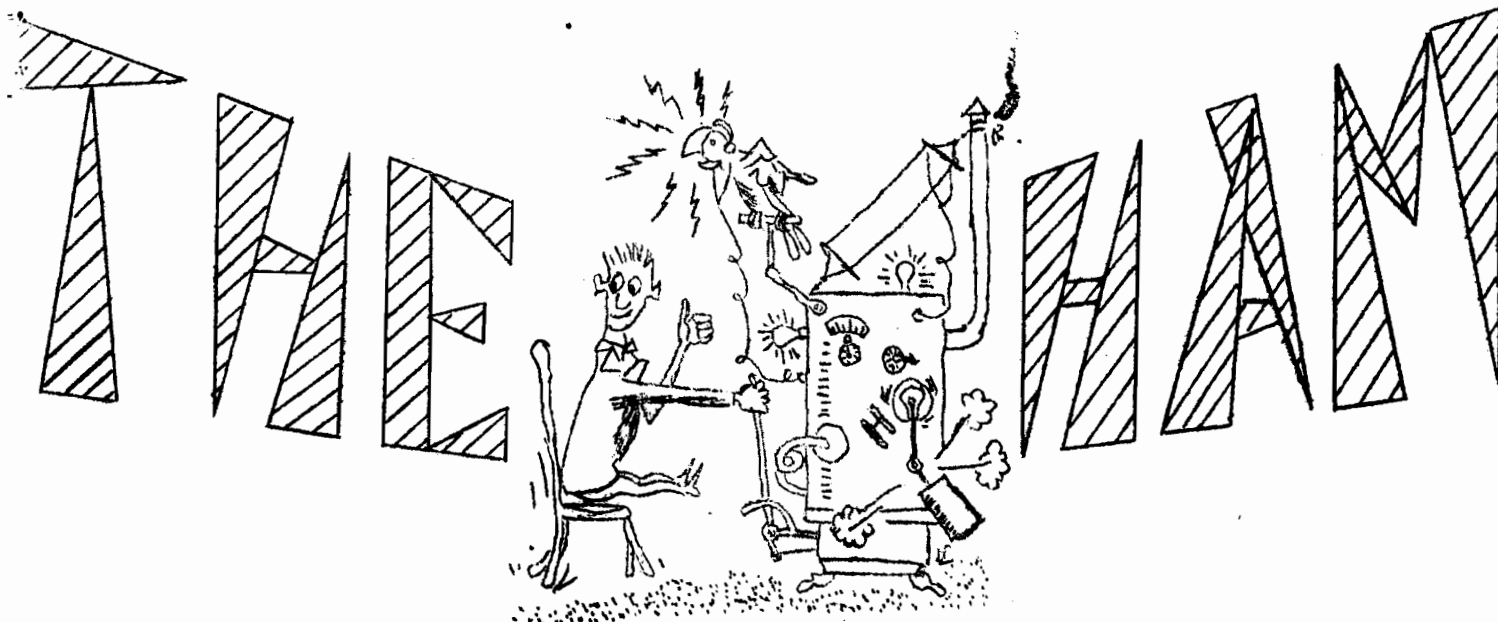


THE BI-TERMINAL MAGAZINE OF THE BRADFORD GRAMMAR SCHOOL AMATEUR RADIO CLUB



Published on the Wednesday after the first Sunday of each half-term. Articles for publication should be addressed to reach the Editor not later than 4 weeks before the date of publication.

Volume 1 Number 2

Wednesday, 13 NOV 1957

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D. Noble;
A. M. Pomfret.

THE BRADFORD GRAMMAR SCHOOL AMATEUR RADIO CLUB,

THE GRAMMAR SCHOOL,

BRADFORD, 9

EDITORIAL

BITERMINALLY

With so many newly licensed amateurs on the air, including myself, Top Band has become quite hectic at times with multi-multi-way QSO's. So much so that one am always left a contact when it had swelled to four or more stations.

Because of the numbers involved, keeping order has become a major job and stations should be very careful not to transmit out of turn.

This has however livened the band up as it used to be rather dead most of the time, being only really good in summer for locals.

The Radio Society seems to be flourishing once again, although there are fewer members than G3KEP left us with. There are however enough members to increase hazards in the Radio Room and everyone should obey the Safety Rules.

Contributions for this issue have been far fewer than should have been forthcoming, and we would like every member of the club to make an effort and give at least one contribution.

