SKYWIRE

THE CANADIAN RADIO AMATEURS' JOURNAL

September, 1952
20 cents

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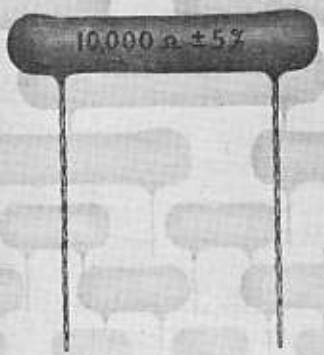

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SEPTEMBER, 1952

SKYWIRE BUSINESS AND EDITORIAL ADDRESS

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SIDEBANDS

The last days of summer are passing as this issue of Skywire is being readied for the press. The first tang of Fall is in the air once more, and the leaves are turning their multi-colored hues.

Once again it's time to get back on the bands after a long summer lay-off. For many, this meant pleasant days of golf and other summer activities. In my own case, to answer the many queries on the subject - What Happened To Skywire During July and August, these two issues were dropped this year because of reduced activity generally among the hams, and very greatly increased activity at this location, although not in ham radio. This has taken the form of buying and re-organizing a weekly newspaper and commercial printing plant in Brampton that kept me so busy - sixteen hours a day seven days a week for two months that there wasn't time even to think of the magazine, much less get it out. Now the pressure is a little lighter and Skywire will be coming your way regularly from this point on.

Perhaps the biggest news of the past summer was the reciprocal operating agreement for U.S. and VE amateurs. Now that this has been reached, we have taken a tremendous stride foreward and ham radio has been recognized in its true light as a tremendous force available in time of need. Sidebands in the past five years has consistently plumped for such an agreement and it is with great satisfaction that we see it in effect today.

You will find that the DX predictions column shows ten meters as being dead insofar as predictable openings are now concerned. This was what we announced would be happening a full year ago. We are on the down side of the cycle, and ten will get much worse before it gets consistently better. Twenty meters, and probably 15 will get the big play, and there'll be plenty of hot stuff on the bands in the months ahead. Forty is going to be hotter than a two bit pistol. If you're interested in action go looking, and you're sure to find it, on seven megs this winter.

On this page next month, we expect to be able to show you a picture of the new Field Day Trophy contributed by Marconi, plus the announcement of the winners for this year. The Trophy is a beauty and any club would be proud as punch to win it. We would like to offer, on behalf of all Canadian hams, the keeping alive of this great Field Day tradition. Ralph Finkle, of Marconi, in Toronto is the man who has made it possible. Thanks again, Ralph.

We would like to see some new ideas that you experimenters have worked out, put on paper and forwarded to Skywire. Those accepted and published, are on a paid basis of five dollars per page. This is an opportunity to pay for your experiments and help another ham along. Let's see what ideas you have there!

For those of you who like to get around to other club meetings, there's a good one to be attended on Friday, October 3rd, at 8.00 that evening, when Alex Reid will be the guest speaker at the Annual Fall Event of the Kitchener-Waterloo ham club. It's a buck a head, with door prizes, gabby-ragging for all after the meeting and so on, plus a feed. Alex Reid will speak on World Radio and the Canadian Amateur, and will hold a lengthy question and answer period if it is needed. Write H.C. Stumpf, 277 Hazel St., Waterloo. Have yourselves a dandy time!!!

OSCILLOSCOPE CHECKS

In DSB and SSB Transmission

By **H. C. WOODHEAD**

Though this article explains the use of the CRO for checking an SSB transmission, for comparison purposes it deals also with the oscillograms obtained on DSB 'phone. Hence, it will be of interest to all who would want to know more about the use of the cathode-ray tube for general telephony testing.—Editor.

THE cathode-ray tube is one of the most useful tools in the hands of the radio engineer to-day and, once its operation has been understood, it can be used for a variety of tests which cannot be carried out in any other way. The interpretation of the patterns obtained requires a certain amount of familiarity with the resultant forms of harmonic motion in two different planes, known to generations of sixth-form schoolboys as "Lissajou's Figures"—but it is not at all difficult.

For checking SSB transmissions oscilloscopically, one must also have a clear conception of the various conditions involved in order to be able to interpret the figures observed. It is therefore proposed to review the difference between SSB and DSB. Taking once again a carrier of 50 kc modulated normally (DSB) by an audio frequency of 1,000 cycles, the resultant will be the original carrier plus two side frequencies separated from it by 1,000 cycles on either side. For lower frequencies of modulation the side frequencies would be closer to the carrier and for higher ones correspondingly farther away. The spaces occupied by these frequencies are called sidebands.

If we represent the carrier as a vector rotating counter-clockwise 50,000 times a second, then the lower sideband will be represented by another vector rotating somewhat slower, in fact 49,000 times a second, and the upper sideband by a third vector rotating at 51,000 times a second. Now all this may sound very complicated, but there is just one thing about the picture that is invariable and that is the carrier vector which is rotating 50,000 times a second.

First Principles

It will greatly simplify things, therefore, if we can imagine ourselves to be rotating counter-clockwise at 50,000 times a second also, for then the carrier vector will appear to us to be stationary and the two sideband vectors to be rotating in opposite directions 1,000 times a second, as shown in Fig. 1. The carrier, in this form of transmission, is constant in frequency and level and does not therefore serve any useful purpose as far as the conveyance of intelligence is concerned. But it does serve as a "standard" against which the frequency of the sidebands is compared in the receiver, thus producing the difference frequency, which is the same thing as the original modulating audio frequency. Since the carrier takes up half the power of the signal and each sideband a quarter (for 100 per cent. modulation) it is obviously an economic proposition to dispense with the carrier if possible and transmit only one of the latter.

