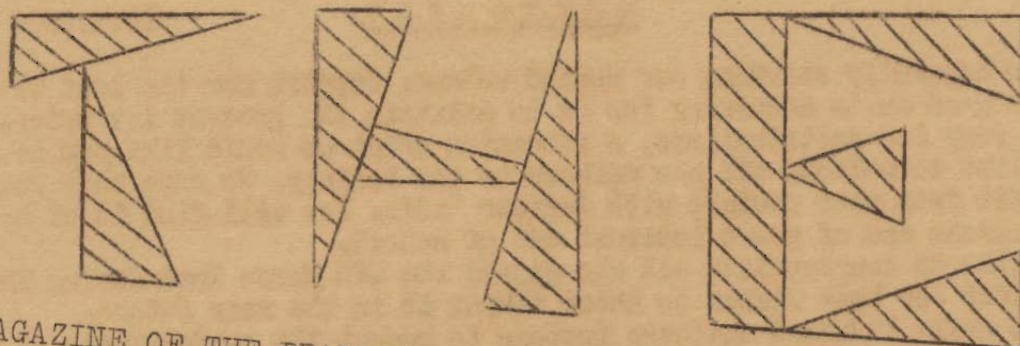
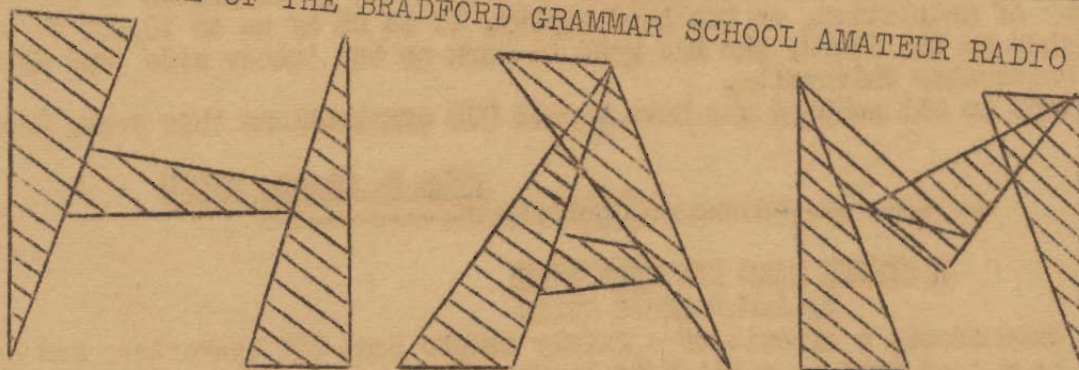


MUTUIS MUTANDIS



THE MAGAZINE OF THE BRADFORD GRAMMAR SCHOOL AMATEUR RADIO CLUB



VOLUME II

NUMBER 1

SATURDAY, 20 SEP 1958

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"THE HAM" is the Amateur Printed, Amateur Radio Magazine of the B.G.S. Amateur Radio Club, The Grammar School, Bradford, and is published at 11.45 a.m. on the first Saturday of each half-term. Material intended for publication should reach the Editor at least four weeks before the publication date.

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David M. Pratt, G3KEP, 27 Woodlands Grove, Bingley
for sale only to members of the Bradford Grammar School.

We are now hopefully starting our second volume. Support for the last two issues has not been as good as is necessary for us to maintain the present low price. We are also receiving very few contributions, a situation which we would like you to remedy.

We would like to welcome all new members to the Society. We hope that you will enjoy and benefit from your contact with Amateur Radio. You will find it of help in your Physics lessons and of great interest out of school.

We would like to congratulate all who passed the GPO Morse Test during the holidays and offer our best wishes to those taking it in the near future. We hope that no newly licensed amateurs propose to repeat the performances of certain persons in the way of modulation, on top band anyway. It is OK by us on 10,000 Mc/s.

Our best wishes go the G3MFJ, who has gone to work on the 'other side' and G3LZW who has gone to Manchester University.

Congratulations to all members who have passed GCE examinations this year. Good show everyone.

John P. Stott, G3MAB

A SIMPLE BAND III CONVERTER

by A.M.Pomfret G3LZZ

Recently, I came across a circuit of a fairly simple Band III converter, and so I thought it would be a good idea to publish it in the 'Ham' as there are still many television receivers in existence which will only receive the local Band I channel. If the project is undertaken it will perhaps be a bit of practice in converter building for the G3KLZ/T 70 cm. transmissions. I am in the dark as much as you are as to the performance and ease of operation of the converter, so I do not propose to do more than give a few points about the circuit itself.

The converter uses a pair of EF91 valves of the Mullard variety, or even a pair of EF80 type. The whole can most suitably be constructed on a small Eddystone diecast box. The power requirements are 6.3 volts at 600 mA and 180 volts at a few mA HT. The circuit is shown below, and the coils are numbered, so that they may be wound from the data below:-

Ld.....10 turns 26 s.w.g. enamelled, close wound.

L2.....21 turns 18 s.w.g. bare; wound 8 turns/in.

L3.....5 $\frac{1}{2}$ turns 18 s.w.g. bare; wound 8 turns/in., with centre tap.

T¹ Primary... 7½ turns 26 s.w.g. enamelled, close wound.

Secondary...2 $\frac{1}{2}$ turns spaced 1/16 in. at h.t. end of primary.

FORMERS L1, L2 Neosid 258/8BA (0.276 in. diam., 0.748 in. long) dust iron core.