We hear that conditions are likely to be very good this winter, so everyone is well advised to get a receiver going and reports of DX heard should be handed to Mr Pomfret if you want them publishing. Should sufficient interest be shown we might start a SWL counties ladder.

If you feel very strongly about any point, or wish to air your wisdom but cannot write an article, why not write us a letter? All unobjectionable letters will be printed.

CURRENT NEWS BY A.M.P.

Although it is now some time since the Jubilee Jamboree, details of the Amateur Radio Station there were not to hand for the last issue, so here is a rather belated account.

The idea of having a station was formed some two years beforehand, and the necessary authorities approached. The G.P.O. allocated the call-sign GB3SP, and 22 firms co-operated in loaning equipment for this all-band station, with its regular hourly news bulletins, many of which included voices of 20 nationalities, as well as national music and song.

G3BA produced an efficient aerial farm with a 600ft. wire for Top Band disappearing into the trees. This aroused the curiosity of many, but one of the main attractions was the T.V. stand where visitors could see themselves on a screen, photographed by a camera in a closed-circuit link. The station itself, of course, was a great feature. Although 1712 contacts were made, including one with VP8CI, the station of the Royal Society's Antarctic Expedition at Halley Bay.

At last the 54000 station was sorrowfully dismantled, the largest ever to be operated, due to the efforts of many people, including Mrs. G3AY and Mrs. G3LNN who helped with the secretarial work, and making cups of tea for thirsty operators.

Now some of the Club news. The A.G.M. early in the term re-elected Fell, A.F. (G3LXF) as secretary. It was also decided to spend some of the club funds on aerials, and two new copper wires now radiate from the Radio Room. One is a receiving aerial for crystal sets, etc., and the other is an 80 metre end-fed. On Wednesday, Oct. 16th., Mr. Eskdale (G2SU) gave a very interesting talk to the society, and his subject was 'Aircraft Radio'. He has been on the air since 1911.

During recent weeks, several members have been granted transmitting licenses, and a 'B.G.S. Net' is held at 9 o'clock every evening (homework permitting) on 1.9 Mc/s. (158 metres).

At the time of writing, Bradford Amateur Radio Society have held two meetings and one outing in the new session. At the opening meeting, D. Skirrow (G3GFD) gave a lecture on the design of receivers for the 2m. and 70cm. amateur bands. A fortnight later, Dr. M.J. Heavy-side (G2QM) gave a very interesting talk on aerials in general, and 2m. arrays in particular. On the 8th. of October, the club paid a visit to Tinsill Television Link Station, a visit enjoyed by all who went.

Also on October 8th., Mullard Ltd., through the courtesy of the Institute of Practical Radio Engineers, showed two films in the Midland Hotel. Several of us represented the Society at it, and it was gratifying to see so many present. The two films were 'Mirror in the Sky' showing the early work of Marconi and Hertz, and now Sir Edward Appleton developed research into the layers of the upper atmosphere, and 'The Principles of the Transistor' which showed the basic physics of the germanium diode and p-n-p transistor, as well as their possible developments.

G3KLZ of Heaton has been on a B.B.C. course down in Worcestershire, and has interested many new friends he has made there by his activities on Top Band.

Finally an announcement about Slow Morse. Special transmissions are at present conducted, sponsored by the R.S.G.B., for those starting or improving their Morse. The transmissions are radiated every Friday evening from 9-30 to 10 o'clock by G3KEP of Cottingley, G3INW or G3KSS of Eccleshill. The present frequency is 1860 kc/s. (161 metres) but may shortly be changed, probably to 1900 kc/s (158 metres).

Well, that rounds up our survey of current events in the local radio world; AMP will be back next issue with more current news. AMP QRT.

B.G.S. AMATEUR RADIO CLUB HELP-OUT SERVICE

Charge 2d. per line (6 words)

Members wishing to use this service should obtain a form from D. Noble (G3MAW) Three IFT's 465 Kc/s one matched Miniature pair unused one Normal Size Type 12 the lot Offers to R.L.Hodgson.

Wanted: 2" flush square 1 mA meter, 100 ohms internal resistance - G3KEP

Broadcast Receiver good condition L,M,SW needs attention on S.W. 6 valves cabinet 20/- o.n.o. LS extra apply G.F.Firth.

Wanted 1/8 watt resistors 5% only B.I.F.

EP9 CY31 OV118 ECH3 AC6PEN etc. all 1/- (AC6PEN 1/6) Wanted switches apply A. M. Pomfret G3LZZ

BEGINNERS' SERIES

Part 2 - The One-Valve set

The one valve set is the next step up from the crystal set. The crystal set just detects the signal, but the one valve set amplifies it slightly as well. Full circuits and layout charts are in the Radio Room, so none will be given here.