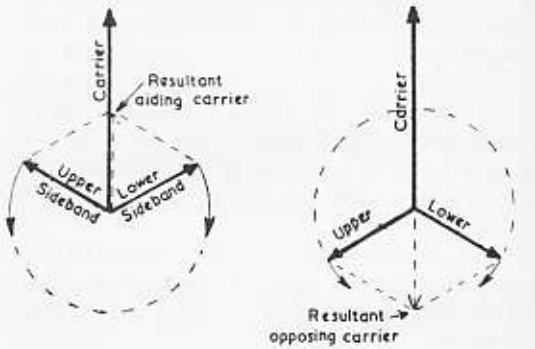


Fig. 1. Vector Diagram of a Double Sideband, 100 per cent. modulated carrier

In this form of single-sideband transmission, the frequency radiated is equal to the sum (or difference) of the unradiated carrier and the modulating frequency. In speech it will consist of a band of frequencies to one side of the unradiated carrier, corresponding to the width of the audio band being transmitted, as has been explained earlier

Once the idea of the "frozen" carrier is grasped, so that the sidebands rotate in opposite directions, the vector diagrams shown with this article will be understood. They show the various conditions of vectors existing throughout one half-cycle of audio modulating frequency at intervals of 30° ; the carrier (if any) and sidebands are shown in thick lines and the resultant in thin lines. In the next column is given the appropriate figure obtained when the radio signal is applied to

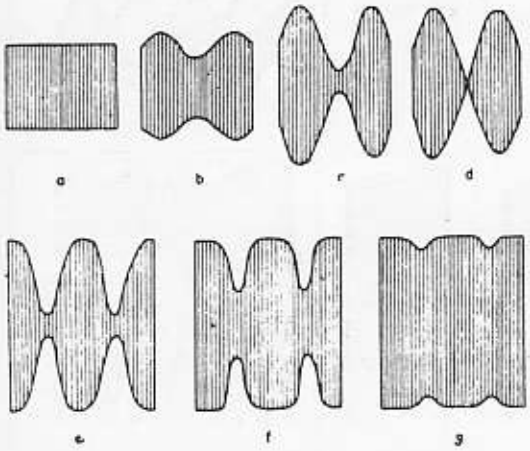


Fig. 2. Oscilloscope Patterns of carrier with increasing proportions of single sideband from (*a*) to (*g*)

(*a*) Plain Carrier

(*d*) 100 per cent. SSB Modulation

(*g*) Limiting on peaks of envelope

the Y plates of a CRT at the same time that the modulating audio frequency is applied to the X plates. For DSB this produces the familiar trapezium of modulation and two conditions of this are shown with a slight

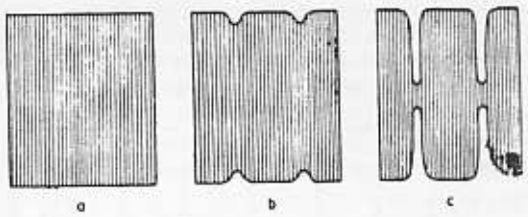


Fig. 3. Effects of limiting on a carrier and one sideband with modulation increasing in level from (*a*) to (*c*)

difference in the phase of the audio tone. The second is often encountered and may cause confusion unless it is recognised as being similar to the first with slight audio rotation. It will simplify the interpretation considerably

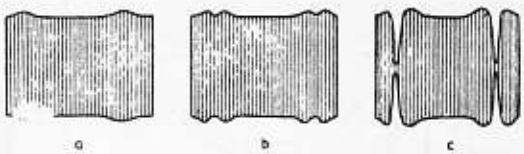


Fig. 4. Instability and overloading on SSB with carrier

if the figures shown in this column can be visualised as transparent cylinders rotating about a vertical axis with change of audio phase. Thus the DSB case becomes a cylinder cut obliquely at either end, and the SSB ideal case is a cylinder which always presents the same shape no matter what the phase of the audio frequency.

In the last column is shown the figure obtained against a linear time base. A careful study of these figures will show how the proportion of unwanted sideband can be measured and some idea obtained of the form of the final signal and the effectiveness of the SSB filter by varying the audio frequency and noting the change in the oscilloscope figure.

SSB Condition

After the initial SSB line-up there may be some difficulty in adjusting the reinserted carrier level so as to produce a satisfactory signal for normal reception. This may, for

