SKYWIRE

THE CANADIAN RADIO AMATEURS' JOURNAL

Summer, 1950

20 cents

Toronto, Ontario, Canada.

SKYWIRE

Vol. 3. No. 5

Published monthly as

THE CANADIAN RADIO AMATEURS' JOURNAL

Editor - Fenwick Job, VE3WO

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Summer, 1950

SKYWIRE BUSINESS AND EDITORIAL ADDRESS

VE3WO — 435 PARKSIDE DRIVE, TORONTO, ONTARIO

Home Phone—LAkeside 8926

AUTHORIZED AS SECOND CLASS MAIL POST OFFICE DEPARTMENT, OTTAWA

SIDEBANDS

On the road to Jewetts' Grove a couple of week-ends ago to renew a number of old pre-war friendships at the Ontario Phone Club Picnic, a bit of nostalgia crept into the trip as, one by one, memories of past years came to mind. There's been a remarkable change in hamming in the last fifteen years, when you come to think of it, but how many have stopped to realize it?

For instance, it isn't likely the young hams just getting into the game, will ever know the pleasures of 160 meters as it used to be - one of the finest of all our bands, for all round use, and a going concern seven nights in the week. There was plenty of DX around if you dug for it, and even low power did a fine job. Today, eleven years since we pulled the switch, 160 is a shadow of its former self. And the clatter set up by Loran isn't making it any more interesting. Of course, Loran may be moved, and we'll get the whole band back again.

It's not all darkness, of course! Any ham from the early thirties can tell you it was really exciting to hear a ham operating on 10 meters. Days would go by without a signal being heard, where today you have trouble dodging the QRM. The authorities were smart in opening ten up first, and forcing activity on this band. It's now one of the best!

And remember the days of 5 meters as it was then - before TV. There were certainly some dandy lashups on this band, including the old loop modulated oscillator. And some of the signals had more than a faint touch of FM to them, in spite of the regs against it. If a guy had said that turret tuners such as every television set today uses would be available, he'd have been a candidate for the nearest booby-hatch. Bandswitching from 54 to 216 megacycles?? Nuts!!

Yep, back in those days, bandswitching of any kind - receiver or transmitter, was just something to dream about. Not twenty years ago, either!! Fifteen! Fifteen years ago, a young fellow named Halligan started making ham receivers - known today around the world as Hallicrafters. The fine old National 101 which was later modified to the 200, and then the 2-40 was something special with its low loss sliding coil rack. The boy owning a factory built set was a rarity - most fellows built their own! Today, the ham who does this commendable work is in a class by himself, and almost as extinct as the Dodo.

Stopping in Guelph at the Hammond plant on the way North was a revelation. From a modest start years ago, these boys, still active today on the bands, have grown into one of the largest manufacturers of quality transformers on the continent. And they've never cut the corner on quality to get production when shortages were a bugaboo. Today, a large plant running to capacity and then some on commercial designs, they're never too busy to take time out, and lend a helping hand to a ham with a special problem.

A few days later a visit to the Erie Resistor plant pointed up the comparison more sharply still, between a decade and a half ago and today. Tiny ceramic condensers smaller than the present half watt resistors, replacing the bulky, cumbersome units of those earlier, and almost forgotten days.

Yes, in the past fifteen years, there have been numberless changes as the electronic art has progressed. Any ham can feel proud to have been a part of that advance. The years ahead will bring with them still more odd applications of electronics which, if forecast today would seem impossible. Changes are coming beyond our dreams today, and if amateur radio, as a hobby is to survive, we will be changing too.

Do some reminiscing yourself, if you're one of the older hams. As a VE3 before the war, before TVI NBFM, the VFO and one or two, or more of the later additions, I had a lot of fun, and so did the rest of you. Tuning any of the bands, you can hear familiar calls from most districts, of hams who will be just that - hams - until Somebody pulls the main switch upstairs, and adds another name to Silent Keys.

de VE3WO

TV PHOTOGRAPHY

Photographing television screen images need be no more difficult than copying. Here are some suggestions to help you take better stills of telecast pictures . . .

In the Television News section of Skywire this month is data on the number of TV sets actually in use in this country, according to the latest guestimates. Since this now large total is growing more rapidly with each passing month, and photography is often a second hobby with the ham, this article will deal with various aspects of obtaining good photos of television images at home.

This type of photography is similar to the normal techniques required to produce a good picture. There are a few problems, but none so serious as to give you trouble if you will follow a few simple directions. You'll find the time worthwhile, since television makes new subject material available in your own home, and the weather doesn't count.

If you feel that making a little extra money would be a good thing, you have an opportunity to earn it in this type of photo-making. Many people would like to have a permanent record or scrapbook of the name stars appearing on their screen. And that's where you enter the picture with pictures.

Most of you are aware of the way in which a television image is reproduced on the face of a cathode ray tube. A beam of electrons activates tube phosphors momentarily as it scans the screen of the tube, producing the varying brightness of the television image. This scanning operation has been mentioned because it is important to the photographer. It tends to limit the time of exposures which can be used.

In most cases, exposure times should not be less than one thirtieth of a second, for this is the time the scanning device takes to reproduce a complete image on your TV screen. However, the fact that the screen has a short persistence of image will sometimes allow a slower shutter speed to be used. You can go to one tenth of a second in some cases, but it's necessary to try and guess when the subject isn't going to move while the shutter is open. And you can't always outguess them!

The American system of scanning gives 525 lines to the picture, and in case you have any doubts on this subject, this figure remains the same, regardless of screen size. Thus, on the larger screens now becoming the standard, these scanning lines are proportionately larger. The photographer is able to obtain good shots, not withstanding sizes of screens encountered, as long as he has a sufficient working space ahead of it. Films have a greater resolving power than can be used in photography of TV images anyway!

Scanning is done in two sequences in TV, as every other line is scanned by the electron beam in one sixtieth of a second, and then the beam goes back and scans the alternate lines in the same period, to produce the completed picture in one thirtieth of a second as mentioned earlier. This interlacing in scanning produces a better eye-impression on the looker-in than if the scanning was to be done on a straight sequence.

If your line voltage is not fairly consistent the contrast of the screen can change quite appreciably in illumination value. While the variation doesn't complicate the routine too badly, it makes it impossible to give exact exposure information. Voltages in the current models of receivers range from about nine to fifteen thousand volts. Tube faces, by the way, give a flat type of lighting comparable to the results obtained outside on a dull day, and the whole effect is one of softness in the finished print.

The equipment you can use can be almost any reasonably good camera with a lens speed of f4.5 or f5.6. It's easier to use a press job with direct ground glass focussing, but it is not essential by any means. The most important thing is correct and careful focus, to obtain good reproductions. One thing on camera types stands out - and that is that focal plane shutters are not suited to TV photography. Don't ask us why - but that is the opinion of top notch experts today.

Don't make the mistake of working too close to the screen. If you're in close, the distortion produced by the curvature of the viewing screen becomes serious. If you're interested in large pictures, enlarge them to the size wanted later. Normally speaking, two feet or slightly more for a ten incher and proportionately more for larger tubes is the distance you should set your camera from the screen surface.

In setting the camera up in front of the TV set, for the taking of direct image photos, position it squarely in front of the screen, so the optical axis of the camera lens is perpendicular to the center of the TV screen. Avoid reflections from the screen itself, eliminating them completely if possible. It sometimes is necessary to reduce these reflections still further by draping light absorbing cloths around the screen. A tripod is an essential and if you're not using a reflex or ground glass camera type, measure the distance from screen to camera lens very carefully, to make sure it is correct.

Now that you have the camera placed, the TV set controls should be carefully adjusted to give the best picture. Don't try for extra brightness of the screen - reduce the contrast of the screen to below normal so that all possible detail will appear and be seen by the camera. Room lights should either be turned off completely, or very low, so they won't interfere with the TV screen image.

For film, use any high speed emulsion type, such as Ansco Supreme or Superpan Press, or Kodak Super-XX. Any of these has enough speed to obtain a good negative. However, the density of the unprocessed film inclines to flatness and a good developer with fair speed and good cold tones must be used. The developing time can be extended a third if you have the extra patience, and thus give a better contrast to the finished negative. Actually tank time depends on studio lights where the show originates, receiver performance and the like, and only experience with a roll or two will give you all the answers. However, one caution! Don't use a soft type of developer containing large amounts of borax, because it just won't do a job!

If there is any appearance of graininess in the finished picture (although usually there isn't a noticeable amount) one of the many textured types of papers can help to reduce this to some extent. During the printing, all normal printing controls and dodgings can be used to make the final result that much nicer and pleasing.

If you're a home-movie bug and would like to make some movie sequences, our advice is to forget it entirely. In the first place, you will have trouble synchronizing the movie camera. Making motion pictures at home of a televised show won't give good results, since the shutter design of the usual 8 and 16mm camera doesn't match the TV tube scanning interval and bad flicker and varied exposure are the inevitable result. TV movie making at home is the same as trying to do the work at a motion picture theatre. You can't sync the two cameras under most conditions, except by accident, and there's no use wasting film. However, if you're still determined, get the tripod out and adjust the camera shutter to eight frames per second - stand back and hope for the best!

Now, to conclude the article, here's a final summary of what to do, plus the suggested exposure to use under normal conditions. Position the camera in front of the kinescope tube dead center, as if you were doing copying work, as indeed you are. Turn room lights low or off completely so no direct illumination reaches the screen from the room and you're ready to shoot. Use the type of film you're most familiar with, and use an exposure of one twenty-fifth of a second at f4.5 or f5.6, if you're using a lens of normal focal length on the camera. If you are using a longer lens to get a larger negative (double extension bellows work) lengthen the exposure time to one tenth of a second, and increase the lens opening by one stop!