Before assembling the set you should make sure that all your parts are of approximately the correct value and that they are all in good condition. Before any soldered joint is made, and they should all be soldered, both connections should be well tinned, i.e. have solder and flux applied simultaneously with the soldering iron.

All soldered joints should hold up to the breaking point of the wire. If you use good components and make your joints well, it saves a lot of trouble looking for faults in the finished job. Avoid using long leads.

The H.T. supply should not be switched on until the valve filament is warmed up (about two minutes). You should avoid poking in the set with the H.T. on.

The one valve set should have as good an aerial and earth as the crystal set. If you wind your own coils you will find it useful to fix the formers in old valve bases so that you can plug different coils in.

It is best to build the set on a metal chassis, and if you do get one with space on for at least two more valves to act as amplifiers. These will be described in subsequent articles.

This has taken the form more of instruction in the art of construction more than a description of the set itself as full details are in the Radio Room.

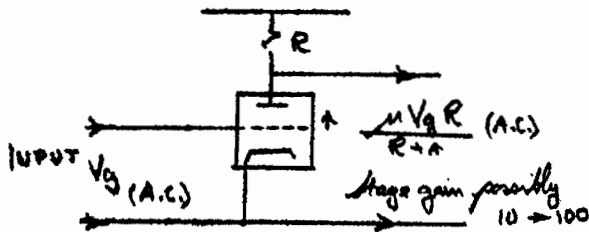
NEW HAMS

Congratulations to the following members of the Club for obtaining their Amateur (Sound) Licenses: Peter J. Barowitz (G3LZW); Andrew M. Pomfret (G3LZZ); John P. Stott (G3MAB); Richard L. Hodgson (G3MAL); and David Noble (G3MAW).

CATHODE OFF-TAKE AND CATHODE FOLLOWER

by R. V. COX, M.A. (G3LQJ)

Most of us are familiar with the common voltage amplification circuit in which a small signal voltage injected into the grid of a valve becomes available, between anode and ground, as a highly magnified signal of amplitude possibly a hundred times greater than the original.

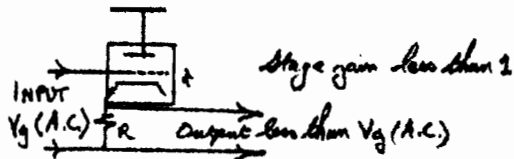


The voltage gain of a stage can be calculated by considering the signal voltage V_g to make the valve act as an AC generator of AC EMF uV_g volts. This causes to flow in circuit an AC current of magnitude $\frac{uV_g}{R+r}$ and hence the AC voltage across the valve, as across a DC generator, is "EMF - Lost Volts" = $uV_g - \frac{uV_g \cdot r}{R+r} = \frac{u \cdot V_g \cdot R}{R+r}$. The stage gain is thus $\frac{uR}{R+r}$.

One feature of this is that the amplified voltage is 180° out of phase with the injected voltage, because, if the grid goes positive, the increased flow of electrons across the valve causes the anode to be more negatively charged, and vice-versa.

The "cathode-follower" is a variation of this arrangement with very contrasting properties. The Load Resistor is put in the cathode circuit and the output is taken from cathode rather than anode.

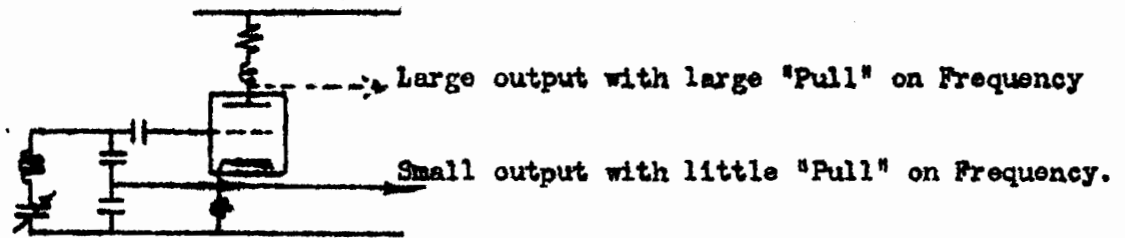
The name "Cathode Follower" is used as the voltage of the cathode "follows" that of the grid. When the grid goes positive, as electrons leave the cathode the cathode becomes, through loss of negative charge, more positive, and vice-versa.