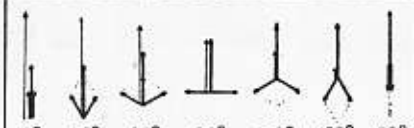
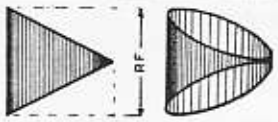
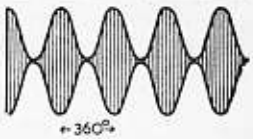
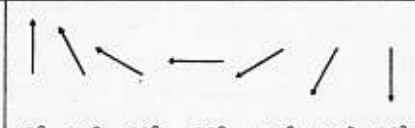
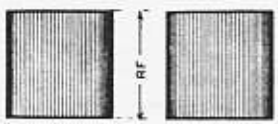
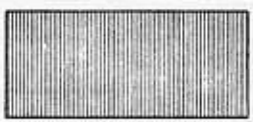
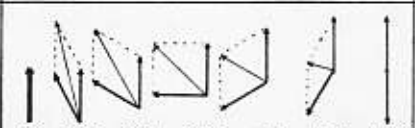
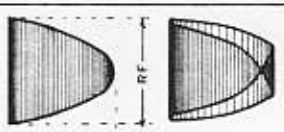
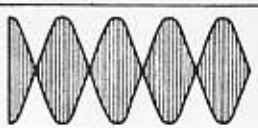
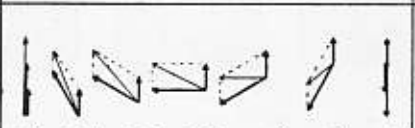
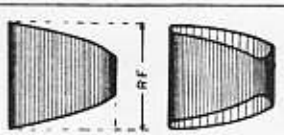
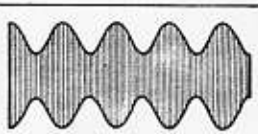
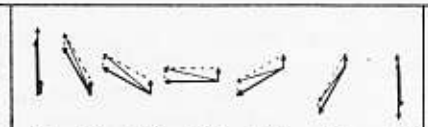
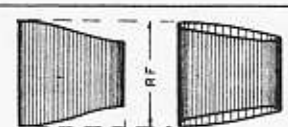
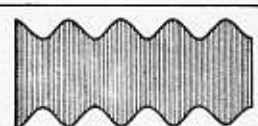
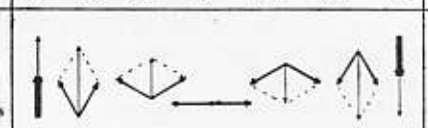
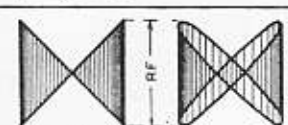
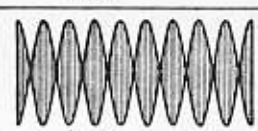
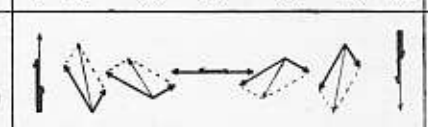
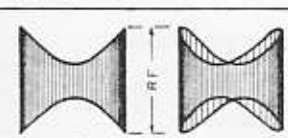
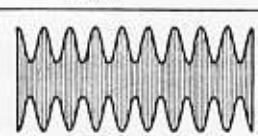
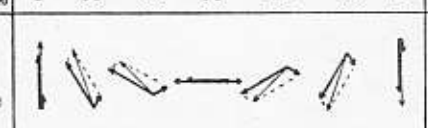
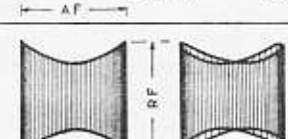
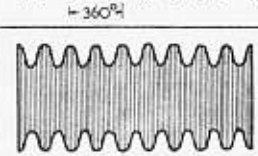
System and Signal	Vector changes throughout one half cycle change of modulating audio frequency	Oscilloscope patterns of final RF against modulating audio frequency for two conditions of audio phasing	Oscilloscope patterns of final RF against a linear time base
DSB 100% Mod			
SSBSC Ideal Condition			
SSB 100% Carrier			
SSB 50% Carrier			
SSB 25% Carrier			
DSBSC Equal Sidebands			
DSBSC One Sideband 50% Suppressed			
DSBSC One Sideband 25% Suppressed			

Table of Vector Diagrams and Oscilloscope Patterns illustrating various forms of modulation from Full Double Sideband to full Single Sideband, with partial carrier and with partial sideband suppression. *(For details see text)*

example, be due to too much reinserted carrier. The oscilloscope will soon indicate what is wrong, for in starting with carrier on and gradually increasing the audio level the figures shown in Fig. 2 should be obtained. It will be seen that up to (*c*) the sideband is less than the carrier ; at (*d*) they are equal in level, representing 100 per cent. modulation ; at (*e*) the sideband is greater than the carrier ; at (*f*) limiting is reached ; while at (*g*) the modulation has almost been suppressed by it. The best condition to work is between (*a*) and (*d*).

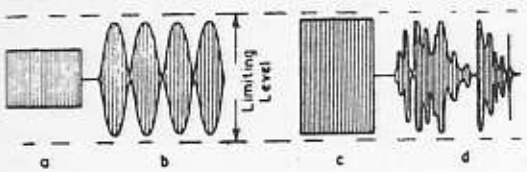


Fig. 5. Line-up figures for SSB working

(*a*) **Carrier level set to less than half limiting value**

(*b*) **Tone applied to give 100 per cent. modulation for carrier working**

(*c*) **Carrier removed and tone increased to give the same peak signal as at (*b*)**

(*d*) **SSBSC speech to give the same peak signal as in (*c*)**

If the drive is saturated with reinserted carrier to start with the successive figures may follow the patterns shown in Fig. 3 without ever forming the standard pattern of Fig. 2 (*d*) at all. A tendency to instability may be revealed as shown in Fig. 4, in which the position is somewhat obscured by severe limiting. It is as well to find the limiting level as indicated at Fig. 2 (*g*) and reduce the carrier below this to allow ample margin. It should then be reduced to one-half this value (as shown on the tube) to allow for modulation. When the carrier has been removed for SSB proper, the speech level may be increased to the point where the sideband peaks reach the double-carrier level. The relative levels are clearly indicated in the successive patterns of Fig. 5.

The application of the ordinary CRO to the testing of SSB is not very simple, but if the former has been adapted (or a unit added) to enable it to be used on the receiver IF channel for the examination of incoming signals, it can be employed also in conjunction with the receiver to test the signals in the drive unit. The author favours such an arrangement but used with a separate frequency changer as shown in the schematic diagram of Fig. 6.