That's all there is to it. After you've shot a couple of rolls using this material as your guide, you'll begin getting the results you expect. Don't be afraid to experiment, and you'll have more fun with your camera.

THE BLINKIT!

by

D.K.. VANDERWATER, VE3BLY

SIMPLE, LOW COST MODULATION INDICATOR ANYONE CAN BUILD!

The Canadian radio amateur prides himself in his ability to convert junk box parts to station equipment of good accuracy and dependability. For instance, nearly every ham in the country has a frequency meter, as is required by our regulations. But hardly two of them are ever alike, if of home construction, because each individual builder has in his shack, an entirely different parts list.

On phone station operation, a most important piece of measuring equipment is the overmodulation indicator. Not only is it too a required item, but a very desirable one to any operator who is conscientious enough to give his fellow VE any consideration at all. Without such a measuring device in constant use while rag-chewing, to hold a check-rein on bad splatter, our phone bands would be in a worse condition than now, indisputably.

The function of such a unit is to give prominent indication of the presence of overmodulation - and it must be designed to operate over long periods of time without a constant need for adjustment or calibration. Here now, is an accurate overmodulation indicator which has both these needed qualities in combination with real simplicity and very low cost.

Currently used overmodulation indicators such as the plate current metering of Class B modulators, and peak reading audio voltmeters are quite accurate when they have been previously calibrated against a scope. Often, too, the scope is used for checking modulation levels - but all these types of indicators lack ease of reading well, and prominence of indication. Actually, what an overmodulation indicator needs, is a sort of red flag to wave before the station operator when the condition it indicates occurs! And this is where the BLINKIT comes in. It has been designed by combining two familiar circuits(Note 1) so that negative peaks of overmodulation cause a neon lamp to flash an adequate warning to the operator.

All phone men must know the reason for the occurence of overmodulation. It happens in an AM transmitter when the instantaneous AC plate voltage exceeds the average DC voltage. Under these conditions, the carrier becomes interrupted on every negative speech peak. That is, as the instantaneous plate voltage appearing at the final amplifier becomes negative, the carrier becomes non-existent- an overmodulation occurs, with all its very, very deplorable interferences! But, it is on this very principle that operation of the BLINKIT depends.

Operation of the BLINKIT is quite simple if it is remembered that when the plate of an ordinary diode is positive with respect to the cathode, electrons are moving from cathode to plate. Looking at the circuit in figure 1, you can see that a diode - or V1 in the schematic, has been connected so that it will conduct each time point Y becomes negative with respect to point Z---as it is only then that overmodulation exists. The resulting pulse of current in the primary of T2 is transferred to the secondary so that a voltage stepped-up pulse now appears at the grid of V2, each time V1 conducts.

A small thyratron such as the 884 is simply a gaseous triode. However, this triode is greatly different from ordinary voltage-amplifying triodes in that if the thyratron is non-conducting (at cut-off) and the grid is raised above cut-off potential, plate current immediately begins to flow. This flow will only cease if the plate voltage drops below the ionizing potential of the gas. In this circuit, V2 is adjusted to cut-off so that each time a pulse is applied to the grid, a condenser is made to discharge thro' V2 and V3 which are in series. In effect, this thyratron tube is just a switch which is used to discharge C1 through the neon lamp. Thus, overmodulation, no matter how slight, causes the BLINKIT to flash that all-important warning.

The resistance network of R1-R2 serves to protect the 6H6 from heater-cathode breakdown. It must be designed so that the peak voltage at point X drops to less than 330 volts at Y. By making R2 47,000 ohms, R1

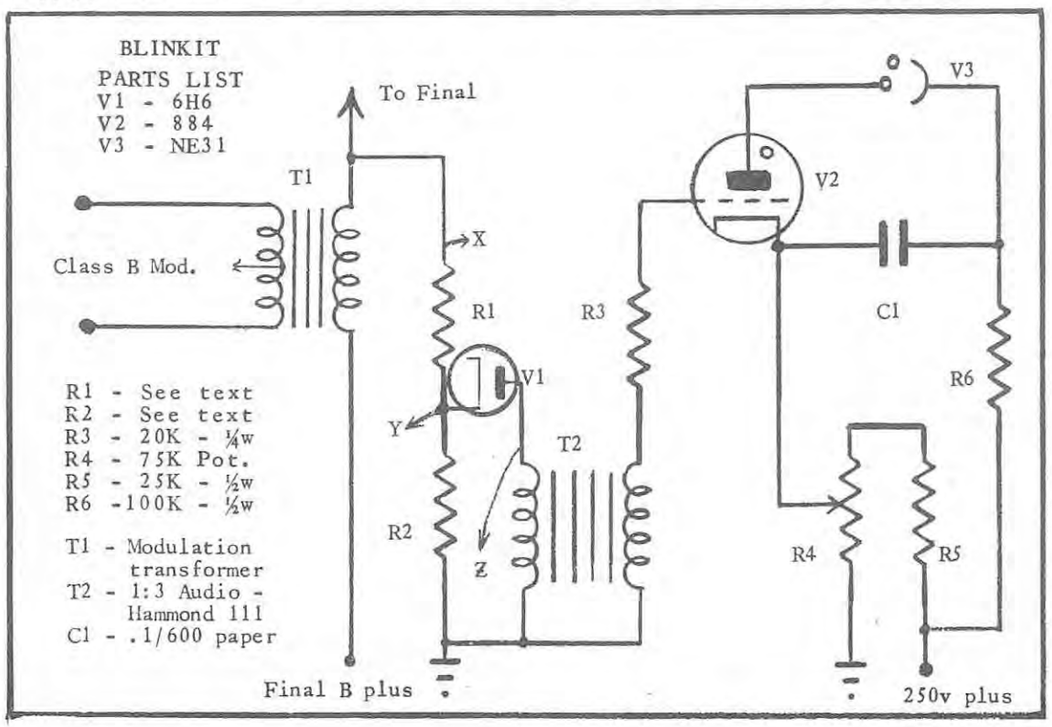
may be calculated from the relation that R1 equals (Eb X 333 - 47,000). This formula yields values for R1 which will well protect the 6H6. Incidentally, one or two watt resistors will be suitable for R1 and R2. It is good practice to break R1 into a pair of one watt resistors if your plate voltage exceeds 700 volts.

CONSTRUCTION!
The BLINKIT may be constructed in various ways. The familiar dish type of work may be utilized, or it can be built on a sub-chassis with cables leading to the transmitter front panel for the neon lamp V3. The NE-31 has been recommended in this application because of the extreme ease in mounting behind any panel, with a standard candelebra base. It may be necessary to install a 2.5mh RF choke at point X in the circuit, to prevent any rectification of stray RF by the 6H6.

ADJUSTMENT!
Adjustment of the BLINKIT is completed as follows: connect the unit to a suitable power supply, which in this case was that of the speech amplifier, and let it warm up for a few minutes with R4 adjusted to allow the neon lamp to glow. Then, back off the potentiometer (R4) until the neon lamp is just extinguished - and the BLINKIT is ready to test on the air. To do this, simply connect point X to the hot side of the modulation transformer (lead to Class C) and put the rig on the air. Having done this, you will find the proper position of your speech amplifier gain control at which the neon lamp blinks when overmodulation occurs.

Once put into operation at the shack, you'll find the BLINKIT is an indispensable item if you honestly give it a trial. The big advantage of this unit is that you can operate without keeping too close an eye on the indicator. If it blinks at all, you're overmodulating, and the warning is to sit back a little more and not push that mike so hard. The fact that the indicator is so easily seen will make your operating more enjoyable. Try the BLINKIT for yourself - and you'll see.

Note 1 - QST - May, 1948 - A.R.R.L.



Standing Waves and Loading

Getting Power into the Aerial

By **W. J. Crawley (G2IQ)**

Are you loading up your feeder line, in which the RF is being wasted, or the aerial, where the power is wanted if the correct radiating characteristics are to be obtained? This is a useful practical discussion on the importance of a truly resonant aerial if standing waves on the feeder are to be avoided.—Ed.

MANY amateurs seem to have the impression that it is possible to judge whether or not an aerial is resonant, or the line flat, by the amount of load it takes when coupled to the transmitter. It is generally assumed that if the aerial draws well then the standing-wave ratio is low and the aerial resonant. (One refers to the untuned transmission line coupled to the plate tank by a swinging link, no auxiliary tuning apparatus being used.) Such is not often the case, however, and in fact the opposite often applies. Recent experiments with a standing-wave ratio meter have led the writer to the conclusion that the higher the standing-wave ratio, the looser the coupling needed to obtain the required "draw"!

Some Practical Results

Tests were carried out on 28 mc with two dipoles, both fed with 70-ohm line. One was almost resonant at the frequency used, the other was purposely made slightly longer than a resonant length. The resonant dipole required a two-turn link fairly tightly coupled to the final stage in order to load the transmitter to the required input.

The non-resonant aerial, however, loaded the final nicely with but a one turn link loosely coupled to the plate tank.