The electrical behaviour of the valve is as follows:- When a signal V_g is injected, the valve behaves as a generator uV_g , the current $\frac{uV_g}{R+r}$ flows, but the effect of this through the cathode load is to make the cathode load alter the bias of the valve. Thus on positive peak current, it provides a negative peak bias of $\frac{uV_g}{R+r} R$ volts. Thus, the effect of the cathode resistor is to provide very high negative feedback and to reduce the amplification to a very low value, a value which is always less than 1! The valve acts then as a non-amplifying stage, in fact a voltage reducing stage. Why, then, is it employed?

The property of the circuit that makes it desirable is that the output impedance of the arrangement is very low, or rather it can be varied at will by choice of suitable resistor. A rule of thumb to measure output impedance is to use the Ohm's Law expression $R = \frac{V}{I}$ in the AC sense and to determine how V changes with current taken: the output impedance of a stage is actually equal to AC voltage amplitude change no current taken whereas this would normally be simply "R", in the case of cathode follower's cathode, the taking of current brings about a compensation in the circuit, through the negative feedback, that reduces the voltage change to a very small quantity. Thus the output impedance is very low.

The two applications most commonly used are (1) to employ the Follower as a final stage of an amplifier as it can be used to match into low impedance loads. It behaves as a matching device like a matching transformer, but has the advantage that it matches without a voltage change, whereas is a transformer is used, a matching ratio of "n" is accompanied by a voltage change of \sqrt{n} . It can actually be used to match into a loudspeaker, if a transformer is not available. (2) to use the cathode off-take principle for the output of a VFO as current taken will alter the voltage distribution in the circuit much less than if taken from the anode. Hence, the VFO will not be "pulled off" frequency.



THE POSSIBILITY OF LIFE ON OTHER PLANETS

by D. G. Rennard

In order to discuss the possibility of life on other planets we must first define life. This is no easy matter. To produce organic compounds (nowadays defined as derivatives of living matter) is not to produce life (a corpse, which is undoubtedly organic, is not alive).

Organic matter is easily produced from inorganic amino-acids, the main constituent of protein, can be synthesised (i.e. made artificially from methane, ammonia, hydrogen, and steam). As all these gases were present in the infant Earth's atmosphere, it is easy to see that proteins could have originated in this way.

These amino acids could change chemically in many ways. The molecules would, in thousands of millions of years, get gradually larger until eventually, they would get to the stage where they could split to form two similar but smaller molecules, when each could combine with outside materials to form an organic molecule.

The process described is perfectly feasible, and there seems, at first glance no reason why this should not occur on other planets. There are, however, good reasons why life cannot occur on several planets. Let us consider the sun's planets in order from it:

mercury cannot possibly support life as its surface temperature is very high (on account of its proximity to the sun); also it has lost all its atmosphere due to a small gravitational pull.

the temperature on Venus is rather high for life, also there is complete lack of water (although life may exist on similar substances such as hydrogen sulphide) but on the whole it seems to be stretching credulity a bit to suppose life on Venus.

life does exist on Earth.

vegetable life is thought to exist on Mars. In summer Mars, where not frozen, is green; in winter brown. This is most easily explained as vegetation which withers in winter. The surface temperature is cold (reaching -130°F at night) for animals.

then comes a long gap so that it is reasonable to suppose that the outer planets cannot sustain life.

Thus the only planets in this system which may sustain life are Mars and Venus. However life may exist in other solar systems, but that is outside the scope of this article.

AN ECONOMICAL 8-10 WATT HIGH QUALITY AMPLIFIER/MODULATOR

by P. J. BAROWITZ (G3LZW)

The circuit to be described is designed to give high quality reproduction of radio, records and microphone inputs using surplus valves and components at a moderate price. The circuit employs the most modern methods of circuitry, including a high degree of negative feedback (N.F.B.), cathode coupled phase-splitter (V2) which is in turn directly coupled to the previous stage (V1b), and a tone control network which gives very wide variation of bass and treble frequencies. It should be mentioned early in this article that the use of a poor speaker and old components will prevent good results from being obtained. The speaker should be at least 8" in diam. and should be one of the best makes available mounted in a correctly designed cabinet or baffle board.

The input to the first stage (half of the first 6SL7 double triode) is suitable for radio input from tuner or speaker sockets or a high output magnetic pickup. If a crystal pickup is to be used (usual record player type), some correction in the circuit is required. For a crystal microphone the connection can be direct provided that the N.F.B. is reduced, or an additional stage may be added to the amplifier using full N.F.B. The extra stage is also required for low output moving coil pickups and microphones.