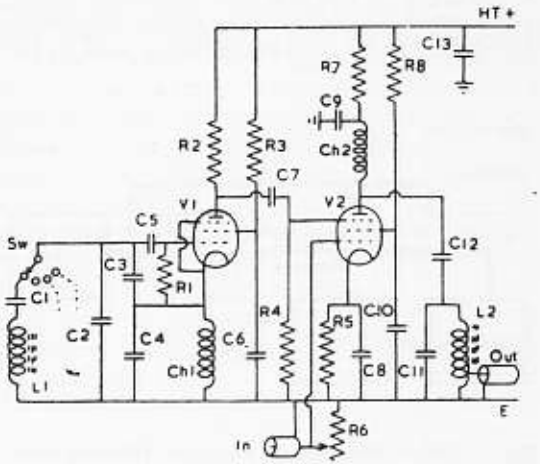


Fig. 6. Circuit diagram of frequency changer for use with an oscilloscope for checking transmitted wave-form

Table of Values

Fig. 6. The FC test circuit described by G2NX

C1	=	10 $\mu\mu$F, ceramic
C2, C3	=	50 $\mu\mu$F, ceramic
C4	=	100 $\mu\mu$F, ceramic
C5	=	15 $\mu\mu$F, ceramic
C6, C8, C9		
C10, C13	=	·01 μF, mica
C7	=	·001 μF, mica
C11	=	500 $\mu\mu$F, mica
C12	=	·005 μF, mica
R1	=	50,000 ohms, ½-watt
R2, R3	=	20,000 ohms, ½-watt
R4	=	100,000 ohms, ½-watt
R5	=	220 ohms, ½-watt
R6	=	1,000 ohm potentiometer
R7, R8	=	1,000 ohms, ½-watt
L1	=	To tune 3·5 mc
L2	=	To tune, with C11, to 465 kc
Ch1	=	Choke for 3·5 mc
Ch2	=	Choke for 465 kc
V1, V2	=	SP61
Sw	=	Range switch

The oscilloscope itself is provided with an

internal amplifier, giving deflection on the Y-plates, and is fed from a co-axial input. All the circuits are fixed tuned to 465 kc. The arrangement is very convenient for plugging into a 75-ohm output from the final IF stage of the receiver for examining wave-form of incoming signals. The frequency-changer unit of Fig. 6 is quite simple, consisting of two 6SJ7's The first is an oscillator which is switched to cover the bands required, including one for 5·65 mc which is used in an

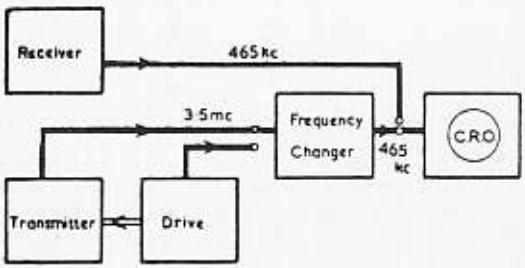


Fig. 7. Block schematic of set-up for checking wave-form of transmitted or received signals on an oscilloscope provided with a 465 kc input

early part of the drive. The second is the frequency changer, having signals applied to the control grid and the oscillator (differing by 465 kc) to the suppressor grid.

The signal is taken to the co-axial input from a pick-up loop in the transmitter and a level control is included. The anode of the second valve is tuned to 465 kc and provided with an output at 75 ohms impedance for connecting to the oscillograph. The arrangement of the test set-up is shown in Fig. 7.

It will, in general, be found advisable to have this equipment in operation during transmission until experience is gained in the adjustment of the respective carrier and speech levels. In any case, a speech-level meter is almost essential to prevent overloading (especially when carrier is being transmitted for calling purposes) for it is very easy to degrade the quality of the transmission by over-modulation in this condition. When using completely suppressed carrier however, it will be found that there is much more latitude and that the speech level can be much higher before appreciable distortion becomes apparent due to overloading, and in practice the level in this condition may be such that peaks go beyond the limiting point. They will, of course, be cut, but, provided ample carrier is reinserted at the receiver, the result is not such as greatly to impair the quality. If the conditions shown in Fig. 5 are adopted for general line-up in the first place, the speech level may subsequently be increased beyond that shown in Fig. 5 (*d*) in accordance with experience and reports of reception.

"THEY DON'T CATCH ME"

The Multi-way Menace

By **NONET**

HAVING been invited by a large number of amateur spiders to enter their parlours, and having, in unguarded moments, succumbed to their entreaties, I have now decided to give up being a fly.

It may be that I am in a minority, but *I do not like nets*, and in future I will have none of them. And, furthermore, I am not making my escape from these extremely sticky traps for the unwary in discreet silence, but am taking this opportunity of telling some of the spiders in whose parlours I have wasted so much time just *why* I am not their future meal.

To start with, the net is a time-waster. The time wasted increases roughly as the square of the number of people in the net. This tendency manifests itself right at the start, when a duet is transformed into a trio. Two chaps having a contact will each say what they want to say and then cut loose ; but if a third comes in, the chances are that each of the original two will repeat practically everything that he has already said—whether interesting or not—for the benefit of the third party. All the usual "I'll be brief about the rig" stuff, and so on, together with some theory (possibly sensible but maybe half-baked) about aerial systems, 807's, microphones or what-have-you.

By the time eight or nine members have joined the assembly, everyone talks *at* the others instead of *to* someone else ; everyone has to remember, or note down, innumerable comments on divers subjects made by all the others ; and one such comment is sure to touch someone off on his pet subject, on which he is a well-known bore. It is a mitigating circumstance, I admit, that the said bore will only have his turn about once in every forty minutes ; but perhaps most of the others have, by then, been touched off on their particular bore too.

I am convinced that when a net has become really large there will be two or three members who will talk just for the sake of talking—even if they have to think quite hard to find something on which they can talk for a long time.

Reducing the QRM ?

Now about the only argument ever put forward in favour of netting is that it reduces the QRM by keeping, on one channel, eight or nine stations who might otherwise be spread over the band. This carries a dangerous grain of truth but is, nevertheless, a complete fallacy. Nine stations transmitting for five minutes each will cause precisely the same amount of QRM, whether they occupy the same frequency for nine consecutive periods of five minutes or whether they spread over the band for sporadic periods.

In fact, to my mind, it is slightly more annoying to find one channel apparently occupied for ever than to hear various short and snappy conversations being spread out over 200 kc or so.