Measurements indicated that the feeder of the resonant aerial had a standing wave ratio of only 1·7-to-1, whilst the other showed 5-to-1. The reason for this difference in loading is that a flat line looks like a pure resistance to the transmitter. This resistance may be anywhere between 50 and 700 ohms, and it is difficult to transfer power to resistances of such wide range with just a loosely coupled link coil! To obtain good "draw" with a loosely coupled link requires that both circuits have high Q, but in this case the Q of the secondary is very low and what transference there is comes about by transformer action. Therefore, to get appreciable loading the coupling has to be very tight and the ratio between primary and secondary has to be low. Just the opposite to what many of us believe.

Testing with Artificial Load

It is quite easy to prove this contention by reducing power and coupling the transmitter through a link to an artificial load—a pure resistance equal to the impedance of the transmission line in use. If a non-inductive resistor of high wattage cannot be found, the test can be made with low power and a three- or five-watt carbon resistor, provided that the same ratio of plate voltage to plate current is maintained. It will be found that the transmitter can be made to draw the required plate current on ten and twenty metres, with 72 ohms and even 300 ohms if the coupling is made very tight, but that on the lower frequency bands even the tightest coupling will not provide sufficient transfer. In most cases it will be found that the artificial load draws very much less than the transmission line. Now if the tranmission line were flat, its influence on the transmitter should correspond to that exerted by the artificial load. The fact that the transmission line feeding the aerial draws very much more than the artificial load proves, *not* that the aerial is "drawing well," but that standing waves are present. Generally speaking the more the line loads the transmitter, the higher the standing wave ratio.

Detecting Standing Waves

In the absence of suitable measuring apparatus, how do we find if we have standing waves? The simplest method is to add an eighth of a wavelength of coaxial cable or ribbon to that already in use and note what effect this has upon the loading of the final.

If the addition does not appreciably alter the "draw," add another eighth of a wavelength and test again. If the further addition does not alter the final plate current and the tank circuit requires no retuning, it can safely be assumed that the line is flat. If, however, the addition of the extra piece of transmission line causes a change in the final plate current, or if the tank circuit needs retuning each time the extra piece is inserted, then the line is definitely not flat, even though the final "loads up beautifully."

Moral

The next time we are tempted to keep cutting pieces off our "flat" [*sic*] line until we obtain the required "draw" from the final, let us pause and remember that we are, in effect, confessing that our so-called flat line is not at all flat. It is more satisfying to have a lower final plate current knowing that the RF is really getting into the aerial!

Band-spreading the Clapp

High-Stability Oscillator Modified

By **R. T. REED**

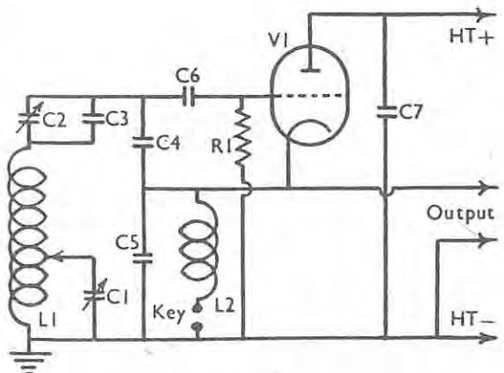
THE Clapp oscillator circuit described in *QST* for May, 1948, is quite outstanding for stability but rather unsuitable for band-spreading. Although it is suggested that this may be obtained by shunting a further capacity across the tuning condenser this will defeat the attempt to keep the tuning capacity small; it also upsets the stability and is difficult to adjust. However, with the modification shown herewith it is possible to arrange to spread the band as much as may be desired.

C1, the main tuning condenser, is about ·0001 μF; C2, the band-set condenser, is 100 $\mu\mu$F and C3 about 50 $\mu\mu$F, so that the circuit does not cease to oscillate when C2 is reduced to a low value. For the oscillator to function at 1·7 mc, L1 should be about 50 turns of 20-gauge wire spaced its own diameter on a 2-in. former of good quality. The tap for the tuning capacity C1 is about 15 turns from the ground end and may easily be adjusted to give the amount of band-spread required.

Table of Values

Modified Clapp Oscillator

C4, C5 = 100 $\mu\mu$F, silver mica
C6 = ·0001 μF, mica
C7 = ·01 μF, mica
R1 = 100,000 ohms
L2 = RFC
V1 = 6C5 or 6J5



Circuit devised by G2RX to obtain wider frequency coverage with the Clapp oscillator, which has exceptionally stable characteristics as a VFO driver.

Clickless Keying

Self-Biasing Oscillator

By **W. VINICOMBE (GM8RV)**

THE text-books offer several methods of keying, from use of a keying valve down to simply opening the HT supply. Each has merits or disadvantages depending on the particular position in which the key is inserted.

The method used at GM8RV is a combination of the merits with none of the disadvantages. It will be observed from the diagram that none of the circuits are truly opened and the key is safe when the potential is measured to the nearest earth point. When the key is down everything is earthed.

This arrangement consists essentially of keying the oscillator cathode by the over-biased grid blocking method. As far as RF is concerned the condenser C1, of ·02 μF (or other value as may be convenient), offers a low-impedance path between cathode and earth. This means that the leads to the key may be of indefinite length (up to 20 ft. have been used), obviating the use of relays.

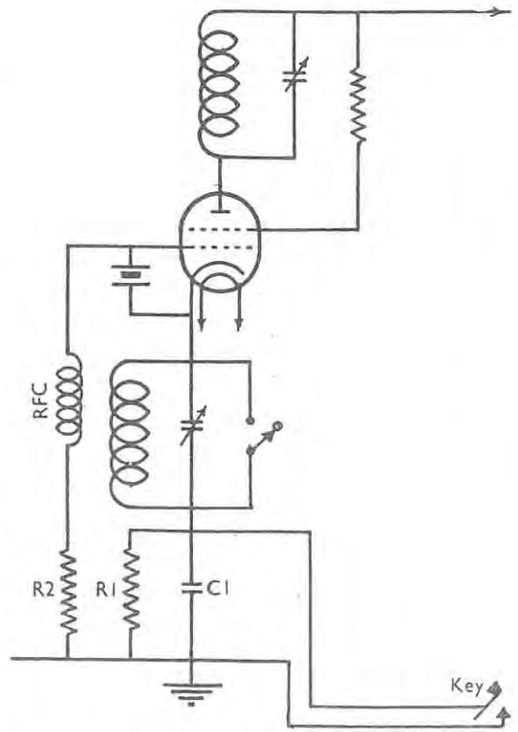
How It Works

The DC in the valve must pass through R1, 10,000 ohms (or other as may be available). As is the case with a resistance in the cathode feed, there is a voltage drop negative at the earth end. This voltage appears on the grid, as bias, by way of R2 and the RFC.

It will be apparent that the valve will draw current in the key-up position or there would be no bias available. In the case under consideration, a 6L6G, the standing current is 2½ mA, giving a potential of 25 volts as bias. Oscillation is maintained at this value, but it is quite negligible, being only just audible on the receiver with the gains turned well up. An additional feature is that as the cathode is never on open-circuit there is no danger of the active material being stripped off.

Another advantage is the apparent absence of key clicks or thumps. No filter is in use and local reports say that no clicks are audible. It can be said with certainty that where reasonably low power is in use, no thumps are audible on a BC receiver in the same house. This is probably due to the small standing current.

The circuit herewith illustrates the method, and only essential components have been valued. The omission of any part or component does not constitute an error. The writer trusts that this small effort may be of assistance to those having trouble in keying.



GM8RV's keying circuit; R1 is 10,000 ohms, and C1 ·02 μF. It involves a small standing current on the valve to produce a self-biasing voltage.

Visiting a Ham

That Personal QSO

By **JIMMINY**

DO not write or ring first ; this gives him time to think up a refusal—just call round. Knock up a spot of CW on the bell push ; it may wake the baby but why should you worry ? (You cannot be expected to know that the brat's only just gone to sleep.)

When he opens the door, say "73," just like that. It is possible to get an idea at this stage how good a ham he is—he may say "Good evening" and at one stroke give himself away for a lid. Should he be a dyed-in-the-wool ham with all the gen, he will immediately say "88."

Then introduce yourself and step in, asking him the way to the shack. Precede him all the way if you can guess where he keeps his gear ; this will give you a large measure of moral superiority and is well worth the risk of wandering into the wrong room.

Once in the operating room (sorry—shack) you should immediately sit yourself in the operating chair, tilting it on its back legs and surveying the gear the while. If you can get a mildly surprised look on your face then it is permissible to say "Nice little place you have here," if not, say "Hm."

At this stage a strong line is to begin looking for the Tx main switch, remarking how inaccessible it is. Then switch on. Good manners are shown by asking the owner *before* actually calling, but do not be put off by his mumbles about "TVI" and "After 8.30" ; tell him he must be firm with the neighbours—then get on the air and call CQ. 'Phone of course ; it is only beginners who have to use the key. Let him know that you can send at 30's and that you have not bothered to learn receiving as you do not intend to use CW anyway when you get *your* ticket. (Here comes a good opportunity to tell him what call you are going to ask for from the GPO.)

All-round Check

If by this time he has managed to fight his way to the transmitter and switched it off, turn your attention to his auxiliary gear. Should he be tuning his receiver, it does not require a great deal of elbow work to get at it yourself. All the better if it has carefully adjusted flywheel tuning. Give the dial a good hearty spin ; the stop should be made solid enough to stand the bump. You might mention here the various disadvantages of his particular receiver. If he has a frequency meter, then give that a look over. In case the xtal does not oscillate. give the case a bang on the bench ; that is also a good test of the frequency stability.