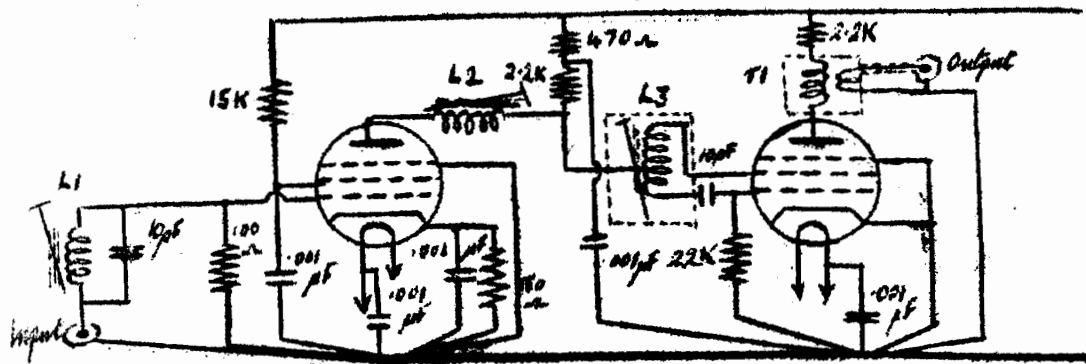
L3, T1 Neosid 5,000A (0.3 in. diam., 1 in. long) dust iron core.

All condensers are disc ceramics, except the 10pF., which are silver micas.

All resistors are $\frac{1}{2}$ watt types.

N.B. T1 is tuned to Channel 2 in Band I

L1 is Band I station rejector.



Circuit of Simple Band III Converter

2nd D.F. COMPETITION

On the first Saturday after the end of term, the 2nd D.F. Competition was held. Partly due to the rain, and partly due to the fact that but one receiver was operative, the searches never found the site. They arrived at 'Dick Hudson's' and had lunch, but wherever they went the signal went less, and, with the arrival of the rain all went home. The usual 'post-mortem' was held. Another competition will be held on the Saturday afternoon after the half term holiday if we get a reasonable number of working receivers. It is up to the officers and senior members here to show a lead, but junior members should also 'try their hand'. There is usually a prize with these competitions, but there is no point in prizes or competitions without eligible competitors. Next time, therefore, the magnitude of the prize will depend upon the number of entrants. Information on D.F. receivers is available elsewhere in this issue.

THE RADIO AMATEUR EMERGENCY NETWORK

What it is.

The Network is an Association of Radio Amateurs who have agreed to lend themselves and their equipment to their fellows in an emergency. It started during the disastrous floods of 1953. Since then it has gained more and more support, until it is now a nation-wide organisation, with branches everywhere. There are two communication 'lanes', one running up each side of the country, and it is hoped to add to them 'feeler' spreading in, so that the whole country is covered eventually. Although this latter part is not yet started, there are local groups everywhere. There are local groups which get together for practices and exercises, in preparation for when they have a part to play. In time of emergency, these groups would provide the local communications, which would link up with main networks. By use of portable equipment, any point could then be linked by radio with any other point in the country.

What it does.

To be able to do all this, the members have to have organisation and experience; to gain experience, exercises are held. These start on the assumption that there is an emergency, and provide practice in the measures taken. The amateur radio licence permits co-operation with: The St. John Ambulance Brigade; The British Red Cross Society and the Police. This means that we can be called upon by any of these organisations, to provide communications. They will not call on us if they do not know how we can be of use, so joint exercises are also held.

The local group is only just starting in earnest, so our exercises are of a simple nature. They, at present, just constitute a sort of P net. However, more complicated ones will occur later.

Short Wave Listeners also take part, as runners and general odd-job men.

Equipment

The only item needed at first is a receiver, to listen to nets. However, for any licensed amateur, or S.W.L. to take part satisfactorily, either fixed battery operated equipment, or portable equipment or both should be available. Some form of emergency supply is essential, because failure of the Public Electricity Supply is a likely event during an Emergency.

You should also be able to come on the air from home, and also to work portable should this be necessary. Our principle role here will probably be relay for the national net, so home working is important.

Top Band is the only one used by the local group at present, though ability to cover 80m. is an advantage.

How to join.

Amateurs and SWL's who are really interested can obtain registration forms from:

David M. Pratt, 27 Woodlands Grove, Cottingloy, Bingley

When completed they should be returned to him. By applying for membership you agree to take part in exercises, paying your own expenses. Unless you are really keen, and intend to take part in all exercises, no matter how inconvenient it is, you should not join. Membership is open to everyone and membership of the R.S.G.B., of which the R.A.E.N. is a branch, is not essential.

Members are needed, so if you are interested, **JOIN NOW!** (There is no fee)

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R.A.E.N. EXERCISE NO. I

The first exercise of the local group was held on the afternoon of Sunday August 30th. The stations taking part assembled at the Baildon Bus terminus at about 2.30 p.m. G3KLZ on his motor bike, G3MGA with an unwilling father in the family car and G3KEP, G3MAB and G3MAW on foot, following an announcement of 'Two only' from the conductress of the bus they had intended to catch. SWL Paul Dennison arrived by bus. G3MGA then proceeded to 'Dick Hudson's', dropping G3MAB on the moor top on his way. G3KLZ, having been instructed to report to Shipley Glen, went home, but returned later in a friend's van. G3KEP went for a walk on the moor, and G3MAW with Paul went just outside Baildon.

