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R.S.G.B. Bulletin

DEVOTED TO THE SCIENCE AND ADVANCEMENT OF AMATEUR RADIO

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In this Issue

CURRENT COMMENT

Is it Amateur Radio?

WE wonder if our U.S. friends in Europe, ever pause to consider the damage which they may be doing to the cause of Amateur Radio in this Continent by their use of our overcrowded bands for the handling of third-party traffic and official military service messages?

It has always been our contention that these messages should be sent either through Military Communication channels or *via* the appropriate commercial telegraph or telephone service.

Increasing concern is being expressed in European amateur circles at the use of our bands for this kind of traffic and also at the extremely high power being used by U.S. military personnel, particularly in Germany.

With another International Telecommunications Conference not very many years away, we do not want to be faced by a bloc of European Government delegates—as happened at Cairo in 1937—who are hopelessly prejudiced against our hobby because they regard amateurs as a menace to their legitimate communication revenue.

What our U.S. friends do inside their *own* country is their own affair, but we think they should respect the customs and regulations of the countries in which they are stationed in Europe. Not only should they cease using the amateur bands for " commercial " traffic but they should also observe the same restrictions on power input as are proper to the nationals of those countries.

We appeal to *QST*, *CQ* and other influential U.S. Amateur Radio publications to give support to our plea for the abolition of traffic handling by U.S. Services personnel stationed on the Continent of Europe.—A.O.M.

New Style Council

ELSEWHERE in the present issue there is a list of nominations for the 1955 Council. It was agreed at the August meeting of the present Council, and is submitted for members' consideration.

Now that the new Articles of Association have come into use the composition of the Society's Council will in future be somewhat changed. The offices of President and Acting (now called Executive) Vice-President, of course, remain, as does that of the Immediate Past President; but as from 1955 there will be *two* Past Presidents on the governing body, for the new Articles of Association provide for the Penultimate Past President as well as for the Immediate Past President to continue in office—an invaluable proviso that assists continuity of thought and policy.

In future, however, there will be only one " honorary " office bearer and he will be the Hon. Treasurer. The offices of Honorary Secretary and Honorary Editor now lapse, having been rendered redundant in recent years by the employment of a full-time Secretary Editor to do the work which in the Society's earlier days was performed by two members, who were appointed for the purpose.

Of *Ordinary* members of the Council there will still be seven.

If the above changes, entailed by the revised Articles of Association, may be regarded as minor ones, there is a further change that is decidedly " major." We refer to the institution of the zonal scheme of Council representation which comes into operation next year. This scheme came into being as the result of the feeling among the membership that there should be greater representation on the governing body from the areas beyond the London metropolis. Quite fortuitously, it has happened in the last two or three years that there has been a greater provincial content in the Society's Council than ever before; indeed, the nominee for the 1955 Presidency lives nearly 200 miles from London, while none of the other nominees can claim a London postal address.

It could of course just as easily happen that in some future years all the nominees were Londoners! Zonal members of the Council will always ensure that there is adequate representation from the provinces.

Now the immediate duty of Corporate Members is twofold; first of all, every one of them should scrutinise the list of Council nominees and decide if he approves the selection, or whether he would like to nominate candidates of his own choice, as of course he can do in the prescribed manner. If this happens there will then be a ballot.

The members' second duty is to ensure that the six zonal representatives required by the revised Articles of Association shall also be duly nominated. *The initiative must come from the membership at large.* The retiring Council makes no move in this respect.

This " Current Comment " is not the place to discuss the detailed procedure needed to constitute next year's Council, but it *is* the place in which to exhort every member to give serious thought to the question and *to do something about it.*

J.H.

" A Rose by any other Name . . . "

THERE was a time when " wireless " meant only one thing, and that was communication between two points without the need of an intervening metallic link. Telegraphy without wires was regarded as a very marvellous thing at the turn of the century—and telephony even more so when the development of the thermionic valve made it possible. Something of the spirit of the times when " wireless " was the word, is captured in the new series of articles by Mr. C. H. L. Edwards about the beginnings of the R.S.G.B.

Even in those early days, however, the need was felt for a word that would more adequately embrace the many applications of the expanding art. Thus " radio " came into use before World War One, though it did not find common currency until a couple of decades after it.

Valves were put to so many uses that even " radio " did not suffice. Before long " electronics " became a presumably final word to denote " everything that goes by valves "—and a good many other things that do not!

These thoughts are promoted by the television feature a month or so ago which suggested that even the expression " Amateur Radio " can have more than one meaning. In an Outside Broadcast from Birmingham the B.B.C. showed viewers something of the work of the enthusiasts for radio control of models. Much of the spirit of Amateur Radio as readers of this magazine know it, informed the occasion, with a carefree atmosphere about the alfresco proceedings that reminded at least one viewer of N.F.D. The miniaturized complexity of the radio equipment—all of it home built, we were told—would delight the eye of any " communicator " type of radio amateur.

Truly, radio has many mansions. Ours, the art of communicating, is only one of them—yet to most of us it is probably the most interesting of all.

J.H.

" Intruders " in Exclusive Amateur Bands— An Official Statement by the G.P.O.

THE orderly use of that portion of the radio frequency spectrum which can be used for long-range communication is governed by international agreement, and must, therefore, depend ultimately upon mutual goodwill between nations. The pre-war international agreement on this subject was necessarily largely out-dated by the rapid development in the use of wireless during the war, and a new allocation table was drawn up after the war. Most nations are now engaged in a gradual transfer of their services into the frequency bands appropriate to them under the post-war table; and the speed with which this transfer will be accomplished will depend not only on international goodwill, but also on the ability of all countries concerned to find suitable replacement frequencies for displaced services. The great increase in international broadcasting which has come about since the war has necessitated the use of many more frequencies for external broadcasting services than would otherwise be required and a number of countries are having, for the present, to operate their broadcasting services in non-broadcasting bands. This has greatly hindered the process of transferring all broadcasting stations to their appropriate frequency bands. Moreover, the fact that the major powers, including the U.K., have themselves not so far been able to accomplish this desirable end (although, as far as the U.K. is concerned, no broadcasting station now operates in a band exclusively allocated to amateurs under the post-war allocation table) limits the power of persuasion which can be brought to bear on other nations who are operating broadcasting stations outside their bands. The U.K. government is doing all it can to encourage the movement of broadcasting stations into their correct frequency bands, but expects the situation to remain difficult while the external broadcasting requirements continue at their present levels.

The TVI Problem—" Sunday Chronicle " Version

READERS of the *Sunday Chronicle* who are also holders of an amater (Sound) Licence must have rubbed their eyes in consternation when they saw blazoned across the front page of the issue dated August 22, 1954, the words:

" TV Faces Big Blot-Out."

For good measure the secondary headline informed readers that the:

" ' No interference ' ban on amateurs goes."

Having recovered from their initial surprise at finding themselves hitting the headlines, some at least began to ask themselves whether the article represented " fair comment." Judging by the spate of letters and telephone calls that reached Headquarters the answer appeared to be in the negative.

Knowing a little of the ways of the National Press, Society Headquarters realised that the Editor of the *Sunday Chronicle* would not be over anxious to correct the misleading statement that " Tens of thousands of TV viewers will have their reception spoiled or blotted out after September 30—because radio amateurs have been given a new freedom."

As the article appeared only a day or two prior to the opening of the National Radio Show, Headquarters staff were able on the Society's stand to give a fair measure of publicity to the true facts as they were set out on Page 213 of the November, 1953, issue of the BULLETIN.

The Facts

As from September 30, 1954, the G.P.O. will continue to expect an amateur to suppress all harmonics outside his authorised bands, but once this has been done and the interference is due to the choice of the i.f. for the complainant's receiver, or to the image response of his receiver, the *G.P.O. will allow the amateur to continue operating after an interval of one month from the date on which the cause of the trouble is notified to the complainant by the Post Office.*

The new arrangements will be confined to areas in which the signal which the complainant is trying to receive is a good one.

Members who have studied carefully the statement published in the BULLETIN last November will have realised that much of what was printed in the *Sunday Chronicle* was *facually* correct. It was the " slant " given to the information that left the impression that the radio amateurs of the United Kingdom were about to wreck the B.B.C. Television Service. Nothing could be further from the truth.

J.C.

The Duke of Edinburgh Speaks to Canadian Radio Amateurs

DURING his recent visit to Canada, the Society's Patron, His Royal Highness, The Duke of Edinburgh, K.G., honoured the Amateur Radio movement by broadcasting a message to the radio amateurs of Canada through the medium of the station operated by Mr. George R. Murray (VE8RZ) of Yellowknife, N.W.T.

The Duke, during his informal eight minutes' talk, explained that there were two reasons why he had made the trip to Canada. " First, like many other boys, I read stories about Canada's North-West and I have long had the ambition to see what it looks like. Second, three years ago when the Queen and I were in Canada, we heard a great deal about new developments in this vast area and of new mines, new discoveries and growing communities. My admiration for earlier explorers and pioneers is greater than ever."

As soon as news of the Duke's broadcast reached London a cablegram was sent, over the President's signature, to Mr. Murray asking him to furnish Headquarters with a full account of what took place, together with photographs. Up to the time this issue closed for Press no word had come from Mr. Murray. However, late in August a letter arrived from old-timer Charlie Harris (VE6HM), of Edmonton, Alberta, in which he stated that he had been pleased to take part in the QSO with VE8RZ when the Duke of Edinburgh was at his station. VE6HM reports that VE8RZ is having special QSL cards printed for the occasion and is sending a batch of them to His Royal Highness with a request that he should sign them for the stations taking part in the " hook-up."

Radio amateurs throughout the British Commonwealth and Empire will envy Mr. Murray his good fortune in being privileged to demonstrate the value of Amateur Radio to the Society's Patron in such a practical manner.

Use the RSM Code—always

A Low Power Portable Transmitter-Receiver

BY JOHN J. YEEND (G3CGD)*

LOW power portable working has given the writer some of his most enjoyable hours in Amateur Radio, with activities ranging from sunny days spent in the glorious Cotswold country among trees which were spaced, it seems, for the convenience of amateurs; to occasional trips into the rain-swept heights of the Black Mountains, where the sight of even a 6ft bush brings joy to the would-be aerial erector. Added to this—since the inauguration of R.S.G.B. Low Power Field Days—has been the pleasure of participation in this unique contest, which calls for a particular kind of ingenuity and skill.

After the rules for the first contest had been published, it was found that slight pruning of the existing 2 volt equipment would bring its weight within the 20lb maximum, but certain modifications were necessary. The receiver, a t.r.f., required a rapid method of band-change which would be capable of holding its calibration. From previous experience of light-weight portable work, with the ground serving as both table and chair, it was also decided that for ease of operation the whole 180 degrees of dial space should be utilised for the required portion of each band.

A " bandset " circuit was then designed, and found to meet all these requirements. In order to test the system in a multiple circuit before commencing work on a new receiver, five tuned circuits of this type were built into the main station receiver, a 2-V-2 job, which has since given more than two years of first-class service, in addition to useful information for the circuit described here. Apart from the obvious aid to tracking provided by reduced coverage, accurate calibration is possible, enabling one to change bands without the tedious searching usually associated with straight receivers. When used at home with a stabilised power supply, calibration is constant, and with dry batteries only an occasional touch on the trimmers is necessary, unless voltages are low. The circuit finally adopted is shown in Fig. 1.

* 30 St. Luke's Road, Cheltenham, Glos.

Receiver

Apart from the ganged bandspread condenser, all components associated with the three tuned circuits are contained in the detachable " bandset " units, which are 4in. long, 2in. deep and 1¾in. wide. Each unit is divided into two compartments by a screen 1¼in. from the " front " end, and, as can be seen in Fig. 2, two Belling-Lee chassis-mounting plugs are fitted to the base. These mate with corresponding sockets positioned centrally in the main chassis. Immediately below the sockets is the three-gang bandspread condenser held with a simple bracket at each end, and with its base almost flush with the chassis rim. Silver mica fixed condensers only should be used in these units. C2, 6, and 11 have been chosen to give a spread of 3500–3600 kc/s and 7000–7100 kc/s respectively, but may be altered to allow more coverage should the receiver be required for telephony operation. As a matter of interest, if a unit is built for Top Band no compensating series capacity is needed.

To trim the receiver first screw out all slugs and, to facilitate pick-up of the signal used to locate the frequency, remove one side of the bandset unit. When the signal has been found on the detector, tune the first circuit for maximum, following up with the second, bearing in mind that reaction

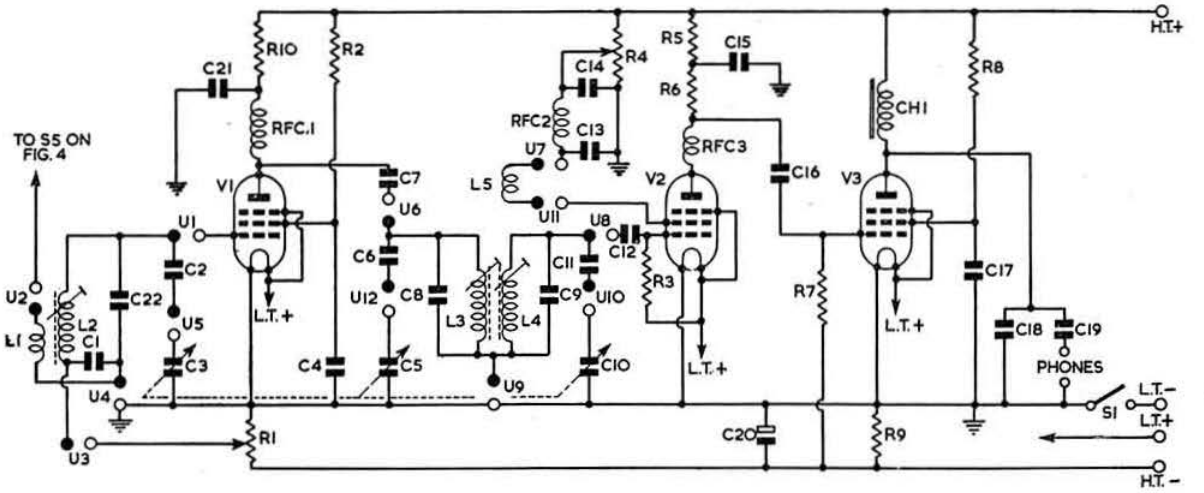


Fig. 1—The circuit of the receiver.

C1, 0.05μF
C2, 6, 11, 25μμF (3.5 Mc/s), 10μμF (7 Mc/s)
C3, 5, 10, 25μμF variable (ex-RF27 type unit)
C4, 17, 0.1μF
C7, 22μμF
C8, 9, 22, 75μμF (3.5 Mc/s), 40μμF (7 Mc/s)
C12, 18, 21, 100μμF
C13, 150μμF
C14, 15, 0.5μF
C16, 0.01μF
C19, 0.25μF
C20, 20μF, 12V wkg.
L1, 3.5 Mc/s: 4 turns, 28 s.w.g. d.c.c., earthy end of L2; 7 Mc/s: 2 turns, 26 s.w.g. enam., earthy end of L2
L2, 3, 4, 3.5 Mc/s: 40 turns, 28 s.w.g. d.c.c.; 7 Mc/s: 21 turns, 26 s.w.g. enam.
L5, 3.5 Mc/s: 21 turns, 28 s.w.g. d.c.c., earthy end of L4; 7 Mc/s: 24 turns, 28 s.w.g. d.c.c., earthy end of L4

All coils are close wound on ¼in. diameter iron-dust cored formers

R1, 25,000 ohms pot.
R2, 120,000 ohms
R3, 3 Megohms
R4, 100,000 ohms wire wound pot.
R5, 6, 22,000 ohms
R7, 2.2 Megohms
R8, 10,000 ohms
R9, 820 ohms
R10, 100,000 ohms
RFC1, 2, 3, r.f. Chokes
S1, on/off switch on R4
V1, 2, 1T4
V3, 3S4

will increase as the r.f. stage is brought to resonance. In the final trimming it is possible to " peak " reaction through only a quarter turn of the r.f. slugs.

The lay-out of the receiver is shown in Fig. 3.

Transmitter

The transmitter circuit shown in Fig. 4 is quite straightforward, and may be used either as v.f.o./b.a.–f.d./p.a., or, with the first stage switched out, at the same input as c.o./p.a. Keying is effected by breaking the h.t. to the buffer stage, and the transmitted signal is free from chirp or drift. The switch, S5, which may be omitted if desired, provides netting by switching the p.a. bias supply on to the v.f.o. in lieu of normal h.t., at the same time removing the aerial from the receiver and earthing its aerial terminal. It will be seen that a 3S4, triode-connected, is used as the Hartley oscillator valve, and although this was done because only this type of valve was available, it is an asset in keeping spares to a minimum.

For ease of construction, both the v.f.o. valve base and buffer coils are mounted on raised platforms, but whereas the former is a true sub-chassis, with space beneath for components, the buffer coil platform is only a quarter-of-an-inch high, and held by a single bolt and spacer. " Sockets " for the p.a. and aerial coils were removed from a TR9 transmitter unit, and, being similar to the female contact on a knife switch, allow either coil to be swung for variable coupling. They are mounted in a strip of polystyrene shown in Fig. 5, and project through ⅜in. clearance holes

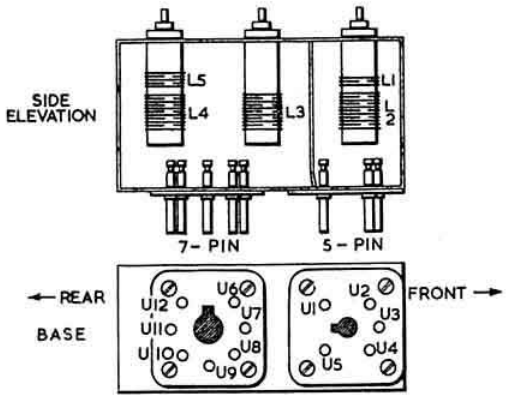
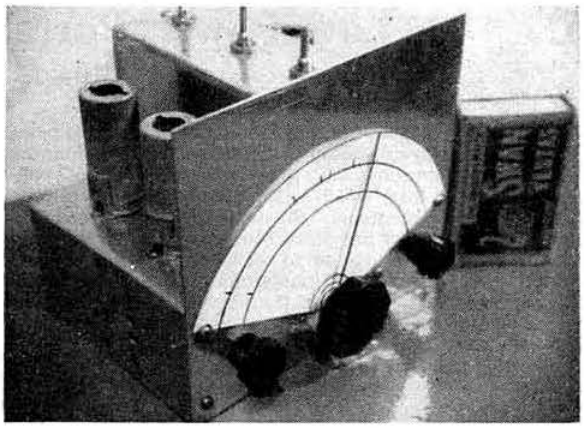


Fig. 2—Details of the receiver coil base.

drilled in the chassis. The wire ends of the coils themselves, doubled back, can be used as plugs; but a more rigid fixing is provided if separate " plugs " are made from thin brass sheet (from an old condenser vane) and bolted to the polystyrene coil base.

Initial setting-up of the transmitter is a simple matter. As in the receiver, the band 3.5 to 3.6 Mc/s just fills the v.f.o. dial, and the coil slug should first be adjusted to give this condition. Then, with 18 volts bias applied to the p.a., and with the buffer coil switched in, its slug should be tuned to give maximum p.a. anode current. Set up the transmitter for 7 Mc/s and repeat the procedure. On both bands maximum current with 90 volts h.t. is about 12 mA, with a dip to 1 mA at resonance.

The aerial circuit L and C values are correct for dipole aerials using 80 ohm feeder, but will have to be altered if feeders having higher impedance are used. By closing the circuit, and providing tapping points on the coil, a half-wave end on aerial has been used successfully, but the circuit had to be re-tuned for quite small changes in frequency, whereas,



The bandset t.r.f. receiver weighs only 11lb. 15oz. This picture shows the excellent dial which has a wide open scale.

with a dipole, it can be adjusted for the centre of the band and left in that position. Theoretically, there should be no need for extra coupling between L4 and 5, and it will be found that, as such, the transmitter can be operated at half a watt with new batteries, but for maximum power a two or three-turn link is necessary.

General Construction

Both the transmitter and receiver were built to dimensions that would enable them to fit comfortably into an ex-R.A.F. back pack, on top of all the other accessories which make up the 20lb portable station. The writer regrets that for this reason he reduced the width of the receiver to 5½in. This has caused a little congestion below chassis, and unless the constructor is used to miniature work and prepared to buy special components, it is desirable to make the chassis at least the same size as the transmitter chassis, which measures 6in. × 4in. × 2in. with a front panel 6in. × 5in. A saving in both space and consumption may be achieved by replacing the output choke with a high value resistor, good headphone reception being given with as little as 12 volts on the 3S4 anode, and 10 volts on G2.

No. 22 s.w.g. aluminium is used for all metalwork in

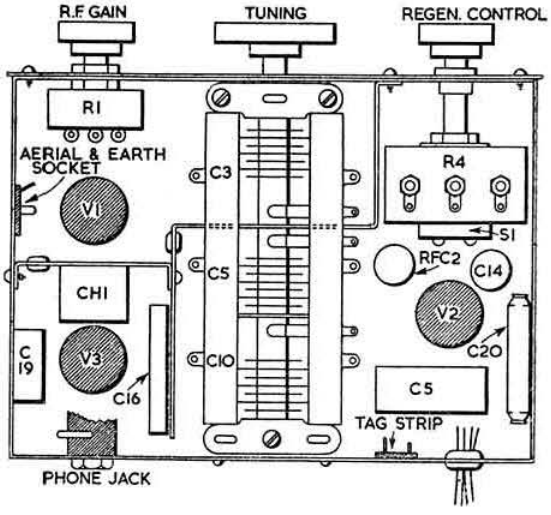


Fig. 3—Component arrangement in the receiver.

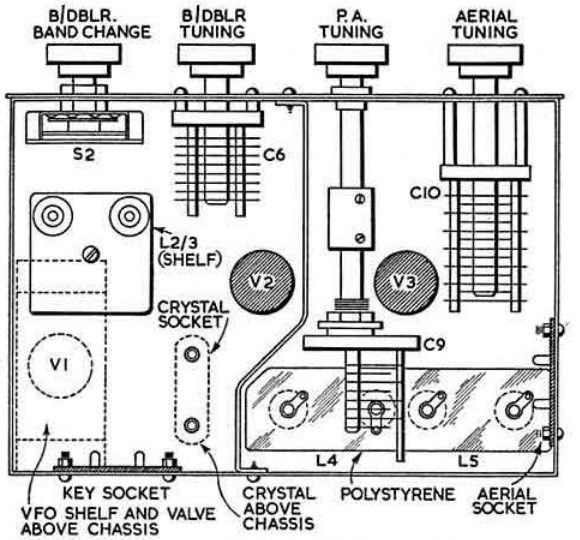


Fig. 5—Layout of the low power transmitter.

conjunction with self-tapping screws which dispense with awkwardly placed nuts and facilitate removal of any part for replacement or modification. Where single-hole fixing variable condensers are used and insulation is required, the bakelite top of an ordinary wander plug (filed slightly to take the spindle) makes an excellent bush.

All coils are coated with polystyrene cement; the self-supporting coils are given two coats inside and out, with an extra application where turns touch the base.

The two and three-pin plugs and sockets are from the Radiospares range, and the miniature 150 volt working condensers (W48 type), made by Hunts, prove very useful in places where space is limited.

Results achieved

The 1953 Low Power Field Day served as an "air test" for this equipment, which was not completed until one hour before the contest was due to commence, and the inevitable teething troubles were not welcome! It was a pleasant surprise, therefore, to find G3CGD/P heading the final results.

Because of extremely poor aerial facilities at the home station most tests had to be made while portable. In point of fact only two further opportunities were presented before winter came. The first was during the Region 1 Field Day when very favourable reports were received from entrants. The second, and real, test, however, came in the Low Power Contest, when—although operated from a small tent—the rig was pitted against competitors using their normal station facilities including superhet receivers. The only addition to the L.P.F.D. equipment was a further aerial with switching unit. The weight remained below 20lb. No less than 81 contacts were made with stations in G, GM, GC, F, DL (2), PA0, and SM, thus gaining the writer second place.

Throughout these tests—in which it was subjected to a good deal of bumping—the equipment proved perfectly reliable, and during the longest spell worked (14 hours) calibration of the v.f.o. and receiver shifted less than 2 kc/s, although the h.t. battery voltage had dropped more than 10 volts.

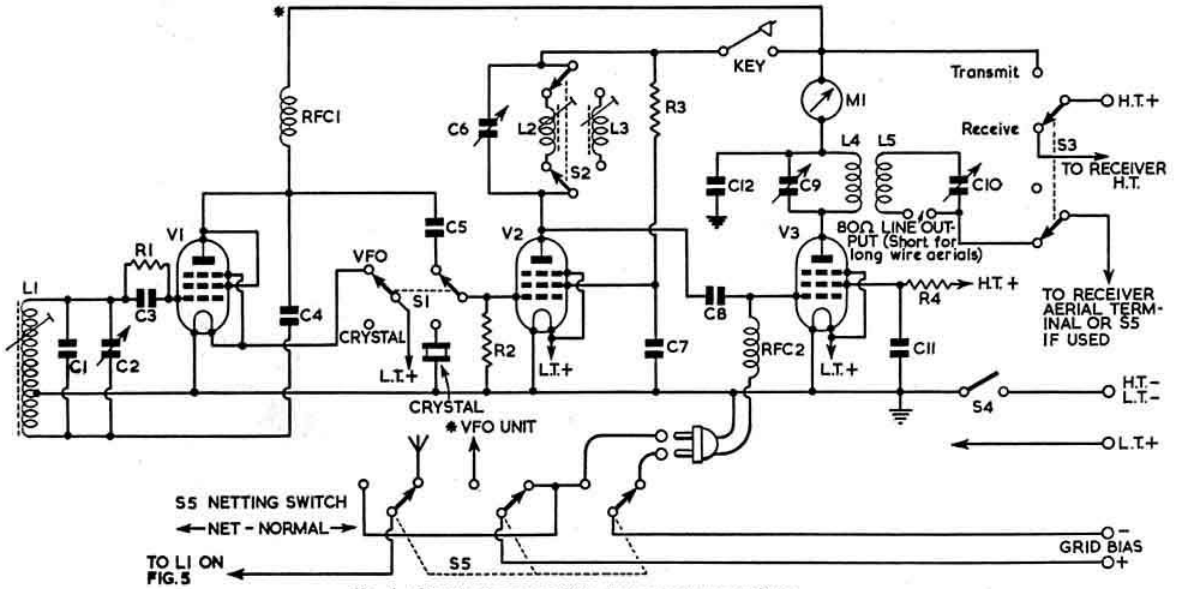


Fig. 4—Circuit diagram of the low power transmitter

C1, 300μμF, silver mica
C2, 15μμF ex-TR1196; vanes removed to leave 3 fixed and 2 moving
C3, 500μμF
C4, 0.001μF
C5, 50μμF
C6, 9, 100μμF variable
C7, 11, 0.05μF
C8, 75μμF
C10, 150μμF variable
C12, 0.01μF
L1, 25 turns, 26 s.w.g. enam., tapped at 9 turns.
L2, 3.5 Mc/s: 50 turns, 28 s.w.g. d.c.c.
L3, 7 Mc/s: 21 turns, 24 s.w.g. enam.
L4, 5, 3.5 Mc/s: 50 turns, 22 s.w.g. enam.; 7 Mc/s: 23 turns, 18 s.w.g. enam.
M1, 0-30 mA m.c. meter
R1, 3, 4, 10,000 ohms
R2, 500,000 ohms
RFC1, 2 r.f. Chokes
S1, 3, 2 pole, 2 way
S2, 2 pole, 4 way
S4, single pole on/off
S5, 3 pole, 2 way
V1, 2, 3, 3S4

All Coils are wound on ½in. diameter Iron-dust Cored Formers except L4 and L5 which are self-supporting.

Amateur Radio at the National Radio Show

THIS year, for the first time since 1938, Amateur Radio was fully represented at the National Radio Show.

The Society's stand, occupying some 440 sq. ft of floor space in the Gallery opposite the R.I.C. Television Studio, attracted large crowds throughout the exhibition period. The theme adopted, "Amateur Radio through the Years," traced the development of radio communication from the early 1900's right up to the present time. Some idea of the comprehensive nature of the equipment displayed can be gained from the accompanying pictures.

In addition to the fine range of amateur and historic equipment—from spark gaps and old-time valves to single sideband and television gear—arranged by the Exhibition (Home Constructors' Section) Committee, Society publications, including the sixth edition of *A Guide to Amateur Radio* were on sale.

Warm thanks are recorded to all those who loaned equipment for display and to the legion of enthusiasts who volunteered for stand duty. The general managership of the stand was in the hands of Mr. M. J. Frost (G3GNL).

The Army Stand

The Amateur Radio Society of 3 Training Battalion, R.E.M.E., featured much to interest the radio amateur. Among the numerous items of equipment shown was a single sideband exciter, 2 m receiver and transmitter, and a comprehensive range of Amateur Television gear. Working exhibits included a flying spot scanner and a demonstration of single sideband reception.

A display of equipment suitable for use in an emergency was a feature of the Society's stand. In this picture can be seen various portable-mobile units constructed by members of R.A.E.N. G2BRH and B.R.S.19675 are left and right respectively. G2FKZ's 2 metre transmitter is to the right of the picture. *(Photo G2LW)*

General view of the R.S.G.B. Stand at Earls Court showing some of the wide range of amateur built equipment which was on display and some of those who helped to man the stand during the 10 days' period of the Exhibition. Equipment shown includes a 2 m transmitter (G2FKZ), s.s.b. unit (G3HRO), receiver (G3IIR), general purpose power pack (G3IIR), three-in-one transmitter (G4DC) and a set of absorption wavemeters (G8TL). Stand helpers from left to right: G2VB, G2BRH, G8TL, G3IIR, B.R.S.19675, B.R.S. 180308, G3GNL and B.R.S.20181. *(Photo G2LW)*

R.A.F. Amateur Radio Society

The R.A.F. Amateur Radio Society's exhibit (arranged by the R.A.F.A.R.S., Locking, Somerset) was in the form of a bell tent in which was installed a representative Amateur Radio station. On the operating table there was a 15-valve double superhet receiver covering all bands from 1.8 to 30 Mc/s, a Top Band phone/c.w. transmitter and an all-band driver unit which could also be used as a 25 watt c.w. transmitter. The driver unit was connected *via* co-axial cable to 5 p.a.'s using 813s on 14, 21 and 28 Mc/s and TZ40s on 3.5 and 7 Mc/s. These power amplifiers, together with the modulator (TZ40s in push pull), were housed in two rack cabinets standing at either side of the operating position. A particular interesting miniature transmitter (constructed by G3IDC) was housed in two small cabinets 8in. by 6in. by 6in., one for the r.f. section and n.b.f.m. unit, the other for the power supply. The transmitter was capable of inputs of from 25 to 40 watts.