The ham you have favoured with your visit will also be immediately grateful when you tell him his receiver is out of alignment—take a look inside and ask him for the trimming tools. You know how easy it is to trim the thing on a signal. Not for one moment can you hope for the trimming tools to be forthcoming—hams are awkward people, but do not be dismayed, a small screwdriver or a penknife blade will do the trick. When the instrument is working to your satisfaction, the time should be about 11.30 p.m.

Sealing the Friendship

This is the moment to ask him for his QSL card and exchange it with one of your own. The more livid your own card is, so much the better. What may appear to be a wince on his face is only chagrin at the poor showing his own card is making. It is as well to mention that you do not get your cards from the printer mentioned on his cards—their printing is so lousy. Your own card can be one that you have already filled up to send to another "G" —don't waste a new card on him.

Then, do not overstay your welcome. Make your way to the front door and stand just outside for half-an-hour or so. It always adds to the pleasurable feeling you leave behind if you can start an argument—in a loud voice, of course. Take no notice of windows opening and closing in the neighbouring houses. They are not your neighbours, anyway.

As you proceed down the garden path, shout "73 OM" and "88 to the XYL" together with a promise to come again soon.

You can be sure he will look forward to your next visit.

CLUB ACTIVITIES

The Third Northern Ontario Hamfest, held at North Bay Dominion Day week-end under the auspices of the Gateway Amateur Radio Club of that city was a huge success. So says Jerry Halliday, the club president (VE3EAW)! Jerry reports an attendance of more than 250 people, half of them as licensed hams. They were there from as far away as Nova Scotia (VE1BF), and the RCAF flew two plane loads in from Ottawa and Quebec City respectively!! The actual Hamfest was spread over three days and nights, with the Friday night Beach Party and Wiener Roast starting the affair.

In case you felt lucky, and haven't yet heard, the Eddystone Receiver winner was J.G. Tizzard, Chief radio op at D.O.T. office, Windsor Airport, Windsor, Ontario. Pop, 3AIN sold the billet, and the stub was drawn from the barrel by one of the blind hams in attendance (there were two) George LaFleur, 3LG of Ottawa. The other, also from Ottawa, was Jim Swail, 3KF.

Novel twist to the Saturday morning registration of visitors, after 130 turned out for the Beach Party was contact with 3 mobile equipped cars operating as taxis, rounding up hams, and bringing them downtown. The registration point was transmitter equipped for perfect liaison with the mobiles. After the usual competitions on Saturday, Jerry says " a lovely ham (?) supper was served, after which came the prizes....45 of them, of all kinds. 3BIB of Oshawa was the luckiest in quantity winning. Five family members won four prizes. They say Frank gave his son of three an ice cream cone for a ten buck Hammond choke the kid had won! Old Wally Haines, 3IB had the honor of drawing the prizes. If your number was called by Wally, you drew another number for your prize, eliminating the loss of interest usually encountered when the best prizes go first as is usually the case. There was plenty of interest right to the end!

On Sunday, a group of 90 made a bus tour to the new Hydro Dam at La Cave, and wound up at a turkey dinner in their honor. The RCAF planes left Sunday night about supper time. And with the huge success of this years festivity, plans are now being made for another Hamfest next year, bigger and better still, at the Bay. That'll be a date to look forward to next year!!

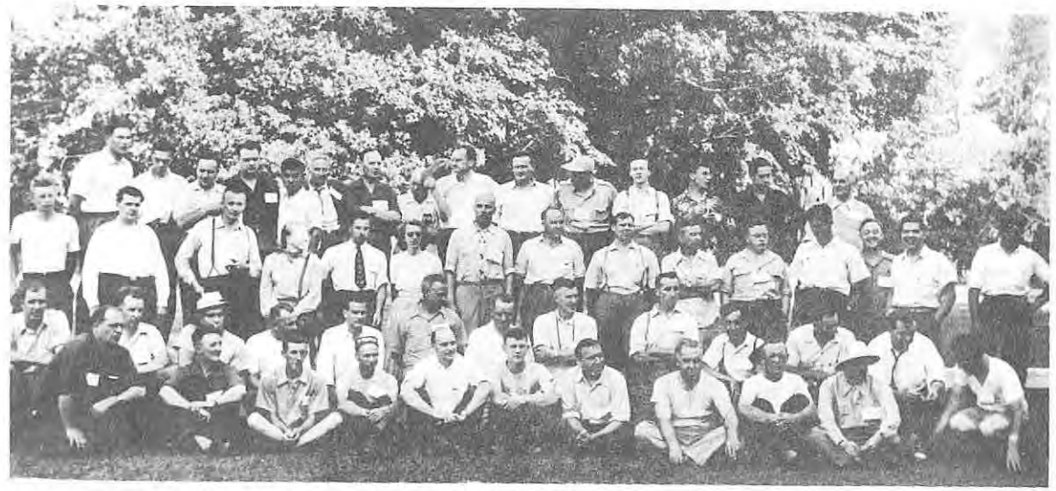
As we go to press, the Calgary Hamfest should be in full swing, and details of this affair, along with a report on the Ottawa outing July 16th are expected for the next issue!!

The Delta Radio Club of Vancouver had quite a Field Day, after a dress rehearsal the week-end before. 7KC, our reporter says he wants to correct a couple of bits of misinformation about the club, since a lot of boys around town seem to think Delta is ultra-exclusive and requires a member to be able to handle forty words a minute, and have a commercial ticket. Such is not the case! Only stipulation is that a fellow be able to copy 20 or be able to do so within a reasonable time, thereby insuring that any member could do his bit in an emergency. They are taking it for granted that all members are able to talk! An idea for other clubs????????

HAMFEST!

The date of this Hamfest will be August 13th, 1950. The place is to be the same as last year at Cap-Sante, County Portneuf, in the Province of Quebec. The 1950 Picnic of the Quebec Amateur groups should be a memorable event if it stacks up to last years outing. That one was a pip!

Base of operations will be the Hotel Chez Maurice there, with a large number of activities arranged. The Honorable Lionel Chevrier has been invited to attend, and more than one thousand letters direct to hams have been mailed out. Last year more than 250 hams got to Cap-Sante and double this number are expected this year. There's a long list of prizes building up, and most of the VE2 clubs are arranging special transportation to the event. If you're in the Province, be sure to attend. For further information and registration, contact VE2VD, Quebec City!

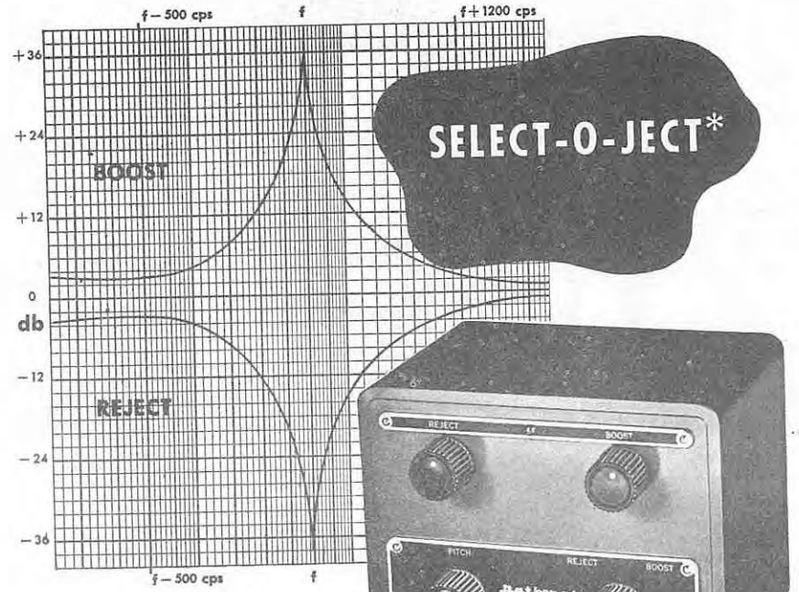


In the picture above, are a number of the amateurs who were present at the Ontario Phone Club picnic outing held at Jewetts Grove , Ontario, (near Bayfield) on Sunday July 9th. There are a number of those faces which will be familiar to many other boys in the province. Actually, a considerably greater number of hams and families were in attendance during the afternoon, but as this picture was made just about 7.00 p.m., many had already left for the long drive home - and others busy eating supper, couldn't be rounded up easily.

The Ontario Phone Club picnic was a fine afternoon for everyone - lots of entertainment to keep things going, in the contests for the family and the boys - the CW vs phone men in their ball game in which phone took a beating; the Brain Trust, transmitter hunt and mobile operations. It's interesting to mention that a very large percentage of hams there had rigs in their car, and there were some really beautiful installations. Probably more than two hundred total attendance was chalked up, but no final accurate figures as to the tickets sold were available. Last year, more than six hundred had attended the outing at Puslinch, near Guelph - the larger total being due to the fact that Puslinch was very much more central, and could be driven to readily. But ask the couple of hundred who were there if they had a fine time, and the answer was emphatically affirmative.

The origin of the Ontario Phone Club is rather unusual, and would be of interest to other Canadian hams. Years ago, it was felt that the hams out of the big centres were pretty much alone, and too far away to be able to attend the usual city club meetings in most cases. Because of this, and to give the partially isolated ham something to feel he was a part of, the Ontario Phone Club was formed, with a nominal membership of one buck dues per year. Meetings are held on 75 meters every Sunday morning, and the boys have a great time rag-chewing and swapping stories. This same idea-application could be picked up in our other provinces to advantage, and would give the fellows in the outlying districts something more to look forward to regularly!