The weather, whilst very pleasant for operations, brought out day-trippers like flies. The first stations to get in contact were G3KEP/G3MAW G3MAB, who dutifully QSY'd from 1980 to 1870 kc/s., where G3MGA was supposed to be. He duly appeared, calling CQ RAYNET, which he kept up for some hours, as his receiver had not been able to pick anything up. The rest of the net therefore left him to it for some time. He and G3KLZ eventually made contact, and we joined them later, though Peter still heard only Duncan. The net finally closed at five.

Messages passed were ones such as:

KEP to MGA 'Got a Receiver'
MGA to KEP 'Got a Transmitter'
MAB to MGA 'Nuts'
MAB to KLZ 'Would you care to run me home?'
and so on.

Altogether it was an enjoyable afternoon, the Civil Defence, who were also exercising, did not annoy us, and only one day tripper turned nasty, when requested to stop his dog chasing sheep he threatened to be violent, but was felled by red lights and buzzing vibrators, probably hoping that the operator would choke himself in his 'phone cord.

-----00000000000000000000-----
STANDARD FREQUENCY TRANSMISSIONS

by A. M. Pomfret, G3LZZ

During the last few months, and partly as a result of my short period off the air owing to the pressure of exams., I developed an interest in standard frequency transmissions; which are transmissions radiated on precise frequencies by certain authorities in various countries, and which serve as international reference standards just as the platinum kilogram in Paris.

In the British Isles, such transmissions are to be found on 60 kc/s., 250 kc/s., 2.5 Mc/s., 5 Mc/s., and 10 Mc/s; that is, on 5000, 1500, 120, 60 and 30 metres. The 200 kc/s standard is modulated by the BBC Light Programme, while the others are sponsored by the National Physical Laboratory, which uses the call-sign MSF, and which boasts an accuracy of 5 parts in 10^9 , i.e., 0.0000005% or plus/minus 0.05 cycles at 10 Mc/s., radiating round-the-clock on all frequencies except 60 kc/s. On this frequency there is only one hour of transmission per day, commencing at 1959 GMT.

Both R.F. and standard audio frequencies are derived from the same atomic standard. MSF radiates its transmissions with 1000 c/s tone and with 1 c/s pulses composed of 5 cycles of the 1000 c/s tone marking each second, the minutes being marked a longer burst of tone of 0.8 second or 800 cycles duration. The pulses or 'ticks' have a plopping sound, as the waveform is a square wave, although the tone is, of course, sine wave.

The transmissions are radiated in quarter hour periods. Assuming the time to be midnight, or 0000 GMT, the period begins with the 1000 c/s tone until 5 seconds before 0005 GMT. At exactly 0005, a burst of 800 cycles of the 1000 c/s tone heralds the beginning of the 1 c/s pulses, marked every minute as already mentioned, and which last until 0010. From then until 0014 carriers are unmodulated, when the station announcement is made, beginning with the call-sign sent twice on MCW and followed by a verbal announcement giving details of the transmissions. Every hour in the period corresponding to 0015 to 5 seconds before 0020 the transmissions are cut, presumably so that the more distant station can be heard on the frequency monitored. Sometimes the normal station announcement is replaced by a special announcement giving details of the temporary cuts in the services, or of the degree to which the phase of the pulses was altered at the end of every month. At the end of June, for instance, it was necessary to retard them 50 milliseconds, while no adjustment was required at the end of July. Considering the number of seconds in an average month, it is easy to get an idea of the accuracy involved.

Other countries indulge in such a service. Those known to and heard by the writer are HBN Switzerland, WWV Washington, WWVH Hawaii, and JJY Tokyo. Of these, only HBN transmits in 15 minute sessions, while the rest transmit in 5 minute periods. HBN has no verbal announcement and a different schedule to MSF. It is to be found on 2.5, 5, and 10 Mc/s., and is best heard superimposed on MSF from evening to mid-morning, or during MSF's five minute break each hour.

Of the remaining three stations, by far the most interesting is the National Bureau of Standards in Washington, call-sign WWV. It can be heard rarely on 2.5 Mc/s., occasionally on 5 Mc/s and regularly on 10, 15, 20, and 25 Mc/s subject to propagation conditions. It transmits a continuous tone for three minutes followed by a short interlude till the station announcement in the final minute of each five minute period. Upon the whole is superimposed a series of 1 c/s pulses of 1000 c/s tone. The minutes are marked by the omission of the 59th tick and a double one on the 60th second. For the 3 minute tone passage WWV alternates between the 1000 c/s and 600 c/s standards. Transmissions are interrupted between the 45th and 48th minute in each hour, and every half hour before the station announcement a propagation forecast is given consisting of a letter and a figure. The forecasts are given 19 and 49 minutes past the hour, and the letter indicates the present state of conditions, while the figure gives the expected conditions during the next few hours. The time is announced verbally as Eastern Standard Time, followed by GMT on MCW and then a repetition of EST. Two tones are used, and WWV alternates between 1000 c/s and 600 c/s.

WWVH, situated near the Date Line, is the most difficult to hear and is usually in Q M from W V, or even JJY. It has no verbal announcement; everything is done on MCW. Listen for the "di-dah-dah di-dah-dah di-di-di-dah di-di-di-dit" before WWV's announcement, which obliterates all further remarks from WWVH. It operates on the same frequencies as WWV and is really a partner station.

JJY, Tokyo, Japan, is distinct from the other two in that it only transmits on 2.5, 5, 10, and 15 Mc/s. The announcements are in English and GMT is given both on 'fone' and MCW. It is often audible and never very strong.