International Radio Controlled Models

Working demonstrations arranged by the International Radio Controlled Models Society were watched by large crowds at each session throughout the Show. Making her first appearance this year was "Nellie" the Electronic Barrel, the latest creation of Mr. Alan Tamplin of Chichester. "Nellie" responds to either 27 or 465 Mc/s signals and took a year to build. Other working models included a model DUKW built by members of the London Group of I.R.C.M.S. and Mr. Tamplin's true - to - scale Churchill tank which weighs 2½ cwt. The u.h.f. band was used for control purposes at Earl's Court.

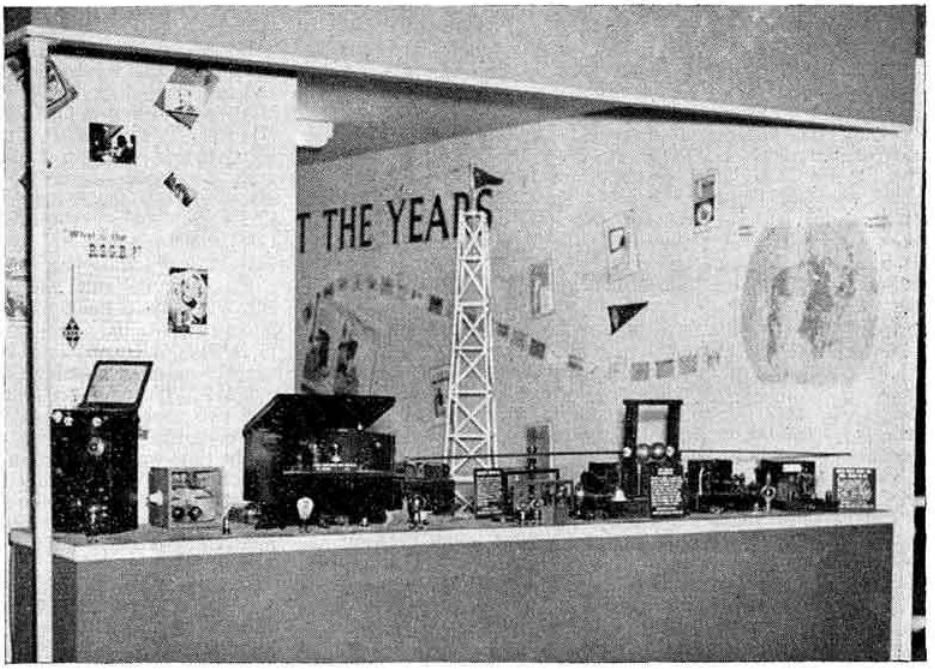
Examples of radio controlled equipment, which included transmitters, receivers, control gear and power supplies were displayed in show cases.

The 420 Mc/s Tests

IT is the considered opinion of the Contests Committee that the technical data submitted as entries for the annual R.S.G.B. 420 Mc/s Tests should be made available to all members interested in 420 Mc/s work.

It is proposed, therefore, to circulate on rota the data submitted in connection with the 1953 Tests. Members who wish to borrow the data should write to the Hon. Secretary, Contests Committee, c/o R.S.G.B. Headquarters. The data will be loaned to each applicant for a period of one week after which time it must be returned without fail to R.S.G.B. Headquarters.

If any member has any objection to his data being circulated he should advise Headquarters by not later than September 30, 1954.



Old and Ancient

One side of the R.S.G.B. Stand was devoted to an exhibition of old and ancient equipment. In this picture can be seen (from left to right) a Marconi Coherer Receiver (1904), a Creed Sender, Hertz Oscillator and Apps Inductor Coil all loaned by Mr. Maurice Child (ex-NWX, G2DC), 2-valve Reflex Receiver (1928, G8TL), Portable 5-metre Transceiver (1936, G2NH), 160-metre Portable Mobile Transmitter and Receiver (1937, G8TL). *(Photo G2LW)*

London Members' Luncheon Club

AN attendance somewhat smaller than usual was recorded at the meeting of the London Members' Luncheon Club held at the Bedford Corner Hotel, Tottenham Court Road, London, W.C.1, on Friday, August 20. Among those making their visit were Helmut Kuhne, DL9QL, Ken Ellis, G5KW, and W. D. Gilmour, G2VB, all of whom accepted the Chairman's invitation to address the Club. Stanley Vanstone, G2AYC, presided.

The Club is due to meet again on September 24 and October 22 when a warm welcome will be extended to all visitors to London.

Reservations should be made to May Gadsden at R.S.G.B. Headquarters either by postcard or telephone (HOL 7373) at least 24 hours in advance of the meeting.

TWO METRES AND DOWN

By W. H. ALLEN, M.B.E. (G2UJ)*

THE Second R.S.G.B. Two Metre Field Day on August 15 was well supported by portable and fixed stations throughout the country in spite of conditions which, while never good, deteriorated during the day. Torrential rain and storms swept many areas.

G3AGS, assisted by G2ALN and '3RP, operated from a site near Rochdale, Lancs. Out of 41 stations heard 40 were worked, a remarkable record. Among the 20 portables contacted were G3GWB/P, '5MA/P and GW5BM/P, all over 100 miles distant, and G2BAT/P (St. Agnes, Cornwall) at 265 miles. The path to the latter station seems to be workable under almost any conditions and has been covered successfully on every field day so far.

Using the equipment described later in this article, **GW5BM/P,** with G2DTD, '3CGD and '3EIY, worked from a site 2150ft a.s.l. on the Black Mountains, Breconshire, the gear being manhandled half-a-mile up the final ridge in rain and a bitter wind. No stations in the London area were heard but results in other directions were fairly satisfactory. It was necessary to close down early to ensure being safely off the dangerous mountain roads before darkness fell.

G3FKO/P (1000ft a.s.l. 2 miles. n.n.e. of Wells, Somerset) worked 19 portables including F9CQ/P at 175 miles, and 13 fixed stations, all but three being on 'phone at strengths between S6 and S9. Weather was excellent and although conditions were fair only one station, G2AHP (Perivale, Middx.), was heard from the London area. Among the stations contacted was G3FSG/M. A J-Beam double skeleton slot was employed in conjunction with 3.5 watts to p.p. 6AK5s.

G5MA/P (3 miles s.e. Cusop, Herefordshire) was in a poor location for London stations and only G2AIW (Twickenham) was worked in that direction. In all 39 different stations were contacted six of which were between 100 and 130 miles distant, including G2ATK/M. Working from near Barnsley, Yorks., **G4JJ/P** raised 16 portables, heavy, static-charged rain and high background noise not withstanding. G2BAT/P, 3DIV/P, 3FD/P, 3GZM/P, 3YZ/P, and 5MA/P were called without success.

G2UJ/P, operated by G4IB and the writer, was sited near Firle Beacon, Sussex Downs, 5 miles s.e. of Lewes, 650ft. a.s.l. As soon as the J-Beam double skeleton slot was erected and the converter switched on it was evident that the thing most lacking was i.f. selectivity. Signal strength from the "locals," G3DIV/P (Eastbourne), 3DVQ/P (nr. Brighton), 3ISA/P (Westerham, Kent), 6AG/P (Wrotham) and from 1500 B.S.T. onwards, F9CQ/P and F9EA/P (nr. Dieppe), was terrific and the beam had to be manoeuvred more to keep undesired signals out than to bring the required signals in. Apologies are tendered to those stations who called us unsuccessfully. G3ARL/P (Bembridge Down, I.o.W.), with only 2½ watts input and G2TP (foot of Box Hill, Sy.) were also very strong signals during the late afternoon. Although the weather at Firle remained fine and sunny all day, severe storms occurred in the near vicinity and a very noisy background was often apparent.

Turning now to the fixed stations, **G5YV** (Morley, Leeds), worked 20 portables including G2BAT/P (who was RST569 during the late morning and early afternoon), G3DIV/P, '3ERD/P, '3GWB/P, '6XM/P (Thirsk), GW3ATZ/M (Flintshire) and GW5BM/P. Conditions were fair for most of the day but a local thunderstorm in the middle of the evening raised the background noise considerably. **G3IUD** (Wilmslow, Ches.) who reported conditions fair, contacted G2BAT/P,' 3GOP/P (Corfe, Dorset), G5MA/P and GW5BM/P. G3YZ/P and '8UQ/P were heard.

B.R.S.20154, situated on low ground and badly screened at Richmond, Surrey, logged 19 portables and 32 fixed stations, including G2UJ/P, '2XV/P, '3DFF/P, '3DIV/P, '3DVQ/P, '3EWB/P, '3FD/P, '3GWB/P, '3GZM/P, '3ISA/P, '3ITF/P, '3YZ/P, '4JJ/P, '5ML/P, '6AG/P, '6TA/P, '6YP/P, '8UQ/P, and F9CQ/P. These excellent results were achieved with a cascode converter, an AR88 and two 6-element stacks at right-angles on the roof. **B.R.S.3003** (Coulsdon, Sy.) heard 11 portable stations the most distant being G3GWB/P (north of Northampton) and the loudest G3DIV/P (Eastbourne).

Six portable and three fixed stations were heard by **B.R.S.19264** (Cheltenham). GW5BM/P was audible at good strength only around midday. G3ERD/P (16 m. n. of Derby) was heard at 80 miles, the strongest station more than 25 miles away being G3GZM/P (Clee Hills, Salop).

G2HCJ (Warrington, Lancs.) worked 27 fixed, 15 portable and two mobile stations during the contest, contacts over 50 miles being made with GW5BM/P and GD3UB. Part of the time was occupied in erecting a 6-element stack with directors and wire netting reflector which although rather out of match showed some 3 to 4 db gain over a 3-element Yagi. Static noise was troublesome at times but was much reduced by erecting a 30ft dural mast near to the 15ft high array.

G2CZS (Chelmsford) worked G2XV/P, 3DIV/P, 3ENS, 3FD/P, 3FSD/P, 3ISA/P and 4SA and heard G3ERD/P. **G2BDQ/P** worked 5 portables and 3 fixed stations in all-day rain while **G6XM/P** enjoyed bright sunshine. Many unidentifiable 'phone carriers were audible from the London direction.

Before the contest began G6XM/P was an excellent signal with **G3WW** (March, Cambs.) but dropped steadily in strength during the day. Ten portables and G2ATK/M were worked and a number of others called. **G8VN** (Rugby) worked G3ERD/P, '3FD/P, '3GWB/P, '3GZM/P, '3YZ/P, '4JJ/P and '5ML/P in less than three hours and called G5MA/P and GW5BM/P for some time without result.

From the *Lea Valley Reflector*, journal of the Enfield R.S.G.B. Group, it is learned that G3FD/P (Dunstable Downs), running 5 watts input, worked a total of 56 stations including 21 portables and two mobiles—G2ATK/M (Broadway Hill, Worcs.) and G6YU/M (nr. Daventry)—the more distant contacts being G3ERD/P, G3HSD/P (Bristol), G4JJ/P, G6XM/P and GW5BM/P.

Other Two Metre News

G8VN is still experimenting with the R.S.G.B. Converter and now has a p.p. neutralised r.f. stage in front giving approximately 10 db gain, the whole combination being a big improvement on the G2IQ type converter with which

* *32 Earls Road, Tunbridge Wells, Kent.*

reception has been carried out so far. F8MX and ON4BZ have been heard and a total of 46 different Gs worked since July 1, a pretty good performance for an indoor aerial under the unfavourable conditions generally reported during the period.

G3WW reports that G5BJ has a high-power transmitter (capable of either a.m. or f.m.) ending up in a pair of 826s ready to go on the air. G3WW had little success with his portable sortie into Devon, being plagued with bad weather and lack of activity. From March contacts were made with, among others, GM3BDA (RST449) and G2BMZ (RS57/8) on August 4 and F8MX (RS7/8) early on the following morning. EI2W was well received during his QSO with G5YV on August 16 and GD3UB (RST559) was worked for the first time on the same evening, for a report of RST579.

G3HBW (Alperton, Middx.) worked F9JY (nr. Cherbourg) on c.w. with reports of S6/7 both ways. F8GH has been a consistent signal with **G3EMU** (Canterbury) during the past month and six contacts have been made. Other stations worked in the period included G2CZS, '3DJX, '3DIV/9, '3INU, '6NB, PA0FC and PE1PL. F3JN, F8EB, F8MX and F8UK were among those heard.

G4JJ has been portable 23 times this year from 11 different counties but intends to call a halt at the end of September and rebuild his equipment so that fewer amps are drawn from his long suffering car battery. A 60ft mast is shortly going up at his home location in Barnsley, Yorks.; reports from the south will be welcome from any distance for comparison purposes. **G5CP**, now active from Wingerworth, nr. Chesterfield, on 144.43 Mc/s, uses an SCR522 transmitter with 829B p.a. and a 3-over-3 array. Screening is bad in all directions between n.w. and s.w. The most distant station worked to date is G3DIV/P on August 15. G5CP would be pleased to hear from anyone able to help him eliminate TVI from his SCR522.

While portable at Carter Bar, Roxburgshire on July 19 between 1840 and 2140 B.S.T. **GM3JDD** and **G3CYY** worked G2BDQ, '2FJR, '3CCH, '3DA, '3IUD, '4LX, '5BD, '5GX, '5YV, '6XX and GM3EGW. Cards will be sent through the Bureau as soon as possible.

B.R.S.3003 (Coulsdon, Surrey) has heard 95 stations in three months on the R.S.G.B. Converter. G2BMZ (Torquay), 154 miles, was a very strong 'phone signal on August 3 at 2300 B.S.T. **G3BFP** (Croydon) is on 145.2 Mc/s and **G3JFR** (Basingstoke, Hants.) will be on 145.3 Mc/s.

G2CZS (Chelmsford) found July 19 to 24 the best period in the past month, G2YB, '3FAN, '3GVC, '3HWF, '5GX, '5MA/P and PE1PL being worked. The Dutch station was contacted again on July 31. August 5 brought a contact with F8GH and good reception of F8MX. **G5BD** (Mablethorpe, Lincs.) worked GM3EGW 28 times during the month in the course of their sked, GM3BDA 8 times and GM3JDD/P, GM3IBV and GM6KH once each. GI3GQB and GW5MA/P (Angleley) were heard.

G3IUD has heard GM3EGW quite consistently on sked with G5BD. PE1PL, the first Continental station yet heard, was RST339 working G5YV on August 9. '3IUD would welcome skeds with stations in Northumberland.

G5YV's sked with PE1PL has been running for six weeks with 100 per cent results both ways but considerable variations in signal strength. Much more scatter fading is noticeable on signals from Leeds than the other way round. Numbers of GI and GM stations were heard at good strength during the evening of August 4, but the only Continental signals other than PE1PL have been F8GH and F8MX.

Although conditions were generally below average, **G3CCH** (Scunthorpe, Lincs.) worked GI3GQB, GM3BDA and GM3EGW on July 25 and several Scottish stations again between August 4 and 6. GI5AJ, alone among the DX stations, was an RST579 signal on August 15.

G3DO (Sutton Coldfield), who has already worked 47 stations in 11 regions since July 1, one more region than in the whole of last year's Ladder contest, concludes that both activity and conditions have not been too bad recently. Among his contacts were G5MA/P in both Anglesey and Hereford, GW5BM/P (Brecknock), GW3GWA/P (Denbighshire), F8MX and G2BAT/P. All were 'phone contacts with the exception of the last.

Portable Activities

GM2BDQ/P, assisted by G4LX, will operate from Morayshire, Nairn and Banff on September 24/6 and **GM3JDD** will be active again during October.

GW5MA/P operated 2 miles s.e. of Amlwch, Anglesey on July 31 and August 1. Thirty-three different stations were contacted, the best being a c.w. QSO with G8OU (Ashtead, Surrey) at 222 miles. Others around the 200 mile mark were G2XV, 203 miles, '2FJR 193 miles and GM3EGW 185 miles. G6RH (Bexley, Kent) at 234 miles was heard.

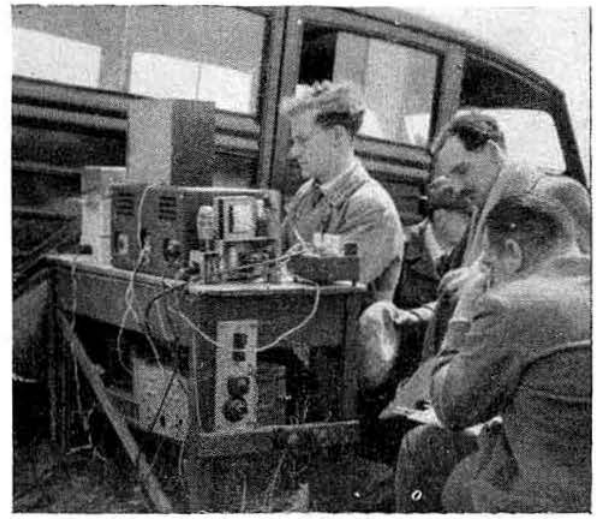
G5BM/P operated from Woodbury Common, Devon, at a height of 560ft a.s.l. between 1900 and 2000 B.S.T. every evening from August 6 to 13. Conditions were poor and local activity at a low level but G3AUS and '3AVF, both in Torquay, '3JGJ (Plympton) and '8DA (Exeter) were worked besides GW3FSG/P (nr. Abergavenny) and GW8UH (Cardiff).

The 70 cm Band

G5YV (Leeds) transmits to DL3FM (nr. Essen) at 2115 to 2125 B.S.T. daily but without result so far. A sked is also run nightly with G3IOO (Oswestry) but a number of failures have been recorded under the present weather conditions which, incidently, included more than 4in. of rain in Leeds in the first three weeks of August. The skeds with G2DD and G2DDD have been dropped mainly through pressure of work.

Another call shortly to be heard on the band will be **G3WW** who now has a 70 cm tripler made to a design by G3HAZ on test.

G3HBW (Alperton, Middx.), 434.66 Mc/s, worked G2DDD (Littlehampton, Sussex), 435.65 Mc/s on August 1 and 10 at RST579, and has a sked at 1230 B.S.T. on Sundays with G3JHM (Worthing, Sussex) who is on 434.92 Mc/s. The sked with GW2ADZ (432.84 Mc/s) at 2000 B.S.T. whenever conditions seem reasonable, has so far met with no success. **G3MI** (Chesham, Bucks.) is on 434.13 Mc/s with



G3DIV/P near Eastbourne, winner of the first 1954 2 metre field day. G3DIV (left) and G2FTS (right) facing camera.
(Photo by G2KU)

a Mullard QQV03-20 tripler and a 10-element stack with wire netting reflector.

Irish News

On August 16 conditions improved sufficiently to enable **EI2W** (Dublin) to work GM3BDA (East Lothian) at good strength and G3DLU (Weston-super-Mare) for the first time. On the following evening, during a gale and heavy rain, a three-way contact took place between EI2W, GI3FZQ (Belfast) and GI3GQB (Newtownards) with remarkable reports all round, GI3FZQ and EI2W being RS59 to each other, the other Northern Ireland station RS58 in Dublin. This was in great contrast to the first Dublin/Belfast contact in June 1951 when conditions were better but results far inferior due to the poorer equipment in use at that time.

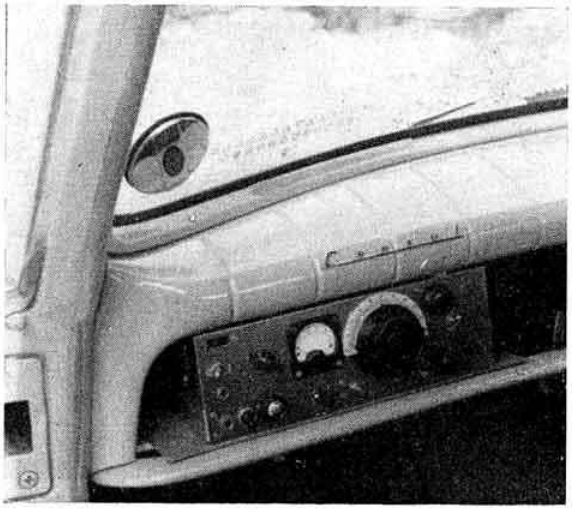
Two Metre Mobile Station

The photograph accompanying this article shows that portable or mobile 2 m gear need not occupy much space in a car nor, if you go the right way about it, need it lack a satisfactory performance by reason of its compactness or the need for conserving input power.

Basing his design upon a model constructed by G6VX and shown at last year's Amateur Radio Exhibition, **G5BM** now possesses a complete station, transmitter, receiver and modulator, which fits into the glove compartment of his car and which can be used with a whip aerial for mobile or a larger array for portable operation. The power unit, together with its 12 volt accumulator, is housed in the boot, connections being made by a multi-core cable and Jones plugs to the "station." The latter may be removed for separate operation without difficulty.

In the transmitter three EL91s perform the roles of c.o./tripler, tripler and f.d. and drive a Mullard QV04-7 p.a. to 12 watts input on either 'phone or c.w., power being derived from a 300 volt 100 mA vibrapack. Anode modulation is effected by a crystal microphone, EF91 and 6C4 pre-amplifiers and a 12AX7 class B stage.

The comprehensive specification of the receiver lacks nothing on account of the small space into which it is built. A Mullard PCC84 series cascode r.f. stage is followed by a 6AK5 mixer with a similar valve as tuneable oscillator, a 9003 first i.f. stage at 8.46 Mc/s, c.c. second frequency changer, two 9003s as 465 kc/s i.f. amplifiers, a double-diode-triode detector, 12AT7 a.f. and b.f.o. and a 6AK6 output stage. In all 17 valves are employed in the equipment, the consumption from a 12 volt accumulator being 2.05A for heaters and 3.5A for the power unit. A motor-generator provides h.t. for the receiver as this has proved more satisfactory from the point of view of background noise than a vibrator supply.



G5BM's complete 2 m transmitter-receiver mounted in the glove compartment of his Ford Consul.

V.H.F. and the Amateur Radio Exhibition

Much is heard these days of noise factor as a measure of v.h.f. receiver performance and one of the features of the V.H.F. Stand at the forthcoming Amateur Radio Exhibition in November will be demonstrations of how noise measurements are made, using either a noise diode or a signal generator. A representative selection of 2 m converters will be available for testing.

Among other attractions on the stand will be a high-efficiency 150 watt p.a. stage for 70 cm and, for the 24 cm band, a power tripler with an output of around 3 watts, besides many other new and interesting pieces of gear.

The writer will be at the Exhibition most evenings from 6 p.m. and is looking forward to meeting v.h.f. enthusiasts both old and new.

The London U.H.F. Group

At the meeting of this Group, on October 7, it is planned to hold a 70 cm converter evening. Sensitivity and noise measuring equipment will be available and everyone is invited to bring his converter along for test. Here is an excellent opportunity to prove whether *your* converter is as good (or as bad) as you think it is! So make a date for 7.30 p.m. that evening at The Bedford Corner Hotel, Bayley Street, Tottenham Court Road.

A U.H.F. Group dinner will be held at the Royal Hotel at 7 p.m. on the last night of the exhibition, Saturday, November 27, when it is hoped that as many v.h.f. and u.h.f. enthusiasts as possible will take the opportunity of meeting one another. For further details see this column next month.

European V.H.F.

In the course of a recent trip to Europe **EI2W** was accorded generous hospitality by the Swiss amateurs and was much impressed with the quality of the equipment and the v.h.f. organisation generally. Even Mt. Pilatus (7000ft) was found to have an a.c. power point at the top, provided by the hotel for the use of portable operators! Twenty-seven Swiss stations are now on 2 m: calls and frequencies are available from G2UJ.

I1FA is the best known of about 50 v.h.f. stations in the Milan/Turin area. OE7AT is a prominent station in Austria, sometimes working from Mt. Pfaendler at Bregenz near Lake Constance. Four v.h.f. stations are known to be active in Luxembourg and 9S4AX (Saar) puts out a good signal on 2 m.

New 10,000 Mc/s Record

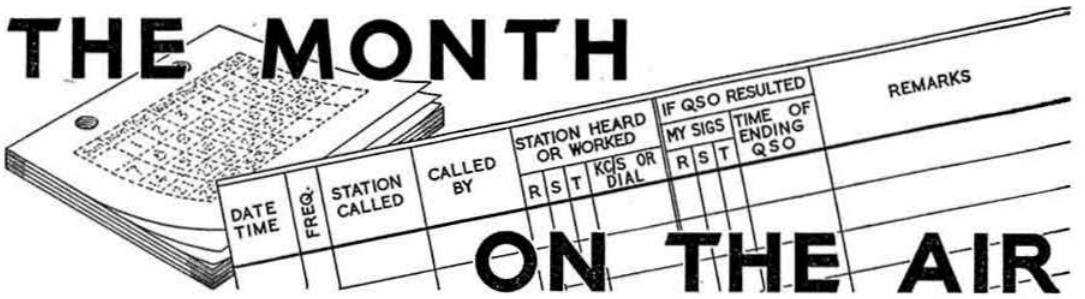
On August 8, 1954, W7JIP and W7OKV established contact on 3 cm over a distance of 109 miles, thus beating their own world record of 47 miles by a handsome margin.

The two portable stations were located respectively on Mt. Hood (6100ft) and on Mary's Peak, near Corvallis, Oregon, at a height of 4097ft a.s.l. It is believed that at one point a mere 10ft clearance existed for the line-of-sight path.

Signals were subject to considerable variation and strengths between S9 plus and nil were experienced during the 45 minute contact.

* * *

There has been a gratifying response to our request for reports this month and it is hoped that will again be the case for the October issue which closes for press on September 20.



By S. A. HERBERT (G3ATU)*

THE " glorious " weather which has been raging over the country recently seems to have been matched by the " superlative " conditions which have not prevailed on any of the so-called DX bands! Roll on winter! Seriously, though, there has been a slight improvement since July and the three low frequency bands are already beginning to show signs of promise for an interesting DX season.

Top Band Topics

By the time this issue is published, Top Band should be settling down for the DX season. Indeed, Europeans were breaking through at good strength early in August.

B.R.S.20126 heard OK2KUS (S6–8 at 2315). **G3IGW** worked several OKs on the key. Until recently active as GM3IGW, he was responsible for " airing " numerous of the " rarer " Scottish counties; he plans to do the same from Northern Ireland. Accompanied by G3JML, he will operate as GI3IGW/A from Londonderry—September 21 and 22; Tyrone—September 23 and 24; Fermanagh—September 25 and 26. The above places and dates may, however, be altered but when active the whole band will be tuned, so as to give the crystal-controlled stations an equal chance of a contact.

ZC4GF who will be active on top band from about the middle of September is building a new v.f.o. rig which will run about 50 watts into a 267ft long-wire. Last year, he tried both vertical and horizontal half-waves but found the former extremely noisy. His crystal frequency was in a bad spot and his only G contacts were with G2JF, '2HX, '3ATU, '3BMY and '8JR. This time, the v.f.o. should result in many more QSOs. ZC4PB hopes also to be active and ZC4CA may be on for a time. **G3JFF** has tried the band for the first time and, from Devon, has worked GM3EHI (Lanarks) and GM3DVX (Edinburgh). Now, he's after a ZL!

VP4LZ has advised B.R.S.20106 that he will use 1805 kc/s in addition to the frequencies given in last month's *M.O.T.A.* column.

Eighty Metres

The static, together with many non-amateur noises, have made the band unpopular from a DX viewpoint, but the one report shows—that from B.R.S.20106—what is there, underneath it all. He dug out EQ2L (0035), F8FW/FC, KP4TF, KV4AA and 11 Ws, including W0PKV and novices WN4GRQ, KN2GQU, '2HAM and '2HDV.

Forty Metres

Forty is still much the same until after midnight, when most of the interlopers vanish. ZL and occasionally VK can be worked in the early mornings and the band should be full of African and Asian DX by now.

G3AAE decided to try the band for the first time in five years and made a triumphant start with VQ2DT (RST569, 2115), followed by ZD4AB, ZD2DCP, KP4DA, PY, OY2Z, CT2BO, W2ISB/MM (which later turned out to be the *Aries*, the motor yacht that recently completed the double crossing of the Atlantic), ST2NG, F8FW/FC, VS9AS, EA6AU, 8BC, 9EB, FQ3BC, FQ7BC and FQ8AN. FQ3BC says he is near Gabes (Tunisia)—which seems peculiar—while FQ8AN (an ex-OE, with the Foreign Legion) is also near Tunis. '3AAE also heard CP5AA, HK1TH and VP1FL, all working the U.S.A. **G3ATU** heard VP8AZ (RST229, 0630), **B.R.S.20106** pulled in c.w. from ZL, TI2PZ, KG4AN, KZ5BE, YV5BL, EQ2L, LU5, W5ABY, '5EUK, '5SS and '5YJS/5 and on two occasions heard VQ9AC at a good S8 around 2200. (" And yet," says Norman, " you never know "!)

Twenty Metres

Poor though it is for much of the day, Twenty is open at odd times for long skip DX. Mornings continue to be mostly devoid of interest, but afternoons provide signals from JA, KA, KR6, DU, FI8 and the like, mostly weak but workable.

Possibly the most interesting happening was the arrival—at long last—of KC4AB (Navassa Is.). He eventually overcame the many difficulties associated with such a project and got going on August 17. His signal in the U.K. was always weak, peaking at S3, but good operating helped to keep the frequency clear. '4AB transmitted on 14100 kc/s and listened at the low end of the band for replies. KV4BB did good work by transmitting on a nearby frequency and telling European stations where to listen and where to transmit. KC4AB was active for only a few days, but more expeditions to Navassa seem likely during the coming winter. Another rare one to pop up was HB9LA, operating as **F8FW/FC** from Corsica. Very active on 3.5, 7, 14 and 21 Mc/s (both c.w. and phone), he expected to make well over 2500 QSOs during his stay on the island (QSL *via* U.S.K.A. or direct to HB9LA). **W4CEN** sends the mouth-watering news that he worked VR2BZ/ZM7 (Tokelau Is.) on 7 and 14 Mc/s on August 16 and that the VR2 would be there the following day, after which he would pass on to ZM6. Several keen types were heard next morning waiting for things to happen, but nothing seems to have transpired. We hope someone **did** manage to contact after all. If not—well, he may go there again.

G3GMY worked a good one in SV9UN (Crete), plus F8FW/FC, 4S7HK, VU2NG, KZ5CP, KL7ADR and MP4BBL, all on key. **GM3ITN**, while on 14 days' leave from B.A.O.R., found 65 watts and a ground-plane adequate to work EA9DF (Rio-de-Oro), ZE5JE, VQ4BNU, CR6CS, LU, VP6GT, W7HYW and W7PSO (both in Wyo.), TA3US and VS2CR, with LX1RB, FF8AK and F8FW/FC on phone. **G3ESP**, after six years on the air, is doing a little c.w. DX hunting. Using a 75 watt G5RV transmitter and a

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138ft end-fed aerial, he worked 9S4AR, VS2CR, F8FW/FC, EA9DF, ZS6, CR7AG and SU1RB. A QSL has arrived from SU1RB (Canal Zone), who would like a " sked " on 14 Mc/s with an amateur preferably in Barking, or in the Ilford-East-Ham-Dagenham area. SU1RB comes from Barking and his present address may be had from G3ATU.