On the Saturday evening before the picnic, a group of Clinton C.A.R.O.A. members, and a few of the Executive of the organization, held a special meeting of the Clinton radar school. Bob MacDonald, retiring President of the Association, spoke to the group and he and Teddy Powell, for personal reasons have found it necessary to resign. Result is that new officers must be found to replace them. A further special meeting on this subject was held Sunday, July 23rd, at the home of Art Stephens, 3YS and the motions presented then have been forwarded to the other Executive Officers in other parts of Canada for final action and decision. Bob MacDonalds' (3APS) resignation was accepted and those of Powell, 3ZE, and R.H. Brown, 5RB are now pending until Executive quoram is obtained.



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Now, National presents a great new HRO receiver after more than three years of designing, development and testing. Retaining all the world-famous, performance-proved HRO features, this superb receiver — the finest National has ever made — now incorporates no less than 14 advanced-design innovations. Exhaustive comparative tests indicate the new HRO-50, by far the most modern and versatile in its field, will set an entirely new standard of performance for communication receivers.

14 ALL NEW FEATURES

1. Direct frequency reading linear scale with a single range in view at a time. 2. Provisions for using 100/1000 kcs. crystal calibrator unit, switched from panel. 3. Variable front-of-panel antenna trimmer. 4. Built-in power supply with heat resistant barrier. 5. Front-of-panel oscillator compensation control. 6. B.F.O. switch separated from B.F.O. frequency control. 7. Provision for incorporation of NFM adapter inside receiver, switched from front panel. 8. Dimmer control for dial and meter illumination. 9. Miniature tubes in front end and high frequency oscillator. 10. Speaker matching transformer built into receiver with 8 and 500 -ohm output terminals. 11. High frequency and beat frequency oscillator circuits not disabled when receiver in "send" position. 12. High-fidelity push-pull audio amplifier, 8 watts undistorted output. 13. Tip jack for phono input. 14. Accessory socket for Select-o-Ject (see page 4).

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CANADIAN MARCONI COMPANY

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MARCONI BUILDING, - MONTREAL

VANCOUVER WINNIPEG TORONTO HALIFAX ST. JOHN'S, NFLD.

DX PREDICTIONS

Prepared by C.B. McKee, Engineering
Division, CBC International Service

On these pages are shown Skywire frequency predictions for amateur communications on various circuits, to almost any part of the world. Although these tables are confined to five major cities or areas here in Canada, any amateur operating at a point reasonably close to these centres will find the predictions quite adequate.

The figures shown directly below any time, and opposite any destination indicate the maximum useable frequency band in megacycles at that time.

Remember that the figures shown indicate maximum useable frequency via F layer, at any time, and do not consider the effect of Sporadic E, which may enable unexpected and unpredictable distance coverage on frequencies higher than those indicated.

DX PREDICTIONS FOR MONTH OF AUGUST, 1950

SACKVILLE to	AST	01	03	05	07	09	11	13	15	17	19	21	23 Hrs.
Europe		7	7	14	14	14	14	14	14	14	14	7	7 Mcs.
Africa		7	-	14	-	-	-	14	14	14	14	14	14
Caribbean		14	14	7	14	14	14	14	14	14	14	14	14
S. America		14	14	7	14	14	-	-	14	14	14	14	14
Australia		14	7	7	7	-	-	-	-	-	-	-	14
U.S.A.. - West		14	7	7	7	14	14	14	14	14	14	14	14
U.S.A.. - Central		14	7	7	14	14	14	14	14	14	14	14	14
U.S.A.. - South		14	14	7	14	14	14	14	14	14	14	14	14
Vancouver		14	7	7	7	14	14	14	14	14	14	14	14
Watrous		7	7	7	7	14	14	14	14	14	14	14	14
Toronto		7	3	3	7	7	7	7	7	7	7	7	7
Montreal		3	3	3	7	7	7	7	7	7	7	7	7

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o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o-o

MONTREAL to	EST	00	02	04	06	08	10	12	14	16	18	20	22 Hrs.
Europe		7	7	14	14	14	14	14	14	14	14	7	7 Mcs.
Africa		14	-	14	-	-	-	14	14	14	14	14	14
Caribbean		14	14	7	14	14	14	14	14	14	14	14	14
S. America		14	14	7	14	14	-	-	14	14	14	14	14
Australia		14	14	14	7	7	7	7	7	14	14	14	14
U.S.A.. - West		14	14	7	7	7	7	7	7	7	7	7	7
U.S.A.. - Central		7	7	7	7	7	14	14	14	14	14	14	14
U.S.A.. - South		14	7	7	14	14	14	14	14	14	14	14	14
Vancouver		14	7	7	7	14	14	14	14	14	14	14	14
Watrous		7	7	7	7	7	14	14	14	14	14	14	14
Toronto		3	3	3	3	7	7	7	7	7	7	7	7
Sackville		3	3	3	7	7	7	7	7	7	7	7	7

(Continued on the next page)

TORONTO to	EST	00	02	04	06	08	10	12	14	16	18	20	22 Hrs.
Europe		7	7	7	14	14	14	14	14	14	14	14	14 Mcs.
Africa		14	-	14	-	-	14	14	14	14	14	14	14
Caribbean		14	14	7	14	14	14	14	14	14	14	14	14
S. America		14	14	7	14	14	-	-	14	14	14	14	14
Australia		14	14	14	7	-	-	-	-	-	14	14	14
U.S.A.. - West		14	14	7	7	14	14	14	14	14	14	14	14
U.S.A.. - Central		7	7	7	7	14	14	14	14	14	14	14	14
U.S.A.. - South		14	7	7	7	14	14	14	14	14	14	14	14
Vancouver		14	7	7	7	14	14	14	14	14	14	14	14
Watrous		7	7	7	7	7	14	14	14	14	14	14	14
Montreal		3	3	3	3	7	7	7	7	7	7	7	7
Sackville		7	3	3	7	7	7	7	7	7	7	7	7

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WATROUS to	MST	22	00	02	04	06	08	10	12	14	16	18	20 Hrs.
Europe		7	14	14	14	14	14	14	14	14	14	14	14 Mcs.
Africa		7	7	7	14	-	-	14	14	14	14	14	14
Caribbean		14	14	14	14	14	14	14	14	14	14	14	14
S. America		14	14	14	7	14	-	14	14	14	14	14	14
Australia		14	14	14	14	14	-	-	-	14	14	14	14
U.S.A.. - West		7	7	7	7	7	7	7	7	14	14	14	14
U.S.A.. - Central		7	7	7	3	7	7	7	7	7	7	7	7
U.S.A.. - South		14	14	14	7	14	14	14	14	14	14	14	14
Vancouver		7	7	7	7	7	7	14	14	14	14	14	14
Toronto		7	7	7	7	7	14	14	14	14	14	14	14
Montreal		7	7	7	7	7	14	14	14	14	14	14	14
Sackville		7	7	7	7	14	14	14	14	14	14	14	14

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VANCOUVER to	PST	21	23	01	03	05	07	09	11	13	15	17	19 Hrs.
Europe		7	7	14	14	14	14	14	14	14	14	7	7 Mcs.
Africa		14	7	7	7	14	14	14	14	14	14	14	14
Caribbean		14	14	14	7	14	14	14	14	14	14	14	14
S. America		14	14	14	7	14	14	14	14	14	14	14	14
Australia		14	14	14	14	7	7	-	-	-	-	14	14
U.S.A.. - West		7	7	3	3	3	3	7	7	7	7	7	7
U.S.A.. - Central		14	7	7	7	7	14	14	14	14	14	14	14
U.S.A.. - South		14	14	14	7	14	14	14	14	14	14	14	14
Watrous		7	7	7	7	7	7	14	14	14	14	14	14
Toronto		14	7	7	7	14	14	14	14	14	14	14	14
Montreal		14	7	7	7	14	14	14	14	14	14	14	14
Sackville		14	7	7	7	14	14	14	14	14	14	14	14

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TRAFFIC LIGHTS

Now that everyone understands the purpose for having traffic nets, and the general principles underlying their operation, let's get down to some specific information and examples on how a net should be run.

Let us assume that PQN is ready to operate on 3570 kcs at 7.00 pm and that the NCS is VE2XYZ. A minute or so before the zero hour, NCS will be heard tuning up his rig, making sure he's right on net frequency. Exactly at seven, the NCS will start calling the net to order. He will call a few times identifying the net and his own call so that member stations will know they are on the right net. So, this is what the NCS sends:

CQ PQN CQ PQN CQ PQN de VE2XYZ QND QNZ

CQ PQN CQ PQN CQ PQN de VE2XYZ QNI K

The exact meaning of this is - Calling PQN stations to order: net is directed to zero beat my frequency (QND QNZ): report into net, go ahead!

The first station ready immediately calls, once, then pauses. If the NCS has heard him the NCS will acknowledge by pressing his key and sending a dit or dit dit. As soon as our hero has heard the dit, he continues by signing his call, and listing what traffic he has and its destination. It is very important that stations reporting into the net give all their traffic and its destination. If this information is not complete, the NCS can't efficiently direct the flow of traffic afterwards. Let's suppose VE2PQR is first reporting in, as follows:

Last month in re-editing, two small omissions occurred - the word "not" was lost in the type-shuffle someplace. To correct any wrong impressions, here are the parts as they should have been:
Line one in Section 3 on page 27 should have read - Usually NOT much in evidence on a net etc., and the second one was in Section 4, same page, line one - Importance of NOT reporting into net late etc.! Our apologies to 2GM and other traffic minded men who caught this - Ed!