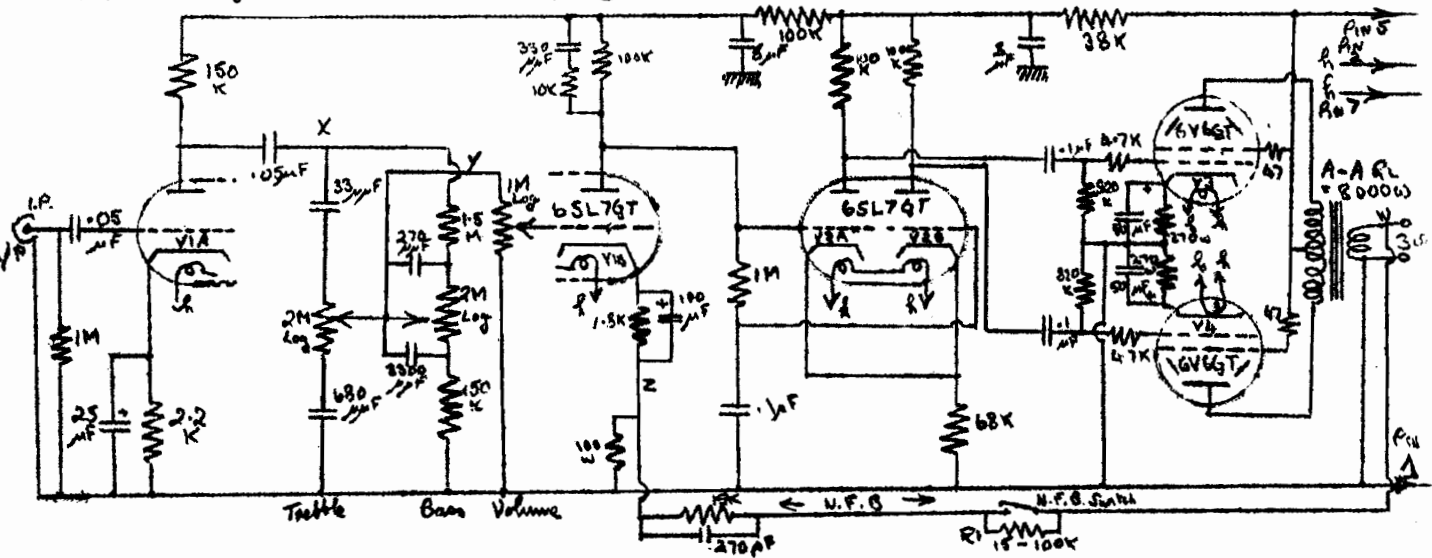
After passing through the tone correction circuits and V1b, the signal is fed to the high gain phase splitter (6SL7) and then to the push-pull 6V6's in the usual way.

The output transformer must be a good quality one and must be able to handle the full 10 watts.

A switch has been included in the feedback loop so that the gain of the amplifier may be increased for use with a microphone. R1 may be omitted to cut off feedback altogether when switch is open, or R1 can be of a value to give the exact required gain. Alternatively R1 could be a 100K log. pot. and then the switch could be omitted. One should always use as much N.F.B. as possible with the given input. The advantages and theory of N.F.B. will be discussed at a series of talks to be given by the author.

The connections to the power supply should preferably be via Octal plugs and sockets, the standard connections are given in the diagram. The H.T. source should be 280-330v at 80-120 mA choke smoothed. The 6.3v supply winding in the power pack must be earthed by a centre tap or hum-dinger.

Other points to note:- The control pots. should not be ex. govt. unless tested for complete noiselessness. Condensers in tone control network should be mica or S.M. type. Anode to grid coupling condensers should have low leakage resistance. Resistors 20% tol except for 5% where value affects balance of p-p system. Construction on long aluminium chassis with layout of correct sequence i.e. input at one end & output at other, controls being on one side. All large components must be rigidly fixed to chassis. Wiring should be short and direct to valve holder pins where possible. Use should be made of tightly twisted leads for L.T. supplies to valves, and sleeving for wire ends components. Use co-ax or jack sockets for input. Screened lead should not be necessary if correct layout is used. Finally, good soldering is essential; dry joints cause noise



Note: Further details for which there is no space here, can be supplied by the author on request; all queries are invited. If well constructed, this amplifier will give you service & pleasure which will more than repay you for the cost and the trouble taken.