B.R.S.18017, despite poor conditions, heard VP2DL and VP2DT (Dominica, new ones on phone), also CR6, EL3A, EL6A, VU2RC, VQ5CY and HR1FM. On c.w. he logged F8FW, I5SG, VS1GN, VE8MA, 8PH, ZD1SS, ZD2DCP, ZD4AB and ZP9AY. **B.R.S.20133,** listening on phone, had a good catch in FP8AP, then logged ZD3BFC, EL2X, F8FW, FM7WN, HH2PB, ZD4AX and ZS3F.

P. M. Crawford intends wearing a black tie, should conditions get worse! However, with KR6JF, VS5RO, YI2AM, FM7WE, VS2EG, TI2RC, TI3LA, ZD3BFC on phone and HH2OT, HC1FG, KA and HZ1 on c.w., he need not depair. **B.R.S.19894** stuck mostly to c.w.—in view of an approaching Morse test (another G3 coming along; and good luck, too)—and unearthed DU1AP, VK4FW (the first for ages), 4S7KH, OY1G, VQ2AB, AP2K, F8FW and the very active I5PP. **H. J. Hill** managed one or two new ones on phone, but found it hard work. He logged ZA1KAD (Box 69, Tirana. Let's hope this isn't yet another of 'em!), FE8PX (1815), KA4WU, OA4AD (1850), MP4KAC, CP5EK, FM7WD, LX1DO, KR6KS, K2ISM/VE8 (Baffin Is.) and heard of VQ4AQ having a very long contact with CR8AB on 14030 c.w. The CR8 is keen, but you must send very slowly to him. Harry hears that VQ4NZK now plans visiting FD, FE and ET3. **G3AAE** worked AP2K and ZD6BX and heard CE0AD, who said he was CE1AD, on the Galapagos (which seems peculiar; HC8 is allotted to the Archipelago). '3AAE also worked YU0A ("The station of the first meeting of YU Amateurs ").

G3JFF says he is now back in the rut (*i.e.* " on the air nearly all the time "!) and has accordingly added 10 new ones, making his score 70 to date. Catches were CE5AW, F8FW/FC, CR5AD, VQ2AB, VE8YC, JA, VQ4EZ, LU0EAB (maritime mobile off Chile), MD5FF (RST349, with 5 watts input), KZ5 and PJ. UQ2KAC, UA9AH, UB5KAB and UA4KCE were all heard working stations outside the Iron Curtain, so it looks as if the list is being extended. **B.R.S.20126** heard ZC7DO, W6PXH, JA7, KG4, VP2, VP5 on phone, while **B.R.S.20106**'s impressive c.w. list details TI2MAR, VP7NM, ZD6BX, DU1AG, ZC5VS, ZP5CF (1715), ZC6UNS, ET3S, ZA1KAA (time will tell!), VP4LZ and lots of JA, etc. On phone, he heard YN4CB, MP4K, VP4PN, VP5AK, KA7HH, and W5DMP and '5YTT (0230). Norman's " grapevine " rumours activity from VK1DY, VS5KG, SV0WK (Crete, September 7), VR3A (14015, weekends at 0600), FY7YT (14039 daily, 1600). Finally, what of CR8MX, who is being received in the U.S.A.? In common with all the DX fraternity, '20106 deplores the " UU " hoax, but feels it may have the effect of cooling off some of the more rabid DX chasers and bringing back a little sanity into the game. **G3ATU** added KC4AB to the c.w. total, likewise FI8AZ (P.O. Box 527, Saigon) and eavesdropped on FQ8AA (Box 449, Brazzaville), ZS3AH, TI2AB, CR9AI, W6AKG/KL7 (1400) and an I1 sending a protracted " CZ DB " (no prize for a correct solution). As for the SP calling CZ1AX—'nuff said.

Overseas News

W6GPB (Joe Horvath, 522, 3rd St. San Rafael, Cal.), confirms that FI8AZ is legitimate and is recognised for the D.U.F. awards. His usual frequency is 14070 kc/s. W6GPB would appreciate help in getting confirmations from VQ8AL (QSO on 16.10.52) and SU1SS (QSO on 11.9.53). So far, QSLs to both, with return postage, have brought no results. **F9RS** reports that FO8AD (Rapa Is.) uses 14110 and 14120 kc/s for daily phone talks with OD5AB. FF8AQ (Emile Henry, Airport, Tessalit, *via* Gao, Fr. Sudan), is now active. He counts as Sahara for D.U.F. French Morocco (CN8) will count for the Italian C.D.M. award with effect from January 1, 1954; 23 countries are now required for the certificate. FK8AJ is active on 7 Mc/s but will take a deal of finding in present conditions.

ZB1CH (Point de Vue Hotel, Rabat, Malta G.C.) is active again on all bands from 10 to 80 metres, with 100 watts c.w. (phone in due course). His heavy baggage—including QSL cards—is on the way by sea and he will QSL 100 per cent on their arrival. '1CH was on Malta in 1949/52 and will QSL again for that period, should any cards have gone astray. **ZC4GF** gives current Cyprus activity as being from '4PB, '4JJ, '4CA and himself. ZC4IP is on leave, '4LW has returned to the U.K. and both '4MW and '4FB are temporarily off the air. **ZC4FB** himself adds the information that his transmitter gave trouble and was finally stripped. When the weather cools and he can stay indoors in reasonable comfort, the matter will be dealt with. He tells us that Mike Faraday (G3BUX-YI3BUX) is back again in Iraq.

Some DX items extracted from the West Gulf DX Club's weekly *Bulletin* are that VR2BZ/ZM7 will go on to VR5, HK0AI is still active from San Andreas Is. on eighty and forty. HK3AB is attempting to interest him in 20 metre operation. EA0AC is daily on 14150 phone (2100). A letter received by ON4RA from the Director of Vatican Radio reads in part . . . " As to the possibility of granting to a group of radio amateurs the licence that you are begging for with such gentleness, the Direction is finding itself in the obligation not to grant it. To grant it even exceptionally to a selected group would make a precedent and it would be hard to refuse others . . . " And that should remove all doubts as to HV1AA, HV1A or any other HV1. Gems from Southern California DX Club's *Bulletin*: KG6IC is active on A3 from Bonin Is. SV2RI and SV9UN are active from Rhodes and Crete, respectively. KP6AK is supposed to be on 14220 with a TBS-50 transmitter. FU8AC frequents 14154 kc/s with 35 watts. FB8BK is en route to Tromelin Islet. The legitimate VR6AC has a new receiver and will be active soon.

G2DHV reports that VE7ASL will be mobile in W1, 2, 3, 4, 5, 6, 7, 8, 9 and 0, until December. VP7NF is in the U.K. until May next. ZL1MP (David Mitchell, ex-GW6AA) may take the call VP7NI. '2DHV has received 80 metre QSLs from ZL3OP and KL7PI; the KL7 remarks that Europe is rare DX on eighty. **G2CDT** recently entertained W6RCR of San Francisco, whose European tour has taken him through 16 countries. W6RCR was first licensed in 1938, since when he has operated as W4GDH, W6GDH, J2ARS, J9ABT and KR6BT.

No activity has been reported from VQ1AC and so far, nothing has come out of Svalbard, though LH2P-LB7UE may yet oblige.

Syrian radio amateurs are taking part in the International Fair at Damascus during September. A special exhibition station using the call-sign YK1DF is operating in the 14 Mc/s band with a power of 500 watts. Foreign amateurs who contact the station during the Fair will take part in a draw organised by the Managing Board of Syrian Radio Amateurs. Prizes will be in the form of Oriental gifts.

* * *

Good hunting and see you next month. Please post your reports and comments to arrive by September 20.

Maria and Joe say " Thank You "

MARIA MONTEIRO (CT1YA) and her husband Joe (CT1JM) who were recently in England, wish to record their thanks to all those who made their visit so happy. Unfortunately, due to shortness of time, they were unable to accept a great many of the invitations that reached them.

Television Transmission for the Amateur

Part 5 — Mixers and Modulators

By M. BARLOW (G3CVO)*

It will be appreciated that the subject matter of these articles has become progressively more complex. Readers unfamiliar with television techniques are strongly advised to start by reading the earlier contributions in the series, which appeared in the November 1952, February, April and September 1953 issues of the R.S.G.B. Bulletin.

WHEN the video and pulse units have been built, there remains the problem of mixing their outputs together in the correct proportions, and applying the "composite" signal to the transmitter modulator. Before doing so, it is necessary to consider the significance of the phrase "in the correct proportions."

It must be emphasised that television modulation is quite unlike normal A3 amplitude modulation. Fig. 1a shows a c.w. carrier, and Fig. 1b the same during 100 per cent. modulation with a sine-wave. The amplitude of the carrier is varying from zero to peak, and has a constant mean value of 50 per cent. of peak. Fig. 1c shows the r.f. envelope of a television signal. The carrier is still varying from zero to a peak, but there is no constant mean value, and without modulation, no carrier is transmitted at all. Fig. 1d shows the same TV envelope when only the synchronising pulses are being radiated—corresponding to an all-black picture.

British standards state that the level of the top of the sync. pulse, that is, black level, should be 30 per cent. of the peak carrier output, with white as peak, and sync. as zero carrier. Any shade of grey in the picture, therefore, lies in the 30 per cent. to 100 per cent. of peak carrier range, and since the video waveform changes from line to line, there is no such thing as a constant mean carrier level. This is why the G.P.O. stipulate that the power input shall be measured under "all-white picture" conditions, corresponding to the maximum r.f. output that can be obtained.

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However, there is a mean level associated with the actual video waveform, as opposed to the r.f. envelope. If the video waveform is rectified, for instance, the d.c. obtained is proportional to the average scene brightness. Conversely, a change in this d.c. level is the only outward change produced by doubling the lighting in the studio, or turning it right down; the a.c. video waveform remains the same, and in the absence of the d.c. component, the picture would be received with a constant average value of brightness. This is the reason for the inclusion of the d.c. component, and the use of d.c. restorers in television receivers. It will at once be apparent that if, at any point in the whole chain, this d.c. level becomes altered, the received picture will no longer be a true likeness to the original. Now the point about "correct proportions" becomes obvious; the requirements are that the sync. amplitude should be 30 per cent. of the peak output, that this 30 per cent. level should correspond to black in the picture, and that the d.c. component should be retained at its correct value.

Establishing Black Level

The mixing operation is commenced by establishing the black level, and then referring everything else to this level. Thus, the sync. pulses will be negative with respect to black, and the picture positive (for a positive composite signal). Some camera tubes generate a black signal naturally, but for flying spot scanning, the easiest way of generating a black signal is to black-out the flyback lines on the scanning raster. These black portions of the signal give the d.c. restoring circuits something to work upon, so that after amplification a video signal is obtained with its correct d.c. component, and with a black level corresponding to a particular d.c. potential on the amplifier anode. This d.c. potential can be altered manually by the "black level set" control, and the correct amplitude of sync. pulse can then be added. Notice that the black level can be set to any desired value by the control, but only one value corresponds to true picture black. Any other value will mean that picture black is not 30 per cent. of peak carrier.

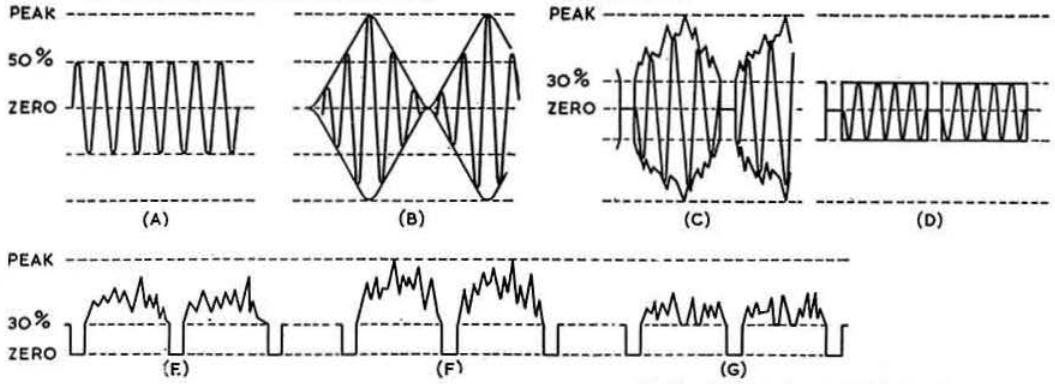

Fig. 1.—Typical r.f envelope patterns (A) Unmodulated carrier; (B) Carrier modulated 100% by sine wave; (C) Typical r.f. envelope under television conditions; (D) R.F. envelope when sync pulses alone are being transmitted; (E) Typical video waveform of one line of a television picture; (F) Same as (E) but with a larger d.c. component, corresponding to increased illumination of the scene; (G) Same as (F) but with less illumination (some clipping of the negative peaks is indicated).

Bearing these points in mind, consider the circuit of Fig. 2. Here a positive video-only (no syncs. or blanking) signal is being applied to the control grid of the video amplifier V2. As shown, there is an a.c. coupling from the previous stage, so it is necessary to achieve d.c. restoration before anything is done involving d.c. levels in the circuit. The d.c. clamp circuit of V1 ensures that during the black portions of the picture, the grid of V2 is held at the potential of the slider of the black level set control VR1. Clamping pulses—for amateur use the line sync. pulses may be used—are fed in equal amplitude and opposite phase to the two diodes. A further property of this circuit is that since the clamped electrode is returned to the clamping level at the end of each line, i.e. at 10125 c/s, spurious l.f. signals such as hum and shading are attenuated, and the whole picture is improved remarkably. Condenser C6 removes the d.c. component again, but a simple d.c. restorer V3 will re-introduce it correctly if required.

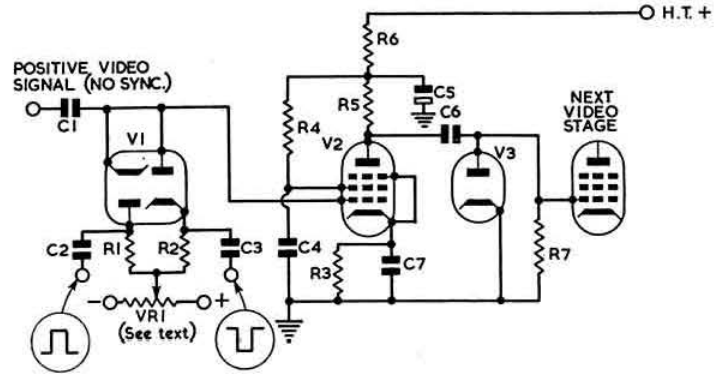

Fig. 2.—Typical video amplifier stage showing d.c. clamping circuit and d.c. restorer

C1	500 $\mu\mu$F	R1, 2	100,000 ohms	R7	1 Megohm
C2, 3	0.1 μF	R3	180 ohms	V1	6H6, EB91
C4, 5	8 μF	R4	10,000 ohms	V2	6AC7, EF50, EF91
C6	0.25 μF	R5	3,300 ohms, 2 watts	V3	EA50
C7	100 $\mu\mu$F	R6	4,700 ohms, 2 watts		

Sync. and Blanking Pulses

With the black level established, the sync. and blanking pulses can be added. Usually the blanking pulses are added to the picture first, and then the sync. is added to these two. For complete versatility, pairs of valves with common load resistors can be used, or various electrodes in one valve can be used for the mixing. The circuit of Fig. 3, due to PA0ZX, uses both methods. V1 is again the clamp valve, this time clamping to earth, VR1 in this case acting as a balancing resistor in case the amplitudes of the clamping pulses are not quite equal. These pulses are obtained from a phase-splitter fed with line sync. pulses. Note that for correct operation, the value of the coupling condenser C2 must not be more than 500$\mu\mu$F. Such a small value is possible without affecting the l.f. response, since no grid leak is used. Negative blanking is also fed into the suppressor of V2; the vision output is thus raised to a value where it can be clipped by V5 during the blanking pulse. V6 is a d.c. restorer, whilst V3 and V4 have a common load resistor to facilitate setting up the sync./picture ratio. If the output is not taken from the common cathode, then an additional cathode-follower stage should be used.

Before leaving the subject of mixers, one other point must be mentioned. If the frequencies of line and frame sync or blanking pulses are doubled at the transmitter, then a black cross test pattern will be reproduced at the receiver, which may be of use since it can be transmitted when the video circuits are inoperative. Similarly any number of vertical or horizontal bars can be introduced from locked oscillators, and by an extension of the

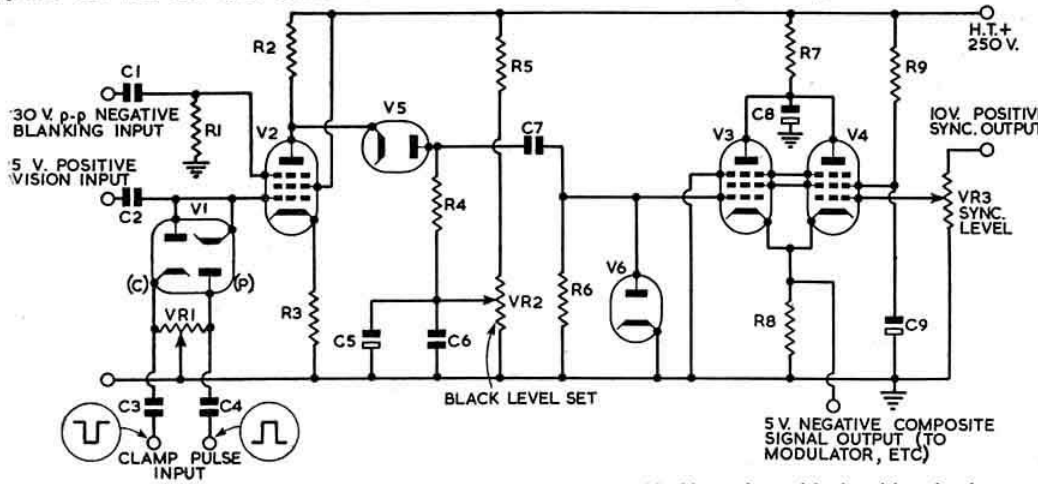

Fig. 3.—Master mixing unit for mixing the synchronising and blanking pulses with the vision signals.

C1	0.5 μF	R1, 6	2 Megohms	V1	6H6, EB91, etc.
C2	500 $\mu\mu$F	R2	3,300 ohms, 2 watts	V2, 3, 4	EF50, EF91
C3, 4	0.1 μF	R3, 8	470 ohms, 1 watt	V5, 6	EA50, EB91
C5, 9	8 μF	R4	100,000 ohms	VR1	250,000 ohms
C6	0.001 μF mica	R5	50,000 ohms, 1 watt	VR2	50,000 ohms
C7	0.25 μF	R7	4,700 ohms, 2 watts	VR3	20,000 ohms
C8	32 μF	R9	10,000 ohms, 1 watt		

principle, various effects such as inlay and overlay can be produced. These pulses and switching waveforms can be inserted in the same way as the blanking or vision signals, leaving the sync signals as they are. This principle is employed in many commercial pattern generators.

Modulators

The above discussion has, of necessity, been specifically TV in nature. Before dealing with the r.f. side, the problem of modulating a u.h.f. transmitter with a wide-band video signal must be considered.

The output from the mixer unit is a composite signal of about 5 volts peak-to-peak; its polarity will depend on the overall design. This signal must be amplified to a level suitable for modulating the transmitter, and this level obviously depends upon the transmitter design used. Although the transmitter proper will be discussed in the last article of this series, one or two generalisations can be made. At the frequencies permitted for amateur television, the p.a. valve will be either an earthed-grid triode, a beam tetrode, *e.g.* the QQVO6/40, or a special valve such as a klystron. The emphasis will be mainly on the 70 cm band, where the available valve types limit the output to 25 watts or less with some exceptions. For normal A3 anode and screen modulation 12.5 watts of audio would be required to 100% modulate a 25 watt carrier. There is no such relation in the case of television, as already explained, but by assuming that an average picture corresponds to about 60% modulation in its accepted sense, a rough idea of the power involved may be gained. It is, of course, essential that the modulator and p.a. can handle peaks without any distortion. In addition, allowance must be made for the fact that basically a u.h.f. transmitter is being modulated; due to inter-electrode capacity, for instance, some r.f. may be radiated even when the p.a. is completely cut off. Transit-time effects cause the grid and anode to be no longer out of phase, and it is customary to modulate both anode (and screen) and control grid to improve efficiency. This is most easily done (as in the SCR522 2 m transmitter) by anode modulating both p.a. and driver stages. For these reasons alone, modulation with a vision signal is very difficult to obtain, and the circuits to be explained are not necessarily the best for the purpose.

In television, it is necessary to modulate the transmitter with the full video bandwidth, say 3 Mc/s. As a modulation transformer is quite out of the question, it is necessary to use valve circuits instead. Fig. 4 shows a very effective "bootstrap" modulator using EF55 or 6AG7 valves. V1 is a video amplifier whose anode load is formed by the grid-cathode resistor of V2A, B, C etc. Any number of valves can be used here depending on the current taken by the p.a. and driver stages. An EF55 will pass 60 mA peak without difficulty. V3 is a d.c. restorer; a clamp would be better, but since the modulater is mounted alongside the transmitter rather than with the vision equipment, the use of a d.c. restorer saves a cable otherwise required for clamp pulses.

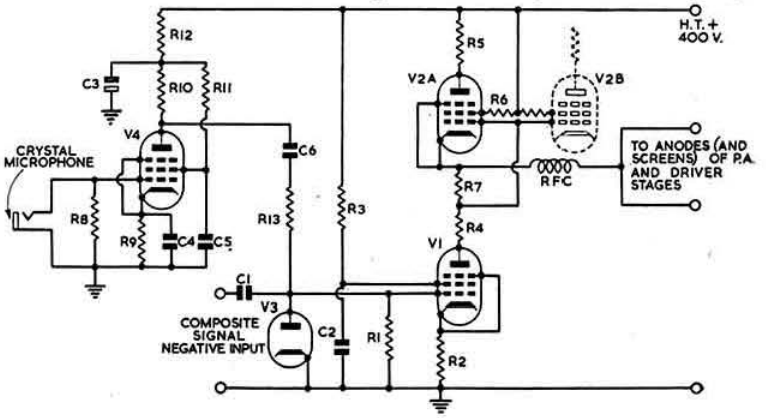

Fig. 4.—A "bootstrap" modulator for 430 Mc/s.

C1	0.25 μF	R2, 9	180 ohms	R12	47,000 ohms, 1 watt
C2	0.5 μF	R3	10,000 ohms, 2 watts	R13	68,000 ohms
C3, 5	8 μF	R4, 5, 6	100 ohms	V1	6AG7
C4	25 μF	R7	3,300 ohms, 1 watt	V2A, B	EF55
C6	0.1 μF	R8	2 Megohms	V3	EA90
R1, 10	470,000 ohms	R11	1 Megohm	V4	EF91

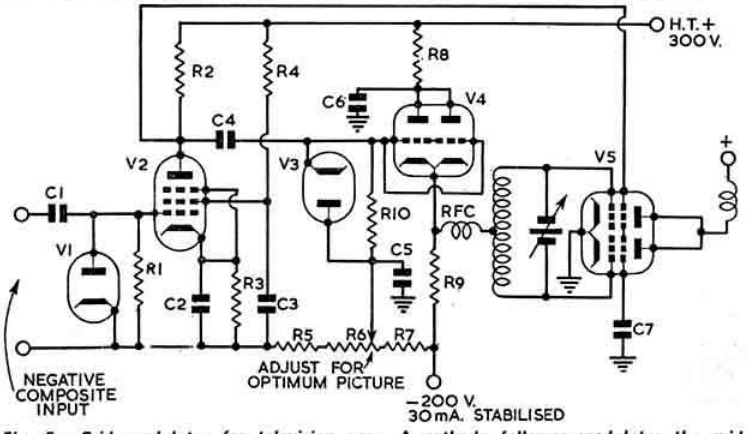

Fig. 5.—Grid modulator for television use. A cathode follower modulates the grid and modulation is also applied to the screen. The circuit was designed by PA0ZX for use in a mobile 420 Mc/s television transmitter employing a QQE03/20 power tripler.

The circuit has the disadvantage that an isolated heater line is required for V2. Also, the h.t. supply must be higher than usual, but as u.h.f. valves are usually low voltage devices, this may be unimportant.

With current G.P.O. regulations, the callsign must be transmitted at intervals on the vision carrier, and an EF91 speech amplifier is provided for this purpose.

Whilst anode modulation permits higher r.f. efficiency, good results can be obtained from grid modulation. It is also possible, but not desirable, to modulate a power multiplier stage. A cathode follower should be used for grid modulation, care

(Continued on page 114)

Checking Communications Receivers

Simple Tests to Maintain Performance

By WILLIAM A. HOPE (B.R.S. 20078)*

At first sight this article might appear to have been written exclusively for non-transmitting members. In point of fact, however, the methods described here can be adopted to advantage by all who wish to maintain the performance of a particular receiver, irrespective of type.

THE performance of a communications receiver falls off for a variety of reasons, two of which are long use and variations in component values. The purpose of this article is to encourage the amateur to restore his receiver to its original condition by simple means. The methods outlined may be used with confidence. Owing to the complexity of the average communication receiver great care should be exercised at all times. For this reason it is recommended that the maker's handbook should be studied before any attempt is made to effect re-alignment.

Initial Procedure

Prior to servicing, the receiver should be tested on all ranges in order to ascertain whether or not the sensitivity and calibration are correct. When this has been done the chassis should be removed from its cabinet and all components examined for overheating. Resistors should be checked with a reliable testmeter and, allowing for the usual tolerance of 20 per cent., all those having a value differing from the specification by 25 per cent. or more should be replaced. Similarly, any condensers which, when isolated and checked on a megger, appear leaky should be replaced. The valves should also be tested, of course.

The following tests may then be carried out, with a non-inductive resistor, equal to the input impedance of the receiver, connected across the receiver input terminals.

I.F. Alignment—No Crystal Filter

The most accurate method of lining up an i.f. amplifier is to use an oscilloscope and wobbulator, but as this equipment is not generally available the amateur must normally use a signal generator in conjunction with an output meter (a multi-range test meter switched to an appropriate a.c. voltage range will serve) connected to the output terminals of the receiver. The a.v.c., b.f.o., and noise limiter are all switched off and the gain controls set at maximum.

The lead to the mixer grid is then disconnected and a modulated signal of about 100 microvolts injected at the intermediate frequency. Next the primary and secondary of the final i.f. transformer are adjusted for maximum reading on the output meter, the procedure being repeated on each of the other i.f. transformers. During this operation it will probably be necessary to reduce the audio and/or r.f. gain.

Finally, all stages are again checked to ensure that maximum output is being obtained.

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I.F. Alignment—With Crystal Filter

The controls are set in the same way as for the alignment of an ordinary i.f. amplifier and the crystal filter switched into circuit. An unmodulated signal of about 100 microvolts is then injected into the mixer grid.

The signal generator is tuned to either side of the nominal intermediate frequency until a pronounced increase in output indicates that the resonant frequency of the crystal has been found. Starting with the *first* i.f. transformer (*i.e.*, that incorporating the crystal filter), all the i.f. stages are adjusted for maximum response.

When this has been done, output from the signal generator is increased to about 130 microvolts and the crystal phasing checked in the following manner. The audio gain control is first adjusted until an output of 200 mW. is obtained. The signal generator is then detuned until an output of 30 mW. is indicated. By rotating the phasing control it should now be possible to reduce output to zero, showing that the crystal circuit is phasing correctly. The procedure is repeated with the signal generator detuned on the other side of the intermediate frequency.

I.F. Bandwidth

To check the i.f. amplifier bandwidth, an unmodulated signal at the intermediate frequency is injected into the receiver, the input being adjusted to give an output of 100 mW. The output of the signal generator is then doubled and the signal generator tuned to one side of the i.f. until the output from the receiver is again 100 mW. The frequency is recorded and the

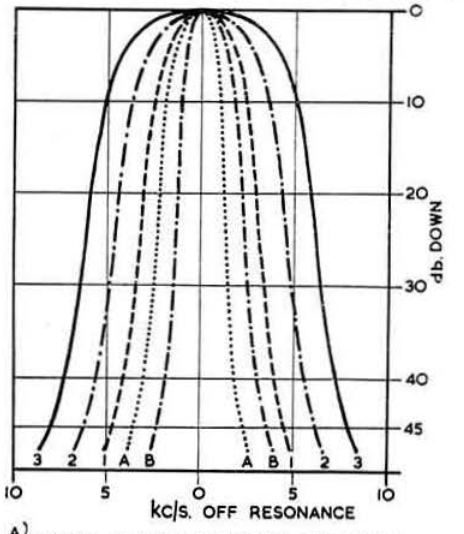


Fig. 1.—Selectivity curves of a typical 465 kc/s i.f. amplifier. The curves A and B represent the effect of the crystal phasing control.

procedure repeated on the other side of the i.f. The difference between the two signal generator frequencies for the same 100 mW output is the i.f. bandwidth at 6db down. The reference level is retained because the original input is doubled.

I.F. Selectivity

I.F. selectivity is the ratio of the voltage input *off resonance* to the input *at resonance* for the same output. Typical selectivity curves of an i.f. amplifier are shown in Fig. 1.

For this test the signal must be unmodulated because the selectivity of the crystal filter would remove the modulation. The output of the signal generator is set so that an output of 100 mW. is obtained from the receiver. The actual input is noted. Assuming the i.f. is 465 kc/s, the signal generator is then tuned to 460 kc/s and the input which is needed to give an output of 100 mW again is found. The procedure is repeated at 5 kc/s intervals down to 440 kc/s and up to 490 kc/s. The input (in microvolts) off resonance in each case is then divided by the input at resonance and the results plotted as in Fig. 1. The ratio can be converted to db by multiplying the logarithm (to the base 10) of the ratio by 20, *i.e.*, $[(20\ Log_{10}\ Eo)\ /Er]\ db$ where *Eo* is the input off resonance and *Er* is the input at resonance. If switched selectivity positions are provided, the tests should be carried out on each position in turn.

Calibration and R.F. Alignment

A crystal frequency sub-standard or a crystal checked heterodyne frequency meter should be used for calibration checking.

Starting on the highest frequency range, and using a 1 Mc/s standard, the receiver should be tuned to, say, 25 Mc/s. The oscillator trimmer is then adjusted until the signal is heard, particular care being taken to ensure that the oscillator is on the correct side of the signal. The calibration is then checked at the low frequency end of the range, the l.f. adjustments being done by inductance variations. The r.f. and mixer stages are then adjusted for maximum output. (In general, the receiver should be aligned first at the high frequency end of each range and then checked at the l.f. end. It is usually necessary to repeat the procedure several times to ensure correct tracking.—Ed.) On tuning through the entire range of the receiver the 1 Mc/s points should be heard every megacycle; the dial calibration should coincide each time. Additional crystal outputs on 100 kc/s and 10 kc/s are needed to check the calibration of some receivers, such as the Eddystone S640, which employ separate bandspread.