VE2XYZ ... (and after hearing dit from him) de VE2PQR QNI QTC 1 QUE AR - meaning this is VE2PQR reporting into the net. I have one for Quebec.

The NCS acknowledges this information and writes it down on his control sheet giving destination of the traffic he will collect. Then he acknowledges to PQR as follow:

VE2PQR de VE2XYZ R .-... (this last sign means wait. Do NOT use QRX which means something else). And then, without pausing the NCS continues as follows:

CQ PQN de VE2XYZ QNI K. The next stations call is made to the net as: VE2XYZ ... (and hearing the NCS dit) de VE2URS QNI QTC 1 QUE 1 MTL AR - meaning this chap has two messages, one for Quebec and one for Montreal.

The NCS acknowledges and calls CQ again: VE2URS de VE2XYZ R .-... CQ PQN de VE2XYZ QNI K.

And so the roll call continues until all stations have reported into the net. Usually about ten minutes after the net has started, the NCS, if there are no more stations answering his general call, will get down to the business of the meeting and direct the movement of traffic.. Let's suppose NCS has the following list in front of him:

2PQR 1 QUE.
2URS 1 QUE 1 MTL
2BVD 2 QUE 10 MTL 5 TORONTO 2 THRU 2FOB 0

If 2PQR is the Montreal station, the NCS will tell him to receive the Montreal messages from 2BVD who has the largest number to dispose of. In this case, since BVD has so much traffic, it would be wise for the NCS to send both stations to a neighboring frequency so that the net frequency could be used by other stations. This is how he does it:
VE2PQR VE2BVD 3560 3560 MTL K (here by PQR and BVD there is an answering dit - to show they've understood!)

The NCS has thus told both PQR and BVD to QSY to 3560 kcs, or ten kc lower than the net frequency, and has directed them to dispose of the Montreal messages. The station

first mentioned by the NCS (2PQR in this case) will be the one to call first to establish contact with the other - 2BVD.

The NCS now continues with the other stations. For example, assuming 2FOB is the Quebec station, he could tell URS to pass his QUE traffic. If there is no mention of frequency, it is understood that the two will remain on the net frequency. So:
VE2FOB QNR VE2URS QUE K - which means- 2FOB receive Quebec traffic from 2URS.

Now FOB gets on the net frequency, calls URS and tells him to go ahead with his QUE traffic : VE2URS (after hearing dit - from URS) de VE2FOB QRV K. This means he is ready to receive the message from URS, so the latter simply gets on the frequency and sends his message, after which it is acknowledged by 2FOB. When this has has happened, both stations simply get off the frequency and the NCS takes over again. This is done as follows:
VE2FOB de VE2URS nr nr 52 ..etc etc. BT BILL AR N VE2URS de VE2FOB nr 52 AR
CQ PQN de VE2XYZ QNI K
Or he continues with the rest of the stations. When the two stations sent to 3560 have cleared their traffic, they come back to the net frequency, and during a lull or after a CQ by NCS they report in as follows:
VE2XYZ de VE2PQR CLR AR
VE2XYZ de VE2BVD CLR MTL AR
In a similar manner the NCS can send any pair of stations to another frequency and they will report back to him when the traffic has been moved, and they're through.

If all the traffic has been cleared and nothing has been left on the hook, the only thing for the NCS to do is release the stations from the net. When a station is thro' before the end of the session and the NCS knows that there is no traffic for that point, he can clear the station from the net at any time. That is usually what is done - stations being excused from the net as soon as they are no longer required to stay.

Clearing a station from the net is very easy and is done in the following way:
VE2FOB de VE2XYZ QRU QNO GN K (that is nothing more for you, leave net , goodnight.
VE2XYZ de VE2FOB R GN QNO (okay goodnight, I am going out of net ---- and so on until a complete circuit has been made and all stations have been cleared from the net. There is just one more thing for NCS to do, and that is to release the frequency for general operation. It's done this way:
CQ PQN de VE2XYZ QNF QNF GN - that says net frequency is free!

Well, that's all there is to it. I hope it is as easy to follow here as it is to do on the air. You have to use your imagination, remembering the most important point of all: the NCS is the Traffic Cop, and everything that is done or said on the net is as he directs. It's a great game, and if you have a good team, there is much enjoyment to be had from traffic handling. Remember too - you're training yourself for an emergency all the time you're having fun! VE2GM!!

OFFICIAL NET SIGNALS

QNA - Answer in pre-arranged order
QNB - Act as relay between -- and ..
QNC - All net stations copy
QND - Net is directed
QNE - Entire net please stand by
QNF - Net is free
QNG - Take over as control station
QNH - Your net frequency is high
QNI - Report into net (or - I report
QNJ - Can you copy me (or station --
QNK - Transmit message for destination to station --
QNL - Your net frequency is low
QNM - You're QRM'ing --, please stand by
QNN - Who is NCS NCS is --
QNO - Going out of net
QNP - Unable to copy you or (station)
QNQ - Send ur information QNC, or - may I send a message QNC
QNR - Answer -- and relay or receive tfc
QNS - Following stations in net
QNT - Leaving net temporarily or for X minutes (or request leave for -
QNU - -- has tfc for you, await instructions or QNU QNR
QNW - Through whom shall I relay message for (destination)
QNX - You are excused from net - or--I request to be excused.
QNY - Please shift to another frequency (or to -- kcs to prevent QRM'ing other net stations (or to clear traffic with (station)
QNZ - Zero beat with NCS

HAMADS

Skywire Hamads must pertain to amateur radio. Rates are 20 cents per word, per insertion for commercial advertisements for profit, and 4 cents per word for all non commercial, non profit advertisements by experimenters or licensed radio amateurs. Full remittance MUST accompany copy. Print plainly and count address in the total. Do NOT send personal checks unless exchange is included. Mail to Skywire, Toronto.

QSL's - Canada's finest - unusual - colorful - inexpensive! Samples? VE3BCB 204 Ranleigh Avenue, Toronto, Ontario.

TRANSMITTER - fone and CW, 300 watts on 10 and 20 meters - 6' rack and panel job. HK-54's final, HY-40Z Class B with Universal driver and ½kw modulation transformers. There are separate power supplies for Final, Class B, oscillator and buffer, and separate pre-amplifier and power unit. Entire rig bargain priced at $225.00 - need cash. Prefer selling as a unit, but will sell sections complete if desired. Any reasonable offers? VE3AKK, 32½ Willowmac Avenue, Chatham, Ontario.

Let Skywire Hamads go to work for you, selling unwanted equipment for cash

FOR SALE - 1-150w Hammond Modulation transformer #2114 : 2-811's, NEW : 60 cycle, 110v primary power transformer - 4000v CT at 500 ma., plus 4000v CT at 150 ma. secondaries : 2 - 110v, 60 cycle transformers, 540v CT at 70 ma., 6.3v at 3 amps, 5v at 1.2 amps. WANTED - One 25 cycle, 110v with 4000v CT at 500 ma., and 4000 at 150 ma., John McKnight, Port Dover, Ontario.

BARGAIN - SYLVANIA MODULATION METER! This is BRAND NEW in unopened carton from manufacturer. Received as a gift, and I'm CW only. No kidding - first money order for nineteen bucks takes this, Express Collect. Guaranteed new and perfect or money back. Airmail your letter to VE3BTL, 99 Marchmount Road, Toronto, Ontario. Will accept your check if exchange included!

No extra charge for Box facilities if you wish to use them. Use Skywire Hamads during summer lull, to clear out unwanted gear. Someone needs the parts you don't! When sending ads to be published, be sure the full remittance is enclosed, to avoid the need for correspondence.

FOR THE RADIO MAN

WANTED!

Articles by Radio Amateurs

2000 to 2500 words

Covering any material of genuine interest to radio amateurs, such as:

- **Transmitters**
- **Receivers**
- **Antennas**
- **Test Equipment**

Articles should be typewritten (double spaced) and accompanied by suitable diagrams, photos, and parts lists. Liberal payment will be made upon acceptance.

Address all communications to

SKYWIRE

435 Parkside Drive, TORONTO, ONTARIO..

HOW'S UR OBS IQ?

The American Radio Relay League

Official Bulletin Nr 247, June 21, 1950. The Department of State announces that the United States has signed an agreement with the government of Ecuador permitting exchange of traffic on behalf of third parties, by amateurs in both countries and possessions. No compensation may be involved and messages must be of a type which would not ordinarily go via commercial circuits. Thus Ecuador is now added to Canada, Chile and Peru, as countries with which American amateurs may handle third party traffic.

Official Bulletin Nr 248, June 27, 1950. A new 144 Mc record was set on the morning of June 24th when W8WXV, Shiloh, Ohio, worked W5VY, San Antonio Texas, for a distance of more than 1200 miles. Hearing W5VY on 50 Mc saying that he was changing to 144, W8WXV switched to 144 too, and heard him at once S7. Contact was made shortly after 11 A.M. continuing until 11.15 when W5VY faded out. He was heard again at 11.30. Reports indicate a wild session all over southern and central U.S. Operators are asked to send complete reports to ARRL for use in QST.

Official Bulletin Nr 249, July 3, 1950. All active operators are cordially invited to apply to their Section Communications Manager for League appointments along the lines for which they are qualified and interested. The CD Bulletin just sent to appointees announces CD Parties, CW July 22 to 24, Phone July 29 to 31. All those receiving the Bulletin are requested to delete the words quote plus different stations unquote in the Party Rules Page 10 to conform to the log form sent with this bulletin.