Even the multi-way QSO in which the participants are on different frequencies is rather less devastating than the tight net which goes on for hours and constantly admits more and more who are foolish enough to yield to the urge to break in.

Glad I'm getting out to-night, OM. . . . . .

Driving the Cathode

Short Note on a Useful Circuit

By **K. W. LAWSON**

In the construction of economical and efficient VHF equipment, it is always essential to keep losses to a minimum.

One arrangement which is well worth more attention is the cathode-drive or inverted triode arrangement. It will work well with most triodes, either directly or indirectly-heated, and RF output can be obtained at frequencies at least as high as 150 mc.

Fig. 1 shows the basic circuit, and Fig. 2 a practical derivative of it. The input capacity of the valve, which is normally between grid and cathode, is now between cathode and earth, though still effectively cathode-grid but without the feedback due to anode-grid capacity. RF chokes are included in the filament (or heater) leads in order to minimise input losses caused by the capacity between the LT supply leads and earth.

No neutralisation is necessary, which is an important advantage, and with proper attention to layout, improved RF output can be obtained in comparison with the conventional arrangements.

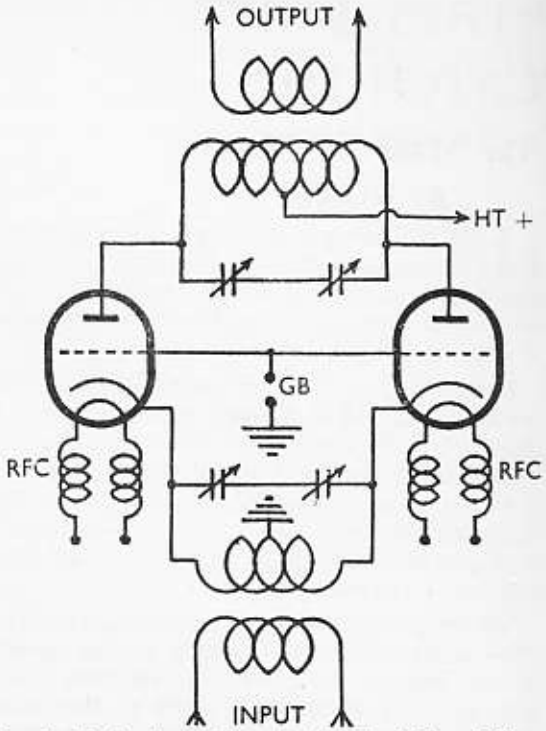


Fig. 1. Basic circuit for cathode drive RF amplifier

Those working on 28, and particularly 58 mc, are urged to do a little experimental work along the lines suggested. They will find themselves amply repaid by the results.

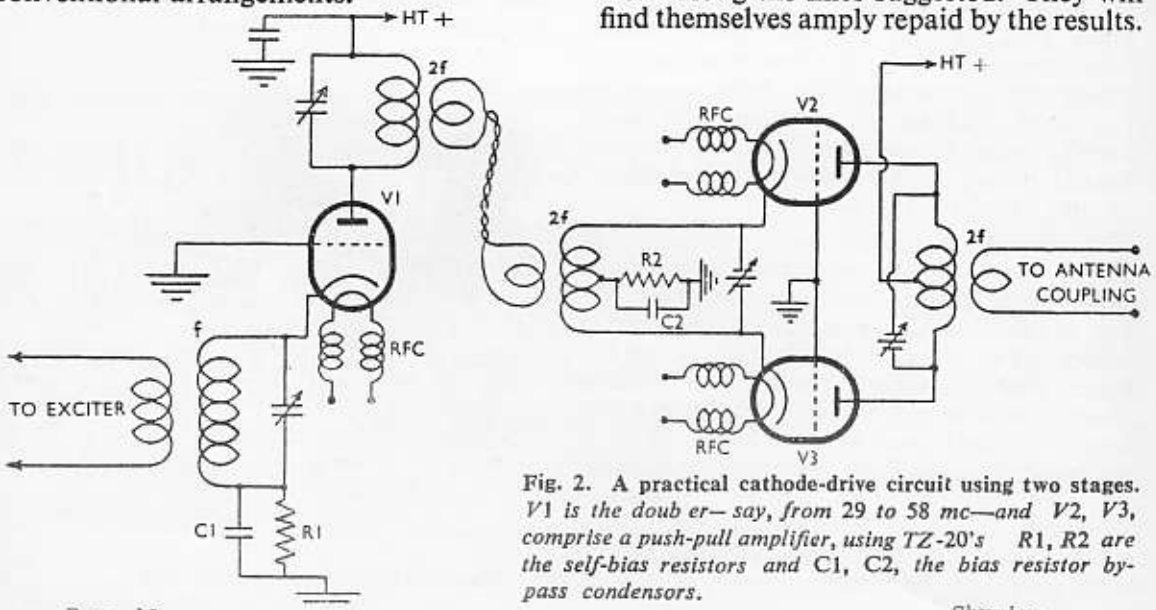


Fig. 2. A practical cathode-drive circuit using two stages. *V1 is the doub er— say, from 29 to 58 mc—and V2, V3, comprise a push-pull amplifier, using TZ-20's R1, R2 are the self-bias resistors and C1, C2, the bias resistor by-pass condensors.*

MODULATION-LEVEL INDICATOR

For Direct Connection

By **H. BARNETT**

FOR the amateur who has neither time, inclination, knowledge nor cash with which to build himself a cathode ray oscilloscope for modulation checking—and for those who have, but who would like a visible indication of modulation depth at all times without the need to rig up the oscilloscope—the simple circuit described here is offered.

The few components required, which can be found in the average junk box, consist of one ½-watt resistor, one variable potentiometer, a changeover switch, a rectifier and an 0-500 μA meter.