Overall Sensitivity

Sensitivity curves of an average receiver on one of its h.f. ranges are shown in Fig. 2. For the purposes of illustration, the checking of the sensitivity from 18 to 32 Mc/s, assuming an approximate signal-to-noise ratio of 9:1 and a constant output of 50 mW., will be described.

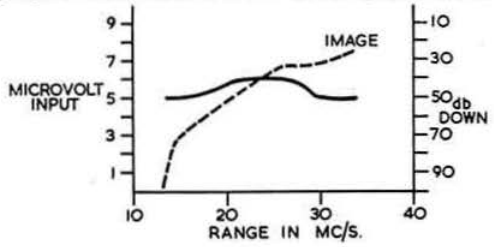


Fig. 2.—Typical communications receiver sensitivity curve. The dotted line represents the image response plotted as described in the text.

A modulated signal is injected at 18 Mc/s and the signal generator output adjusted to give a receiver output of 50 mW. The procedure is then repeated each megacycle up to 32 Mc/s and a graph of the results plotted—frequency on the horizontal scale and microvolts input on the vertical scale.

Image Ratio

Basically, the image ratio is the ratio of the voltage output from the desired signal to the voltage output from the undesired signal. For example, if a receiver with an i.f. of 465 kc/s is tuned to a signal on 20 Mc/s, the local oscillator may be tuned to 20.465 Mc/s. However, a signal on 20.93 Mc/s will also give a 465 kc/s "beat" thus producing the image. The image ratio is, therefore, dependent on the selectivity of the r.f. stage and choice of i.f.; the higher the intermediate frequency the better will be the image ratio.

To check the receiver's performance in this respect, it should be tuned to, say, 20 Mc/s and the signal generator adjusted to give a receiver output of 50 mW. The signal generator is then tuned to 20.93 Mc/s and its output adjusted to give a receiver output of 50 mW again. If the procedure is repeated each megacycle, the results may be plotted on the same graph as the overall sensitivity.

Television Transmission for the Amateur

(continued from page 119)

being taken to maintain correct bias on the p.a. A problem that arises with earthed grid valves in particular is that they must be "earthed" *via* at least 200$\mu\mu$F. This means that the modulator load is highly reactive. A very large cathode follower valve may be needed, but for a small valve, such as the CV53 running at about 2 watts input, a 6AG7 is quite satisfactory. If, say, a DET24 is used, a pair of 807s or EF55s may be required. It must also be remembered that a considerable excess of grid driving power must be available with conventional p.a. circuits under wide-band grid modulation conditions, the surplus being dissipated in a lamp or similar non-linear impedance. If only just enough drive to the p.a. is available, grid modulation will not be as satisfactory as anode modulation.

Components List for Fig. 5

C1	0.25 μF	R6	25,000 ohms, wire wound
C2, 3, 6	50 μF	R7	20,000 ohms, 1 watt
C4	0.5 μF	R8	5,000 ohms, 4 watts
C5	25 μF	R9	4,700 ohms, 10 watts
C7	10 $\mu\mu$F	V1, 3	EB91
R1	470,000 ohms	V2	6AG7
R2	1,500 ohms 2 watts	V4	ECC82
R3	220 ohms, 1 watt	V5	QQE03/20
R4	10,000 ohms, 1 watt		
R5	25,000 ohms, 1 watt		

A grid modulator for a QQV03/20 power tripler is shown in Fig. 5. V2 is a video amplifier, V1 and V3 are d.c. restorers, and V4 is the cathode follower. Note that the p.a. is also modulated on the screen by the lead from V1, in order to increase the "depth of modulation." 35% r.f. efficiency is obtainable. The circuit can be used with any other p.a. with minor modifications.

(To be concluded)

The R.S.G.B. in Retrospect

1934—1938

By C. H. L. EDWARDS (G8TL)*

The Society Comes of Age

IN July, 1934, the Society attained its majority—an occasion marked by the issue of a special 21st Birthday Number of the *T. & R. Bulletin*. Great satisfaction was expressed when the following message came to hand from H.R.H. The Prince of Wales, K.G. (now H.R.H. The Duke of Windsor, K.G.) who was then Patron of the Society:

> "*On the occasion of the 21st Anniversary of the R.S.G.B. it affords me great pleasure to offer you my sincere congratulations on the material assistance which has been afforded by the Society and its industrious members in the development of wireless as we know it.*
>
> "*Wireless telegraphy and broadcasting are outstanding achievements of the age, and their rapid progress during the last decade would have been impossible without the enthusiasm and research of the amateurs headed by the Radio Society of Great Britain.*
>
> *Edward P. Patron.*"

Under the Presidency of Mr. Arthur E. Watts (G6UN) the membership of the Society had, by this time, risen to around 2000.

The Research and Experimental Section, now under the management of Mr. H. Cecil Page (G6PA) had taken the place of Contact Bureau. At about this time too a Technical and Information Bureau was established to answer members' questions. In preparation for future International Conferences the Band Monitoring Group made band occupancy checks. In September, 1934, television permits were made available by the Post Office, the frequencies allocated being 28 to 30 Mc/s for sound and 30 to 32 Mc/s for vision. During this year permission to use aerials longer than the statutory 100ft was granted on application to the G.P.O. The amateur licence had, up to that time, allowed only two hours a day for transmission. An increase to four hours a day was authorised.

The "Bulletin" Grows

At the beginning of 1935 membership had increased to about 2250 with 500 overseas members on the roll. Services to non-transmitting members were continued, despite the fact that then, as today, few bothered to acknowledge the many hours of devoted service put in by those who transmitted slow Morse for practice purposes. Fewer still acknowledged the use of the calibration signals, yet had the Society failed to maintain these services it would no doubt have been subjected to severe criticism.

By this time the BULLETIN had increased to an average of 40 pages per issue. Discussions with the G.P.O. resulted in improved license facilities, including permission to operate portable equipment. The period during which the 3.5 Mc/s band could not be used in summertime was reduced to the month of September only. Since 1932 the band had only been available at weekends during the months of May to September. A new clause added to the amateur licence made it an offence to use an amateur station for the benefit of any social or political organisation.

Looking to the future, the Council set up a small committee to study matters which might be discussed at the forthcoming Cairo International Telecommunication Conference.

* *10 Chepstow Crescent, Newbury Park, Ilford, Essex.*

Guard Bands Reduced

At the beginning of 1936, with Mr. A. E. Watts still President, the membership stood at a little over 2600.

During this year, largely as the result of the efforts of the General Secretary, the G.P.O. agreed to issue 25 watt licences. Other license concessions secured during the year included permission to use aerials up to 150ft in length, a reduction of the extra charge for 25 watt permits from £1 1s. to 10s., and the granting of 56 Mc/s portable facilities, without extra charge, to members recommended by the Society. After representations by the Liaison Committee, the G.P.O. agreed to reduce the guard-bands (which were a feature of pre-war British license regulations) to 5 kc/s at each end of the bands which thus became 1720 to 1925 kc/s, 3505 to 3730 kc/s, 7005 to 7295 kc/s, 14005 to 14395 kc/s, 28010 to 29990 kc/s and 56026 to 59980 kc/s.

[After the Washington Conference of 1927 the G.P.O. instituted guard bands 25 kc/s wide at the high and low ends of all amateur bands. The guard bands were designed to avoid the possibility of amateur signals falling outside the International amateur bands. ED.]

Holders of all experimental licences were informed that a broadcast receiving licence had to be taken out if they wished to listen to the B.B.C. As all call-signs in the G2, 5 and 6 series had by now been allocated, call-signs in the G8 series were introduced.

After making more than 5000 checks the Band Monitoring Group reported that the general standard of operating technique shown by the British amateurs was excellent. Very few cases of off-frequency operation were reported.

Because membership had increased County Representatives found it increasingly difficult to organise activities in their county effectively, Town Representatives were therefore appointed to look after the interests of local groups.

When H.M. King George V died, in January, 1936, a telegram of sympathy was sent to the Society's Patron, (H.R.H. The Prince of Wales, K.G.) who then became King Edward VIII.

For the first time brief autobiographies were published of those nominated to serve on the Governing Body. Radio insurance policies for amateur stations were offered by Lloyds. A kilocycles-to-metres conversion booklet had a steady sale.

Membership reaches 3000

Mr. E. D. Ostermeyer (G5AR) became President in January, 1937. At the same time Mr. Clarricoats was appointed by the Council to assume full responsibility for the BULLETIN. His new title was Secretary-Editor. Membership passed the 3000 mark. The G.P.O. had by this time issued 1386 full licences and 1230 A.A. licences.

Following the resignation of Mr. J. D. Chisholm (G2CX) as QSL Manager the Bureau was transferred to Headquarters who dealt with an average of 30,000 cards a month.

Preparing for the Cairo Conference

"Questions and Answers," "The Helping Hand" and "Soliloquies from the Shack" by "Uncle Tom" (L. H. Thomas, G6QB) were new BULLETIN features. The following extract from "Soliloquy" published in the July, 1937 issue could apply with equal force today:

> "*Cairo is not far away and anything might happen there. Certain it must be that little can happen in the amateur's favour unless he takes steps to police his own ranks, and very swiftly. Some of the Cairo delegates might own dual wave receivers, and might, with the rest of the world, have writhed in impotent anger at the rot they hear some time or other. Unless it is cleared up, this rotten operating will swing the pendulum against us all in the end.*"

In preparation for the Cairo I.T.U. Conference, Messrs. Watts and Clarricoats were invited to submit a detailed

statement to the G.P.O. in support of the amateur case. The result of band occupancy checks made over a period of four years together with reports of commercial activity were included in the statement together with much other data.

Mr. H. A. M. Whyte (G6WY) became QRA Manager in succession to Mr. Maurice Williams (G6PP) who resigned after nine years' service.

As the result of representations made by the Society the G.P.O. agreed to issue separate prefixes to Scotland (GM) and Wales (GW).

Emergency Network Suggested

During 1937 the Society suggested to the Home Office that, in the event of war, an emergency Amateur Radio network might be useful. The offer was not, however, accepted.

At this time applications for permission to use high power had to be based on sound technical grounds and an assurance given that crystal control or some other form of frequency stabilisation would be used. All such applications had to be submitted to R.S.G.B. Headquarters together with a report from the District Representative.

The Cairo Conference, 1938

Mr. Arthur Watts (G6UN), who was again President in 1938, volunteered to attend the Cairo International Telecommunications Conference as an I.A.R.U. delegate. One of the major issues discussed at that conference was the future of the 7 Mc/s band which, after much argument, was held as an amateur allocation subject to the proviso that in Europe the portion 7200 to 7300 kc/s would be shared with broadcasting. Difficulty was also experienced in retaining the 56 to 60 Mc/s band but thanks to the support given by the British and U.S.A. Governments its continued use was finally secured with the possibility of a new band around 112 Mc/s for experiments. The chief impression which the I.A.R.U. delegates brought back to their respective countries was that the experimental work done by amateurs had been chiefly responsible for the v.h.f. bands being retained as amateur allocations.

The R.S.G.B. Stand at Radiolympia, 1936. In the picture are G2MI (now President), Miss May Gadsden and the General Secretary. Miss Joan Clarricoats (now Mrs. Matthews, wife of Peter Matthews. G3BPM) is next to G6CL.

National Field Day, again held in June, was by now rapidly becoming one of the most popular events in the R.S.G.B. Calendar. The Society's 13th Annual Convention took place in September and a stand was again taken at Radiolympia. Membership was now 3350; full calls issued numbered 2200 and A.A. calls about 1700.

Revenue from BULLETIN advertising rose to more than £2000 net. As a service to members, a film was compiled of well-known British amateur stations. The first G3 calls were issued, the G8 series having been exhausted.

The first Old Timers' Dinner for those licensed before June 1, 1928—held at the Florence Restaurant, Rupert Street, London—was attended by more than 80 amateurs. The R.S.G.B. supported the formation of the First Class Operators' Club. John Hunter (G2ZQ) became the first President.

The Civilian Wireless Reserve

A most important development during 1938 was the formation of the R.A.F. Civilian Wireless Reserve. The Air Ministry recognising that many amateurs, particularly those with good technical ability and education, would make excellent R.A.F. officers should the need arise, invited the co-operation of the R.S.G.B. After discussing the project with representatives of the Society, Air Commodore C. W. Nutting, O.B.E., D.S.C., Director of Signals, R.A.F., addressed the members present at the 1938 Convention and gave details of the scheme. Mr. Watts and the General Secretary served on the Organising Committee and both remained members until September, 1939. Among the tasks imposed on Mr. Clarricoats by the Air Ministry was that of recommending District Controllers for commissioned rank. The Reserve recruited a large number of skilled personnel, a fact which proved an enormous asset to the Service when war broke out the following year.

"The Amateur Radio Handbook"

The year 1938 was noteworthy also for the first appearance of *The Amateur Radio Handbook* which grew out of *A Guide to Amateur Radio*. The latter had been published annually from 1933 to 1937. After the appearance of the 1937 edition of the *Guide* a group of old-timers, which included Messrs. H. A. M. Clark (G6OT), D. N. Corfield (G5CD), F. Charman (G6CJ), S. K. Lewer (G6LJ) and J. W. Mathews (G6LL), together with the General Secretary decided that the moment had arrived to recommend the Council to launch a comprehensive Amateur Radio text-book. Each member of the Guide Committee selected a subject or group of subjects and after months of re-writing and cross-checking, a final all night meeting took place at the home of Mr. Clarricoats where the various sections were welded into one comprehensive handbook. These contributors deserve great credit, for they received no financial benefit from the Society for the long hours they so willingly put into the preparation of the handbook. Incidentally, nearly 200,000 copies were sold in the course of the next few years and reprinting only ceased when the type wore out! It is worth recalling that practically all of the Society's subsequent financial reserves were built up from the sale of the *Handbook* and the *Supplement* to it, produced during the war years and not from subscriptions.

(*To be continued.*)

University of Adelaide

THE Amateur Radio station attached to the recently reformed Adelaide University Radio Club is anxious to contact other Universities and similar organisations throughout the world.

The Club station operates mainly on 14 Mc/s under the call-sign VK5UA.

NATIONAL FIELD DAY 1954 RESULTS

N.F.D. Trophy Winners	...	Bristol (G2IK/P & G6GN/P)	1091 pts.
Runners-up	...	Coventry (G5PP/P & G5SK/P)	1089 pts.
Leading "A" station	...	East Molesey (G6MB/P) ...	692 pts.
Leading "B" station	...	Croydon (G6LX/P) ...	656 pts.
Best 1.8 Mc/s ...	...	Coventry (G5PP/P) ...	335 pts.
Best 3.5 Mc/s ...	...	Croydon (G6LX/P) ...	452 pts.
Best 7 Mc/s ...	...	Forfar (GM3FEU/P) ...	364 pts.
Best 14 Mc/s ...	...	Croydon (G6LX/P) ...	204 pts.
Scottish N.F.D. Trophy ...	...	Aberdeen (GM2CAS/P & GM2FHH/P) ...	868 pts.

Overseas station contributing most points to competing stations: DL2RO/P.

Bristol does it again
Roy Poeton, G3CTN (Bristol C.R.), operates the Bristol "A" station transmitter (G2IK/P) with Eric Chambers, G2FYT (Bristol T.R.) as second operator in the background. Standing watching is Claude Pope, B.R.S.12716.

NATIONAL Field Day, 1954—or National Flood Day as one Group dubbed it—will long be remembered by all who sampled the watery charm of this "random variation" of a British summer. But none will have better reason to remember June 12–13 than the members of the Bristol Group. In those twenty-four hours, when the greater part of the British Isles became steadily damper and damper, Bristol was able to win—by the narrowest of margins—the Field Day Trophy for the third successive year. Comment on such a record is superfluous. One can only state the plain facts: for three years running, Bristol—out of more than 100 groups—have emerged victorious. Perhaps we had better give them the Trophy outright at Convention and have done with it!

Surprisingly enough in view of the consistent downpour experienced almost everywhere (though some Northern groups were able to report *good* weather), the scores were generally up on last year. No fewer than eight groups topped the four figure mark compared with five in 1953 and only two in 1952. Few stations were put off the air for long—except those who wisely closed down at the height of a severe electrical storm. Fortunately, only one minor shock is reported from this cause, though formidable static charges built up on some of the long-wire aerials. Not only was this the wettest, but almost certainly the most QRN-prone N.F.D. on record.

How difficult it is becoming to dislodge the leading groups is clearly shown by the fact that all four top awards—winners, runners-up, leading "A," and leading "B"—go to the same groups as in 1953. Coventry, however, who have been runners-up four times since the war, came within an ace of breaking the long run of West Country victories. Indeed they would almost certainly have done so if they could have achieved the same extraordinarily high standard of accuracy in their log as that recorded by Bristol. Altogether Coventry made over 400 contacts, and set a cracking pace by making 25 contacts in the first hour on 3.5 Mc/s.

As though to counteract the non-changing aspect of the top awards, new groups succeeded in capturing all of the "Best of the Band" positions: Coventry 1.8 Mc/s; Croydon 3.5 Mc/s; Forfar 7 Mc/s; and Croydon again on 14 Mc/s. Croydon with three top positions to their credit (Best "B," best 3.5 Mc/s, and best 14 Mc/s)—all gained by their "B" station—and a third in the final table seem all set to challenge the leaders next year.

The freedom to choose frequency groupings has now firmly established its popularity: while this facility appears to make little or no difference to final results, it undoubtedly enables the activity to be spread more evenly between the two stations, particularly for the lower scoring groups.

Bristol does it again
A slight hitch at Bristol "B" station. Vic Newport, G3CHW is seen investigating the interior of the receiver which has given cause for anxiety. Others in the picture are Harry Gratton, G6GN, and Ken Ottrey., G3ECS.
(Photo—Western Daily Press, Bristol)

Station Operators and Equipment

Here for the record are the operators and equipment that brought home the top awards:—

Bristol "A".—(1.8/3.5) e.c.o. (6L6)—p.a./p.d. (807) with

Psn.	Town or Area	1.8	3.5	7	14	"A"	"B"	Total	Freq. grouping
1	Bristol	257	351	308	175	608	483	1091	Old
2	Coventry ...	335	425	150	179	485	604	1089	New
3	Croydon ...	194	452	204	204	398	656	1054	New
4	Cambridge ...	281	447	167	154	448	601	1049	New
5	Cheltenham ...	313	367	183	176	496	543	1039	New
6	Stourbridge ...	310	346	242	140	552	486	1038	New
7	East Molesey ...	262	430	239	87	692	326	1018	Old
8	Gravesend ...	279	351	243	140	630	383	1013	Old
9	Hexham & Dist.	198	425	205	163	403	588	991	New
10	Derby	220	363	270	124	583	394	977	Old
11	Slough	278	317	228	141	595	369	964	Old
12	Weston-super-Mare	290	357	212	94	502	451	953	New
13	Southampton ...	245	378	207	118	452	496	948	New
14	Hove & Dist. ...	274	378	157	134	431	512	943	New
15	Guildford & Woking	273	450	174	3	447	453	900	New
16	Pontefract ...	297	353	155	92	452	445	897	New
17	Coulsdon & Dist.	284	353	183	68	467	421	888	New
18	Cardiff	249	257	268	103	506	371	877	Old
19	Aberdeen ...	110	221	363	174	331	537	868	Old
20	Hull	295	274	269	12	564	286	850	New
	Brentwood & Dist.	271	428	98	53	369	481	850	New
22	Sheffield ...	277	350	149	71	426	421	847	New
	Gloucester ...	259	278	237	73	537	310	847	Old
	Medway ...	259	365	186	37	445	402	847	New
25	Southgate & Dist.	262	343	174	60	436	403	839	New
26	Chelmsford ...	252	386	154	25	406	411	817	New
27	Brighton ...	262	319	159	59	421	378	799	New
28	Ealing	308	336	147	6	455	342	797	New
29	South Birm'ham	303	380	103	5	406	385	791	New
	Forfar	203	214	364	10	417	374	791	Old
31	York	278	338	168	2	446	340	786	New
32	Glasgow ...	192	198	256	131	390	387	777	Old
33	Chester ...	226	178	249	90	404	339	745	Old
34	Grimsby & Cleethorpes	267	345	89	38	356	383	739	New
35	Norwood & Dist.	216	217	169	118	433	287	720	Old
36	Neath & Port Talbot	234	269	78	124	312	393	705	New
37	Norwich ...	204	294	105	90	309	384	693	New
38	Edinburgh ...	204	240	168	77	372	317	689	New
39	Peterborough ...	296	331	12	48	308	379	687	New
40	West Cum'land	177	322	166	14	343	336	679	New
41	Barnsley ...	231	365	78	3	309	368	677	New
42	Sutton & Cheam	192	231	213	40	423	253	676	Old
43	Edgware & Hendon	223	316	95	36	318	352	670	New
	Blackpool ...	181	310	113	66	294	376	670	New
45	Chingford ...	253	273	49	88	302	361	663	New
46	Stockport ...	234	317	92	18	326	335	661	New
47	Luton ...	252	343	62	3	314	346	660	New
48	Boston	191	326	136	–	517	136	653	Old
49	West Hartlepool	216	256	99	75	472	174	646	Old
50	Harlow & Dist.	148	203	150	138	351	288	639	Old
51	Newcastle-on-Tyne	109	230	171	125	339	296	635	Old
52	Slaithwaite ...	298	333	–	–	631	–	631	Old
53	Isle of Thanet ...	148	329	143	6	477	149	626	Old
54	East Ham ...	178	267	128	51	445	179	624	Old
55	Guernsey ...	121	240	255	5	361	260	621	Old
56	Welwyn Garden City	177	275	120	44	452	164	616	Old
57	Torquay ...	207	157	228	18	364	246	610	Old
58	Ilford	218	308	81	–	299	308	607	New
59	Stroud	213	303	85	2	298	305	603	New
60	Redhill & Reigate	137	169	203	93	306	296	602	Old
61	Christchurch ...	197	230	158	10	327	168	595	Old
62	Worksop & Retford	146	208	196	40	354	236	590	Old
63	High Wycombe	183	224	124	47	307	271	578	New
64	Bath	189	258	94	33	283	291	574	New
65	Wrexham & Dist.	205	252	99	3	304	255	559	New
66	Liverpool ...	88	245	213	2	333	215	548	Old
67	Portsmouth ...	218	294	26	–	244	294	539	New
68	Darwen & Blackburn	275	211	47	–	486	47	533	Old
69	Leicester ...	146	297	82	–	443	82	525	Old
70	Maidstone, Tonbridge & Tunbridge Wells	168	226	110	16	278	242	520	New
71	Rugby	140	278	46	42	186	320	506	New
72	Scarborough ...	48	221	194	38	242	259	501	New
73	Bury	224	270	–	–	494	–	494	Old
74	Petersfield & Dist.	203	287	–	–	490	–	490	Old
	Bletchley ...	219	271	–	–	490	–	490	Old
76	Oxford	135	345	–	–	480	–	480	Old
77	Lewisham ...	15	358	52	27	67	380	447	New
78	Bromley & Beckenham	86	108	181	67	194	248	442	Old
79	Cannock ...	206	226	–	–	435	–	435	Old
80	Uxbridge & Hayes	137	111	158	7	248	165	413	Old
81	Nottingham ...	169	164	78	–	333	78	411	Old
	Exeter	28	231	152	–	180	231	411	New
83	Shefford & Bedford	152	206	39	3	358	42	400	Old
84	East Renfrew ...	120	113	161	–	233	161	394	Old
85	Newark ...	142	237	–	–	388	–	388	Old
86	Loughborough	270	–	90	–	360	–	360	New
87	Lowestoft & Beccles	64	230	63	–	127	230	357	New
88	Enfield	169	168	–	–	337	–	337	Old
89	Wirral	*	336	*	*	–	336	336	New
90	Rotherham ...	81	253	–	–	334	–	334	Old
91	Acton, Brentford & Chiswick	133	193	–	–	326	–	326	Old
	Romford ...	–	297	–	24	–	321	321	New
92	N.W. Manchester	97	104	120	–	201	120	321	Old
	Preston ...	43	218	–	60	261	60	321	Old
95	Dorchester ...	141	176	–	–	317	–	317	Old
96	Baldock ...	–	246	–	67	–	313	313	New
97	Great Yarmouth	80	208	22	–	288	22	310	Old
98	Southport & Formby	116	70	113	5	186	118	304	Old
99	Southend-on-Sea	97	132	69	–	229	69	298	Old
100	Chislehurst & Sidcup	62	24	126	63	86	189	275	Old
101	Walsall	149	–	59	–	208	–	208	New
102	Ardrossan ...	42	76	9	70	118	79	197	Old
103	Mansfield ...	–	185	–	–	185	–	185	Old
104	Cleckheaton ...	67	91	–	–	158	–	158	Old
105	Hounslow & Dist.	154	–	–	–	154	–	154	Old
106	Danbury ...	–	132	–	–	–	132	132	New
107	Plymouth ...	–	90	9	–	90	9	99	Old
	South Shields ...	*	*	*	*	–	–	–	New
	North Cornwall	–	*	–	–	–	–	–	Old

* Denotes disqualification of log due to declared use of power input in excess of 5 watts.

"A" Station Honour Roll

1	EAST MOLESEY (G6MB/P)	692*
2	SLAITHWAITE (G8NF/P)	631*
3	GRAVESEND (G6BQ/P)	630*
4	BRISTOL (G2IK/P)	608*
5	SLOUGH (G3BTP/P)	595*
6	DERBY (G2OU/P)	583*
7	HULL (G2DPA/P)	564†
8	STOURBRIDGE (G8GF/P)	552†
9	GLOUCESTER (G3MA/P)	537*
10	BOSTON (G2AAS/P)	517*
11	CARDIFF (GW5BI/P)	506*
12	WESTON-SUPER-MARE (G5TN/P)	502†
13	CHELTENHAM (G3CGD/P)	496†
14	BURY (G2GA/P)	494*
15	PETERSFIELD & DISTRICT (G5PF/P)	490*
15	BLETCHLEY (G3HYM/P)	490*
17	DARWEN & BLACKBURN (G2HW/P)	486*
18	COVENTRY (G5PP/P)	485†
19	OXFORD (G2DU/P)	480*
20	ISLE OF THANET (G2IC/P)	477*

* Denotes used 1.8 and 3.5 Mc/s. † Denotes used 1.8 and 7 Mc/s.

"B" Station Honour Roll

1	CROYDON (G6LX/P)	656†
2	COVENTRY (G5SK/P)	604†
3	CAMBRIDGE (G5DQ/P)	601†
4	HEXHAM & DISTRICT (G5RI/P)	588†
5	CHELTENHAM (G5BM/P)	543†
6	ABERDEEN (GM2FHH/P)	537*
7	HOVE & DISTRICT (G3FXB/P)	512†
8	SOUTHAMPTON (G5OB/P)	496†
9	STOURBRIDGE (G4MI/P)	486†
10	BRISTOL (G6GN/P)	483*
11	BRENTWOOD & DISTRICT (G8RC/P)	481†
12	GUILDFORD & WOKING (G3FZC/P)	453†
13	WESTON-SUPER-MARE (G5DV/P)	451†
14	PONTEFRACT (G3US/P)	445†
15	COULSDON & DISTRICT (G2KU/P)	421†
15	SHEFFIELD (G5TO/P)	421†
17	CHELMSFORD (G4VF/P)	411†
18	SOUTHGATE & DISTRICT (G5FA/P)	403†
19	MEDWAY (G6NU/P)	402†
20	DERBY (G8QZ/P)	394*

* Denotes used 7 and 14 Mc/s. † Denotes used 3.5 and 14 Mc/s.

Derby "A" station after the rain had ceased. Included in the group are: G3GRM, G5YY, G3GSO, G2CVV (T.R.), G3FGY and G3IBL.

300 volts h.t. HRO receiver. Half-wave dipoles. Petrol generator. Operators G2IK, 2FYT, 3CTN.

Bristol "*B*".—(7/14) v.f.o. (6SK7—6F6—6F6)—f.d. (6V6)—f.d. (6J5 14 Mc/s only)—p.a. (807) with 300 volts h.t. SP400X receiver (later replaced by AR88D owing to screen-bypass condenser failure). Petrol generator. Operators G3RQ, 3CHW, 3ECS, 6GN.

Coventry "*A*".—(1.8/7) 6J5—6F6—6V6GT—807 with 250 volts h.t. AR88 plus BC453 as Q5-er. 260 ft end fed and 7 Mc/s half-wave dipole. Petrol generator. Operators G3HWR, 3IWF, 5PP, 5SK, 6TD.

Coventry "*B*".—(3.5/14) 6J6—Z77—EL91—EL91—miniature 807 with 260 volts h.t. Modified BC454 plus BC453 as Q5-er, with crystal-controlled converter for 14 Mc/s. Aerials 260 ft 3.5 Mc/s dipole and two section W8JK. Petrol generator. Operators G2DK, 3ABA, 3HLA, 4NB.

East Molesey "*A*".—(1.8/7) Clapp v.f.o. (CV138)—p.a. (CV428) with 250 volts h.t. HRO plus Q5-er. 264 ft centre-fed aerial with tuned feeders. 12-volt rotary generator plus storage batteries. Operators G2NH, 5LC, 6GB.

Croydon "*B*".—(3.5/14) v.f.o. (EF80)—f.d./b.a. (EF42)—f.d. (EF42 14 Mc/s only)—p.a. (half of 815, the remaining half being connected to provide neutralisation) with 200 volts h.t. AR88. Three 138 ft end fed aerials spaced 120 degrees and used separately. Genemotor and vibrapack. Operators G3BFP, 4QK, 5BZ, 6LX.

Surveying the remaining stations, our pet statistician finds that once again there was a most marked preponderance of HRO receivers (90) compared with: Eddystone 640–17; AR88–16; BC348–16; home-built (ranging from four-valve straight to 18-valve double superhet)–10; CR100–10; R107–7; BC342–6; AR77–3; and a number of miscellaneous types (including one Japanese riddle) with not more than two of any particular model. Home-built receivers show a decided increase in number while many of the commercially-built models have been extensively modified or incorporate home-built converters.