ACCUMULATORS: THEIR CARE AND MAINTENANCE

by G. D. Armitage

There are two different types of secondary cells or accumulators, known respectively as the lead-acid cell and the alkaline cell. Alkaline cells are made in two forms; one using nickel and iron, the other nickel and cadmium for the respective sets of plates. The lead-acid type is more easily damaged than the alkaline types of cell.

LEAD-ACID CELLS Two independent sets of plates, interleaved but not touching each other, are immersed in sulphuric acid and enclosed in a suitable container. Two terminals are brought to the top of the accumulator jar, which are connected to each set of plates. There are two forms of construction of plates, known as the Faure (or pasted) and the Planté (or formed), and the modern constructions are based on one or the other of these types.

Faure plates consist of cast lead-alloy grids with openings into which the active material is inserted in the form of a paste. Planté plates make use of a lead base on which the active material is deposited by a special forming process. The active materials employed in lead-acid cells are lead peroxide for the positive plates and spongy lead for the negative. The sulphuric acid used for the electrolyte varies in specific gravity according to the type of accumulator. The acid used in general purpose stationary cells is from 1.205 to 1.215 in car starter accumulators, and as much as 1.28 for the batteries of electric vehicles. Unduly strong or weak solutions are harmful to the cells, and the manufacturer's recommendations should always be carried out to the letter.

ALKALINE CELLS This type of cell differs radically in construction from the lead-acid type, and it does not employ acid. The electrolyte is a solution of potassium hydroxide in distilled water, the specific gravity being about 1.19. In the nickel-cadmium cell, the active material of the positive plates is a nickel hydrate mixture which also contains graphite and other materials. For the negative plates, a mixture of cadmium and iron oxides is used. In the nickel iron cell, the positive plates are of similar construction and iron oxides are used for the negative plates. The nominal voltage per cell is 1.2volts, compared with the 2volts of the lead-acid type.

Alkaline cells may be discharged at rates up to the short circuit value without damage, and in many ways are remarkably resistant to the effects of careless use. In particular, they are not harmed by long periods of inactivity.

THE CARE AND MAINTENANCE OF ACCUMULATORS

The Initial Charge. The makers usually state for how long the initial charge should take. The usual time of charge is about six hours, but a little longer charge will not do any harm. When the voltage of the accumulator has fallen to 1.8, the discharge should be stopped and re-charge should begin immediately.

Alkaline Accumulators. The electrolyte (potassium hydroxide) in distilled water, should have from 1.19 to 1.16 specific gravity. Alkaline accumulators should never be put on charge with lead-acid accumulators since, owing to the difference in characteristics, this would be detrimental to both types.

The initial voltage is about 1.4 per discharged cell put on charge at the normal rate (6 hour rate), rising to about 1.5 volts during the first hour, until, after a gradual rise, the top voltage of about 1.8 is reached at the end of the fifth hour. The charge must then be continued at the full rate for a further hour.

There is much more to be said on this subject, and I shall be pleased to answer questions at any time.

A SUPER-REGENERATIVE RECEIVER FOR THE TWO METRE BAND

by Anthony F. Fell (G3LXF)

I expect most readers of this magazine will have built or intended to build the 'reaction type' receiver. As you will know, the amplification and sensitivity of the circuit is increased by turning up the reaction control until the set is just about to oscillate. Beyond that point, the set howls with defiance and the reception of telephony is impossible. Now if this howling could somehow be stopped, the reaction could be increased and the amplification of the valve would be greatly improved. This

is what the super-Regen. circuit does. For the technically minded this is effected by injecting a voltage of supersonic frequency (known as the quenching frequency) in such a way that the 'howl' ceases oscillation every half cycle of the quenching frequency. As simple as that!

The characteristics of a super-regen. are such that it is best suited to the higher frequencies. This one here is designed for operation between 120 and 160 Mc/s- ideally covering the 2 metre amateur band. The sensitivity is very good, considering that only 1 valve is used, and compared with the 'reaction type' 1 valve set, the amplification is enormous. Due to the fact that no audible beat note is heard, only reception of telephony or M.C.W. is possible.

THE CIRCUIT

Coupled to L2 via L1, the signal is selected by C1 and demodulated (or detected) by the grid leak resistor and condenser (R1 and C2) and V1. Reaction is provided by the arrangement of L2 between anode and grid, and regulated by R2. The quenching frequency is determined by C3, and is the low frequency oscillation produced when reaction has been carried beyond a certain point. Finally, the audio is reproduced, via T1, in the headphones. If required, an output stage can be added for more volume. Details will be gladly supplied on request.