Official Bulletin Nr 250, July 11, 1950 Cooperation of all amateurs is requested by the ARRL Board of Directors in the voluntary setting aside of 29.6 to 29.7 Mc for mobile operations. In view of the problems of lower powered mobile stations, fixed amateur stations are asked to use frequencies other than 29.6 to 29.7 Mc so the mobiles may have full success in operating in this band sector. All amateurs with operative mobile equipment, are urged to identify their stations with the Emergency Corps by contacting the nearest ARRL Emergency Coordinator for application form and information.

Special Canadian Bulletin!
In a good many cities in Canada, VHF now represents a considerable portion of the amateur activity. Several new VE records have been made on frequencies above 50 Mc and there are surely more to come. If those hams now occupying the VHF bands will submit reports to Skywire, a VHF column will be started to encourage new hams to move up to these frequencies. Send your reports in regularly to Skywire - trade reports -- and all VE's will benefit. Let the other boys know what you're doing in your part of the country. Send your reports every month as a summary, and if something unusual breaks, use the traffic nets to let us know about it.

Official Bulletin Nr 251, July 19th, 1950. With the assistance of amateurs who are active on the 28 Mc band, ARRL each year conducts a program of on the air code practice for persons wishing to learn the Continental Code. Volunteers are needed for the new program currently being planned. Schedules may be arranged to suit the convenience of any co-operating amateurs, and will be published in QST. A combination of voice and code transmissions is considered to be the most effective. Suggestions for conducting code lessons over the air are available from ARRL. If you are operating on 28 Mc and would like to assist in this program, send a postal or radiogram to the Communications Department indicating your interest, and complete details will be furnished immediately.

LADIES PRESENT

While the merits of the A-Bomb and other destructive weapons are bandied back and forth, there's one about which little is, at the moment, being heard. This is the submarine - which could be more potent than ever before in history, in the event of war.

The Soviets, for instance, have built their navy around a tremendous fleet of the underwater craft. These are the most modern type in use today and apparently the Soviets have not only taken the German Schnorkel tube to heart, in their design, but also the idea that subs could almost by themselves win a war. They nearly did in both the Great Wars! In both cases, the U-boats nearly cleaned out Allied shipping, and military minds now say that had Germany built more submarines it's quite likely they could have won. But the Nazi High Command counted on land armies and thereby missed the boat.

The British and Canadian navies which took the worst pounding in the early years of both wars, are now taking part in the development of new types of subs, and new anti-submarine weapons of detection and interception. Because Britain is hard pressed for money, the U.S. is co-operating in this study, and big new U.S. subs of the Schnorkel type are being used for mock attacks by the anti-submarine defense equipment.

But before talking about these items - which are mostly electronic, let's consider for a moment, the Schnorkel type of underwater boat. This new U-boat was perfected by the Germans just before the end of the war, and very few of them ever got to sea. In case you somehow don't know what a Schnorkel is at this late date, it is a long flexible funnel with a valve at the top. The sub while submerged keeps this valve at the surface, and draws air into the boat through it. This allows the sub to re-charge its' batteries, and to operate its' Diesel and other power plants while submerged.

The older type undersea craft had to surface for the greater part of every night while at sea, to replenish batteries, so they could stay under the surface all day. The Schnorkel doesn't do away entirely with electric motors, but it is hoped that eventually a gas engine needing less air than Diesels can be used. Smaller engine requirements as a result give more room for crew - and torpedoes!

There have been a great number of improvements in the Schnorkel type by Britain and in the U.S., and the American version is now so big and fast that they can outrun the biggest and best destroyers, P.T. boats and corvettes of World War Two. Accordingly, the Canadian Navy has designed a new anti-submarine ship which looks a lot like a small destroyer. Terribly fast, the vessel can take two direct torpedo hits without sinking, and can maneuver well enough to chase a sub and sink it. The ship is unusually low, with no high masts above the deck. The bridge is just a few feet above the deck too, on the principle that the sighting of submarines is now done by radar, instead of binoculars!

These ships had to have instruments to fight the U-boat. The most important of these is the one developed in the U.S. toward the end of the war - the magnetometer. Carried in a ship or plane, the instrument will detect a submarine by the distortion in the earths' magnetic field caused by the U-boat hull.

Canadian-built radar is, of course, another prime detection instrument, but radar does not work too well against submerged subs. Now, however, efforts are being made to get a radar built so delicately that it will accurately pick up the tiny valve of the Schnorkel unit on the surface, while the U-boat itself is submerged.

Sonar is the next instrument of defence in the undersea battling. Sonar is a radio way of detecting the sounds of submarines engines whether it is on the surface, or running submerged. Similarly, when a sub sends a radio message, Sonar picks it up. Some Sonar systems are so delicate that they have picked up messages that flashed for only fifteen seconds from a sub three thousand miles away.

There's just one major drawback to these detection units, and that is they are subject to interference from weather conditions, and of course submarine designers are almost constantly inventing new ways of diminishing their effectiveness.

Harvard University is now using a ten ton magnetic brain which can give answers so fast that a battery of five typewriters is used to record them. This brain figures mathematical problems out, using about one hundred miles of wire, about forty five hundred vacuum tubes and nearly four hundred thousand soldered connections. The new instrument is on the large side - thirty feet long and fifteen feet wide.

Harvard began building the brain, called the Mark Third, in May of 1946, for the U.S. Navy of Commerce. It is being used at the Naval Proving Ground at Dahlgren, Virginia. After a lengthy testing procedure, the brain was declared ready for use, but there had been considerable publicity given to the machine prior to this. You may remember the Sunday funny papers carrying a series on a Joe who was trying to sell out one of these brains to an Eastern power - a story beyond doubt, inspired by the publicity given to the machine in the papers.

Actually, the brains vital work is done by magnetic tapes that operate on a series of drums, rotating at speeds up to one hundred and fifty miles an hour. The memory system built in electronically, can store up to 64 thousand digits at one time.

When the machine was first unveiled to an audience of leading physicists, economists engineers, mathematicians and industrialists, some of the general public expected to see it used for the solving of a different type of problem than for which it was designed. While it is capable of figuring out the moves needed to play a perfect game of checkers, it's not likely anyone would want to spend the half million dollars on the machine (the cost of the Mark Third) to get that answer.

Rather, the brain will be used for extremely important work, such as aiding rocket design, to get the rocket to the rocket targets, and by business men to determine cycles of good and bad business. The electronic brain, as complex and expensive as it is, is nothing more than a computer which can do many thousands of times faster than a human brain, problems concerning addition, subtraction or multiplication, and dividing. A man must be there to operate it, and feed information into the thing.

There are other uses for the electronic brain which might be more interesting to readers than those just outlined. As a result of the invention, a whole new science has come into being, called cybernetics. This is the substitution of the electronic brain for human thinking. There are many instances when the machine does better, more accurate thinking than we ourselves could hope to do. One of these functions is flying a rocket plane.

Today, in an ordinary plane flying eight to ten miles a minute, a mechanical brain is a very necessary item for recording test data. And when interplanetary travel starts, and a speed of seven miles a second is required to break the earths gravitation pull, a brain a lot like the Mark Third will undoubtedly be in use.

Just imagine how the pilot of such a space ship would feel travelling at that incredible speed. If there was an object to be avoided seven miles ahead, he'd have just a single second to change course, and miss he hoped, the object. Even assuming that our human eyes could seenan obstacle seven miles ahead, it takes a tenth of a second for our nerves to carry the first message from the eyes to the brain, and another fraction of a second is needed to appraise the situation and decide what to do about it. Still another fraction of that second is required to move the controls. Thus a pilot would be on top of an obstacle in the time it would take him to act, and he would have been unable to alter course in time. And, if the other object had happened to be a space ship coming straight at our hero, at the same speed, he would be half a second from the crash by the time he knew there was something there.

Scientists believe the job of controlling a planes flight under such conditions could not be left to even the keenest of human brains. An electronic unit, employing a radar principle must be substituted. By the time these fantastic speeds are reached - and they will be in the forseeable future, these control problems will be pretty well solved, for science has been hard at work on them for some considerable time now.

Don't spoof at the idea that we will have space travel some day! The experts consider it as a definite fact in our future, and are even at this writing, trying to evolve the atomic fuel which will be needed. A new way of using atoms has been found, and this super- power is almost ready now!

TELEVISION

One of the most unusual stories on TV this month concerns the events which happened to all television set owners served by the Norwich, Connecticut municipal power plant. For some time now, these people have been required to pay one dollar and twenty six cents extra on their electricity bill each month. This charge is not for juice, charged for as usual, but just for the privilege of having the set connected to the line. The whole thing isn't much of a threat to the growing television industry as yet, but it does show how mis-information can be worked into the rates of a public utility.

The extra charge was worked out by a reputable firm of consulting engineers on the basis of a television set requiring about five times as much power as the average small radio, and that the video set is used almost always at night. So, when an outstanding program is available, all the TV sets are turned on, and electrical consumption goes up. Thus, extra load capacity must be provided to care for the increased load. This extra capacity costs money, and must be paid for by someone - preferably the TV owner.