Several groups object to the use (by others) of petrol generators, and there have again been a number of suggestions that limitations on the type of power amplifier valve be imposed. The Contests Committee, however, though

Top Ten

1.8 Mc/s		3.5 Mc/s	
Coventry	335	Croydon	452
Cheltenham	313	Guildford & Woking	450
Stourbridge	310	Cambridge	447
Ealing	308	E. Molesey	430
S. Birmingham.	303	Brentwood	428
Slaithwaite	298	Coventry	425
Pontefract	297	Hexham	425
Peterborough	296	Chelmsford	386
Hull	295	S. Birmingham	380
Weston-s-Mare	290	Southampton	378
		Hove	378
7 Mc/s		**14 Mc/s**	
Forfar	364	Croydon	204
Aberdeen	363	Coventry	179
Bristol	308	Cheltenham	176
Derby	270	Bristol	175
Hull	269	Aberdeen	174
Cardiff	268	Hexham	163
Glasgow	256	Cambridge	154
Guernsey	255	Slough	141
Chester...	249	Stourbridge	140
Gravesend	243	Gravesend	140

Field Day Winners, 1948–53

1948		1949	
(1) Edgware & Hendon	774	(1) E. Molesey	914
(2) Southgate	693	(2) Coventry	850
(A) Slough	423	(A) Slough	469
(B) Edgware & Hendon	441	(B) E. Molesey	486
1950		**1951**	
(1) Cheltenham	847	(1) Falkirk	931
(2) Cambridge	818	(2) Slough	894
(A) Coventry	522	(A) Chelmsford	556
(B) W. Cornwall	431	(B) Falkirk	503
1952		**1953**	
(1) Bristol	1123	(1) Bristol	1054
(2) E. Molesey	1032	(2) Coventry	1021
(A) Bletchley	627	(A) E. Molesey	623
(B) Slough	511	(B) Croydon	562

Some of those who assisted at the West Hartlepool station. Included in the group are: G3GIL, G3CHJ, G3AWL, G3LS, and G3IEN.

G4GA (third left front) and party at the Chingford "A" station.

recognising the logic behind these requests, is most reluctant to introduce any new rules restricting the right of Groups to choose their own equipment. Such restrictions would undoubtedly make it more difficult for many of the smaller groups—who often adapt fixed station equipment for the day—to put together a station. Such rules might, therefore, defeat the prime object of N.F.D. which is that as many as possible groups should take part. No rules could be devised which would prevent a group determined to flout the power rules from doing so. Once again, we can only ask what possible satisfaction could be obtained from winning the Trophy by deliberately cheating in this respect?

The present popularity of power amplifier valves is: 58 stations used the ubitiquous 807 (or equivalent); TT11–24; 6V6–16; 6L6–10; 6AG7–8; 832–7; QVO4/7–7; 832–7; 6AQ5–5; and various miscellaneous types. Approximately 55 stations used petrol generators either direct or to float-charge storage batteries. Several of these found that keeping a p.e. set going in wet weather is by no means easy; another point in their favour is that many of them are considerably more portable than some of the very large storage batteries favoured by other groups.

ZC4CA/P, located at Kantara, Cyprus, gave points to many N.F.D. stations. Here are some of the operators. Left to right S.W.L., G3BUX, ZC4CA, ZC4CK, ZC4LW, ZC4CK, ZC4MW, ZC4GF and at the rear (right) ZC4FB.

Around the Bands

Scoring rates on the four bands followed closely the pattern of 1953, the 3.5 Mc/s band generally contributing the most points. 14 Mc/s, however, showed a marked improvement indicating perhaps that conditions on this band are now on the mend again. DX this year included such plums as VS6, JA2, KL7, W6, PY, LU, ZD4 and ST2. VP9BL/P, ZC4CA/P and ZB1F/P put 12 points apiece on a number of the logs. The ZC4CA/P crew consisted of ZC4CA, CK, FB, GF, JJ, LW, PB, ex-YI2AM and an enthusiastic SWL camp major. A half-gale almost dislodged them at times from their eyrie—a ridge 2000 ft above the Mediterranean. But there may well be a general exodus to Cyprus after reading of "lazing in the hot sunshine during off-duty moments." The rig was c.o./p.a. with power descending, as the batteries gave out, from an early peak of 30 watts.

On 7 Mc/s a close struggle developed between two Scottish groups. Forfar scraped home by a single point but Aberdeen had the consolation of carrying off the Scottish N.F.D. Trophy for the first time.

As usual several portables were out in Eire. Continental field stations, also, were most welcome and included the

Included in this picture, taken at the Walsall "A" station, are G2FQR, G3APZ, G2FPR and G3BLZ.

regular Swiss "fieldites" plus strong German, Belgian and Dutch contingents. Once again, DL2RO/P, at the Royal Signals Training School, with between 7 and 10 watts on the four bands to a 260 ft end-fed wire only 16 ft high and a battery operated AR88D proved to be the overseas station contributing the most points to British portables. 2RO comments that call-signs were often difficult to read due to incorrect Morse, and a number of stations have lost points by not waiting to receive acknowledgment of their reports.

Here and There

Cheltenham remarks on the apparent deterioration of record keeping during the contest, leading to "double contacts" or, even more annoying, the refusal of other

G3ARM (left) and G3DBB operating G3GIO/P, one of the Guildford stations.

stations to make contact owing to confusion with similar call-signs already worked. There is no doubt that an efficient " logger " is one of the most valuable assets to a station. By the way, Cheltenham's chief logger has performed this duty for a full 24 hours at each of the post-war N.F.D.s.

Although located on top of a covered reservoir, Wirral experienced difficulties neither from watery notes, nor standing waves! Towards the end, many other groups began to think that they were *in* reservoirs. Rochester, for example, where the rain never ceased, carried on when their tent struck a leak by covering operators and equipment with a plastic " mac " propped up by beer bottles.

A mysterious occurence is reported from the Isle of Thanet where an aerial halyard was apparently deliberately cut through by intruders at 0100 hours—whether by a rival group or local televiewers is unknown. By the aid of car headlamps a 45-foot mast was successfully lowered and re-erected to put the station back on the air within an hour.

Though the overall activity was well maintained, several groups report that operators were unusually hard to come by—and not only in the rain-drenched areas. Blackpool, for instance, had only two full-time and two part-time operators to man both stations. Several marathon efforts by individual operators are reported including the 450 points or so of G3CYS.

Operating and notes varied from very good to middling, with a few complaints of " barging in " on the Empire portables. Once again most of the stations on 1.8 Mc/s persisted in crowding into the first 75 kc/s of the band and ignored the top 125 kc/s.

A few stations had regrettably to be disqualified owing to their declared power being slightly in excess of 5 watts. This was almost certainly the result of slide-rule errors rather than deliberate infringements of the power conditions: groups who do run up the power take good care that this is not reflected in their entry forms. Another instance of bad luck was at Shefford where it transpired too late that a guest operator was a non-member of the Society. One group lost a considerable number of points

NATIONAL FIELD DAY

Group : RUGBY

Call Sign : G8VN/P Station : A ("A" or "B")

Band : 1·8 Mc/s. Claimed Score for this Band : 140

This Station also Claims Points on : 7 Mc/s.

Site : WATER TOWER FARM, BARBY ROAD, RUGBY, WARWICKSHIRE.

(Associated Station : G3AZT/P. (Call sign))

Equipment :

Transmitter : 6F12 VFO → 6U6/1 CF → 6L6/2 FD (1·8 Mc/s) → 6F12 FD → 6V6 PA

H.T. applied to P.A. : 200 (volts). P.A. anode current : 25 mA.

Transmitting Aerials : (1) 235 FT LONG FED (2) 66 FT DIPOLE 150 ft/c.

Receiver : 飛一號無線機 第1327號 東京無線電機株式會社

Receiving Aerials : 135 FT LONG FED.

Power Supplies : VIBRATOR POWER PACK RUNNING ON 6V BATTERIES.

Many different types of receiver were used during N.F.D. Here is a description of the one in use at the Rugby "A" station G8VN/P.

Slough Group. Left to right: Mr. Bruce, G6CJ, G3JSA, G2HOX, G3BGP. *(Photo G3GYD)*

because an operator did not hold a current G.P.O. licence.

The Contests Committee has felt it necessary to draw the attention of the Council to a particular group which, for the second year running, has claimed points for contacts with its own members, despite the change in rules intended to prevent this happening.

On a brighter note, however, the Committee was relieved to find a marked improvement in the logs, and in the care taken to ensure that these were completed in accordance with the rules.

A number of suggestions were submitted. But, for the majority, their feelings were summarised by Scarborough who report " Complaints—nil; improvements—nil."

Hamrad Wholesale, Ltd.

WE have been asked by the above company to state that they operate from 348 Portobello Road, London, W.10. Through the use of a piece of broken type the address shown in their announcement published on Page 94 of the August BULLETIN could have been misread as 343 or 34B Portobello Road. Due to this fact, correspondence for Hamrad Wholesale, Ltd. has been sent everywhere but to the right address, causing a great deal of unnecessary work to all concerned.

Practical Notes on the Miller-Transitron Time-Base

By J. D. HERRING (B.R.S.6360)*

IN the June, 1947, issue of the R.S.G.B. BULLETIN there appeared a comprehensive and extremely lucid analysis of the Miller time-base by B. H. Briggs, B.A. (G2FJD). The article ends with a description of a practical circuit for a self-running linear one-valve time-base. A somewhat similar arrangement with slightly different component values was used by J. F. O. Vaughan in an article, entitled " A General Purpose Oscilloscope," in the May, 1948, issue of *Wireless World*. The writer recently had occasion to construct a simple oscilloscope, of small size, as part of a piece of test equipment, and it was decided to try the type of time-base described using the basic circuit illustrated in Fig. 1 with the component values suggested by G2FJD. A frequency range of 10000:1 is covered in three ranges and a preliminary trial revealed that although the circuit was reasonably satisfactory at the low frequency end of each range, the fly-back progressively deteriorated as the control was advanced until at the high frequency end of each range extremely undesirable effects were experienced.

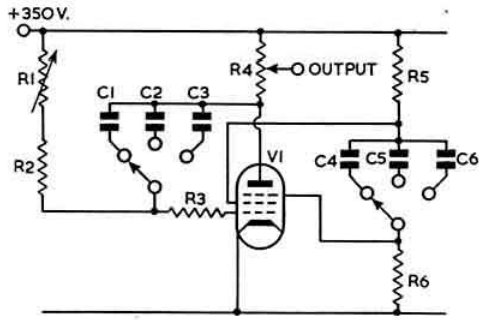


Fig. 1. Circuit diagram of the Miller-transitron time-base designed by B. H. Briggs (G2FJD). Range 1, 20 to 500 c/s; Range 2, 400 to 10,000 c/s; Range 3, 8,000 to 200,000 c/s. C1, 0.01 μF; C2, 500 μμF; C3, 25 μμF; C4, 0.02 μF; C5, 0.001 μF; C6, 100 μμF; R1, 5 Megohm variable; R2, 100,000 ohms; R3, 100 ohms; R4, 50,000 ohms potentiometer; R5, 40,000 ohms; R6, 100,000 ohms; V1, EF50.

Practical Difficulties

With the control set at the 500 c/s end of Range 1, a sine wave of frequency 5,000 c/s would only show three waves on the forward sweep, the others being spread over the fly-back and partly piled up in a bright line at the beginning of the trace, while the familiar Lissajous figures were full of spurious lines caused by the slow fly-back, with a curved bright edge down one side. It will be readily appreciated that this prevented the use of the oscilloscope for frequency calibration purposes apart from being highly undesirable in any application. Even if the fly-back trace could have been suppressed, which appeared to be impracticable at comparatively low frequencies, it would have been most misleading to have less than half the input actually appearing on the screen.

All the foregoing could have been predicted from the original BULLETIN article, particularly from the diagram showing the voltage excursion and recovery of the suppressor grid. The time constant of R6C4 on Range 1 is 0.002 second, which is of the same order as that of the time-base frequency of 500 c/s. The fly-back at this frequency will therefore occupy a large proportion of the complete cycle of operations.

In order to check these results by actual observation, a standard Puckle time-base was connected to the X plates of the cathode-ray tube and the Miller-transitron to the Y plates. The results are shown in Fig. 2 for 50 c/s and 500 c/s from the Miller-transitron, the Puckle being run at half these speeds. Whereas at 50 c/s the fly-back is not unreasonable, it occupies about two-thirds of the total trace at 500 c/s.

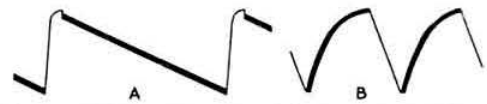


Fig. 2 (a). Repetition frequency 50 c/s. C1, 0.01 μF; C4, 0.02μF; R1, 4 Megohms approximately; R6, 100,000 ohms. (b) Repetition frequency 500 c/s. C1, 0.01 μF; C4, 0.02 μF; R1, zero; R6, 100,000 ohms.

One obvious way of obtaining good fly-back at all settings of the frequency control is to divide up the required coverage into a large number of ranges so that the appropriate RC combination for any range is always an acceptable compromise at all frequencies. This would however, entail fitting a two-bank switch of many positions with a corresponding double set of condensers. In addition, R1 would have to be reduced and R2 increased accordingly to suit the new conditions.

Circuit Modifications

The above solution may be suitable where a large number of small ranges is preferred and sufficient space is available for the additional components. It was, however, unsuited for the purposes mentioned earlier. Tests were, therefore, made to determine whether it would be practicable to vary the time constant R6C4, etc., continuously over each range. This could only be done in practice by varying R6. Rather surprisingly, it was found that R6 could be considerably reduced without ill-effects. Taking Range 1 as an example, it was found that C4 could be reduced to 0.01 μF, R6 being a 100,000 ohms linear potentiometer. The waveforms of the time-base output at 50 c/s and 500 c/s respectively are shown in Fig. 3A and B, the conditions being the same as for

Fig. 3 (a) Repetition frequency 50 c/s. C1, 0.01 μF; C4, 0.01 μF; R1, 4 Megohms; R6, 30,000 ohms. (b) Repetition frequency 500 c/s. C1, 0.01 μF; C6, 0.01 μF; R1, 100,000 ohms; R6, 20,000 ohms.

Fig. 2 except that R6 was adjusted for optimum results. At 50 c/s the fly-back was now so fast that no appreciable deviation from a straight vertical line was visible, while at 500 c/s the fly-back was only about one-tenth of the total trace. This improvement was obtained at the expense of a small reduction in output but there was still ample for a reasonably sensitive tube.

Users of the circuit need not be afraid of reducing the value of R6 too far; the only adverse effect is a progressive fall in output. In this respect, the circuit is much superior to the Puckle, which may collapse altogether, and possibly refuse to re-start, if the fly-back control is reduced too much.

The much reduced fly-back time at the high frequency end of the range has a large effect on the running frequency. Whereas at 500 c/s, with the original values of R6C4, this frequency is obtained with R1 at zero setting and R2 equal to approximately 100,000 ohms, it is now obtained at a much higher value of R1 plus R2. It is necessary therefore to increase R2 if the frequency coverage is to remain unaltered.

* 34A, *Ayleswade Road, Salisbury, Wilts.*

Radio Amateur Emergency Network

ALTHOUGH the holiday period might be expected to be one in which R.A.E.N. activity would flag, reports from many groups all over the country indicate that interest and enthusiasm has been well maintained. Nevertheless, an appeal must be made once again to all E.C.O.s who have *never* sent a report to the Hon. Secretary since their appointment to do so without delay. In the absence of such information it is impossible to build up an over-all picture of progress made so far. It would appear, judging by the lack of reports, that certain groups are dormant. R.A.E.N. must be a live organisation if it is to be of any use. An E.C.O. who finds that, for one reason or another, he is unable actively to organise his group should inform the Hon. Secretary, suggesting, if possible, a successor with the necessary qualifications. In this connection, the R.A.E.N. Committee has decided that E.C.O. appointments shall be valid for one year only as from January 1, 1955.

R.A.E.N. Appointments

The following appointments have now been confirmed:

Lt.-Col. A. C. Dunn (G2ACD) as County Controller for the East Riding of Yorkshire.

C. Biggs (G2TZ) as E.C.O. for Dorchester.

G. A. Partridge (G3CED) as E.C.O. for the Isle of Thanet.

News from the Groups

The E.C.O. for **Stirling and Clackmannanshire** (GM3OM) reports excellent progress in his somewhat scattered area. Good publicity has been received in the local Press and weekly exercises are held each Sunday at 1100 on 3610 kc/s. These exercises consist (at the moment) of frequency changing and subsequent re-netting under the direction of the control station. No "chit-chat" is permitted, transmissions relating solely to the matter in hand. Contact has been made with G6UC (**Berwick-on-Tweed**) with a view to arranging a monthly exercise for control stations. Good progress is also reported by GI3BHX (E.C.O. for **Armoy**) who wishes to record his thanks to G3JAM and G8TL for their help and co-operation in connection with mobile and walkie-talkie equipment. He has discussed with GI2DZG (E.C.O. for **Belfast**) the possibility of calling a meeting of all Northern Ireland E.C.O.s to deal with certain problems peculiar to Northern Ireland. E.C.O.s are invited to write to GI3BHX suggesting a convenient date for such a meeting.

Middlesbrough have carried out tests to determine the coverage of a low power (6 watts) portable-mobile transmitter working to a fixed 10 watt Top Band station. As a result they are confident that good communication can be provided throughout the area of the Cleveland Hills. The portable equipment includes a v.f.o./p.a. transmitter, Hambander receiver and a 132ft long-wire. Members of the group are voluntarily subscribing 1s. a month to help cover expenses. Non-payment does not, however, debar anyone from taking part in activities.

The high level of amateur activity generally in the **Wirral** area has, in some ways, made R.A.E.N. progress somewhat slower than was anticipated. However, G2FNI has designed an excellent walkie-talkie which is being described in the local club's newsletter. Field tests, arranged by G2AMV and G3ERB (the E.C.O.), are due to take place shortly. A Top Band net is held on Sundays at 1030 on 1870.5 kc/s in which a fair number of members take part. It is known that many more listen. At the moment, the primary object is the exchange of ideas.

Another group making slow but sure progress is **Huddersfield** whose E.C.O. (G3ABS) says they now have a portable station for 1.8 and 3.5 Mc/s available. It is hoped to arrange a meeting with the Barnsley and Sheffield groups shortly. The local police, fire brigade and rescue services are all interested. **Blackpool and Fylde,** under the leadership of G3GXX, have received good publicity locally and have made contact with various local organisations. Mobile and walkie-talkie equipment for 28 Mc/s is under construction.

In **Reading** where G3AED and G3EJA are forming a group a net is held on 1900 kc/s on Friday evenings immediately after the television programme ends. G3AIP is developing a 144 Mc/s transceiver which it is hoped will be duplicated by other members so that all are familiar with the equipment. Another group intending to standardise equipment is **Southampton** where tests are being carried out with two walkie-talkies, one on 28 Mc/s the other on 144 Mc/s. When the design is finally agreed, each member will receive a copy of the circuit diagram. Two members have already offered to make the necessary chassis. The group has two portable-mobile stations (G3ION/P and G3GOP/P) on 144 Mc/s. The E.C.O. (G3CGE) reports that the R.A.E.N. display at the Southampton Show proved a great attraction. G. J. Fowle has resigned as E.C.O. for **Weymouth.** For the time being G2TZ (E.C.O. for Dorchester) will cover the area.

Change of Address

All E.C.O.s and members are asked to note that the address of the Hon. Secretary (C. L. Fenton, G3ABB) is now "Niarbyl," Gay Bowers Road, Gay Bowers, Danbury, near Chelmsford, Essex.

Emergency Calling Frequencies for R.A.E.N.

The following calling frequencies will be used by R.A.E.N. stations in the event of an emergency:

1980 kc/s	14100 kc/s
3600 kc/s	21150 kc/s
7050 kc/s	28200 kc/s

145 Mc/s

These frequencies are published as calling frequencies for use in emergency only. Stations will call CQ QRRR DE G..... and QSY to a mutually agreed frequency immediately after establishing contact. Contacts should not be continued on emergency calling frequencies. All frequencies should be monitored as much as possible.

G5DH on the Air

THE Society has been advised that a Post Office experimental station, using the call-sign G5DH, will operate on 14.3 Mc/s for a period of about two hours during the afternoon of Friday, September 24, 1954. Two minute dashes and the station call will be transmitted.

It is understood that the transmissions are connected with propagation tests which the U.K. is carrying out with Australia.

International Committee of the Red Cross Broadcasts

THE Broadcasting Section of the International Committee of the Red Cross, will be glad to receive reports from members on a series of trial transmissions which are due to take place on September 25, 27 and 29, 1954. English language transmissions will be made at 0630, 1210, 1530 and 2200 GMT. The station will operate on 41.61 metres (7210 kc/s). Reports should be sent direct to the Broadcasting Section of the International Committee of the Red Cross, Geneva.

A copy of the complete schedule can be obtained on application to Headquarters but supplies are very limited. A s.a.e. should be enclosed.

Mobile Column

By JOHN A. ROUSE (G2AHL)*

JUDGING by correspondence received since the first appearance of this feature in the August issue of the BULLETIN, mobile interest is at present greatest on the 144 Mc/s band where the number of operators using car-borne equipment is steadily growing. But the lower frequencies are by no means being ignored. **G3IVP** for instance is getting good results on Top Band using a crystal controlled transmitter running 2 watts input, a 1-V-1 battery receiver and a base-loaded whip with a 4ft top. Tests show that a 20 mile radius is possible on phone with R5 signals while c.w. gives a range of 60 miles. Valleys and trees seem to have very little effect. G3IVP suggests that " overs " should be kept short to minimise the risk of losing contact whilst in motion.

From Northern Ireland comes news of the equipment used by **GI3BHX.** A single 500 volt rotary converter provides the power for a transmitting running 50 watts to an 807 which is clamp modulated by a 6Y6. A 6V6 crystal oscillator or v.f.o. drives the p.a., bias for which is derived from a VR150/30 in parallel with a 4μF condenser both in series with an r.f. choke connected between grid and cathode of the 807. GI3BHX suggests that Nife cells are more suitable than the usual car batteries for serious mobile work as they can be charged at two or three times the usual rate.

One of the first to operate mobile on 3.5 Mc/s was **G3AMM** who worked G, GI and GM stations for his first three contacts on June 1. The entire transmitter-receiver is housed in the inside framework of a TU5 unit, the transmitter line-up being 6V6 crystal oscillator on 3714 kc/s with a TT11 p.a. running 10 watts and anode and screen modulated by a 12AU7 and 12AX7. The microphone is an ex-U.S. Army Type T17. Power is obtained from a rotary converter (250V at 135 mA, for an input of 5 amps). The receiver is an all-dry battery superhet and the aerial a 13ft centre-loaded whip with pigtail tuning.

Two Metre Mobile

An interesting theory to explain the action of his whip aerial is put forward by **G2HCG.** The whip, which is fed with co-ax, slopes back at an angle of 45 degrees and is adjusted for optimum loading the resultant effective length appearing to bear no relationship to a quarter wavelength. Measurements made with a field strength meter suggest that the function of the aerial rod is to excite the car body, the windows acting as slot radiators. The idea is supported by the fact that operation of the wind screen wipers results in fluctuations of up to 2 " S " points, the radiated signal being down when the wipers are up, thus destroying the slot effect of the windscreen. Normal range while mobile is 30 miles to a well-equipped fixed station. From a hilltop stop, communication over 100 miles is possible. A single section skeleton slot with two reflectors is carried for portable use.

G3MY, details of whose high frequency equipment were given last month, uses a 12AT7 oscillator and tripler in conjunction with a 24 Mc/s crystal as the first valve in his 144 Mc/s transmitter. An output of 3 watts is obtained from the 6CH6 power doubler which is modulated by a 6BW6 fed by a 6AG5 and crystal microphone. The ordinary vertical broadcast whip is used as the aerial. Best DX to date is 35 miles.

One of the most active 2 m mobile operators is **G2ATK** who recently worked G3EPW (Bolton) from the centre of Wolverhampton. Shortly afterwards, while in London on August 24, he worked G2DTO, '3FSD, '3FYY, '3EYV, '3GHI, '3ISA, '6AG and '3FSG/M. A visit to the Liverpool and Manchester areas the previous week brought contacts with G3EPW, '3IUD, '3IPA and GW3GWA. During a journey from Buxton to Ashbourne (Derbys.) G6FK reported '2ATK's signals RS58.

G3GOP, another 2 m operator whose equipment was mentioned briefly in the August issue, uses a transmitter comprising an EF91 crystal oscillator tripling to 24 Mc/s, an EL91 tripler to 72 Mc/s, followed by another EL91 doubling to 144 Mc/s and driving a QV04-7 p.a. to an input of 8 watts. Keying is in the cathode of the 72 Mc/s stage. The p.a. is anode and screen modulated by a 6V6 driven by a 6C4 and carbon microphone. The transformers were obtained from an SCR522. On the receiving side there is a 12AT7 cacode r.f. stage, 6AK5 triode mixer (1 Megohm grid-leak, h.t. voltage 40), 12AT7 tunable oscillator on 77–78 Mc/s doubling in the second half of the valve, 10 Mc/s i.f. amplifier using 6AM6 (with controlled regeneration) and 6BA6, EAC91 detector/a.v.c./first a.f. and a 6C4 output stage. A generator giving 275 volts at 150 mA supplies the power in conjunction with 12 volt batteries. A 19 in vertical fed with 3ft of 52 ohm co-axial cable and a 4-element Yagi are the aerials used.

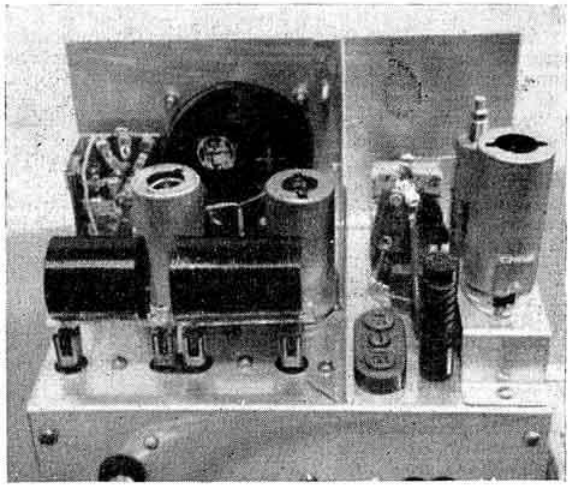
Old-timer Ken Ellis, **G5KW** (well known under a multitude of calls) is active with mobile equipment on 2, 20, 40 and 80 metres.

Calling Frequencies

No comments have so far been received regarding the suggestion made last month that 3600 kc/s and 29627 kc/s should be designated mobile calling frequencies. There has been one development, however: the R.A.E.N. Committee has adopted 3600 kc/s as an emergency calling frequency, so some new thinking may be necessary for the 3.5 Mc/s band. Suggestions will be most welcome.

* * *

All those who have contributed to this column, either by letter or by personal contact, are thanked for their co-operation. It is the intention to devote the feature mainly to the technical and operational problems of mobile work and hints and kinks borne of experience will therefore be particularly welcome. Reports, comments and descriptions of equipment, etc. should be addressed to " Mobile Column," R.S.G.B. BULLETIN, New Ruskin House, Little Russell Street, London, W.C.1.



A rear view of the low power transmitter described on page 107. The v.f.o. is on the right of the picture.

*Assistant Editor, R.S.G.B. BULLETIN.

Transistor News

North Sea Bridged with Transistor Transmitter

DURING a series of tests organised by the Transistor Experimental Group of the Leicester Radio Society on August 12, C. L. Wright, G3CCA (Leicester), operating on 1850 kc/s, made contact with PA0CG (The Hague), on 3501 kc/s, receiving a report of RST358 on his transistor signals. W. Scotton (G3IZS) acted as control station. Attempts to make contact with PA0QU and other Dutch stations unfortunately failed, owing to poor conditions. The group pays tribute to the hard work done by their Dutch colleagues.

The equipment used by G3CCA (shown in the accompanying photograph) comprises a tetrode transistor v.f.o. (series-Colpitts type) driving a tetrode transistor p.a. with an input of 62 mW. The aerial was a 132ft long-wire tuned against ground.

Here is a picture of the transistor transmitter used by G3CCA of Leicester. The p.a. coil is to the left followed by a GET1. The v.f.o./c.o. coil and a GET 2 are on the right. The crystal (1850 kc/s), used for netting, is in the right-hand top corner. Outstanding contacts have been with GM3EFS (275 miles) and G2FP (170 miles).

Although c.w. was used during the tests, the transmitter can be modulated by means of a GET–2 (microphone amplifier) feeding a tetrode transistor connected to the p.a. *via* a specially designed modulation transformer in the collector circuit of the p.a. transistor. The tetrode transistor is a conventional junction type with the addition of a fourth electrode, which is biased in such a way that the base resistance is substantially reduced.

Tests using the equipment described are frequently carried out with another group in the Buckingham area led by G6FO and G3HMO.

QRP Society Transistor Tests

THE QRP Society's transistor transmitter tests, organised by G3IEE and G3JNB and held on August 15, 16 and 17, proved most successful and a further series is planned for the end of November.

Among those taking part were G2BSQ, G2DMR, G3FRV, G3IEE, G3IZS, G3CCA, G3JNB and GC2CNC. Reports were received from G3RD, G3ACP, G3ILC, G3DHZ, G3GVU, G3JKA and G3JXA and many short-wave listeners. All stations using transistor transmitters were heard at ranges exceeding five miles, the maximum input power being 115 mW.

GC2CNC, using a transmitter similar to that described by G3IEE in the March, 1954, issue of the BULLETIN, worked G6GM (Devon), G2JF (Kent), G3HDQ (Cheshire), GW3ZV (Glamorgan) and G2GQS. He was also heard in Nottingham, Surrey, Devon and Middlesex. The input to the transmitter was about 100 mW and the aerial a half-wave. Most other stations used quarter-wave aerials.

G3CCA (Leicester) was heard in Middlesex during the tests. One of the most surprising reports came from G2BSQ who produced TVI on his own television receiver with an input of 90 mW.

Sun-Powered Transistor Transmitter

JUST before this issue went to press it was learned from the *Daily Telegraph* of September 8, 1954, that Mr. J. M. Osborne (G3HMO) of Buckingham had succeeded in transmitting signals on Top Band with a transistor transmitter powered by 16 photo-electric cells exposed to the daylight. C. W. signals from this remarkable set-up were received in High Wycombe, Wellingborough, Leighton Buzzard and Northampton.

We feel sure that all members will wish to congratulate Messrs. Osborne and Forsyth (G6FO), Managing Editor of the *Short Wave Magazine*, who organised the tests.

Walton Amateur Radio Exhibition

AN Amateur Radio exhibition, organised by the QRP Society, will be held during the afternoon of October 30, 1954, in St. Mary's Parish Hall, Walton-on-Thames, Surrey. The opening ceremony will be performed by the President of R.S.G.B. (Mr. Arthur Milne, G2MI).

The exhibits will include displays of amateur equipment, commercial sound and vision receivers, components, radio controlled models, high fidelity equipment, Amateur Television and "walkie-talkie" sets. A live station will be in operation. One stand will be devoted to the sale of surplus equipment.

Admission to the exhibition will be by ticket, price 1s. (children half-price) at the door, or in blocks of six or more at 8d. each before October 23 from the Hon. Secretary, QRP Society, "The Retreat," Rydens Avenue, Walton-on-Thames, from whom a guide leaflet for the benefit of visiting radio amateurs may be obtained.