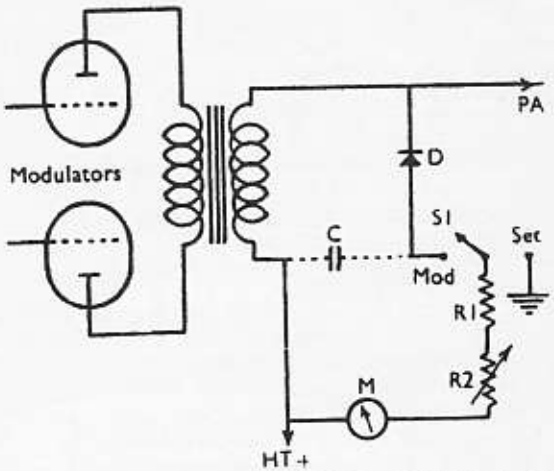
Referring to the circuit diagram it will be seen that when S1 is in the SET position, the micro-ammeter will act as a DC voltmeter, and the degree of deflection may be controlled by R2. If the meter is set at 400 μA and this point taken as the 100 per cent. modulation mark, it follows that 200 μA will indicate 50 per cent modulation.

Action and Adjustment

When S1 is put over to MOD, the meter, in conjunction with the rectifier, will act as an AC voltmeter, and will measure the audio volts appearing across the secondary of the modulation transformer. When this AC voltage is the same as the DC volts on the plate of the power amplifier, 100 per cent. modulation will be effected. Thus, once set up as shown above, the meter will, at all times, give an indication of the depth of modulation being obtained.

For those who possess a CRO, the meter can be adjusted, with S1 in the MOD position, whilst observing the carrier envelope on the oscilloscope. But for all practical purposes, setting up the meter by this method, or by using the DC voltage on the power amplifier anode, will not result in any appreciable differences. As a refinement, the scale can be marked up in red at the 50 per cent. and 100 per cent. levels.

The circuit as described has the disadvantage that the meter needle is continually "flapping" over the scale as one speaks into the microphone. This may be overcome by inserting a condenser C, as shown in the dotted lines on the circuit diagram. With this condenser in circuit, the needle will rise rapidly on peaks of modulation, but will return to zero more slowly, thus giving a more average indication of modulation. With the circuit shown, a paper tubular condenser 0·25 μF, rated at 500 volts, was used.



Circuit of the indicator described by G2AIQ. Intended for voltages around 500, suitable precautions would have to be taken in the interests of safety (and to prevent damage to the rectifier itself) at higher operating voltages.

Table of Values

Circuit of the Modulation-Level Indicator

C = *See text*
R1 = 120,000 ohms, ½-watt
R2 = 1 megohm, variable
D = Crystal Rectifier
M = 0-500 μA meter

The values shown in the circuit diagram are for use with a PA anode voltage of 350 volts and a 0-500 μA meter. With other anode voltages and different meter scaling, R1 and R2 would have to be made suitable values and rating, and precautions taken to prevent damage in cases where high voltages are involved. The method of operation, however, remains the same.

Resurrecting the D. C. Relay

By HARRY G. BURNETT

Most of us, when we discarded storage batteries, shelved the once-popular low voltage d.c. relay. It is now difficult to find a source of supply for this type of relay in most amateur stations. This relay, as a rule, was wound with a few turns of heavy wire. Consequently, a low voltage source capable of supplying the comparatively heavy current was needed to operate it. With the storage battery passe, we had no readily available means of magnetizing the solenoid. Reflect upon the bother and expense of transforming, rectifying and filtering the a.c. at hand to provide a substitute for the battery, and it is not hard to understand why the average amateur turned to the a.c. relay as the better solution of the relay problem.

It is true that the a.c. relay is the simpler to use in modern installations. The a.c. is readily and cheaply obtainable at 115 volts, or at any lower voltage. Problems of rectification and filtering are, of course, absent.

However, there are arguments against using the a.c. relay. Here are some of them: The a.c. relay often chatters; it usually hums; and it is certain to try your patience to the breaking point when you attempt to tame it and quiet it. It is difficult to build a good one yourself, if you are trying to economize or want one for a special purpose. Buying a new a.c. relay does not solve the problem of what to do with a d.c. relay lying idle.

The smaller d.c. relays do not require a strong magnetic field from the solenoid to operate. We can reduce the current necessary by increasing the number of turns in the solenoid. This is true, you will remember, because the magnetic field produced by the relay coil is represented by I x T. Thus, for a given magnetic effect, if we increase T, we may decrease I. Practically this means, for example, that we can remove the few turns of heavy wire from the coil of an old d.c. relay, and by rewinding with many turns of fine wire produce the same magnetic effect with a greatly reduced current. We can thus put old discarded "B" eliminator relays, etc., back into operation, provided that we can discover a source of d.c. capable of supplying the few milliamperes of current necessary.

Inexpensive auto horn relays or generator cut-outs may be rewound with fine wire to work on low current.

We all have "adequately filtered" d.c. power supplies. They supply several milliamperes of current to the bleeders across them, and to the r.f. and a.f. tubes they feed. The voltages supplied by these power packs are usually a bit high to apply to any relay coil directly. If there were some way of reducing this available source of voltage, our problem would be solved, and we could put our revamped relays to work.

A little thought yields the following: We can connect one side of the solenoid to the negative of our power supply and tap the other side on the bleeder at a point giving sufficient voltage to operate the relay. Care must be taken, of course, not to exceed the wattage rating of the bleeder. Again, we can insert the relay coil in series with the negative connection of the bleeder, or in series with the negative connection of the power supply to the transmitter proper. In this application, the bleeder must draw enough current to operate the relay, or the transmitting tubes enough plate and screen current to energize the relay coil. In all three cases, you will note, connection to the *negative* is indicated. This is so because of safety and insulation considerations. If the bleeder current is sufficient, connection in series with the bleeder is probably the best choice for most applications.