To this point, perhaps, the argument makes some sense - or will when everyone in the town has a video receiver and can decide if the charge is justified. However, how the amount charged was arrived at interested a number of people, and this is what they have found:

A large part of the charge is for demand capacity taken by 500 to 1,000 watts of extra lighting which the consultants claimed was turned on only during the time the TV set was working. This is certainly something new in television audiences who are usually quite busy turning lights off before sitting down for TV entertainment. The consulting firms' claim was that the new sets have pictures so bright that the viewer can't stand them unless the room is brightened by the half to a full kilowatt of extra illumination!

The new tubes are bright, all right, and the tubes are operated brightly during the day when there's sunlight to contend with, but at night, it's a different story. The set is adjusted to suit the viewer group, as far as brightness is concerned, and in most of the homes, no room lights are left on at all although it's a matter of personal preference whether they are or not.

Last night (Saturday, July 22nd) on the fine University of Buffalo Roundtable Forum there was a discussion on how TV might affect the eyes. One of the Doctors on the panel said that some light should be left on in the room or headaches would be likely, just as in the movies. Since this touches on a subject in which many of you are greatly interested, let's clean up all this TV eye-strain talk with a report by the National Society for Prevention of Blindness. They say - it is not the eyes that are damaged by television, but rather that television is demanding more accurate use of the eyes - and therefore the correction of small errors to promote their comfort. Paradoxically, it may be the fatigue induced by TV which will be a sight conservation boon, for it will cause the individual to seek medical attention earlier, and in a number of cases, allow serious eye diseases to be discovered at a more favorable time than would otherwise be the case.

If you've been wondering just about how many television sets are actually in use in this country, the answer, according to the latest figures available, and as of the end of the month of April, 1950, is just about fourteen thousand. And this comparatively small total represents nearly six million dollars worth of video. About ninety nine percent of the sets are located in Ontario, with a few in British Columbia to date.

Up Windsor way, where the looking in is very much the best in Canada at this time, there are almost six thousand sets of many kinds, getting TV reception on five channels with no trouble, and on eight if special beams are erected by the user for the additional three stations. Windsor, as mentioned before is the present TV center of Canada and the testing ground for new models. Believe it or not, the sets designed for good fringe area work are too hot in this area, and attenuating pads are needed to reduce the received signal.

In the Niagara peninsula, near WBEN-TV, some twenty two hundred owners look in. The signal in this area is good enough that a simple dipole will give more contrast than needed, in many neighborhoods. Hamilton and Toronto, consistently good reception points account for just over five thousand sets, and about the same number of high gain beams - Yagi's, colinear stacked arrays and the like. Some users in Toronto can get Rochester at times, on Channel Six, but are normally confined to watching Channel Four, Buffalo. In other Ontario cities - along the lakes, pick-ups are being made from Erie, Toledo, Syracuse and Cleveland regularly.

You may note that regular reception has been stressed. The reason for this is that there have been numberless cases to date, of Skip Reception of far distant stations. For one example, Cleveland and Buffalo both operate on Channel four, and frequently during the summer months, interference is caused to the Buffalo signal by Cleveland, messing up the picture.

But let's go one step farther than this semi-normal (because it happens regularly during the supper period in Toronto) to what took place on the night of June 24th, 1950. ARRL had been predicting VHF openings about this time of the month, for some weeks. About ten oclock that night, television was bad - and getting worse. Picture interference was so bad that it made watching an effort. Almost everyone thought Cleveland was trying to take over the sync circuit, and at times, a light picture flashed on the screen as the circuit locked in momentarily. VHF was getting hot.

That night Buffalo signed off the air at its usual time, and instead of the raster appearing as the screen went dead, a barely discernible picture remained - source unknown. Two different Toronto TV watchers - both hams - took the trouble to Orient their Yagi antenna systems until a fairly good picture was obtained. The FM sound was not coming in at all, it might be added, and the origin of the picture was still a mystery. As the picture built up and time passed, a station call flashed on the screen - WIVJ located in Miami, Florida. And remember this was confirmed by two hams in Toronto, who were operating independently. The payoff to the story came along a few days later from the ARRL, in their OBS number 248, printed on page 24 of this issue. It told of a new 144 megacycle record of more than 1200 miles.

Back again to some of the in-studio happenings across the continent! A new television rehearsal camera has been developed which is capable of performing nearly all the needed functions of a fully electronic video camera and the cost is only about $150.00.

The camera was invented by Father R.C. Williams of Creighton University of Omaha, Neb., who is the co-ordinator of television at the place of learning. It was designed for the planning and testing of basic camera shots for a television production without the use of a real camera. Through a series of direct, view-finding lenses, arranged in a turret, giving size and proportion of the the images on the cameramans screen closely resembling those on a real camera, the new rehearsal type enables the producer and director to test basic picturization, and mark a script for final rehearsals and production. Also, through an arrangement of mirrors, the producer and director can view the images from more than one camera simultaneously from a remote point.

The cameras are mounted on tripods and dollies, and are operated by cameramen who are supplied with headphones and microphone to enable them to hear the producers instruction and the actors and the music of the entire production, as well as to ask questions in case of need, through the mike. With the new cameras ready, the producer will go through the script, planning camera position and the choice of lens for each scene, as well as testing positions and lens uses he already had planned.

Pilot lights on the rehearsal cameras are provided so that the producer, by switching them off or on, may indicate which camera is to be used for each scene. Since each of the four lens with which the cameras are equipped corresponds in relative focal length with the electronic version, and further adjustments can be made, the producer can see the image on each camera, and monitor them all at the same time.

The University points out that the new rehearsal camera makes it possible for groups to experiment, and become familiar with the fundamentals of television production and to prepare programs without investing in the expensive TV cameras and the expert radio technicians required to maintain them. If you can make use of the plans for such units, the blueprints are available from the Uni-

versity, and the necessary parts to complete a mock-up would run about one hundred and fifty dollars in the United States.

All the necessary equipment for a complete television station in one package is now being offered through the Radio Corporation of America. This package has been designed by RCA engineers to enable broadcasters in the smaller communities to get into TV at a reasonable cost.

The complete installation consists of one hundred and eighty two pieces of equipment, and will provide basic television broadcast facilities. A five hundred watt transmitter is the heart of the system, and the other equipment includes a super-turnstile antenna and the recently produced switching console which gives transmitting control, dual monitoring, audio and video control, fading and switching and film control in one unit.

Providing facilities for transmission from a film is a projector, a multiplexer, slide projector and a film camera chain. Mikes, loudspeakers and TV receivers are included for the announcers booth, and provision for future expansion is made by two additional video inputs.

Price for this unit is reported to range up to eighty five thousand dollars in the U.S. This doesn't include the cost of tower, or station site facilities, transmitter-film-control house, or studios for broadcasting. Programs transmitted by such a station are confined to film, kinescope recordings or coaxial cable network shows when available, but equipment for studio programs may be added at any time later, when needed. The entire package of equipment needs about 1200 square feet of floor space to operate.

Around Toronto, where television may get a start some of these days, there's further talk about the Famous Players mobile TV unit which is used to relay programs on a closed circuit to the Imperial Theatre - Canada's largest movie house, with a seating capacity of 3,373 people. This unit is doing the only actual televising in the country, and it now looks like they'll have the field to themselves for longer than expected. The CBC is hinting there will be a further delay in the start of their programming, originally slated for September 1st of next year. Yes, next year. U.S. cities can plan, construct, and put into operation a TV transmitter in a matter of several weeks, but the CBC has decided not to rush into anything and is therefore taking a couple of years to do the same job. And they have just said they can't promise anything definite for September, 1951, due to shortage of steel and probability of strikes, although they're going to do their best to live up to that date deadline. In the meantime, no private licenses have been issued to broadcasters who would be ready to go on the air in four to six months, and thus score a beat over the Corporation that would be very undesirable from their point of view!

But to get back to the Famous Players unit, a familiar sight around the Queen City - at the Imperial Theatre, patrons will see, within a minute of their actual happening, events of special interest taking place in a radius of fifteen miles from the theatre, which embraces most of the city and suburbs. The mobile transmitter operates on a frequency of seven thousand megacycles, in case you were wondering about possible interception of any of their broadcasts.

The mobile unit is sent to the scene and set up for telecasting the event. As soon as the action starts, the transmitter sends the image to the theatre receiver, there to be recorded on film which is developed at a very high speed, run through a special projector, and is shown on the screen all within sixty seconds of the original action. And if the Famous Players chain of nearly four hundred movie houses in Canada wants copies, these can be made from the original quite easily.

The company's mobile unit was designed under the supervision of George Cuthbert, TV chief of the chain, and in a specially constructed truck body. On the roof will be set two RCA cameras (RCA, by the way make the best TV cameras, and even CBS are now using them in their studio work) and these will plug in special panels connecting to the mixer inside the mobile unit. This mixer is completely portable so that all types of events may be covered. A four foot parabolic antenna on the roof transmits back to the theatre. Leased wires carry the audio portion of the show. If you're in the city, you can visit the research and workshop labs which are located in part of the Victoria Theatre, Toronto.

SUPERMODULATION ANSWERS! As a result of the circuit data published in Skywire last month, there have been a number of letters questioning two points. One, the voltage value for C1 and C5! Yes, they should have read six thousand but a typographical error was the cause of confusion. Many thanks to our readers, those who wrote, for pointing this out. Secondly, as to the coils, the B & W, or similar line, in half kilowatt type will do the job. The only need is to make sure both tubes dip or resonate at the same dial setting. If they don't, stray capacity is affecting one half of the coil, and it will be necessary for you to either relocate the center tap to correct this condition, or add some capacity across one half of the main gang, to permit tuning to resonance for both tubes at the one time. Do NOT operate final unless properly tuned!