For the best times of day for receiving these transmissions it is best to consult the R.S.G.B. Bulletin each month for G3AAE's frequency predictions. But the summary below will serve as a rough guide.

60 kc/s	-	Useless for most listeners	- MSF
200 kc/s	-	BBC Light Programme	
2.5 Mc/s	-	MSF all day with QRN during the day	
		HBN during hours of darkness	
		WWV, WWVH, and JJY inaudible	
5 Mc/s	-	MSF all day with QSB severe at times.	
		HBN during hours of darkness	
		WWV sometimes in early morning	
		WWVH and JJY inaudible	

- 10 Mc/s - MSF faintly during daylight hours, esp. morning
HBN during hour of darkness if skip is short
WWV from midnight to mid-morning at good strength
WWVH roughly as WWV though weaker
JJY late afternoon till late at night.
- 15 Mc/s - WWV as 10 Mc/s but weaker
WWVH stronger than on 10 Mc/s
JJY as 10 Mc/s though stronger
- 20 Mc/s - WWV early evening
WWVH faint during evening
- 25 Mc/s - WWV early evening
WWVH faint during evening

To conclude on a note for music-lovers, there is an audio standard of 440 c/s (Top A, Standard Concert Pitch), which is radiated on Third Programme frequencies by the BBC before transmission. Its function is somewhat obscure, but at least it enables G3LZW, &c. to get tuned up. I shall be interested to hear any comments from readers on Standard frequency Transmissions.

D.F. RECEIVERS

The third direction finding competition will take place shortly after half-term, but, as has been stated elsewhere, there is no point in a competition without competitors. We are hoping for a large turnout from the junior members of the club, as well as the senior members, who would do well to follow the footsteps of the ex-librarian. There should be little more difficulty in constructing a D.F. receiver than a small receiver of any other type; the sole difference is in the aerial system employed.

The aerial used is what is usually referred to as a frame aerial, a coil of wire of large cross-sectional area. This has the property that it receives the signal from 1 direction only. It is possible to estimate the direction with reasonable accuracy from the fact that there is a sharp 'null-point' when the aerial is at rt. ls to the signal.

The very simplest form of D.F. receiver would be a one or two-valve unit similar to that shown in the figure. The aerial should be fairly large: battery valves or very low consumption mains valves may be used, the cathodes should be connected to earth: the insertion of a 1 K resistor shunted by a 25 uF condenser in the cathode lead of V2 should improve the performance.

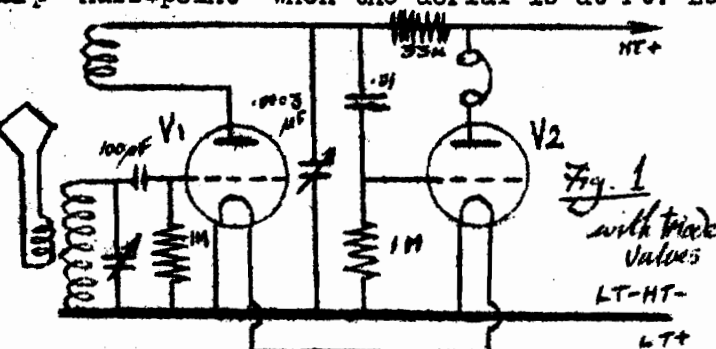
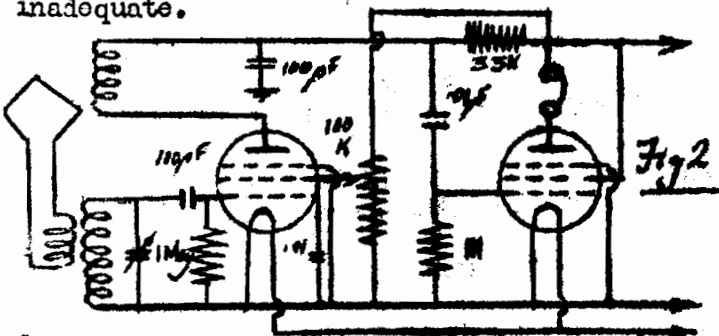


Figure 2 shows the circuit adapted for pentode valves. In either case, the 30 K anode resistor may be replaced by headphones, and the second valve and its associated components omitted, although in this case the sensitivity will probably be inadequate.

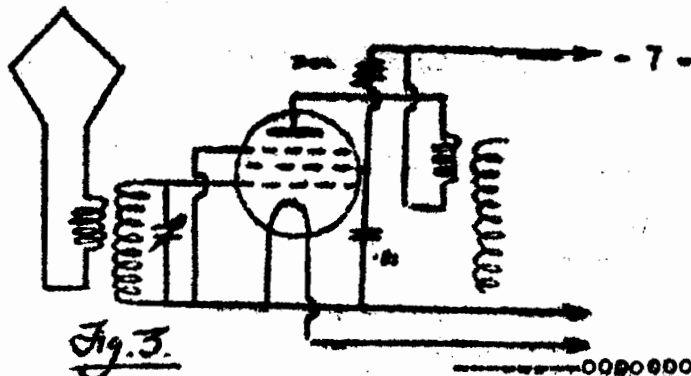


The use of an R.F. Amplifier stage will also increase the sensitivity. A suitable circuit is shown in Figure 3.

Any of these simple D.F. receivers may be operated on a long-wire aerial if required quite simply.

The aerial should be connected to the grid end of the aerial coil, and the receiver will then function as a simple 1-, 2-, or 3-valve set.