CONSTRUCTION

A suggested circuit layout is given with the circuit diagram. It is essential that all wiring be as short as possible, thus cutting losses to a minimum. Otherwise, everything is quite straight forward.

ADJUSTMENT

R1, though nominally 10 Megohms, could be replaced by anything between 4.7 and 10 Megohms, and experiment with different will prove worthwhile. Also, varying the distance (i.e. the coupling) between L1 and L2 will give the best coupling position. C3 should be such that when R2 is turned $\frac{2}{3}$ of the way up, there is a loud hiss. Thus, to obtain this effect, it may be necessary to alter the value slightly from that given.

AERIAL

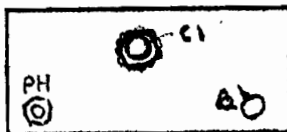
A dipole is recommended for this receiver. It is best made from two lengths of tubing 19" long and each fastened to a piece of low-loss insulation.

OPERATION

Excellent results will be obtained if a mains power-supply, such as that described by David Noble in the last issue of the HAM, be used.

CIRCUIT VALUES

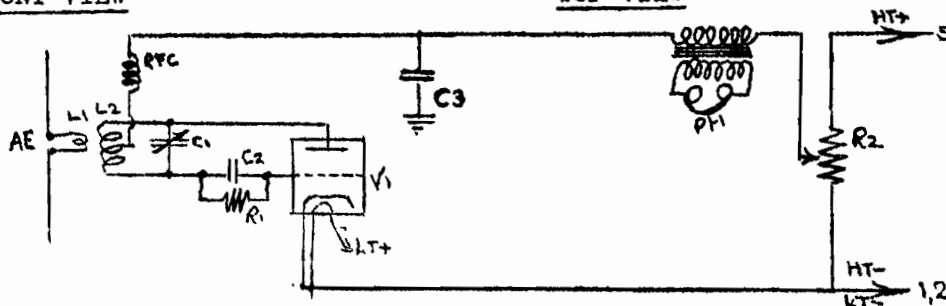
- | | |
|--|---|
| C1 - 20 pfd variable with insulated extension spindle. | RFC - 22turns on $\frac{1}{4}$ former 24 S.W.G. en. |
| C2 - 50 pfd Silver Mica | L1 - 1 turn $\frac{3}{8}$ in. dia. self-supporting 16 s.w.g. |
| C3 - .002 - .005 uF (See Text) | L2 - 3 turns $\frac{3}{8}$ in. dia. self-supporting 16 s.w.g. |
| R1 - 4.7 - 10 Megohms. (See Text) | PH - High Resistance 'Phones. |
| R2 - 500 K ohm variable | V1 - 955, 7193, CV6, VR137 or similar. |
| T1 - Intervalve transformer, about 1:1 | |



FRONT VIEW



TOP VIEW



(Page 9)
GOOD OPERATING TIPS - PART II
by David M. Pratt, G3KEP

With the advent of several B.G.S. members obtaining amateur transmitting licences, the writer has noticed one or two slight differences in the procedure to that normally appropriate to radio amateurs. Based on these differences, here are a few more 'dos & don'ts' following from a similar article on page 9 of the last issue of the 'Haw'.

- (1) When using C.W., do not give a telephony station a RST report. The procedure for the report should be sent as follows: = ur RS 59 59 = NOT = ur RST 59 59 =
- (2) When replying to a CQ call, only call the station. Do not pass any other information, as there may be several other stations calling him.
- (3) The method of ending a transmission is: G3JKY de G2CUI ~~ur~~ k . Several operators tend to insert the break sign (-...-) between their own call-sign and ur.
- (4) If any part of your equipment is not working correctly, do not use the equipment until the trouble has been cured. Cure any 'chirp' or 'drift' that you have as soon as possible, as it may be of annoyance to other operators using the band. Although 'cut & try' methods may be used for initial experiments or tests, or in cases of genuine emergency, they should not be used for general use if they are not up to the standard of the average amateur radio station.
- (5) When in contact with a distant station on telephony, address your remarks to the station slowly and clearly in your natural voice. Do not shout into the microphone as this will decrease the readability.
- (6) Especially when in contact with a distant station, do not make long pauses between your words and phrases because, if interference is bad, the station with whom you are in contact may assume that the transmission has been returned to him.
- (7) If there are other people in the room with you, and you wish to address some remarks to them while your transmitter is on, always switch off your modulation before doing so.
- (8) If you give your call-sign more than once when calling or working a station, only send 'de' once, e.g. G2CUI G2CUI de G5VR G5VR
- (9) When signing off from a multiway contact, always listen to the next over from each station in the contact unless absolutely impossible.
- (10) Never be late for a pre-arranged contact --- Some local amateurs have a bad reputation for this.
- (11) B.G.S. QTR PLAN:
When in a 2 - way contact, do not let each over exceed 5 minutes;
When in a 3 - way contact, do not let each over exceed 4 minutes;
When in a 4 - way contact, do not let each over exceed $3\frac{1}{2}$ minutes;
When in a 5 - way contact, do not let each over exceed 3 minutes.