Instruction Courses

MEMBERS residing in or near Glasgow may like to know that a course of instruction for those who wish to study for the Radio Amateurs' Examination will be given at Allan Glen's School, 134 Montrose Street, Glasgow C.4, during the coming session. The classes are on Tuesdays from 7 to 9.30 p.m. and the fee for the course is 10s. Instruction in Morse is not at the moment available. The lecturers are Mr. A. M. Fraser, GM3AXX (Theory) and Mr. J. Sey, GM8MJ (practical). Those living outside Glasgow must, when applying for admission, present a "Permit to Enrol" from their County Education Authority.

Details of similar courses in and around London were given on page 80 of the August, 1954, issue of the R.S.G.B. BULLETIN.

Holiday Coincidence

WHILE on holiday, Ellis E. Evans (GW3CDH) asked his nearest neighbour on the beach at Broadsands if he would take a photo of GW3CDH and his family. In the ensuing conversation the "nearest neighbour" revealed that he was S. Roberts (G6QS) of Leeds.

Amateur Television

By M. BARLOW (G3CVO)*

SEVERAL enquiries about modulators for 70 cm television transmitters have been received and whilst the subject is dealt with in detail in Part 5 of *Television Transmission for the Amateur* on page 117, readers may be interested in the circuit developed by the writer and shown in Fig. 1. A standard 1 volt p-p positive composite video signal is amplified by V1A, the crystal diode in the anode circuit correcting for top bend distortion (due to p.a. grid current saturation) depending on the setting of VR1. V1B is run without a cathode bias resistor, thus being self-restoring as far as the d.c. component is concerned. A similar arrangement in the anode of V1B causes the sync pulses to be "stretched" from their normal 30 per cent of total signal to about 50 per cent, depending on the setting of VR2. This is to correct for "bottom bend" distortion near cut-off in the p.a. stage. The output of V1B is fed to a 6CH6 cathode follower feeding the p.a. With this simple circuit, which is suitable for modulating power amplifiers up to about 10 watts input, it has not been possible to include peak white clipping (a form of overmodulation prevention) without upsetting the other controls.

There seems to be some doubt as to the best value of h.t. to use in vision equipment, in view of the differing requirements of the various units. A value of 250 volts is recommended since this is easily obtained from existing higher voltage power packs through stabilising circuits which are essential. Also, with the low values of load resistor required for television work, valve dissipation is not so easily exceeded with low h.t. Finally, that most useful valve, the EF91 (and its equivalents, the Z77 and 6AM6) will work with its screen taken directly to the positive 250 volt line *via* a 68 ohm stopper resistor, thus saving several components in each stage. At G3CVO, a 375V, 250 mA, power pack is stabilised *via* an A1837/6AS7 series regulator valve and is used to feed all vision and pulse units at the recommended voltage.

Notes and News

Frank Lee (St. Albans)—now G3JVO/T—is probably the first television-only licensee. As the G.P.O. are at present issuing normal "G3-plus-three" call-signs to such licensees some slight confusion is inevitable. G3JVO/T is building a transmitter, the line-up of which will be Z77 (9 Mc/s), 6J6 (45 Mc/s), push-pull 5763s (145 Mc/s) and 33B/152M power trebler to 420 Mc/s. "Bootstrap" modulation, using 7193s as the modulator valves, with a 6CH6 video amplifier and 6AL5/D77 d.c. restorer, will be employed. G3JVO/T points out that 7193s will pass 30 mA as series stabilisers and are very cheap.

Michael Cole (Chelmsford) has been experimenting with wide-band 3 and 10 cm links and is now considering putting television signals over them. Although only 15 years of age, he has never built any radio equipment for a frequency of *less* than 3000 Mc/s.

*10 Baddow Place Avenue, Great Baddow, Essex.

A. E. Sale (Rayleigh) has finished his latest 5527 camera which is entirely miniaturised. The Z77 has been found to be as good as any of the easily available valve types for the first (and most critical) stage of the video amplifier. A large horseshoe magnet clamped on to the lens housing appears to affect the secondary emission characteristics and a picture of reasonable signal-to-noise ratio is obtained with only 100 watts of illumination under these conditions. A new 70 cm transmitter using a 12AT7 (m.o.), 33B/152M (b.a.) and push-pull 8012s in the p.a. is being tested. G3CVO is building a similar unit with a QV06/40 p.a.

G3ICU (London, N.W.10) has nearly completed his Staticon camera and P. K. Jones (London, N.W.6) is building a 16 mm. telecine unit. DL1YA reports that Amateur Television received plenty of publicity as a result of the display at the International Amateur Radio Meeting in Munich.

The next meeting of the British Amateur Television Club will be held at Chelmsford on November 10.

* * *

Members are asked to note G3CVO's new address to which all reports should be sent for inclusion in future issues.

"The Model Engineer" Exhibition

AMONG the many fine exhibits at the Annual *Model Engineer* Exhibition held last month at the New Horticultural Hall, London, was a miniature working radio and television set exhibited by Mr. L. G. White of Worcester Park, Surrey. The screen is about the size of a large postage stamp.

The International Radio Controlled Models Society demonstrated a number of boats on a specially constructed water tank.

Army Wireless Reserve Squadron

MEMBERS of the Army Wireless Reserve Squadron, who will be in camp at Chester from September 25 to October 9, intend to operate portable during off duty hours in some of the rarer Welsh counties. Operation, on Top Band only, will be with the following call-signs G(GW)3ADZ, '3FDU, '3DNQ, '3EJF, '3AMO, '3IFM, '3ICR, '3FQN, '3JAY, '3JBV and '8PG.

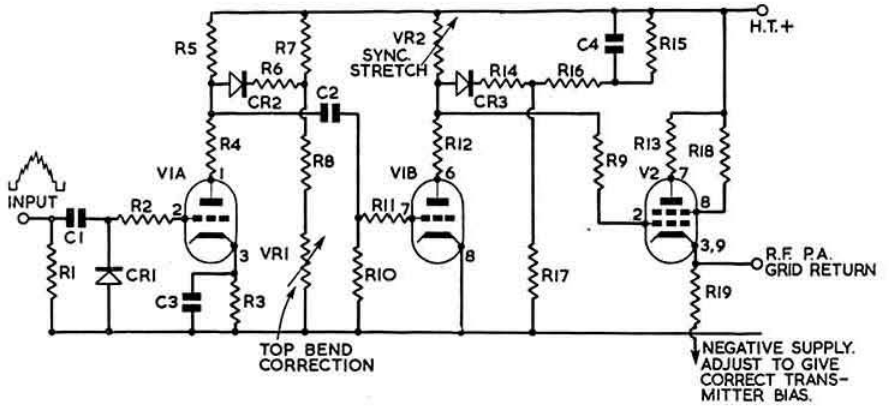


Fig. 1.—Simple modulator for a low power television transmitter. C1, 2, 4, 0.1μF; CR1, 2, 3, CV425; R1, 75 ohms; R2, 470 ohms; R3, 220 ohms; R4, 9, 11, 12, 13, 18, 47 ohms; R5, 3900 ohms; R6, 14, 100 ohms; R7, 4700 ohms; R8, 10,000 ohms; R10, 680,000 ohms; R15, 68,000 ohms; R16, 2700 ohms; R17, 22,000 ohms; R19, two 22,000 ohms 1 watt in parallel; V1, 12BH7; V2, 6CH6; VR1, 20,000 ohms; VR2, 25,000 ohms.

Society News

Election of Council for 1955

IN accordance with Article 55 of the Articles of Association of the Society, the Council have nominated the following Corporate Members to fill the vacancies in the Council which will occur on December 31 next.

Officers

President: H. A. Bartlett, G5QA.
Executive Vice-President: R. H. Hammans, G2IG.
Honorary Treasurer: D. A. Findlay, G3BZG.

Ordinary Members

C. H. L. Edwards, G8TL.
A. C. Gee, G2UK.
F. Hicks-Arnold, G6MB.
J. H. Hum, G5UM.
L. E. Newnham, G6NZ.
N. F. O'Brien, G3LP.
R. L. Varney, G5RV.

Not later than October 24 next, any 10 Corporate Members may nominate any other Corporate Member to serve on the Council by delivering their nomination in writing in a single document to the Secretary, together with the written consent of such nominee to accept office if elected but each such nominator shall be debarred from nominating any other person for this election.

Zonal Representatives

Not later than October 24 next, any 10 Corporate Members may nominate any other duly qualified Corporate Member to serve as a Zonal Representative on the Council by delivering their nomination in writing in a single document to the Secretary, together with the written consent of such nominee to accept office if elected, but each such nominator shall be debarred from nominating any other person for this election.

Candidates for Zonal Representative must be resident within the Zone for which they are nominated and the nominators must be resident in that Zone.

The six Zones comprise the following Regions:—

Zone	Regions
A	1 and 2
B	3 and 4
C	5, 7 and 8
D	6 and 9
E	10 and 11
F	12, 13, 14 and 15

The Isle of Man is in Zone A and the Channel Islands in Zone D. A list of the counties and areas forming the various Regions appears on page 137 of this issue.

Norman Keith Adams Prize and Bevan Swift Memorial Premium

ACTING on the advice of the Technical Committee the Council has decided to award the Norman Keith Adams Prize for the current year to Messrs. F. J. H. Charman, B.E.M. (G6CJ) and J. W. Mathews, Assoc.Brit.I.R.E. (G6LL) for their original paper entitled "The Reflectometer" published in the December, 1953, and February' 1954, issues of the BULLETIN.

Also on the advice of the Technical Committee the Council has decided to award the Bevan Swift Memorial Premium for the current year to Mr. W. H. Allen, M.B.E. (G2UJ) for his meritorious paper entitled "The R.S.G.B. Two Metre Converter," published in the February, 1954, issue of the BULLETIN.

The presentations will be made at the Annual General Meeting on December 17, 1954.

London Lecture Meeting

Friday, October 22, 1954

"TRANSISTORS AND CRYSTAL VALVES IN RADIO"

By

B. R. BETTRIDGE, A.M.Brit.I.R.E.

(Osram Valve and Electronics Dept.)

at the

Institution of Electrical Engineers, Savoy Place, Victoria Embankment

Buffet Tea 5.30 p.m. **Lecture 6.30 p.m.**

R.S.G.B. Film Library

THE Council is pleased to announce that the R.S.G.B. Film Library is again open and that the following films are available:—

1947 D/F Event (200ft).
1947 N.F.D. (400ft).
1951 N.F.D. (650ft).
1951 Festival of Britain Year Convention (800ft).

Members who wish to borrow any, or all, of these films should write in the first instance to the Honorary Film Curator, Mr. L. S. Gillham, 2 Parkstone Avenue, Hornchurch, Essex, giving the following details:—

(1) Film (or films) required.
(2) Date of showing.
(3) Type and number of projector.
(4) Details of projectionist's experience.

The films should be returned by registered post immediately after use to the Film Curator, and not to R.S.G.B. Headquarters. Films should be re-wound on their *original* spools. Films returned on old spools which are bent or twisted will be re-wound anew and the member charged for the cost of the spool.

The R.S.G.B. films are also available for display by affiliated societies.

R.S.G.B. Tape Library

MEMBERS are asked to note that the Honorary Curator of the R.S.G.B. Tape Library is now Mr. E. Fish, 107 Eaton Road, Ilford, Essex.

Members who wish to borrow tapes from the library should, in the first instance, write to Mr. Fish giving him the following details:—

(1) Lecture required.
(2) Date of meeting.
(3) Whether a Scophony Baird Mark II Twin Rack recorder is available.

Tapes are only loaned out provided the above-mentioned type of recorder is available.

Members who experience difficulty in obtaining a Scophony Baird Recorder should write to Mr. Rule, Baird Television, Ltd., Lancelot Road, Wembley, Middlesex, who

may be able to arrange the loan of a machine of the correct type.

Tapes should be returned to Mr. Fish by registered post and on their own reels immediately after use.

The lectures at present available from the library are as follows :—

"V.H.F. Television", by Sir Noel Ashbridge, M.I.E.E. (1 hour 40 minutes).

"The Engineer and Society", by Capt. P. P. Eckersley, M.I.E.E. (1 hour 20 minutes).

"Receivers", by R. H. Hammans, G2IG (1 hour).

"Steps to be taken to avoid TVI in home-built transmitters", by Louis Varney, A.M.I.E.E., G5RV (1 hour).

Use the RSM Code for reporting on telephony transmissions

Montague Jamie

AT a Special Meeting of the Council held on August 10, 1954, it was Resolved, unanimously,

"*That Mr. Montague Jamie, a Member of the Society, be and is hereby expelled from membership in accordance with Article 26 of the Articles of Association of the Society having in the opinion of the Council been guilty of such conduct as has rendered it undesirable in the interests of the Society that he should continue a member thereof in that he has on various occasions between August 1, 1953, and February 25, 1954, and again on more recent occasions represented himself as operating amateur radio transmitting apparatus in a number of unusual places thus leading those or some of those with whom he has been in radio contact to believe that they were in contact with one or another of these unusual localities whereas in fact Mr. Jamie was at the time operating a radio transmitter under misleading call-signs in Khartoum, his normal location during this period.*"

Mr. Jamie was, in accordance with Article 26, advised that if unable to be present at the meeting he could appoint some other member to represent him, provided he furnished the name of that person beforehand. Mr. Jamie did not avail himself of that opportunity.

Group and Club Magazines

IN the May, 1954, issue of the BULLETIN, Editors of Group and Club Magazines were invited to send details of their publications to Headquarters.

The response to that invitation is recorded below:—

CQ-TV. British Amateur Television Club. Editor: M. Barlow (G3CVO), 10 Baddow Place Avenue, Great Baddow, Essex. Quarterly (5s. includes Club subscription).

Ham Notes and News. Southampton and District R.S.G.B. Group. Editor: P. J. Buchan, 15 Violet Road, Southampton. Monthly (6d.).

The Lea Valley Reflector. Enfield & District R.S.G.B. Group. Editor: H. Hyman (G3IZQ), 89 Brantwood Road, London, N.17. Monthly (5s. p.a.). Free to those who do not miss more than three successive group meetings.

QTC News Letter. British Two-Call Club. Editor: G. V. Haylock (G2DHV), 63 Lewisham Hill, London, S.E.13. Quarterly (2s. 6d. p.a.).

Radio Rag. Stoke-on-Trent Amateur Radio Society. Editor: Dan Poole (G3AQW), 13 Oldfield Avenue, Norton-le-Moors, Stoke-on-Trent. Monthly (6d.).

*Southgate Amateur Magazine.** Southgate and District R.S.G.B. Group. Editor: G. I. Turner (G3DGN) "Deegeen," Clifford Road, New Barnet, Herts. Monthly (3s. 6d. p.a.). Free to those who attend Group Meetings.

Editors of other Group and Club Magazines are invited to send details to Headquarters.

**Free exchange for other magazines.*

Radio Amateur Emergency Network

ACTING on the advice of the R.A.E.N. Committee the Council has decided that, as from January 1, 1955: (*a*) E.C.O. appointments shall be on a yearly basis; (*b*) all persons holding executive office in R.A.E.N. must be members of R.S.G.B.

The R.A.E.N. Committee have placed on record that the duties of a County Controller shall be:

(*a*) to maintain the prestige of R.A.E.N. in his County by making all possible liaison with likely user authorities.

(*b*) to act as a liaison between R.A.E.N. headquarters and the E.C.Os in his County.

(*c*) to assume responsibility for the organisation of R.A.E.N. in his County.

(*d*) to submit a quarterly report to R.A.E.N. Headquarters.

R.S.G.B. Amateur Radio Call Book Winter 1954 Edition

THE closing date for this edition (due to be published on November 24, 1954) will be Saturday, October 16, 1954, but as from September 30, 1954 the *Call Book* Editor (Mr. J. P. P. Tyndall, G2QI, 174 The Drive, Ilford, Essex) will only accept changes of address or additions if sent to him on a postcard.

Convention—Late News

ALDERMAN K. A. L. BROWN, who was Lord Mayor of Bristol during the last civic year, has accepted the Society's invitation to open the Amateur Radio Exhibition which is being run as part of Convention. The Opening Ceremony will take place at 12 noon on Friday, September 17, 1954, in the Royal West of England Academy.

* * *

M. Fernand Raoult (F9AA), President, R.E.F., Herr Otfried Luhrs (DL1KV), Vice-President, D.A.R.C.; and Mr. Tom Green (EI9N), Vice-President, I.R.T.S.; are among the many well-known personalities who have accepted an invitation extended to them to attend Convention as guests of the Society.

* * *

Mr. J. Riley (EI2G), President of the International V.H.F. Society will represent that organisation.

* * *

Mr. Harold Bishop, C.B.E., B.Sc.(Eng.), Director of Technical Services, B.B.C. will propose a toast to the Society at the Convention Dinner.

* * *

An unexpectedly large pre-Convention rush led to an urgent order being placed with the manufacturers for new supplies of the souvenir ashtray, illustrated in the August issue. Members unable to attend Convention may obtain one of the ashtrays by remitting 3s. 6d. to the Convention Secretary, Mr. D. F. Davies, 51 Theresa Avenue, Bristol, 7.

* * *

Prizes valued at more than £250 have been donated for presentation at the Convention Dinner. The ladies will not be forgotten.

* * *

A film and photographic record will be taken of Convention "highlights."

* * *

Past-President W. A. Scarr, M.A. (G2WS) hopes to arrange a Get Together of 70 cm enthusiasts during Convention.

Council Proceedings

Resumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Tuesday, July 13, 1954, at 3 p.m.

Present.—The President (Mr. A. O. Milne in the Chair), Messrs. I. D. Auchterlonie, H. A. Bartlett, C. H. L. Edwards, A. C. Gee, F. Hicks-Arnold, J. H. Hum, N. F. O'Brien, R. L. Varney and John Clarricoats (General Secretary).

Apologies.—Apologies were submitted for the absence of Messrs. L. Cooper, D. A. Findlay, R. H. Hammans and L. E. Newnham.

* * *

Membership

Resolved (a) to elect 49 Corporate Members and 1 Associate, (b) to grant Corporate Membership to 18 Associates who had applied for membership, (c) to grant Life Membership to Mr. G. H. Brown, G3FVW.

Resolved unanimously, to waive for a period of twelve months the subscriptions of Messrs. D. A. Hann, G3UY, and M. G. Jones, GW3JLI, on the ground that they suffer from blindness.

The Secretary reported that of the 849 Members whose subscriptions became due on April 1, 1954, 219 became overdue on June 30, 1954.

The Secretary submitted details of the reasons given by the 69 members who wrote to resign during the four weeks ended July 10, 1954. Only 15 had resigned for financial reasons. Of the remainder, 23 gave no reason, 20 stated they had lost interest in Amateur Radio, 11 gave miscellaneous non-financial reasons.

Applications for Affiliation

Resolved to grant affiliation to the Royal Military Academy Sandhurst Radio Club and the Benson (R.A.F.) Amateur Radio Club.

Yugoslav Convention

Resolved unanimously, that the President shall be authorised to attend the Yugoslavian Amateur Radio Convention in Ljubljana from August 19 to 23, 1954, and that the Society shall pay his expenses from London to Ljubljana. The Council accepted with deep appreciation the offer made by the Yugoslav Society to be responsible for his hotel expenses and the cost of travelling back to London.

Licence Matters

The Secretary reported upon discussions which had taken place between representatives of the G.P.O. and the Society with regard to the continued presence of "intruders" in exclusive amateur bands. The G.P.O. had agreed to consider issuing a statement to the Society explaining why it is not possible at the present time for the U.K. Government to take action.

The Secretary also reported upon discussions which had taken place between the G.P.O. and the Society concerning the action of the Post Office in requiring an applicant for a telephony licence to show that his station had been operated consistently on telegraphy for a period of 12 months. The G.P.O. had agreed to look into the general question of Morse requirements and Service exemptions.

R.S.G.B. Bulletin

The Secretary tabled advance copies of the July issue of the BULLETIN (the first to be printed by Patina Press Ltd.). Apart from a few minor errors which had occurred, the Council Members expressed themselves as being well pleased with the appearance and layout of the BULLETIN.

I.A.R.U. Calendar No. 48

The Secretary tabled a copy of Calendar No. 48 dated June, 1954.

Resolved (a) to record an "Aye" vote in favour of Proposal 87 (Re-admission of the Japanese Amateur Radio League to membership), (b) to record an "Aye" vote in favour of Proposal 88 (To adopt the RSM Code).

Scottish Top Band Trophy

Resolved to accept an offer made by Mr. James Maitland, B.R.S.16925 to present a trophy to the Society for annual award to the Scottish member obtaining the highest aggregate score in the two annual R.S.G.B. Top Band Contests.

Reports of Committees

Contests

Resolved to accept, as a Report, the Minutes of a Meeting of the Contests Committee held on July 8, 1954, and the recommendations contained therein. (The recommendations dealt with the results of the B.E.R.U. and first 1954 420 Mc/s Contests).

Exhibition (Home Constructor's Section)

Resolved to accept, as Reports, the Minutes of Meetings of the Exhibition (Home Constructor's Section) Committee held on June 30, 1954.

The Minutes contained no Recommendations.

The meeting terminated at 5.15 p.m.

THE RSM CODE

READABILITY

R1	Unreadable
R2	Barely readable, occasional words distinguishable.
R3	Readable with considerable difficulty.
R4	Readable with practically no difficulty.
R5	Perfectly readable.

SIGNAL STRENGTH

S1	Faint, signals barely perceptible.
S2	Very weak signals.
S3	Weak signals.
S4	Fair signals.
S5	Fairly good signals.
S6	Good signals.
S7	Moderately strong signals.
S8	Strong signals.
S9	Extremely strong signals.

MODULATION QUALITY

M1	Unintelligible modulation.
M2	Defective modulation due to spurious or parasitic oscillations, or to causes unknown.
M3	Defective modulation due to frequency modulation of the carrier.
M4	Defective modulation due to over modulation.
M5	Good modulation, not exceeding 100 per cent.

Representation 1955-1956

Election of County Representatives

IN accordance with established practice, an election of County Representatives is due to take place this year with effect from January 1, 1955.

Nominations

Not later than October 31 next, any five Corporate Members resident in a particular County (or Group of Counties, as the case may be) may nominate any other duly qualified Corporate Member resident in that County (or Group of Counties, as the case may be) for the office of County Representative, by delivering their nomination in writing to the General Secretary, together with the written consent of such person to accept office if elected.

Period of Office

County Representatives will hold office for a period of two years as from January 1, 1955.

Confirmation of Appointment

County Representatives will only be confirmed in their appointment if the total membership in the County (or Group of Counties) they propose to represent is in excess of 25.

Vacancies

In the event of no nomination being received prior to November 1, 1954, from the Corporate Members resident in a particular County (or Group of Counties) the Council reserves the right to make an appointment.

Ballots

In the event of more than one person being nominated for a particular office a Ballot will be conducted, details of which will be published in the November, 1954, issue of the R.S.G.B. BULLETIN.

Resignations

If for any reason an elected or appointed Representative wishes to resign his office he should notify Headquarters who will advertise the vacancy. Local Members cannot automatically appoint another member to undertake the duties of a Representative who has resigned.

The Council reserves the right to call upon any Representative to resign his office if, in their opinion, he is considered to be unsuitable or unsatisfactory.

Local Societies

It is not permissible for local societies, whether affiliated to the R.S.G.B. or not, to nominate members to serve as R.S.G.B. Representatives.

Present County Representatives

All present County (or District) Representatives go out of office on December 31, 1954.

Regions and Counties

The following is a list of the Regions and Counties (or Districts) forming them:—

Region 1 (North Western).—Cheshire; Cumberland; Lancashire (East); Lancashire (West); Westmorland; and the Isle of Man.

Region 2 (North Eastern).—Durham; Northumberland; Yorkshire (East); Yorkshire (North); Yorkshire (West).

Region 3 (West Midlands).—Herefordshire; Shropshire; Staffordshire; Warwickshire; Worcestershire; Birmingham (Postal Area).

Region 4 (East Midlands).—Derbyshire; Leicestershire and Rutland; Lincolnshire; Northamptonshire; Nottinghamshire.

Region 5 (Eastern).—Bedfordshire; Cambridgeshire; Essex (outside London Region); Hertfordshire (outside London Region); Huntingdonshire; Norfolk; Suffolk.

Region 6 (South Central).—Berkshire (outside London Region); Buckinghamshire (outside London Region); Gloucestershire (excluding the Bristol Area); Hampshire; Oxfordshire; Wiltshire; the Channel Islands.

Region 7 (London).—London North; London South; London South-East; London South-West; London East; London West.

Notes.—(1) In the London Region the six Representatives concerned are known as District Representatives.

(2) The London Region covers the whole of Surrey and all territory within 25 miles radius of Charing Cross.

Region 8 (South Eastern).—Kent (outside London Region); Sussex.

Region 9 (South Western).—Bristol; Cornwall; Devonshire; Dorset; Somerset.

Region 10 (South Wales).—Brecknockshire; Carmarthenshire; Pembrokeshire and Cardiganshire; Glamorganshire; Monmouthshire and Radnorshire.

Region 11 (North Wales).—Anglesey and Caernarvonshire; Denbighshire; Flintshire; Merionethshire and Montgomeryshire.

Region 12 (North Scotland).—Aberdeenshire, Banffshire and Kincardineshire; Angus and Perthshire; Morayshire and Nairnshire; Inverness-shire, Ross-shire, Sutherland, Caithness, Orkney and Shetland.

Region 13 (East Scotland).—Berwickshire; Peebleshire; Roxburghshire and Selkirkshire; East, Mid- and West Lothians; Fifeshire and Kinross.

Region 14 (West Scotland).—Argyllshire and Dumbartonshire; Ayrshire, Buteshire, Dumfries-shire, Kirkcudbrightshire and Wigtownshire; Clackmannan and Stirlingshire; City of Glasgow Postal Districts, Lanarkshire and Renfrewshire.

Region 15 (Northern Ireland).—Antrim; Armagh; Down; Fermanagh; Londonderry; Tyrone.

Region 12 Representative

CONSEQUENT upon his being posted to Istanbul on business, Mr. John Douglas, GM2CAS, of Aberdeen, has been compelled to resign from the office of Region 12 Representative.

Nominations for his successor, who will hold office until December 31, 1955, should be made in writing and in prescribed form to reach the General Secretary by not later than December 31, 1954.

Best thanks are recorded to Mr. Douglas for his past most valuable services to the Society.

Watts Radio (Weybridge), Ltd.

THE above company are now operating from 8 Apple Market, Kingston-on-Thames, Surrey, at which address they will continue to cater exclusively for the home constructor.

LONDON MEMBERS' LUNCHEON CLUB

will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road,

at 12.30 p.m. on September 24, 1954.

Telephone table reservations to HOL 7373 prior to day of luncheon. Visiting amateurs especially welcome.

Tests and Contests

National Field Day, 1955

THE Contests Committee has carefully considered the comments received with the 1954 entries, and only minor changes have been made in the rules for 1955.

T.R.s and A.R.s are asked to note that the new covering sheets to be completed for each log are designed to enable them to obtain the very small number of personal signatures now required from operators on Field Day itself, and that contacts made by operators who have not signed the covering sheets personally are liable to be disallowed. Attention is also drawn to Rule 3, which has been slightly re-worded to make it quite clear that all operators must hold a current *British Isles* (G, GC, GD, GI, GM, GW) licence, and to Rule 9, which has been modified to permit tents other than those to be used for the actual stations to be erected before 1200 G.M.T.

All timings and log-keeping have been altered to G.M.T. in conformity with the practice now required by the G.P.O., and all competing stations will use the " /P " suffix. Contacts with stations not using the " /P " suffix will not count as portable-to-portable contacts within the British Isles.

Rules

1. *The event will commence at* 1700 *G.M.T. on Saturday, June* 6, 1955 *and conclude at* 1700 *G.M.T. on Sunday, June* 7, 1955.
2. *Only properly constituted R.S.G.B. Town or Area Groups within the British Isles, which, for the purposes of the event, comprise the prefix zones, G, GC, GD, GI, GM and GW, may enter for the contest.*
3. *Operators of portable stations competing in the contest must each hold a current British Isles (G.P.O.) Amateur Transmitting Licence, and must be fully paid-up Corporate Members of the Society at the time of the contest.*
4. *Each competing Group will be permitted to place two stations (" A " and " B ") in operation. " A " stations may operate on* 1.8 *and* 3.5 *Mc/s or* 1.8 *and* 7 *Mc/s and " B " stations on* 7 *and* 14 *Mc/s or* 3.5 *and* 14 *Mc/s, provided that no " A " station shall work on the same band as its associated " B " station. Both stations may operate from the same site or from different sites, provided they are located within the agreed limits of the area covered by their Regional Representative. It will be permissible for two or more towns or areas within a single region to amalgamate for the purpose of the event.*
5. *Each station must be licensed to use a different call-sign. Club and other collectively held call-signs are not permitted.*
6. *Applications for N.F.D. may be made only by properly appointed T.R.s and A.R.s as the case may be. Such applications, which must be sent to Headquarters, shall be set out in the following manner:—*

National Field Day, 1955

On behalf of the members in.....(Town or Area), I submit this application for permission to enter the event and propose to operate portable stations as follows:—

" A " Station Call Sign...../P. Licensee.....

Frequencies .....

Site .....

" B " Station Call Sign...../P. Licensee.....

Frequencies .....

Site .....

(If applicable) I desire to combine with.....(Town or Area) for the purpose of scoring.

Signed.....(T.R. or A.R.)

Call Sign..... Address.....

.....

This application is necessary to enter the contest. Frequencies chosen may not be varied after applications have been submitted. Application forms will be sent to T.R.s and A.R.s by Headquarters.