I hope that these notes will give some help to junior members, and that we do get some more entrants this time.



Further details on D/F Receivers may be obtained from David Noble (6SA), G3MAW, as space has not permitted details of D/F aeriols to be given in this article.
.....keep

Fig. 3.

CURRENT NEWS BY AMP

(Andrew M. Pomfret)

G3LZZ

Because of illness, I was unable to write my current news article for the last issue, and so I had a stand-in in the person of G3MAW. Firstly he mentioned S.W.L.s. For this issue I have not received any matter from listeners with regard to their DX claims, but at least a start has been made in the club with a counties list and details of a countries competition too. This kept some of the younger members happy while the licensed members went QRT pending their 'O' and 'A' Level examinations.

More orders have been sent to Wales. This fellow seems to have almost unlimited supplies of some valves at his disposal, and regular orders have been sent off via G3LZZ. And when the valves arrive with extras and useful junk, who can grumble?

Some marvellous DX has been worked during the holiday period, with G3MGE/A at Swanage and G3MAL/A in London. Has anyone heard G3LZW/DLQ? G3MAW and G3KEP have identical 10 metre rigs and have been experimenting on that band with indoor dipoles. The system seems to work out quite nicely, and is a good idea if static or congestion are prevalent on Top Band.

The D.F. competition was not all that it might have been, but the weather conditions became most unkind towards us after a fairly promising start. Although it was quite a large party that assembled at Hawksworth, only three people had receivers. One never seemed to function properly at all, my own using seven valves, worked originally and once picked up the B.F. transmission, but I inadvertently left the LT on and the battery polarised. Once again Peter was left to guide the party, and eventually we arrived at Dick Hudson's, where we refreshed ourselves before continuing, now in pouring rain. Now we had lost the scent, and so we retraced our steps in time to hear an announcement to the effect that if the TX had not been discovered by 1.30, the contest would end. This was received with mixed feelings, because while we felt that as the signals were so strong that it was worth continuing the search, the weather made us all feel as though we had had enough for one day. We arrived home wet and tired, but consoled by the thought of the prize awaiting us. The day ended happily for all, and everyone felt it had been worth while.

The Bradford Club has been holding its usual summer run of informal meetings, but appears to have a most interesting session ahead of it, to judge from the syllabus. On September 23rd we are to hear G3LZW's talk on HI-Fi. This for us is a highlight in the calendar, and one of the last occasions on which we shall see him before he departs to Manchester University. On October 7th, G3GFD will talk on VHF Equipment, while on the 21st a Quiz will be held. It has also been suggested recently that new premises be found in which to hold more frequent meetings, and install a club station under the old club call of G3NN.

SWL McManus has joined the R107 fraternity along with G3LZW, G3LZZ, G3MAW and SWL Kaye. We hope that he obtains satisfaction from it, and does not do himself a mischief lifting it around.

Finally, to reply to comments of G3MAL. The 6L6/6V6 arrangement was only used for one afternoon as I was at that time short of another 6V6; the carbon miks, I agree, is not ideal to say the least. Moves 6V6's are obtained from

Hivac, Ltd., price unknown (buy one and see). 'Desterfying' is a result of my poor writing. All happy? Good!

Until the next issue, when Current News will have more to say of interest to all readers, the Editorial Staff wish you all the best, and once more earnestly beg for contributions.

73 de AMP (G3LZZ)

THE RF24 ON 10, 15, and 20 metres

Many communications receivers in use by amateurs, particularly those of ex-service origin, do not cover the popular higher frequency bands, while the performance of those which do generally compares unfavourably with that on the lower frequencies. The most satisfactory solution is to use a crystal controlled converter with the main station receiver as a tunable first i.f. In this way, the tuning mechanism, calibration, selectivity and other facilities of the main receiver can be combined with the excellent stability and signal-to-noise ratio of the converter to provide reception of a high order.

The converter described in this article is a simple modification of the RF24 unit, available quite cheaply from surplus stores. The oscillator section is re-wired for crystal control, and the r.f. and mixer stages aligned for optimum performance.

All the oscillator components mounted above the chassis are stripped out, and the oscillator section is then re-wired as shown in Fig. 1. Four turns should be removed from the primary of the injection transformer mounted on the screen below the chassis between the oscillator and mixer stages.

All r.f. and mixer fixed padders are, damping resistors should be removed and replaced by the following values of padders:

Switch Position	R.F. Padder	Mixer Padder
1	82 pF	150 pF
2	15 pF	47 pF
3	15 pF	47 pF
4	not required	not required
5	not required	not required

The trimmers across the oscillator anode coil should be adjusted so that 7.5 Mc/s is obtained on Position 1, 15 Mc/s on positions 2 and 3, and 22.5 Mc/s is obtained on Positions 4 and 5. These oscillator frequencies make the tunable first i.f. 6.5 to 6.85 Mc/s for the 14 Mc/s band, 6 to 6.45 Mc/s for the 21 Mc/s band, and 5.5 to 7.5 Mc/s for the 28 Mc/s band.