By judicious care in placing the relay in connection with the proper power supply, correct timing of relay action and even time delay effects can be produced.

We might go on at length about possible applications for these resurrected d.c. relays. They make it easy to utilize a regulated power pack for the e.c.o., as well as the receiver; cutting the receiver B– while transmitting; disconnecting and grounding the receiving antenna when transmitting; shorting a resistance in series with the filament transformer primaries to raise filament voltages to offset poor line regulation when the transmitter is on; and a host of other labor-saving arrangements. Few are at a loss to think of ways to use a relay, so we leave the application to you. Certainly high resistance (low current) relay solenoids raise the d.c. relay from the "dead-letter" class.

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CX	$ 9.75	Crystal	5 Meg.	—50 db.	30-10,000	Substantially Flat
CX-1	9.95	Crystal	5 Meg.	—50 db.	30-10,000	Rising Characteristics
CDS	19.50	Dynamic	500 Ohm	—62 db.	30-10,000	Substantially Flat
CDM	19.50	Dynamic	5 Meg.	—50 db.	30-10,000	Substantially Flat
CC	8.75	Ceramic	5 Meg.	—62 db.	30-10,000	Substantially Flat
CC-1	9.75	Ceramic	5 Meg.	—62 db.	30-10,000	Rising Characteristics

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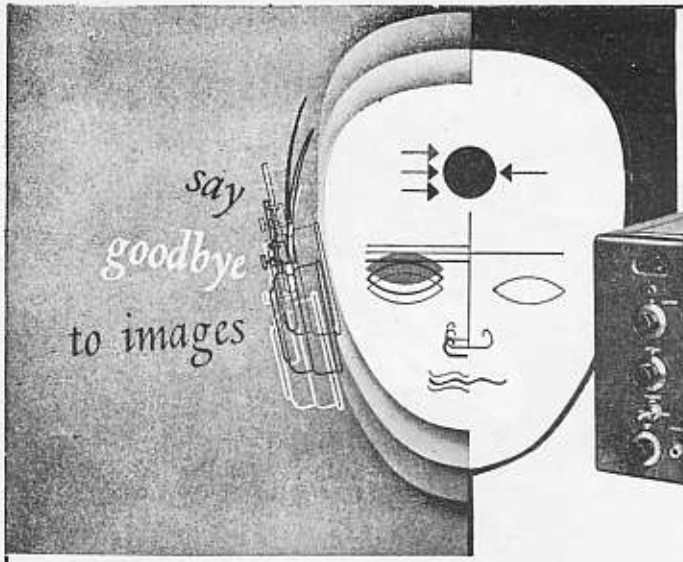

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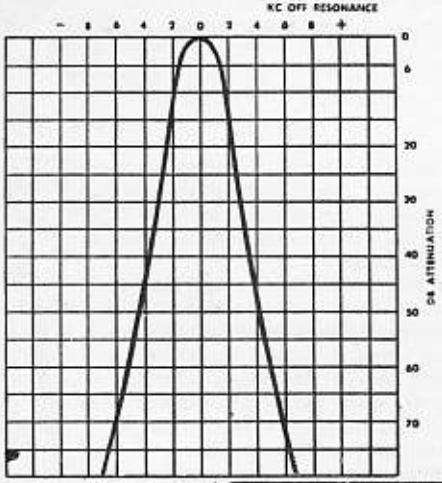

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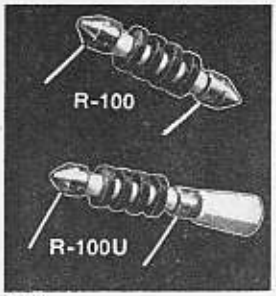


R-100

These RF chokes are identical electrically, but differ in mounting provisions, are available in 2.5, 5 and 10 millihenry sizes and are rated at 125 milliamperes.

R-300

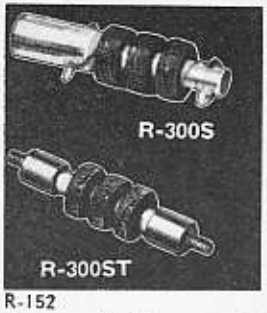
These RF chokes are similar in size to R-100 series but have higher current capacity.

The R-33 series chokes are 2-section RF chokes available in 10, 50, 100 and 750 microhenry sizes.

The R-50 series chokes are 3 and 4-section RF chokes and available in 0.5, 1, 2.5, and 10 millihenry sizes. They are rated at 50 milliamperes R—50-1 choke is wound on an iron core.

The R-33G choke is a 2-section 750 microhenry RF choke hermetically sealed in glass with a current rating of 33 milliamperes.

The R-60 choke is a high current RF choke (500 milliamperes) available in 2 and 4 microhenry sizes.



R-152

For use in the range between 2 and 4 Mc. Ideal for high power transmitter stages operated in the 80 meter amateur band. Inductance 4 m.h., DC resistance 10 ohms, DC current 600 ma. Coils honeycomb wound on steatite core.

R-154

For the 20, 40 and 80 meter bands. Inductance 1 m.h., DC resistance 6 ohms, DC current 600 ma. Coils honeycomb wound on steatite core. The R-154U does not have the third mounting foot

The R-175 Choke is suitable for parallel-feed as well as series-feed in transmitters with plate supply up to 3000 volts modulated or 4000 volts unmodulated. Unlike conventional chokes, the reactance of the R-175 is high throughout the 10 and 20 meter bands as well as the 40 and 80 meter bands. Inductance 225 μh, distributed capacity 0.6 mmf., DC resistance 6 ohms, DC current 800 ma., voltage breakdown to base 12,500 volts.