7. *Applications, duly signed, addressed to Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, London, W.C.1, must be post-marked not later than March* 31, 1955. *In no circumstances will late entries be accepted.*
8. *Stations must be operated from tents.*
9. *No apparatus may be erected on the site prior to* 1200 *G.M.T. on June* 6, 1955. *This rule includes aerials and aerial fittings as well as tented accommodation for the stations.*
10. *Any aerials may be used up to a maximum of three per station (including the receiving aerial) subject to the following limitations:—*
(*a*) *All aerials and feeders must be constructed from wire of total cross-sectional area not greater than that of* 14 *s.w.g.*
(*b*) *No part of the aerials shall exceed a height of* 45*ft above ground level.*
11. *Equipment at any " A " or " B " station must not exceed two transmitters and one receiver. Reserve equipment may be kept available, but not connected.*
12. *The total d.c. input to the anode circuit of the valve or valves energising the aerial, or to any previous stage of the transmitter, shall not exceed* 5 *watts.*
13. *Power for any part of the station shall not be derived from supply mains.*
14. *The contest is restricted to the use of c.w. (A1) only.*
15. *An exchange of reports must be made and acknowledged before points may be claimed. In the case of portable to portable contacts between stations located in the British Isles (G, GC, GD, GI, GM and GW), this report must include the first three letters of the operator's surname, e.g. RST579 JON (station being operated by W. Jones), and such letters, both incoming and outgoing, together with signal reports, must be entered on the log sheets. Proof of contacts may be required.*
16. *Contacts with ships, or unlicensed stations located in countries where licences are obtainable, will not count for points. The decision as to whether a station is to be classed as unlicensed will rest with the Contests Committee.*
17. *Only one contact with a specific station may be made on each band during the contest.*
18. *Points must not be claimed for contacts made by a competing station within its own town or area or with members of its own group whether fixed, portable or mobile, and any such claim may entail disqualification of the complete entry.*
19. *Points will be scored on the following basis:—*

A.—*Between competing stations and fixed stations—*

	Points
(*a*) *Within the British Isles*	1
(*b*) *In the rest of Europe (including Eire)*	2
(*c*) *Outside Europe*	3
(*d*) *In the British Empire*	6

B.—*Between competing stations and portable stations—*

	Points
(*a*) *Within the British Isles*	3
(*b*) *In the rest of Europe (including Eire)*	4
(*c*) *Outside Europe*	6
(*d*) *In the British Empire*	12

20. *An entry will be valid only if signed by the properly appointed T.R. or A.R., who will be solely responsible for the conduct of the event in his Town or Area.*
21. *Contacts made by any operator whose personal signature does not appear on the covering sheet(s) of the appropriate log(s) will be disallowed.*
22. *Each station's entry shall consist of extracts from the station log, a separate extract being submitted for each band worked. Forms for this purpose will be supplied by Headquarters. Entries must reach the Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, London, W.C.1, post-marked not later than June* 20, 1955. *In no circumstances will late entries be accepted.*
23. *In addition to the National Field Day Trophy and miniature replica which will be awarded to the Group obtaining the highest combined score, miniature replicas will be awarded to the Groups with the leading " A " and " B " station scores. Should the winning Group also lead with the highest " A " or " B " station score, it will only be eligible for one replica; the other would not then be awarded. A certificate will be awarded to each of the following: (a) The leading Group on each band; (b) The chief operator of the British Isles or overseas station whose check log shows that he contributed the most points to competitors.*
24. *The N.F.D. Trophy will be held by the winning Group for one year and will be handed to the T.R. or A.R., who will be held responsible for its custody during the year.*
25. *The Scottish N.F.D. Trophy (together with miniature) will be awarded to the Scottish Town or Area Group scoring the highest number of points.*

Fifth D/F Qualifying Event, 1954

EIGHT competitors assembled at Wyle railway station for the start of the fifth in the 1954 series of qualifying events, organised on this occasion by the Salisbury and District Short Wave Club.

Despite a check between the hidden transmitter site and a mobile station shortly before the start, two contestants failed to identify the first transmission; however, one of these competitors later succeeded in locating the transmitter.

A very heavy downpour of rain then washed out all transmissions until 1504, apparently due to detuning of the aerial in the wet foliage. From 1504 onwards transmissions were reported as normal, and the first to locate the site was R. T. Craxton, G3IKL (B.T.H. Rugby) at 1548. Two other competitors located the transmitter before the end of the contest, A. C. A. Newman, G2FIX (Salisbury) at 1601, and

P. N. Prior, B.R.S.19746 (B.T.H. Rugby) at 1625. R. D. Charlton, G3CPC, of Twickenham, arrived after the end of the last transmission. Messrs. Craxton, Newman and Prior qualify for the National Final. Of the remaining four competitors, two gave up due to the heavy rain, one got completely lost on his bearings and one complained that the signals he was receiving were too weak to take bearings.

The contest was organised by V. G. Page, G3IVP, and the transmitter operated under the Salisbury Club call-sign, G3FKF/P.

Direction Finding Qualifying Events.

The Contests Committee will be glad to hear from any additional R.S.G.B. Group or Affiliated Society which may be interested in taking part in the 1955 series of the D/F Qualifying Events. The support for these events continues to grow apace. Letters for the Committee should be sent to the Honorary Secretary, c/o R.S.G.B. Headquarters.

The 70 cm Band—Admiralty Seek Data

THE Signal and Radio Establishment at Portsmouth have suggested to Signal Division, Naval Staff, Admiralty, that amateurs working in the 70 cm band may be able to provide some useful information on radio propagation in that part of the spectrum. The details required are as follows:—

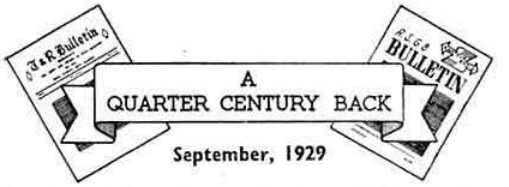
(a) Information as regards amateur contacts on the 70 cm band over distances greater than line of sight including both one way and two-way contacts.
(b) Details of the transmitting and receiving aerials used including height above m.s.l.
(c) Approximate power radiated and signal-to-noise ratio of the receiver.
(d) Any meteorological data available appertaining to the time of the contact.

Any information that might be of assistance should be sent to

The Captain Superintendent,
Admiralty Signal and Radar Establishment,
Portsdown, Cosham,
Portsmouth, Hants.

marked for the attention of Mr. S. J. Moss.

This picture of G2DTD operating G5BM/P (Cheltenham) was taken by the light of a Tilley lamp during the small hours of N.F.D. Sunday.



"CONVENTION Dinner will be held at Pinoli's on Saturday, September 28. Tickets are 5s. each. . . . Last year over 140 members were present."

* * *

The Editorial Staff described "The R.S.G.B. Short Wave Four"—a screen-grid h.f. receiver which should "receive 2XAD and other American stations at good loudspeaker strength, even when it is daylight the whole way across the Atlantic Ocean."

The valves specified were Marconi S625 (h.f.), DE5B (detector), Mullard PM5X (l.f.), PM6 (l.f.). Frequency range was 6 to 30 Mc/s.

* * *

D. N. Corfield, G5CD, discussed "Some Points on Broadcast Receiver Design," under the six headings of Aerial System, H.F. Amplifier, Detector, L.F. Amplifier, Loudspeaker, and Power Supply.

"If it is thought that the aerial system may not give sufficient volume from a distant station then one h.f. valve may be used, but more than one is not advised unless conditions are exceptional."

"Horn types (of loudspeaker) are not advised, unless one has space to house a horn of length at least 15 ft. These horns can be obtained . . . folded into a shape that is not unreasonable in size."

* * *

In an article "Low Power at G6CL," John Clarricoats described the results of his low-power experiments over a period of three years. Using 4.5 watts Nijni Novgorod (U1UA) and Lynn, Mass. (NU1BKE) were worked in January, 1927, on 45 Metres. Many contacts were made later that year with F. L. Hogg's station in Iceland. More than 750 stations were worked using 1 watt to a twin A.O.G. aerial. In 1928 25 U.S. and Canadian stations were worked between March 4 and 29 using 5 to 7 watts from a small 300 volt accumulator. The valve in use was a Telefunken RE504. In May, 1928, NU1ASY was worked on 23 Metres with 6 watts input, and in April, 1929, Yokohoma with an input of 4.8 watts. "For European work it is now definitely established that signals are louder when using 3 watts than 7 watts on the 14 Mc/s band."

* * *

Twenty-one London Members, together with Brenda Bell, sister of the famous New Zealand amateur Frank Bell, visited Rugby Radio. The party was entertained by Mr. Harry Faulkner.

Contests Diary

1954

September 25-26		420 Mc/s Test and Contest §
October 2-3	-	Low Power Contest †
November 13-14		"Top Band" (No. 2)

§ *For rules, see page 37, July, 1954* BULLETIN.
† *For rules, see page 87, August, 1954* BULLETIN.

Eighteenth B.E.R.U. Contest 1955

EXAMINATION of the comments received with entries for the 1954 Contest shows that the rules can now be stabilised, and it is intended that the rules now approved for 1955 shall continue in use in following years. The only modification is the splitting of Zone 16 into two zones, making a total of 25 zones.

Due to the poor support received in recent years for the Receiving Section, it has been decided that this shall be discontinued.

Rules

1. *The Event is divided into two Telegraphy Sections, namely:—*
   (a) Senior (maximum licensed power).
   (b) Junior (maximum input 25 watts).
2. *The Event (Senior and Junior) will take place from* 0001 *G.M.T. Saturday, January* 29, *to* 2359 *G.M.T. Sunday, January* 30, 1955.
3. *The Contests are open to all British subjects living within the British Empire and British Mandated Territories and to members of British Forces of Occupation operating properly authorised stations, who are fully paid-up members of either the R.S.G.B. or one of the British Empire Societies listed below. All entrants agree to be bound by the Rules of the Contests.*
4. *An entrant who is not a member of the R.S.G.B. must certify in the declaration that he was a fully paid-up member of one of the listed British Empire Societies and that he was resident in that country at the time of the Contest.*
5. *An entrant not located in one of the prescribed Prefix Zones shall be considered as being in the Prefix Zone nearest to his station.*
6. *Only the entrant will be permitted to operate his station for the duration of the Contest.*
7. *Entries must be legibly written or typed on quarto or foolscap paper as set out in the example, using one side of the paper only. Sheet* 1 *will bear the name, address, etc. and the declaration; Sheet* 2 *the analysis. Continuation sheets will continue the log in time order (G.M.T.).*
8. *All entries must be posted within* 14 *days of the close of the Contest—post-marked not later than February* 14, 1955—*and must be addressed to the R.S.G.B. Contests Committee, New Ruskin House,* 28/30 *Little Russell Street, London, W.C.*1. *The closing date for acceptance of entries is May* 1, 1955.
9. *The judging of entries will be carried out by the R.S.G.B. Contests Committee. The decision of the R.S.G.B. Council will be final in all cases of dispute. No correspondence will be entered into regarding any decision made by the Council or the Contests Committee.*
10. *Operation is restricted to the following bands:* 3.5, 7, 14, 21 *and* 28 *Mc/s. Transmissions must be of type A*1 *(pure c.w.) only, and frequent tone reports of T*8 *or less may result in disqualification.*
11. *The conditions laid down in the entrant's licence must be observed. The input to the valve or valves delivering power to the aerial must not exceed* 25 *watts in the Junior Section.*
12. *Contacts may be made with any station using a British Empire call-sign in any of the Territories indicated in Rule* 3, *except that contacts with station in the entrant's own zone, or with mobile or unlicensed stations in places where licenses are obtainable, will not count for points. Only one contact per band with each station will count for points, but duplicate contacts should be logged. The decision as to whether or not a station is valid will rest with the R.S.G.B. Contests Committee.*
13. *For each zone (outside the entrant's own zone) the first contact on a specific band will count* 15 *points, the second contact* 14 *points, and so on till after the* 14*th contact they count* 1 *point each. This system will be repeated on each band. For entrants outside the British Isles, Zone* 2 *is subdivided into three zones under call-sign figures: (a) call-signs with figures* 2 *and* 4*; (b) call-signs with figure* 3, *and (c) call-signs with figures* 5, 6 *and* 8. *Thus, for example, stations signing G*3, *GC*3, *GD*3, *GI*3, *GM*3 *and GW*3 *are all in Zone* 2*b. British Isles stations cannot work each other for points.*
14. *Serial numbers must be exchanged and acknowledged before a contact can count for points. The serial number of* 6 *figures is made up of the RST report plus three figures which may start with any number between* 001 *and* 100 *for the first contact and will increase in value by one for each successive contact; e.g.* 087 *for the first and* 088 *for the second contact, etc.*
15. *A trophy or miniature cup will be awarded to the winner of each section, and certificates will be awarded to the first three entrants in each section. In addition, certificates will be awarded to the leading entrant in each zone, provided that three entries have been received from that zone and a second certificate will be awarded for each zone yielding ten or more logs.*

BRITISH EMPIRE SOCIETIES

Amateur Radio Society of India, Canadian Section A.R.R.L., Ceylon Amateur Radio Society, Hong Kong Amateur Radio Transmitters' Society, Jamaica Amateur Radio Club, Malta Amateur Radio Society, Montreal Amateur Radio Club, Newfoundland Amateur Radio Association, New Zealand Association of Radio Transmitters, Northern Rhodesia Amateur Radio Society, Pakistan Amateur Radio Society, Radio Society of East Africa, Radio Society of Southern Rhodesia, South African Radio League, Wireless Institute of Australia.

ENTRY FORM

SHEET 1 Call Sign.....

B.E.R.U. Contest, 1955.....Section

Name (Block Letters).....
Address .....
Input Power to Final Stage.....
Aerials Used .....
(Other station details may be included).

DECLARATION:—

I hereby certify that my station was operated strictly in accordance with the rules and spirit of this Contest, and I agree that the decision of the Council of the R.S.G.B. shall be final in all cases of dispute.

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

If an entrant is a non-member of the R.S.G.B., he must sign the following additional Declaration:—

I hereby certify that at the time of the Contest I was a fully paid-up member of .....

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

Date	G.M.T. Contact Established	Band Used Mc/s	Call Sign of Station Worked	Serial Nos. Sent	Serial Nos. Rcvd.	Points Claimed	(Leave Blank)
TOTAL							

ENTRY FORM

SHEET 2 **Prefix Zone Analysis**

	Prefix Zone	Mc/s Contacts	Mc/s Points	Mc/s Contacts	Mc/s Points	Mc/s Contacts	Mc/s Points
1	AP, VU, 4S7						
2	(*a*) All G prefixes with Figures 2 and 4						
	(*b*) All G prefixes with Figure 3						
	(*c*) All G prefixes with Figures 5, 6 and 8 (see Rule 13)						
3	DL2, MB9						
4	MD, MF, ZB, ZC4, 5A2C ...						
5	VE1, VO						
6	VE2						
7	VE3						
8	VE4, 5, 6						
9	VE7, 8						
10	VK2, 4						
11	VK3, 7						
12	VK5, 6						
13	VK9, VR4						
14	All VP except VP8						
15	VP8, VK1						
16	VQ1, 3, 4, 5						
17	VQ2, ZD6, ZE						
18	VQ6, 8, 9 VS9, MP4, ST, ZC2(M13)						
19	VR1, 2, 3, 5, 6, ZK, ZM ...						
20	VS1-6						
21	All ZD except ZD6						
22	ZL						
23	ZS1, 2						
24	ZS3, 6, 9						
25	ZS4, 5, 7, 8						
	TOTALS						

BC348 Receiver

Copies of the circuit diagram of the BC348 (size 10in. by 12in.) may be obtained for a nominal charge from B. B. Wilson (B.R.S.19449), 297 Linthorpe Road, Middlesbrough.

Regional and Club News

BRADFORD AMATEUR RADIO SOCIETY.—Full details of the winter programme, which was due to commence on September 14 with "Any Questions?" may be obtained from the *Hon. Secretary*: F. J. Davies, 39 Pullan Avenue, Bradford.

BRITISH TWO-CALL CLUB.—Members who have recently joined the club include G3JND/VQ3DN, G2ATU/ZD4BM and VP7NF/VP4LX/VP9SS. The latter, in the U.K. until May, 1955, would like to meet other members. Membership is open to British subjects who hold or have held call-signs in two or more countries (the U.K. counting as one). Details may be obtained from the *Hon. Secretary*: G. V. Haylock (G2DHV), 63 Lewisham Hill, London, S.E.13.

EDINBURGH AMATEUR RADIO CLUB.—Meetings are held at 16 Bothwell Street every Wednesday, commencing at 7.30 p.m. Forthcoming lectures will deal with "420 Mc/s Transmitter and Receiver" by A. Reading and "N.B.F.M." by J. Snankland (GM8FM). The club transmitter, now harmonic-proof, is active under the call-sign GM3HAM. *Hon. Secretary*: D. Black, 16 Edina Place, Edinburgh.

HULL & DISTRICT RADIO SOCIETY.—Beverley members of the Hull Society operated portable using the Society's call-sign G3AMW during the weekend of July 24–25, from a site 80ft a.s.l. On Top Band, using a 270ft long-wire aerial on 45ft masts a report of RS59 was received from a station in London. In all, about 50 contacts were made on 1.8 3.5 and 7 Mc/s including one with OZ. Equipment included a 15 watt transmitter (1625 p.a.) choke modulated by a 1625 and a BC348 receiver. Power was derived from a No. 19 set rotary unit, and 12V batteries. The operators were G2CPS, G2DPA and G3GAW. Altogether, nearly 30 members and their families took part.

KINGSTON & DISTRICT AMATEUR RADIO SOCIETY.—At the meeting on October 7, the new Mullard 5–10 Amplifier will be described and demonstrated by Messrs. Ferguson and Burby of Mullard, Ltd. The A.G.M. is arranged for October 20. Recent activities have included participation in the QKP Society's transistor transmitter tests and a talk and demonstration on transistors by A. Cockle (G3IEE).

NORWOOD & DISTRICT.—The August meeting was well attended although the lecture on "R.A.E.N. and Portable Equipment" had unfortunately to be postponed. All local members and friends are invited to attend the September meeting at Windermere House, Westow Street.

RAVENSBOURNE AMATEUR RADIO CLUB.—Meetings, at Durham Hill School, Downham, recommence on September 22. The annual subscription is 1s. 6d. Classes in radio theory are due to commence shortly. The L.C.C. fee will be 10s. (4s. per term).

READING RADIO SOCIETY.—The Society's annual outing to Sandbanks and Swanage took place on August 29. On October 9, two Mullard films will be shown, while on October 30 a talk will be given by Mr. Edwards of the A.E.I. Research Laboratory, Aldermaston. *Hon. Secretary*: L. A. Hensford (G2BHS), 30 Boston Avenue, Reading.

SLADE RADIO SOCIETY.—A copy of the tape recording recently received from the Catalpa Amateur Radio Society of Birmingham, Mich., U.S.A., has been made and is available on loan to other societies. It runs for one hour and gives much information regarding the American City of Birmingham. The winner of the D/F Contest for the Harcourt Trophy, held on August 15, was G. C. Simmonds. J. J. Grant (Rugby Amateur Radio Society) was second. A lecture on "The Application of Electronics to the Instrument Industry" was given by T. J. Hayward (G3HHD). *Hon. Secretary*: C. N. Smart, 110 Woolmore Road, Erdington, Birmingham 23.

SOUTH MANCHESTER RADIO CLUB.—Meetings have been arranged for September 24 ("Design of Power Packs" by M. Barnsley, G3HZM) and October 8 (A.G.M.) at Ladybarn House, Mauldeth Road, Fallowfield, Manchester 14. *Hon. Secretary*: M. Barnsley (G3HZM), 17 Cross Street, Bradford, Manchester 14.

STOURBRIDGE & DISTRICT AMATEUR RADIO SOCIETY.—N. T. Harper (G4MI) described and demonstrated his home-constructed tape recorder at the meeting on August 10. The talk was recorded and played back as an example of what can be accomplished. Members of the society have visited the Sutton Coldfield TV station. *Hon. Secretary*: F. W. Meredith, 26 Gilbanks Road, Wollaston, Stourbridge.

A Scottish Wedding
In this happy group picture taken at the recent wedding in Banff, Scotland, of Ian Sutherland, GM3EZO to Miss E. J. Bruce, the local amateur fraternity was well represented. From left to right, GM3HVS and YL; GM3HXT (best man); GM3EZO and XYL; G3EPL and XYL; GM3GCH and XYL; GM3DPK and XYL.

TEES-SIDE AMATEUR RADIO CLUB.—"Line Transmission" is the title of the lecture to be given at the meeting in the Eston Scout Hut, Eston, at 8 p.m. on October 7. *Hon. Secretary*: H. Walker (G3CBW), 64 Ayresome Street, Middlesbrough.

TORBAY AMATEUR RADIO SOCIETY.—At the August meeting, G3FHI gave a talk on "Aspects of Crystal Grinding." The subject at the September meeting (on the 18th) will be "Transistors" when G3AVF will be the speaker. ZC4IW (son of the Hon. Secretary), has returned home following his Army service. Visitors have included G3FPJ. *Hon. Secretary*: L. H. Webber (G3GDW), 43 Lime Tree Walk, Newton Abbott.

WARRINGTON & DISTRICT RADIO SOCIETY.—The annual Inter-Club Top Band Telephony Contest, organised by the Society, will take place on September 26. All members of local societies may take part. A visit to the Port Radar Station, Liverpool, is being arranged. *Hon. Secretary*: G. H. Flood, 32 Capesthorne Road, Orford, Warrington.

Affiliated Societies

THE following is an addition to the list of Affiliated Societies published in the August, 1954, issue of the BULLETIN:—

AMATEUR RADIO CLUB, c/o 2/Lt. R. Walker, R. Sigs., 12 Wireless Squadron, British Troops in Austria, B.T.A. 3.

The following is a correction to the same list:—

WEST LANCS RADIO SOCIETY, c/o S. Turner (G3JUB), 5 Balfe Street, Seaforth, Liverpool 21.

Representation

THE following is an amendment to the list of Town Representatives published in the December, 1953, issue.—

Region 9—Devonshire

Exeter

E. G. Bright (G3JW), Crockwell House, Exminster, nr. Exeter.

York Conventionette

Some of those who gathered in York on July 11 for the Region 2 Conventionette. The President (Mr. A. O. Milne) is seated in the centre.

Forthcoming Events

REGION 1

Bury.—October 15, 7.30 p.m., The Drive, Seedfield, Bury.
Chester (C. & D.A.R.S.).—Tuesdays, 7.30 p.m., Tarran Hut, Y.M.C.A., Chester.
Crosby.—Tuesdays, 8 p.m., over Gordon's Sweetshop, St. John's Road, Waterloo.
Isle of Man (I.O.M.A.R.S.).—October 6, Broadway House, Douglas.
Lancaster (L. & D.A.R.S.).—October 6, 7.30 p.m., George Hotel, Torrisholme.
Liverpool (L. & D.A.R.S.).—Tuesdays, 7.30 p.m., St. Barnabas Hall, Penny Lane, Liverpool 15.
Manchester (M. & D.A.R.S.).—October 4, 7.30 p.m., Brunswick Hotel, Piccadilly, Manchester.
Preston.—September 24, October 8, 22, Belle Vue Hotel, New Hall Lane, Preston.
Rochdale (R.R.T.S.).—Fridays, 7.45 p.m., 1 Law Street, Sudden.
South Manchester (S.M.R.C.).—Fridays, 7.45 p.m., Ladybarn House, Mauldeth Road, Manchester 14.
Southport.—Thursdays, 8 p.m., Y.M.C.A., off Eastbank Street, Southport.
Stockport (S.R.S.).—September 15, 29; October 13, 8 p.m., Blossoms Hotel, Buxton Road, Stockport.
Warrington (W. & D.A.R.S.).—September 15, October 6, 20, 7.30 p.m., King's Head Hotel, Winwick Street, Warrington.
West Cumberland.—October 7, 7 p.m., Kells Community Centre, Whitehaven.
Wirral (W.A.R.S.).—September 15, October 6, 20, 7.45 p.m., Y.M.C.A. Whetstone Lane, Birkenhead.

REGION 2

Barnsley.—September 24, October 8, 7.30 p.m., King George Hotel Peel Street.
Bradford.—September 28, October 12, Cambridge House, 66 Little Horton Lane.
Catterick.—Wednesdays, 7 p.m., Loos Lines, Catterick Camp.
Darlington.—Thursdays, 7.30 p.m., 129 Woodlands Road.
Doncaster.—October 13, 7.30 p.m., Y.W.C.A., Cleveland Street.
Gateshead.—Mondays, 7.30 p.m., Mechanics Institute, 7 Whitehall Road.
Hull.—September 27, October 12, 7.30 p.m., "Rampant Horse," Paisley Street.
Leeds.—Wednesdays (from September 29), 7.30 p.m., Swarthmore Educational Centre, Woodhouse Square.
Middlesbrough (T-S.A.R.C.).—October 7, 8 p.m., 2nd Eston Scout Hut, Eston.
Newcastle-upon-Tyne.—October 5, 7.30 p.m., c/o D. G. Lucas, 33 Broad Chare, Quayside.
Pontefract (P.A.T.G.).—September 30, October 14, 8 p.m., "Fox Inn," Knottingley Road.
Rotherham.—Wednesdays, 7 p.m., "Cutlers Arms," Westgate.
Scarborough.—Thursdays, 7.30 p.m., B.R. Rifle Club, West Parade Road.
Sheffield.—September 22, 8 p.m., "Dog and Partridge," Trippet Lane. October 13, 8 p.m., Albreda Works, Lydgate Lane.
Slaithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
York.—Thursdays, 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

REGION 3

Birmingham (South).—October 4, 7.30 p.m., Friends Hall, Watford Road, Cotteridge. **(M.A.R.S.).**—September 21, 6.45 p.m., Imperial Hotel. **(S.R.S.).**—September 26, Double Midnight D/F Test.
Coventry.—September 24, 7.30 p.m., Priory High School, Wheatley Street. **(C.A.R.S.).**—September 27, October 11, 7.30 p.m., 9 Queens Road.
Kenilworth, Leamington & Warwick.—October 21, 7.30 p.m., Dalehouse Lane.
Malvern.—October 4, 8 p.m., "Foley Arms."
Rugby.—October 7, 7.30 p.m., B.T.H. Recreation Hall, Hillmorton Street'
Solihull.—September 17, October 1, 7.30 p.m., Old Manor House, High Street, Solihull.
Stoke-on-Trent.—September 29, 8 p.m., "Lion's Head," John Street, Hanley.
Stourbridge (St. A.R.S.).—October 5, 8 p.m., King Edward VI School.
Wolverhampton.—September 27, October 11, 8 p.m. Stockwell End, Tettenhall.
Wrekin.—October 4, 8 p.m., Wrekin Services Club, Roseway, Wellington.

REGION 4

Alvaston.—Tuesdays and Thursdays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, nr. Derby.
Chesterfield.—Tuesdays, 7.30 p.m., Bradbury Hall, Chatsworth Road.
Derby (D. & D.A.R.S.).—Wednesdays, 7.30 p.m., Derby College Arts and Crafts, Sub-basement, Green Lane.
Leicester (L.R.S.).—September 27, October 11, 7.30 p.m., Holly Bush Hotel, Belgrave Gate.
Lincoln (L.S.W.C.).—October 6, 7.30 p.m., Technical College, Cathedral Street.
Mansfield (M. & D.A.R.S.).—October 13, 7.30 p.m., Denman's Head Hotel, Market Place, Sutton-in-Ashfield.
Newark.—September 19, October 3, 7 p.m., Northern Hotel, Appleton Gate.
Northampton (N.S.W.C.).—Fridays, 7 p.m., October 1, 6 p.m., Club Room, 8 Duke Street.
Nottingham.—September 17, October 15, 7.30 p.m., Sherwood Community Centre, opposite Woodthorpe Drive, Sherwood.
Peterborough.—October 6, 7.30 p.m., 21 Hankey Street.
Worksop.—October 4, 7 p.m., King Edward Hotel.

REGION 5

Chelmsford.—October 5, 7.30 p.m., Marconi College, Arbour Lane.
Lowestoft & Beccles (L. & B.A.R.C.).—September 29, October 13, 7.30 p.m., Y.M.C.A., Lowestoft.

REGION 6

Cheltenham.—October 7, 8 p.m., 128 Prestbury Road.
Gloucester (G.R.S.).—Thursdays, 7.30 p.m., The Cedars, 83 Hucclecote Road, Gloucester.
High Wycombe.—September 21, 7.30 p.m., G6JK, 17 New Drive, Totteridge.
Oxford (O. & D.A.R.S.).—September 29, October 13, 7.30 p.m., Club Room, "Magdalen Arms," Iffley Road, Oxford.
Portsmouth.—Tuesdays, 7.30 p.m., British Legion Club, Queens Crescent, Southsea. (Clubroom open every evening.)
Southampton.—October 2, 7 p.m., 1 Prospect Place.
Stroud.—Wednesdays, 7.30 p.m., Subscription Rooms.

REGION 7

Acton, Brentford & Chiswick.—Tuesdays, 7.30 p.m., A.E.U. Rooms, 66 Chiswick High Road, W.4.
Barnes, Putney & Richmond.—October 1, 7.30 p.m., 337 Upper Richmond Road, S.W.14.
Bexleyheath (N.K.R.S.).—September 23, October 14, 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath.
Bromley (N.W.K.A.R.S.).—October 1, 8 p.m., "Shortlands Tavern," Station Road, Shortlands.
Chingford.—September 24, October 8, Venue from G4GA (SIL 5635) or B.R.S.19765 (SIL 6055).
Chislehurst & Sidcup.—October 13, "Seven Stars," High Street, Footscray.
Croydon.—October 12, 7.30 p.m., "Blacksmith Arms," 1 South End, Croydon.
Dorking.—Tuesdays, 7.30 p.m., 5 London Road.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway, W.5.
East Ham.—Tuesdays, 8 p.m., September 21, October 5, 12 Leigh Road.
East London.—September 19, October 17, 2.30 p.m., Town Hall, Ilford.
Enfield.—Sunday, September 19, 3 p.m., George Spicer School, Southbury Road, Enfield.
Finsbury Park.—September 21, 7.30 p.m., 164 Albion Road, Stoke Newington, N.16.
Guildford & Woking.—September 26, Royal Arms Hotel, North Street, Guildford.
Hendon & Edgware.—Wednesdays, 8 p.m., 22 Goodwins Avenue, Mill Hill, N.W.7.
Hoddesdon.—October 7, 8 p.m., "Salisbury Arms."
Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Road.
Lewisham (R.A.R.C.).—Wednesdays, 8 p.m., Durham Hill School, Downham.
Kingston (K. & D.R.S.).—Alternate Wednesdays, 7.45 p.m., Penrhyn House, Penrhyn Road.
Norwood.—September 18, October 16, Windermere House, Weston Street, Crystal Palace.
Southgate & Finchley.—October 14, 7.30 p.m., Arnos School, Wilmer Way.
Sutton & Cheam (S. & C.R.S.).—September 21, "The Harrow," Cheam Village, Surrey.
Welwyn Garden City.—October 5, 7 p.m., Homestead Court. (Annual Hamfest.)

REGION 8

Brighton.—T.R. at home, 7.30 p.m., 27 Warren Avenue, Woodingdean. **(B.D.R.C.)** Tuesdays, 7.30 p.m., "Eagle Arms," Gloucester Road.
Isle of Thanet (I.O.T.R.S.).—Fridays, 7.30 p.m., Hilderstone House, Broadstairs.
Maidstone (M.K.A.R.S.).—Tuesdays, 7.30 p.m., Elms School, London Road.

REGION 9

Bristol.—No group meeting in September.
Exeter.—October 1, 7 p.m., Y.M.C.A., St. David's Hill.
North Devon.—October 7, G3BO, "Rosebank," Westcombe, Bideford.
Penzance.—October 7, Railway Hotel.
Plymouth.—September 18, October 16, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.
Torquay.—September 18, October 16, 7.30 p.m., Y.M.C.A., Castle Road.
West Cornwall (W.C.R.C.).—September 16, October 7, "Fifteen Balls," Penryn, nr. Falmouth.
Weston-super-Mare.—October 5, 7.30 p.m., Y.M.C.A.
Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road.

REGION 10

Cardiff.—October 11, 7.30 p.m., "The British Volunteer," The Hayes, Cardiff.
Neath & Port Talbot.—October 13, 7.30 p.m., Royal Dock Hotel, Briton Ferry.