The mixer and r.f. stages are aligned as follows:-

Switch Position 1 (14 - 14.35 Mc/s): Adjust trimmer 1 in each section at 14.15 Mc/s

Switch Position 2 (21 - 21.2 Mc/s): Adjust trimmer 2 in each section at 21.1 Mc/s

Switch Position 3 (21.2 - 21.45 Mc/s): Adjust trimmer 3 in each section at 21.3 Mc/s

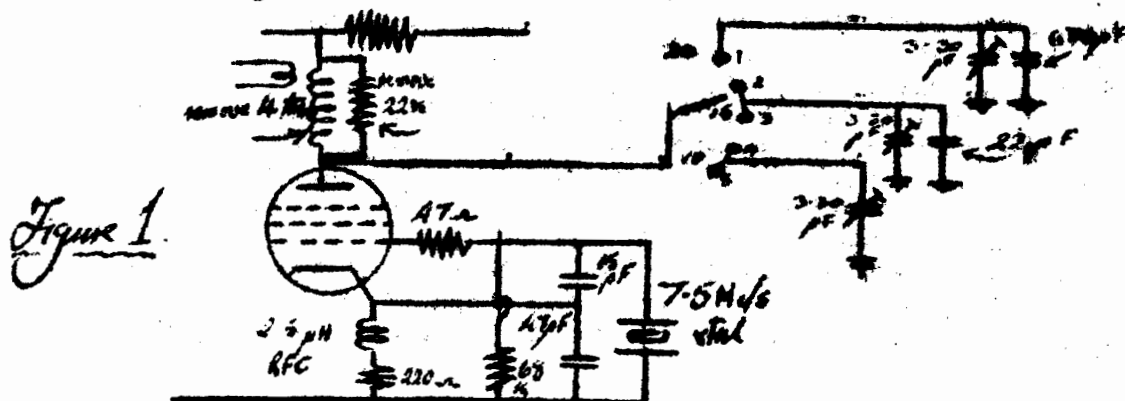
Switch Position 4 (28 - 29 Mc/s): Adjust trimmer 4 in each section at 28.5 Mc/s

and Switch Position 5 (29 - 30 Mc/s): Adjust trimmer 5 in each section at 29.5 Mc/s.

The i.f. output coil should be peaked at 6.4 Mc/s by means of its iron dust core which can be reached through a hole in the side of the chassis.

It is important that the converter is connected to the receiver by a short length of co-axial cable. As with all converters, this is essential to prevent break-through.

Incidentally, 7.5 Mc/s crystals may be obtained from the surplus market, and are advertised in the magazines for as little as 1/- each.



- 9 -
RADIO AMATEURS' EXAMINATION

Once again, there will be a course at the school for the Radio Amateurs' Examination - the examination for the Amateur Transmitting Licence, and we have reproduced below, therefore, the new Syllabus for the examination

"The Postmaster-General requires that every applicant for an Amateur (Sound) Licence or an Amateur (Television) Licence must have passed the Radio Amateurs' Examination as evidence of his possessing the requisite theoretical technical knowledge. Every applicant for an Amateur (Sound) Licence must also have passed the Post Office Morse Test within one year of applying for his licence unless he holds a current Postmaster-General's First Class, Second Class, or Special Certificate.

"The examination will be a Pass examination, and will consist of a single question paper of three hours' duration. The paper will be split up into two parts. Part I will contain only two questions, each of them compulsory. These questions will be drawn from items 1 and 2 of the syllabus. Part II will consist of eight questions, drawn from the remaining items of the syllabus, of which six only should be attempted. Candidates are expected to achieve a Pass in each part separately; failure in either Part entails failure in the examination as a whole.

"The examination is open to all candidates, whether they have attended a course of tuition or not, and a certificate will be awarded to successful candidates.

"Where courses are provided, it is recommended that theoretical lectures should be accompanied, wherever possible, by simple practical demonstrations and students should be encouraged to regard practical work as an integral part of their training.

SYLLABUS:

PART I

1. Licensing Conditions

Conditions laid down by H.M. Postmaster-General for the Amateur (Sound) Licence, covering the purpose for which the transmitters may be used; types of signals permissible; types of emission; power, frequency control and measurements; avoidance of interference to other stations, particularly in bands shared with other services; qualifications of operators; log-keeping and use of call-signs.

2. Transmitter Interference

Frequency stability. Avoidance of harmonic radiation and of interference by shock excitation; use of key-click filters and other means of preventing spurious emissions. Dangers of over-modulation. Devices for reducing interference with nearby radio and television receivers.

PART II

3. Elementary Electricity and Magnetism

Elementary theory of electricity; conductors and insulators; units; Ohm's Law; resistances in series and parallel. Power. Permanent magnets and electro-magnets and their use in radio work. Self and mutual inductance; types of inductors used in receiving and transmitting circuits. Capacitance; construction of various types of capacitors and their arrangement in series and parallel.

4. Radio Principles (Elementary)

Alternating currents and voltages. Alternating current theory incorporating circuits with inductance, capacitance and resistance. Impedance, resonance, coupled circuits, acceptor and rejector circuits.

5. Thermionic Valves and Circuitry

Construction of valves; characteristic curves. Diodes, triodes and multi-electrode valves. Use of valves as oscillators, amplifiers, detectors and frequency-changers. Power rectification. Power packs, stabilization and smoothing.

6. Radio Receivers

Typical receivers; principles and operation of T.R.F. and super-heterodyne C.W. reception. Interference caused by receivers.

7. Low Power Transmitters

Oscillator circuits; use of quartz crystals to control oscillators; frequency multipliers, power amplifiers. Methods of keying transmitters. Methods of amplitude modulation.

8. Propagation

Wavelength, frequency, velocity. Nature and propagation of radio waves. Ionospheric and tropospheric conditions and their effect on propagation.