Under no circumstances should the over of any simplex QSO exceed 10 minutes

When working duplex give the call-signs of each station every 10 minutes.

- (12) Whistling or humming on the amateur bands is a very bad habit of some people.

Do not do this unless it is really essential to do so.

REMEMBER: i) The quality of the average 160 metre transmission is high. One of the reasons is that only a small amount of audio power is required to modulate a ten-watt carrier.

ii) The standard of operating on the 160 metre band is better than on any other amateur allocation. Some of the most efficient operators are to be found on this band, and a number of contests are arranged every year.

We would remind members that the annual Soldering Competition will be held on Friday, 15th November. The entrance fee for the competition is 6d. per entry payable before the competition. The prizes will be issued, and the results announced at the meeting in Room 18 on Monday, 18th November. The prizes will depend on the number of entries. Further details are posted on the School and Society notice boards.

We are all sorry to hear of the present illness of Mrs. Cox which has unfortunately necessitated Mr. Cox's temporary resignation from his office as Vice-President. (ly We deeply sympathize with him, and wish Mrs. Cox a speedy recovery. Meanwhile, we hope that Mr. L. Hodgson will continue with Mr. Cox's good work for the Club.

THE SHORT WAVE MAGAZINE CLUB CONTEST

This will be held on Sat., 16 Nov., Sun., 17 Nov., Sat., 23 Nov., & Sun., 24 Nov. from 1600 to 1900 GMT on each day. It is proposed to enter this 1.8 Mc/s contest again this year using the station of G3KEP. Further details can be found in the October, 1957 Short Wave Magazine.

B.G.S. AMATEUR RADIO CLUB TOP-BAND CONTEST NO. 1.

This is open to any licensed amateur of the Club (G3LQJ, LXF, LZW, LZZ, MAB, MAL, MAW) December, 1st from 1800 to 2100 GMT, CW only. 5 points for each BGS member; 3 points for each ex-BGS member; 4 points for GC, GI, GM, GD, GW; 2 points for non-BGS G stns. Logs submitted to G3KEP by 8th Dec. - Prize given if at least 6 logs are submitted. Exchange report, name, and QTH.

R	E	C	E	I	V	E	R
N	L	I	T				
D	E	E	D	D	Y		
E	R	C	E	O			
E	G	T	R	O	U	T	
P	I	R					I
S		I	L	L			M
E	T	C	D	I	E		

Solution to Crossword in Vol. I, No. 1

- Across:
- 1 G3LZW always says, "QRX, - -," (2 words, 6+2)
 - 5 Metric unit of work.
 - 6 Comes before plane.
 - 7 A transmitter is not much use without this.
 - 8 "N and pieces".
 - 9 - - Peak Voltage
1.414
 - 15 A word meaning P.D.
- Down:
- 2 Electrons flow from the - pole of a battery.
 - 3 Adjacent to.
 - 4 They sometimes pay dividends.
 - 5 The fire's dying - .
 - 10 Volts, current, and resistance.
 - 11 A male sheep
 - 14 The largest species of deer.
 - 17 French for "if" .

- 16 Bats - with their ears.
- 18 Nominative Singular neuter of "is" (Latin again)

		2		3			4
X	X		X		X	X	
5			X	6	10	11	
	X	7	12				
8				X	9		
	X	13	X	14	X	X	X
	X	15				17	X
16			X		X	18	

CONTRIBUTIONS for the next issue

of the HAM should be addressed to reach

J. P. STOTT (6Sb) by Wednesday, 18th December, 1957. No late contributions will be accepted for publication.

ORDERS for the next issue of the HAM must be made before 18th December, 1957.

If a copy of the magazine is not ordered the management staff cannot be responsible for printing too few a number of copies.