Region 13

Dunfermline.—Mondays and Thursdays, 7.30 p.m., behind 34 Viewfield Terrace, Dunfermline.

REGION 14

Falkirk.—September 24, October 8, 7.30 p.m., Temperance Café, High Street, Falkirk.

Letters to the Editor

The R.S.G.B. Two Metre Converter

DEAR SIR,—I am very grateful to Commander Pegler (G3ENI) for his reply to my letter published in the May issue of the BULLETIN. That letter was written early in March and much has happened since then. After weeks of experimenting, I finally made the converter work in an extremely satisfactory manner, and it now shows a very definite improvement in signal-noise ratio over the G2IQ converter with which I originally compared it, good though the latter is. Several 2 m enthusiasts have heard the new converter in action and were very impressed by its performance.

For the assistance of others I should like to mention two points. Firstly, I found it absolutely essential to screen completely the input circuit of the r.f. stage from the output; this I did by soldering stout copper foil to the centre spigot of the valveholder and to tag 2 (the grounded grid), carried out between tags 5 and 6 to form a complete " box " enclosing L1, C1, RFC1 and tags 2, 3, 4, 5, between the copper foil and the sides of the chassis.

Secondly, in the Brimar " Application Report " on the 12AT7 used as a mixer, the importance of the length of the lead from the mixer anode tag (6) to the body of the by-pass capacitor (C5) is emphasised; it is stated that if this lead exceeds one inch (at 100 Mc/s) mixer regeneration will occur. So I reduced the lead to three-quarters of an inch (for 145 Mc/s) and this alteration, together with the screening of the r.f. stage, completely cured the tendency to regeneration which was the cause of all my troubles.

I can now read an S1 phone signal (if properly modulated). The sensitivity is very even all round the dial. I feel that I owe a great debt to Mr. W. H. Allen (G2UJ) and to Commander Pegler for a very fine converter.

Yours faithfully,
V. G. P. WILLIAMS (G3FYY).

London, N.W.2.

Reply

While regretting that Mr. Williams has experienced some difficulty in getting his converter working, I would say that during development of the circuit very complete screening was at first incorporated and gradually discarded as unnecessary. It will be appreciated that L1 is not resonant in the 2 m band and I have, in fact, coupled it quite tightly to the anode end of L2 without inducing instability. In one model, a tendency towards self-oscillation, combined with over sharp tuning of the r.f. valve anode circuit and resulting inability to cover the required 2 Mc/s bandwidth without retuning, was traced to L3 being resonant to the image frequency. I am aware of the possibility of regeneration due to the length of the mixer anode connection but failed to find any undesirable effects when this lead was varied from a negligible length to at least 2½ in.

W.H.A.

Should Horizontally Polarised Aerials be Used?

DEAR SIR,—In view of the fact that mobile operation is now permitted I suggest that some thought be given to the problem of horizontally polarised aerials for use particularly on 2 metres.

If practical designs are not soon made available vertical polarization will become standard for mobile use with consequent loss of uniformity and reduced signal strength when working fixed stations.

Yours faithfully,
RALPH C. TAYLOR (G2HCJ)

Warrington, Lancs.

The Origin of $\overline{KN}$

DEAR SIR,—As an ex-Op., may I give my opinion about the origin of $\overline{KN}$. In the days when the vast majority of ship stations used spark and QRM was much worse than anything experienced to-day, a ship in a congested area often had great difficulty in receiving from a distant station, although the distant station being in a quiet area had no trouble in the QSO.

A ship station, for example, in the English Channel clearing traffic to one far out in the Atlantic would, after each message, send $\overline{AR}$ $\overline{AS}$ (wait) and the Op. would then go over to receive to check on QRM. It was often necessary to send a series of $\overline{AS}$ until the channel cleared, followed by a hurried $\overline{KN}$ meaning K now, and the Op. at the other end sent a snappy QSL.

$\overline{KN}$ is not new. It was used at least 25 years ago.

Yours faithfully,
BRIAN G. MAGUIRE (GI3CFI).

Coleraine, N. Ireland.

The Editor does not necessarily endorse the views and opinions expressed by contributors to this feature.

T.R. Switch for Single Sideband

DEAR SIR,—Upon seeing in the June issue of the BULLETIN the circuit developed by GI3ZX from Cronin's original circuit, which I had already tested and found inadequate for its purpose, I made some measurements on the modified circuit, and found it considerably better, as the table shows. However, it is still far from perfect as a protection for the receiver.

The efficiency of action in either circuit depends on the short-circuiting effect of the neon; unfortunately, very low voltage neons are not available.

Since it was thought that a limiter acting at much lower voltage would make either circuit really successful, a diode was tried. To prevent the diode from conducting during reception, and thus causing loss of received signal, a small amount of bias was applied from a single 1.5 V cell. Theoretically, a by-pass condenser should be connected across the cell, but was not found necessary in practice.

The following table shows how the measurements compare:—

Circuit in use	Output to Receiver			
	With limiter removed	CV71 neon (230 V striking)	CV188 neon (140 V striking)	EA50 diode
Cronin	92 V	48 V	29 V	0.9 V
GI3ZX	92 V	29 V	17 V	1.1 V

It will be noted that by using a diode limiter in place of a neon, the improvement is very considerable.

The difference in the two readings with the diode is probably due to small errors in tuning the circuits and to slight differences in their behaviour, and does not necessarily indicate any real difference in efficiency. Even lower outputs were obtained when the diode bias was reduced to 1 V by means of a potentiometer, but the added complication was not considered worthwhile.

Since the valve diode requires heater voltage, which may be inconvenient in some circumstances, a germanium diode was also tried, with similar reduction of transmitter leakage to the receiver. However, the finite reverse resistance of the germanium diode caused a loss of 10 per cent. in receiver input voltage when the circuit was in the " receive " condition, whereas the valve diode caused no measurable loss.

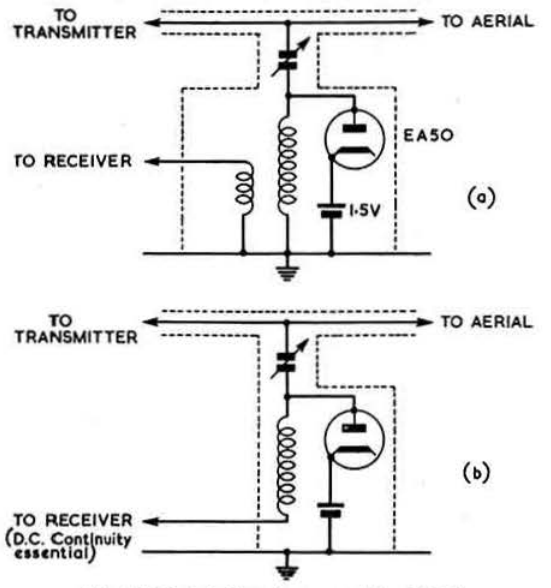
Yours faithfully,
C. C. NEWTON (G8PN).

Birmingham 14.

The Unwritten Law of Precedence

DEAR SIR,—I would like to appeal to newcomers to Amateur Radio, particularly new 'phone operators, to observe the unwritten law of precedence which has been traditional for many years.

May I point out that the operator who instigates a QSO, *i.e.*, the one who first calls CQ on a clear channel, thereby takes precedence on that frequency as far as further QSOs are concerned. To illustrate:—Station " A " calls CQ, " B " replies and a QSO ensues. At the end of the contact station " B " signs off and listens, " A " says good-bye to " B " and



The T/R Switch Circuit suggested by G8PN

states that he is standing by for other calls. Should station " C " wish to QSO " A " and " B " together he should break-in quickly and ask permission to join in. In this case " A " is the station which has the right to grant or refuse permission. Alternatively, should " C " wish to QSO " B " only, he should wait until the end of the " A "/" B " contact and then call " B " just off " A"s frequency (so as to avoid interferring with any station who may now call " A ").

At the end of any QSO the instigating station remains in possession of the channel and the other station or stations move off and find a clear spot for themselves. In no circumstances may " C " call " B " on " A "s frequency immediately after the " A "/" B " QSO and proceed to make a full contact with " B " on this channel. To do so would be the height of bad manners. It is most necessary, in these days of crowded bands, that such elementary rules of courtesy be observed and I am sorry to say that this form of claim jumping is becoming most prevalent.

Yours faithfully,
DONALD MAY (G2BB).

Yateley, Surrey.

Letters to the Editor

Due to pressure on available space a number of 'Letters to the Editor' have been unavoidably held over from this issue.

Can You Help?

● H. Davies (G3JSG), 18 Harrow Avenue, Rochdale, who requires information on the ex-R.A.F. transmitter Type T1403 Ref. 10D/13330? Details of the frequency range, power output and types of valves used are particularly wanted.

● C. F. Atkins (G3HCV), c/o The Corner House, Lympne, Hythe, Kent, who requires a pair of Cannon connectors (female) for the power supply section of the transmitter-receiver type TCS-13? Those required are labelled P.801 (16 contacts) and P.803 (12 contacts) in the circuit diagram.

● S. W. Folland (G3ADK), Southview, Kingsdown Avenue, Luton, who wishes to buy or borrow the handbook for the Admiralty receiver type DST100, Mark III?

● R. Reynolds (G3IDW), 136 Beech Avenue, Swindon, Wilts., who wants information on the National NC120 receiver?

● R. Stringer (G3IOZ), The Gables, Kilsby, near Rugby, who wishes to borrow the circuit diagram and any other information regarding the ex-Air Ministry receiver type R1139?

● J. G. Sidler, 1090 Alden Street, Meadville, Pa., U.S.A., who requires information on the ex-Air Ministry transmitter-receiver T1115/R1116A?

New Books

RADIO LABORATORY HANDBOOK. By M. G. Scroggie, B.Sc. M.I.E.E. Sixth Edition. Published by Iliffe & Sons, Ltd. Page size 8¾in. × 5¾in. 436 pages, 299 illustrations. Price 25/-.

This book which is a standard reference work on laboratory electronic techniques, is intended for professional engineers and amateurs. It describes the layout and furnishing of an up-to-date laboratory and the various types of apparatus available. Commercial instruments and improvised equipment are covered. Later chapters deal in detail with methods of making measurements and tests of every kind. A large section is devoted to general principles and reference material of everyday use to the radio engineer.

Radio Laboratory Handbook was originally published in 1938, and quickly gained recognition as a lucid, practical manual filling the gap between " popular " home experimenters' literature and the advanced professional textbooks. In the intervening period, there have been extensive developments in techniques and equipment, with which subsequent editions have kept pace. This edition has been almost entirely rewritten and is now presented in a new format. The usefulness of the text is enhanced by some 300 photographs, drawings, and circuit diagrams.

RADIO VALVE DATA. Compiled by the Staff of *Wireless World*. Fourth Edition. Published by Iliffe & Sons, Ltd. Page size 11in. × 8½in. 100 pages. Price 3/6.

The latest edition of this widely-used reference book contains full operating data on over 2000 types of British and American radio valves and some 200 cathode-ray tubes. Seventeen British valve manufacturers have co-operated with *Wireless World* in ensuring that the information given is accurate, comprehensive and up to date.

Main tables give the electrical characteristics of each valve, and separate tables show their base connections. The main tables further classify the valves into current, replacement or obsolete types, as recommended by the makers. An index enables any valve to be traced immediately. A valuable new Feature is the full list of equivalents.

" AT A GLANCE " RADIO VALVE AND TELEVISION TUBE EQUIVALENTS. By B. B. Babini. 60 pages. Published by Bernards (Publishers), Ltd., London, W.6. Price 5/-.

A multi-language introduction enhances the value of this new Bernards' publication which lists British, U.S.A., European and Service types of valves and television tubes. A brief description is given against each television tube listed.

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09.30	G3BKE	1900	Newcastle on Tyne
10.00	G6MH	1990	Southend-on-Sea
11.00	G2FXA	1900	Stockton-on-Tees
11.00	G3GZA	1837.5	Bristol
12.00	G3LP	1850	Cheltenham
12.00	G3JBU	1850	Northampton
12.00	GI5UR	1860	Belfast
14.00	G5AM	1900	Witnesham, Ipswich
21.00	G2FIX	1812	Nr. Salisbury
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19.00	G3NC	1825	Swindon
19.00	G3JBU	1850	Northampton
19.15	G2FRX	1850	Plymouth
21.00	G3BLN	1900	Bournemouth
21.00	G3FSM	1900	Brentwood
22.15	G2BRH	1900	Ilford
22.30	G8TL	1900	Ilford
Tuesdays			
18.30	G2FXA	1900	Stockton-on-Tees
18.30	G3JMP	1875	Bristol
20.30	G3GDZ	1905	Kingsbury, N.W.9
21.00	G3EFA	1855	Southport
21.30	G3DBP	1915	Nottingham
Wednesdays			
19.00	G3GZA	1837.5	Bristol
19.00	G3HUB/A	1902	Chelmsford
22.30	G3FBA	1910	Bath
Thursdays			
19.00	G3NC	1825	Swindon
19.15	G2FRX	1850	Plymouth
20.00†	G2CPS, G2CNX, G3GWT	1910	Hull, Yorks.
20.30	G3JQM	1878	Barwick, Yeovil
22.30	G3ADZ	1940	Southsea
23.00	G3LA	1915	Brentwood
Fridays			
18.00	G3GEN	1900	Gloucester
19.00	G3BLN	1900	Bournemouth
20.00	G3IIH	1900	Wirral
20.30	G3IMP	1920	Romford
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ARMSTRONG 125/A, 5 Bands as new, £26. Baker corner cabinet (walnut). A12 Rola, as new, £11. Hallicrafter S19, £13. Buyer collects. Jeffries, " Westward Ho," North Street, Downend, Bristol. (265

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BC221/AE stabilized power pack, £26/10. BC453, £2/5 (Med. wave coils, 7/6). HRO coils B/S 80, 40., med. wave, £2 each. Haynes focus coil F912/H, 10/-. " Eddystone " cabinet, 16in., chassis, handles, new, £2/5. Valves 807, 35T, QVO4/7, 6AG7, 6SJ7, VR150/Exchange wanted, 829B. Box 283, National Publicity Co., Ltd., 36/37 Upper Thames Street London, E.C.4. (283

B2 PARTS: Set transmitter coils, £1; Receiver with valves, £2. Powe, pack, £5. Wanted: High power final for 14 Mc/s c.w. G8UAr 406 Higher Brunshaw, Burnley. (285

B2 vibrator power pack, in good condition wanted; also post-war *CQ* magazines, and *QST* for October, November, December, 1951. Haylock (G2DHV), 63 Lewisham Hill, S.E.13. (295

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CR100 tuning condenser coil pack I.F's crystal valve cans new with circuit, £5. 813, £3. 3E29/829, 50/-. 815, £1. 150 mA Woden chokes, £1. U.M.I, £2. 6J5, 2/6 each. TZ40, 12/6. VT501 (TT11), 5/-. B2 receiver and transmitter, diagram, phones, £6. TU5B v.f.o. on 80 metres, 30/-. Box 252, National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (252

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FOR SALE: Eddystone S640 Communications receiver with handbook. Very good condition, £20, carriage paid. P. Bentley, 6 Buntingsdale Road, Market Drayton, Shropshire. (263

FOR SALE or exchange Eddystone 640 and 1155 with power pack, plus cash, for good communication receiver 10-500 metres. Drummond, 18 Springfield Road, Aberdeen. (274

FOR SALE: CR100/3 good condition, £18. T.C.S. 12 receiver, £5. Power supply for h.t. 1154 transmitter 1200 volts 200 mA, £4. 813 valves (2) £1/10 each. L. Frankland, G3GEE, 107 Saville Road, Blackpool. (278

FOR SALE: " CRO (converted Test Unit 78) with Puckle time-base, Y amplifier," £12. G3ABX, Rozel, Otford, Kent. (282

FOR SALE: Rotary convertor 24/28V, d.c. to plug in BC 348, brand new. Offers, Box 259, National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (259

FOR SALE: E.D.C.C. rotary convertor d.c./a.c. Offers. L. Marsland Gander, 11 Beverley Close, Barnes, S.W.13. (287

FOR SALE: ASB 8 receiver as new, unmodified, ideal for 420 Mc/s, £7. Canadian 52 receiver top band to twenty with type 3 power pack, £10. Details, Box 251, National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (251

G2IJ has the following brand new valves for sale at 7/6 each, post paid. 6SN7, 8-17, 6J7, 6K7, 5U4. 13 George Street, Kingston, Portsmouth (299

G2RO quitting during brief return to England. Eddystone 750 and speaker, R1155 with internal speaker and power, ramshackle compact 120 watt c.w. transmitter with phone provision and v.f.o., generous assortment of meters, components, valves, etc. First caller weekend of September 25, with car willing to take away everything gets the lot for £50 cash. No splitting, no offers. 17 Homestead Park, Dollis Hill Lane, N.W.2. (302

HAMBANDER receiver for sale. Excellent condition, looks new, £10. G3HRU, 7 Benton Park Drive, Yeadon, Yorks. 257)

HAM QTH. Modern Freehold S.D. 3 bed, 2 rec., tiled kitchen and bathroom, ideal boiler, garage; house well fitted with gas and power points, good decorative order. Attractive garden with fruit trees, two 38ft. masts with steel tabernacles, exclusive district near Bromley, Kent, easily accessible buses, shops, trains; quiet location good for DX. Price £2750. Offers considered. G2WI. Phone Ravensbourne 3245. (273

HRO-MX f.b. condition 10 coils 50 kc/s to 30 Mc/s including band-spread, 21 Mc/s, 4 spare valves, £32 o.n.o. 105 oscillator, 30/-. Labgear viewing unit, £5. New VCR97, 20/-. BC455, 30/-. Valves 829, 30/-; new QV04-7, 12/6; 8025, 10/-; EF8D, 8/-; 6L6, VR150, 1625, 6AG5, 5/-; 955, 954, 956, 117Z6, 12SK7, 12SJ7, 3/-. HRO 14 Mc/s b/s coil, 42/-. Box 268, National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (268

HRO receiver 8 coils with power unit, coil cabinet and LS in table rack. Can be seen S.W. London. Offers to Box 256, National Publicity Co., Ltd., 36/37 Upper Thames Street, E.C.4. (256

MARCONI precision heterodyne wavemeter 3-30 Mc/s, service equivalent of TF783 and signal generator type 52A. Offers please. R. W. Livermore, 256 Grove Green Road, Leytonstone, E.11. (270

METALWORK.—All types cabinets, chassis, racks, etc., to your own specifications. Philpott's Metal Works, Ltd. (G4BII), Chapman Street, Loughborough. (99

MOVING. Must sell gear by 25th. Indicator units, TV units, R1147B with power pack, valves, components. Cheap. R. Neilson, Tintagel, Cornwall. (277

PATENTS and Trade Marks, Handbooks and advice free. Kings Patent Agency, Ltd. (B. T. King, G5TA, Mem. R.S.G.B., Reg. Pat. Agent), 146a Queen Victoria Street, London, E.C.4. Phone: City 6161. 50 years' refs. (98

QSLs and log book (P.M.G. approved). Samples free. State whether G or B.R.S. Atkinson Bros., Printers, Elland. (772

RACK built transmitter crystal and p.a. 50 watt output, complete with power packs, £7/10 the lot. 14 Emmanuel Road, Sutton Coldfield. (296

SALE: 1.7/3.5 Mc/s transmitter; v.f.o.; p.a. with mod. 3Q5 o.p.; very fine /P rig, £7/10-. R103A; 1.7/7.5 Mc/s; 250 a.c. 6V d.c. built-in, as new, £6/10-. R1224; battery receiver 1-10 Mc/s, very good condition, £4. " Hambander " receiver 1.7/31 Mc/s, 230 a.c., p.p. b.f.o., etc., £15. Box 253, National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (253

SELL or swap. S640 in good condition, £15 or nearest. Wanted: 25/100 watt phone transmitter for 20 metres. Also want B2 receiver and 2m converter. Have some useful gear for sale cheap. S.A.E. for list. G3GCV, 99 Runcorn Road, Barnton, Northwich, Cheshire. (272

SX28. Perfect condition, recently lined up by professional in screened room, £45 or offer. Also R.F. Unit type 27 modified to 2 metre convertor, very sensitive, £6 or offer. Box 284, National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (284

(Continued on page 152)

EXCHANGE AND MART SECTION

(*Continued from page 151*)

TCS6 or 9 receivers, good condition, £7. R103, new, £6/10/-. Exciter/low power transmitter, covers 1.8–21 Mc/s, £3. 522 transmitter, less valves, £2/10/-. Receiver (incomplete), 12/6, the two, £3. German 12-valve portable transmitter/receivers 3–7.5 Mc/s, £6. Signal generator 1–130A with built-in power pack, 90–160 Mc/s, less crystal, £10. Valves and other gear. Box 255, National Publicity Co., Ltd., 36/37 Upper Thames Street, E.C.4. (255

THE PANDA PR120V, Britain's finest amateur transmitter, the perfect table-topper, 150 watts, a bargain at £150, less agency commission where applicable. New Agents welcomed throughout Commonwealth. Write for literature to Panda Radio Company, 59 Union Street, London, S.E.1. (271

TOP band c.w. transmitter v.f.o. P1 output, power pack f.b. job on black crackle chassis. Eddystone dials, etc., £5. TU5B built-in Osc. and p.a., £1/10/-. Power Supply 6.3V, 200V, 300V, 600V. Three separate supplies, £6. BC312 complete with motor generator and base plate BC610 v.f.o. units TU61 and 48. TR1196 complete with generator R1147 and type 38 transmitter-receiver. Any offer considered for the above. S.A.E. please. L. J. Coupland, 214 Wyberton West Road, Boston, Lines. (248

V.H.F. transmitter W.7944 and power pack, v.h.f. receiver S.450B and power pack, £5 the lot. Communication receiver naval 10 to 5000 metres, 230V, £9. Large cabinet loudspeaker, suitable hall. Miscellaneous valves, condensers, relays, meters and rectifiers, etc. Buyers collect heavy items. 76 Boothroyd Lane, Dewsbury, Yorks. (Evenings). (264

VIBROPLEX Bug, 35/-. 2½in. 50 microamp F.S.D. meter, 30/-. Transformers, 230V adjustable primary—2000/2000 500 mA, £4. 1250/1250 250 mA Woden, £3/10. 350/350 150 mA, heaters, 12/6. VCR97, £1. 813, £2. 829, £2. 866 jr, £1 pair. RF27, 25/-. 1131 modulator, with or without valves, offers. All carriage paid. Cobb, 30 Rugby Gardens, Ovenden, Halifax. (258

WANTED. Quantities required of the trans/receiver 3/mark II, commonly known as the type B2, must be complete and in perfect working order and condition as new. Please reply direct to: Posen Electrical & Radio Co., P.O. Box 1186, Bulayawo, Southern Rhodesia. (260

WANTED: 150 watt phone/c.w. amateur transmitter. Also wavemeter required. State conditions and price. G. Tomlinson, 22 Queens Drive, Billingham, Co. Durham. (267

WANTED: *Bulletin*, July, 1926. *CQ*, January, March, April, June, November, December, 1945, May, 1946. *Radio* before 1936. *R/9* before April, 1935. *QST* before 1924. *Radio* Ref, April, 1935. Many *QTC*, *Ham Chatter*, *Radio ZS*, *Amateur Radio*, *Break-in*, *Xtal*, *I.R.T.S. News*, 1926 *A.R.R.L.Handbook*. *R.S.G.B. Diary-Log Book*, 1927/8. G3IDG, 95 Ramsden Road, London, S.W.12. (279

WANTED: BC624 (receiver section of SCR-522) preferably complete and good condition. Details and price to D. G. Bromby, 19 Alverton Avenue, Poole, Dorset. (280

WANTED: HRO coils, receivers, power packs, AR88Ds, AR88LFs, SX28s, BC348s, AR77s, and many other types, also laboratory test equipment and R54/APR4, TN17, TN18 and TN19 units. Details please to R. T. & I. Service, 254 Grove Green Road, Leytonstone, London, E.11. (LEY 4986). (1010

3B/401J, QQVO6/40, 829B, 832A, 446A, 6AK5, 3AP1 valves, useful v.h.f. gear, power supply equipment. *QST*, *SWM*, *Bulletins* 1945-1951. Several books. All cheap. S.A.E. list. G5RP, Old Gaol House Abingdon, Berks. (269

100 receiver valves, also 813's, 866's and C meters, transformers, chokes, power packs, at give away prices. Must clear. S.A.E. for list. Scarr, Howden, Yorks. (291

APPOINTMENTS SECTION

Situations Vacant

ASSISTANT LECTURER (ELECTRICAL ENGINEERING) required by NIGERIA for two or three tours totalling 36 months. Appointment either (*a*) on temporary terms with salary scale (including expatriation pay) £807 rising to £1453 a year plus gratuity at rate of £100/£150 a year or (*b*) with prospect of permanency with salary scale (including expatriation pay) £750 rising to £1315 a year. Outfit allowance up to £60. Free passages for officer and wife. Assistance towards cost of children's passages or grant up to £150 annually for maintenance in United Kingdom. Liberal leave on full salary. Candidates, with H.N.C. in Electrical Engineering, must have had sound training in radio receiving and transmitting work and must be able to teach feeder and aerial theory; theory and practice of all types of recording apparatus and general audio and acoustic theory. They should have had wide experience in the industry and experience of teaching. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2C/40373/RC. (293

ASSISTANT SIGNALS OFFICER required by the SIERRA LEONE Government CIVIL AVIATION DEPARTMENT for one tour of 18/24 months with prospect of permanency. Salary scale (including expatriation pay) £742 rising to £1177 a year. Outfit allowance, £60. Liberal leave on full salary. Free passages for officer and wife. Assistance towards cost of children's passages or grant up to £150 annually for maintenance in U.K. Candidates should be experienced in MF, HF, VHF, and VHF/DF and ancillary equipment and should hold the P.M.G. Certificate in Wireless Telegraphy or equivalent. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2C/30353/RC. (289

A VACANCY exists for a young amateur radio enthusiast on the editorial staff of a well known publishing house. A basic knowledge of Radio and Television circuitry and some experience of servicing and maintenance would be an advantage. There are excellent opportunities for a young man with the above qualifications who wishes to make a career in technical journalism. Write giving age and details of past experience and quote Box 304, National Publicity Co., Ltd., 36-37 Upper Thames Street, E.C.4. (304

MANAGER required for Ham radio shop in West End area. Good technical knowledge essential. Good salary offered. State qualifications. Applications to Box 303, National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (303

RADIO ENGINEER required by small West End firm of specialists in high quality audio equipment and general electronic engineering. Applicants should have good basic knowledge of audio amplifiers and general radio equipment. Permanent position with good salary to a keen and conscientious man, preferably a Ham. Phone: WELbeck 4058 for interview (297

RADIO OFFICERS required by the EAST AFRICA HIGH COMMISSION DIRECTORATE OF CIVIL AVIATION for one tour of 30 to 48 months in the first instance with prospect of permanency. Salary scale (including present temporary allowance of 35 per cent. of salary) £742 rising to £965 a year. Gratuity of 13½ per cent. of total basic salary drawn during contract for those not taken on permanent establishment. Free passages. Liberal leave on full salary. Outfit allowance, £30. Candidates must be capable of operating at 25 w.p.m. and should preferably hold M.C.A. 1st Class Certificate in Radio Telegraphy. Knowledge of touch typing for teleprinter, the operation of modern radio or radar aids, or experience in radio maintenance would be an advantage. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2C/30606/RC. (294

RADIO TECHNICIAN required as SIGNALS ASSISTANT INSPECTOR OF POLICE by NYASALAND GOVERNMENT for one tour of 2-3 years with prospect of permanency. Salary scale (including present temporary allowance of approx. 13 per cent. of salary) £651 rising to £1103 a year. Commencing salary according to experience. Outfit allowance, £50. Uniform allowance, £10 a year. Free passages. Liberal leave on full salary. Candidates must be between 21 and 30 years of age, of good education and physique, not below 5ft. 7in. in height, normal vision without glasses. They must have a sound knowledge of H.F. and V.H.F. fixed and mobile simplex and duplex radio telephone systems and low power petrol/electric charges and alternators. Knowledge of morse and ability to instruct trainees in radio subjects desirable. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M1/36023/RC. (292

STOREKEEPER (RADIO EQUIPMENT) required for NIGERIA Posts and Telegraphs Department, for one tour of 12-24 months in first instance either (*a*) with prospect of pensionable employment, salary scale (including expatriation pay) £750 rising to £1175 a year; or (*b*) on contract, salary scale (including expatriation pay) £807 rising to £1269 a year plus gratuity at rate of £100/£150 a year. Commencing salary according to experience. Outfit allowance up to £60. Free passages for officer and wife. Assistance towards cost of children's passages or grant up to £150 annually for their maintenance in United Kingdom. Liberal leave on full salary. Candidates must have substantial experience in radio equipment storekeeping, including H.F. and V.H.F., stock control and stores accounting procedure. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M3B/34215/RC. (266

(*Continued on Cover iii*)

APPOINTMENTS SECTION

(*Continued from page 152*)

SITUATION Vacant for Junior, age 15–17 years, in Electrical Engineers Association. Apply Museum 3450. (301

SEVERAL Young Engineers, preferably with a degree, Grad. I.E.E. or equivalent are required for the application of valves, cathode-ray tubes and transistors, to circuits of A.M., F.M., V.H.F., U.H.F., and television equipment. Apply to the Personnel Manager, Brimar Valve Works, Footscray, Kent. (278

TECHNICAL INSTRUCTOR (BROADCASTING) required by the NIGERIAN BROADCASTING SERVICE for two tours of 12 to 15 months each, with possibility of permanency. Salary scale (including expatriation pay) £1307 rising to £1453 a year plus gratuity at rate of £150 a year. Outfit allowance of £60. Liberal leave on full salary. Free passages for officer and wife. Assistance towards cost of children's passages or grant up to £150 annually for maintenance in U.K. Candidates should have instructional experience and must have reached B.B.C. Grade C minus or equivalent. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2C/30513/RC. (288

TECHNICIANS, GRADE I (RADIO) required by EAST AFRICAN POSTS AND TELECOMS ADMINISTRATION on probation for pensionable employment. Salary scale (including present temporary allowance of 35 per cent. of salary) £742 rising to £1134 a pear. Outfit allowance, £30. Free passages. Liberal leave on full salary. Normal tour 4 years. Candidates should possess a thorough practical knowledge of the working and maintenance of modern H.F. radio telegraph equipment and V.H.F. multi-channel radio-telephone equipment. G.P.O. staff should apply through departmental channels. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2C/32424/RC. (290

THE BRITISH ELECTRICAL AND ALLIED INDUSTRIES RESEARCH ASSOCIATION have vacancies for student apprentices; also for laboratory assistants for building and operation of electronic recording equipment, for use in researches on electrical discharges in gases, circuit-breakers, etc. Write to Laboratory Manager, E.R.A. Laboratories, 5 Wadsworth Road, Greenford, Middlesex. (250

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