9. Aerials

Common types of receiving and transmitting aerials. Transmission lines, Directional systems. Aerial couplings to lines and transmitters.

10. Measurements

Measurement of frequency and simple frequency meters (including crystal-controlled types). Use of verniers and other interpolation methods. Artificial aerials and their use for lining-up transmitters. Measurement of anode direct current and voltage, and power input to final stage.

-----OOOOOOOOOOOOOO----- AN INTRODUCTION TO LOCAL AMATEUR TELEVISION TRANSMISSION

So far, nothing has appeared in this magazine about Amateur Television, and it was thought that we may say a little about the subject in this issue of "The Ham". The idea of local Amateur T.V. transmission was born during a contact between G3KEP and G3KLZ some three years ago, when the idea of two-way television transmission was thought of as being a worth-while project of the distant future. It was decided to proceed with work on one station before thinking about the other. So, work commenced on G3KLZ/T and, as many of us who were fortunate enough saw, demonstrations of the first 'primitive' results were radiated from G3KLZ/T to G3LOJ early last June. G3KLZ has nearly finished the crystal controlled transmitter to be used at his station, and should be fully operational with the new equipment shortly after his return from Worcestershire in December.

Meanwhile, work has been proceeding with the second station to be operated from Eldwick early in November at G3KEP/T. The equipment at this station will for the time being be a Self-Excited Oscillator transmitter for vision on 445 Mc/s., and an EF91-EF91-QV04/7-832A-ECC91-QQV02/6 arrangement for sound on 441.5 Mc/s. Eventually a transmitter for vision will be made similar to that used for sound, and a peak white output of about 6 watts should then be obtained. At a later date, this may be followed by a QQV06/40A P.A. running up to 150 watts peak white input.

The aerial systems have not yet been decided upon, but there will be two arrays for both sound and vision. One being horizontally polarized and the other vertical. The standard of the sound effective radiated power (E.R.P.) being half that of the vision will be strictly adhered to.

VIDEO EQUIPMENT

At present, the transmission may be modulated by either Test Card C or the output from a video pattern generator. Sometime in the near future, a flying-spot scanner will be made for use at Eldwick so that a simple camera may be made, and our own Test Card radiated. As soon as the equipment can be installed at Eldwick, transmissions will commence from "K.E.P. Studios" and will be radiated from 12.30 to 1.30 and from 7 to 8 p.m. daily. The sound channel will be modulated with high quality music or 1000 c.p.s. sinusoidal tone with announcements every ten minutes. The lunch-time transmission will be horizontally polarized and beamed S.E. towards Bradford, and the evening transmission will be vertically polarized and omni-directional. The day-time transmissions will be switched on automatically. A suitable converter design will be described in our next issue.

We hope that many readers will take interest to this new field of Amateur Radio, and we look forward to receiving reports from U.H.F. Viewers.

-----OOOOOOOOOOOOOO----- THE HAM HELP-OUT SERVICE

Advertising Manager: David Noble, G3MAW (Assistant Editor)

Charge: 2d. per line of 6 words, or part of a line

The following valve types are available at 2/- each, reduction for quantity:
DP61; EB91; ECC91; EF91; EF92; 6X4;
12AT7. All are used, but fairly
now and guaranteed in working order.
Arriv: J. P. Stott, C.W.O.

R155A and o/p stage, less p.p. £4.
Partly made Band III Converter with
p.p., valves, and circuits £1 - G3KEP

The crystal set and one-valve set are both very simple to construct. The expense of headphones is present in both cases; but a valve costs very little more than a crystal, and gives much louder headphone results. The one-valve set also has much greater ability to distinguish between two signals on nearby frequencies.

The circuit of a crystal set is shown in figure 1.

A good aerial is needed; this is shown by the symbol Υ , and is usually connected by a plug and socket. It should be a long piece of wire insulated at the supports. An efficient earth is also necessary. The symbol is \perp ; it is also usually connected by plug and socket, and may be formed of a wire leading to several tin cans buried in the garden (mind the roses) or a water pipe. It should be built on a baseboard of a wooden block and a plywood front panel.

The symbol $\text{---} \text{|||||} \text{---}$ represents the tuning coil; for medium waveband 60 turns of wire on a $1\frac{1}{2}$ " former are suitable. The headphones are represented by $\text{---} \text{O} \text{---}$, the crystal by $\text{---} \text{>|<---}$ (actually it is a small rectifier). The leads should be held by a pair of pliers when it is being soldered in. The remaining component is the tuning condenser, a 0.0005 uF variable.

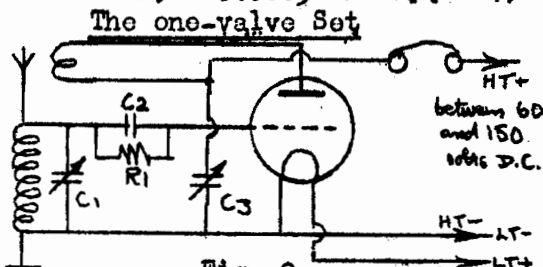
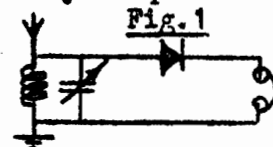


Fig. 2

The connections to the normal cheaply-obtainable battery valve is shown in Fig. 3., although an officer will show you how to connect other types.

The tuning coil may be 60 turns as before, with the other coil 15 turns on the same formers. of the two variable condensers, the first \pm should be a 0.0005 uF variable, the other a 0.0001 uF variable. C2 is a 0.0001 uF fixed condenser, and R1, a 1,000,000 ohm resistor.

