
G3RZE	S/Sgt R. Chidley	VE1ADQ	Capt. A.D. Yerxa
G3SAE	WOII R. McMillan	VE2BOE	F.V Greenleaves
G3SAX	J. Robinson	VE3BFC	J.J. Jarvie
G3SIG	Club Station 92 Sig Regt AER	VQ2W	P. Golledge
G3SIQ	A.J. Greenwood	VS1LB	Club Station, Singapore
G3SJB	Capt. A.D. Yerxa	VS1LL	Lt. Col. W.W. Cock
G3SJF	P. Heaton	VS1MB	Capt. J.E.P. Philp
G3SPQ	Club Station, 240 Sig Sqn, YORK	VS9ABT	Major B.H. Townson
G4JT	Major D.A.W. Clark	VS9ASS	Major G.S. Symons
G5HZ	N.I. Bower	5B4CZ	E. Ross
G5PM	Club Station, RMA Sandhurst	5B4NO	Sgt. D. Tanner
G5TV	Col. W.H. Lloyd	5B4SG	P.A. Hainsworth
G5YN	Lt. Col. Sir Evan Y. Nepean, Bart.	5B4SS	Cpl. Nicholson
G6MA	Lt. Col. (Retd) H.O. Pargeter	5B4TJ	Club Stn, 261 Signal Squadron
GI2DZG	W. E. Caughey	5B4TX	Club Stn., 259 Signal Squadron
GI3ALT	G.H. Brooks	5N2JKO	M. Dransfield
GI3HXV	R. Parsons	5N2RSB	S/Sgt. R. Briggs
GI3IWD	Capt. J.W. Douglas	9M2ER	Lt. Col. J.C. Clinch
GI3PUE	Club Station 66(Ulster) Sig Regt TA	9M2EZ	S/Sgt. D. Parker
GM2HIK	Lieut. J.A. Clark	9M2GF	WOII Craze