As an alternative to winding your own coil, some firms supply coils ready wound.



Fig. 3

A LOW POWER TRANSMITTER

The low-power 'phone transmitter consists of two units, the transmitter and the modulator. These two should preferably be supplied from separate powerpacks, but it is possible to get away with only one. If the transmitter section is first constructed it may be operated separately.

The first stage is the variable frequency oscillator, which determines the frequency of transmission; the neon is a VR150/30, VR105/30, VR75/30, or a miniature variety (90C1, &c.). Its purpose is to stabilise the H.T. voltage fed to the V.F.O., and so prevent frequency variations.

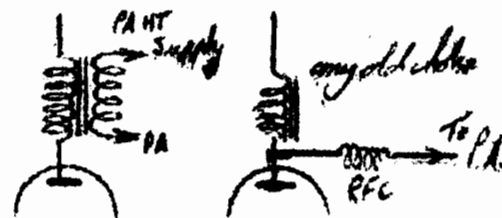
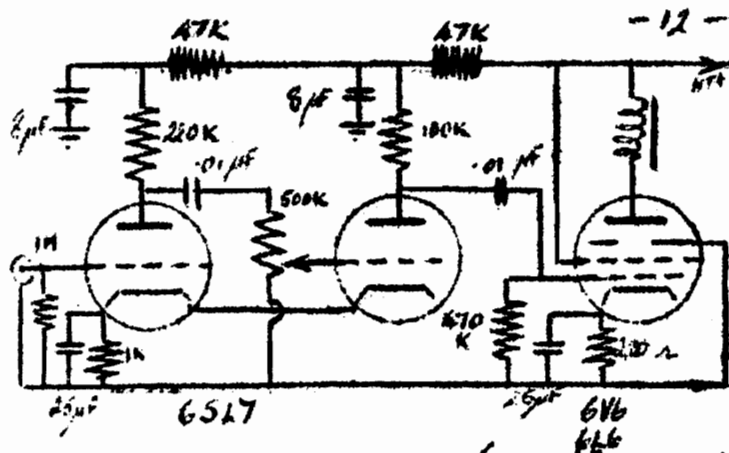
As a circuit of a transmitter was described last issue, it was not considered necessary to reproduce the circuit again. Back copies of the last two issues may still be obtained from the Editor.

The second stage isolates the V.F.O. and amplifies the signal which is modulated and passed into the aerial by the final 6V6 power amplifier stage.

The modulator is a simple audio amplifier circuit. The output valve may be a 6V6 and a 6L6; the preamplifier is a 6BN7 or a 6SL7. The output may be taken from a secondary winding of high impedance on the output transformer, or the high tension supply on the power amplifier stage could be taken from the anode of the 6V6 (Choke modulation). The circuit is intended for use with a crystal microphone, and is given on Page 12.

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THE LAST TWO ISSUES OF "THE HAM" ARE STILL AVAILABLE FROM THE EDITOR, PRICE 4D.

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THE DEADLINE FOR THE NEXT ISSUE IS WEDNESDAY, 15th OCTOBER, 1958.
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Alternative transmitter to transmitter

Circuit Diagram of the modulator described on page 11

OBJECTS OF THE HAM

1. To exchange ideas among members of the B.G.S. Amateur Radio Club.
2. To convey, to members, news and current topics of Amateur Radio Interest.
3. To contribute to the "true spirit of Amateur Radio".

DATES TO REMEMBER

20th Sept.	Ham Published.
21st Sept.	I.S.W.L. Contest.
23rd Sept.	High Fidelity Sound Reproduction - Bradford Amateur Radio Society
24th September	Annual General Meeting
28th Sept.	R.A.E.N. Rally
5th. Oct.	B.G.S. Top Band Contest
7th. Oct.	V.H.F. Equipment - Bradford Amateur Radio Society.
11th Oct.	Parents' Day
15th Oct.	Next Ham Deadline
21st Oct.	Quiz - Bradford Amateur Radio Society
2nd. Nov.	B.G.S. Top Band Contest
4th Nov.	Bradford Amateur Radio Society Meeting
8th Nov.	D.F. Competition.
8th Nov.	Next Ham Published
12th Nov.	Annual Soldering Competition.

R.A.E.N. RALLY 28th September, 1958

Here is a précis of the rules for the contest, as SWL's and non-RSGB members may wish to enter! The Rally is open to all RAEN members who will be divided into three groups: a) Out stations; b) Fixed stations; and c) Receiving stations. The Rally will take place from 0900 to 1200 GMT and 1400 to 1700 GMT Telephony and from 1800 to 2100 GMT Telegraphy. Operation will be in the 160, 80, 10 and 2 metre bands.

Out station to Out station - 5 points; Out station to fixed station - 3 points
 Out station to non-RAEN station - 1 point; Fixed station to out station - 3 points
 Fixed station to fixed station - 2 points; Fixed station to non-RAEN station - 1 point
 Further details of the contest will be given at the Raynet sked. on Sunday morning, & test phrases and logs will be issued to intending participants the Bradford A.R.S. meeting on Tuesday, 23rd. September, or at any other such time that participants may see the area controller before the rally.

Late News: A new receiver and top band transmitter will be installed at G3MHB during the next few weeks. Congratulations to G3MAW on his appointment of Public Relations Officer of the Bradford Amateur Radio Society. The B.G.S. Club is well represented with G3MAB also on the Committee.