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DX PREDICTIONS

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

DX PREDICTIONS FOR MONTHS OF OCTOBER, 1952.

Skywire frequency predictions are for amateur communications on various circuits to almost any part of the world. These tables are for five major areas in Canada, and amateurs who are operating reasonably close to the cities indicated will find these predictions quite adequate.

Figures shown are in megacycles and indicate the band to be used. They are for normal F layer transmission and don't consider Sporadic E which may provide unusual DX openings!

Toronto to: EST	00	02	04	06	08	10	12	14	16	18	20	22
Europe	7	7	7	14	14	14	14	14	14	7	7	7
Africa	14	-	-	-	-	-	-	14	14	14	14	7
Caribbean	7	7	7	14	14	14	14	14	14	14	14	7
S. America	7	7	7	14	14	14	14	14	14	14	7	7
Australia	7	7	7	7	-	-	-	-	-	-	-	14
U.S. - West	14	14	7	7	14	14	14	14	14	14	14	14
U.S. - Central	7	7	7	7	14	14	14	14	14	14	14	14
U.S. - South	7	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	14	14	14	14	14	14	14	7
Montreal	4	4	4	4	7	7	7	7	7	7	7	4
Sackville	4	4	4	7	7	7	7	7	7	7	7	7

Sackville to: AST	01	03	05	07	09	11	13	15	17	19	21	23
Europe	7	7	7	14	14	14	14	14	14	7	7	7
Africa	7	-	-	-	-	-	-	14	14	14	14	7
Caribbean	7	7	7	14	14	14	14	14	14	14	14	7
S. America	7	7	7	14	14	14	14	14	14	14	7	7
Australia	7	7	7	7	-	-	-	-	-	-	-	7
U.S. - West	7	7	7	14	14	14	14	14	14	14	14	14
U.S. - Central	14	7	7	7	14	14	14	14	14	14	14	14
U.S. - 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	14	14	14	14	14	14	14	7
Toronto	4	4	4	7	7	7	7	7	7	7	7	7
Montreal	4	4	4	7	7	7	7	7	7	7	7	7

Watrous to: MST	22	00	02	04	06	08	10	12	14	16	18	20
Europe	7	7	7	7	14	14	14	14	14	14	7	7
Africa	7	7	7	14	-	-	14	14	14	14	14	14
Caribbean	14	14	14	7	14	14	14	14	14	14	14	14
S. America	7	14	14	7	14	14	14	14	14	14	14	7
Australia	14	14	7	7	7	7	-	-	-	-	-	14
U.S. - West	7	4	7	7	7	7	7	7	7	7	7	7
U.S. - Central	7	7	7	14	14	14	14	14	14	14	14	7
U.S. - South	14	14	7	7	14	14	14	14	14	14	14	14
Vancouver	7	7	7	7	7	14	14	14	14	14	14	14
Toronto	7	7	7	7	14	14	14	14	14	14	14	7
Montreal	7	7	7	7	14	14	14	14	14	14	14	7
Sackville	7	7	7	7	7	14	14	14	14	14	14	14

Montreal to: EST	00	02	04	06	08	10	12	14	16	18	20	22
Europe	7	7	7	14	14	14	14	14	14	7	7	7
Africa	14	-	-	-	-	-	-	14	14	14	14	7
Caribbean	7	7	7	14	14	14	14	14	14	14	14	14
S. America	7	7	7	14	14	14	14	14	14	14	7	7
Australia	7	7	7	7	-	-	-	-	-	-	-	14
U.S. - West	14	7	7	14	14	14	14	14	14	14	14	14
U.S. - Central	7	7	7	7	14	14	14	14	14	14	14	14
U.S. - South	14	7	7	7	14	14	14	14	14	14	14	14
Vancouver	7	7	7	14	14	14	14	14	14	14	14	14
Watrous	7	7	7	7	14	14	14	14	14	14	14	7
Toronto	4	4	4	4	7	7	7	7	7	7	7	4
Sackville	4	4	4	7	7	7	7	7	7	7	7	7

Vancouver to: PST	21	23	01	03	05	07	09	11	13	15	17	19
Europe	7	7	7	7	14	14	14	14	14	7	7	7
Africa	14	7	7	7	14	14	14	14	14	14	14	14
Caribbean	7	14	14	7	14	14	14	14	14	14	14	7
S. America	7	14	14	14	14	14	14	14	14	14	14	7
Australia	14	14	7	7	7	7	-	-	-	-	-	14
U.S. - West	7	7	4	4	4	7	7	7	7	7	7	7
U.S. - Central	14	7	7	7	7	14	14	14	14	14	14	14
U.S. - South	14	14	14	7	14	14	14	14	14	14	14	14
Watrous	7	7	7	7	7	14	14	14	14	14	14	14
Toronto	14	7	7	7	14	14	14	14	14	14	14	14
Montreal	7	7	7	14	14	14	14	14	14	14	14	14
Sackville	14	7	7	7	14	14	14	14	14	14	14	14

FOR *top speed* INSTALLATION plus TOP QUALITY ALL BAND RECEPTION

specify the ANTIFERENCE-ANTEX®

Designed, developed and proved in performance by the largest British manufacturer of television antennas, the Antiference "Antex" combines four features to make it your logical choice for installation in normal TV reception areas.

The Antiference "Antex" is available only through your jobber or write our Engineering Department for complete details contained in Bulletin CA12.

(1) TOP SPEED ERECTION is assured with the "Antex" antenna. The twin lead can be connected to the insulator terminal at ground level before fitting the rods, and since each antenna weighs only 2 lbs. you get maximum ease of handling on ladders.

(2) REMARKABLE ALL BAND PERFORMANCE, through exceptionally high gain and directivity, is built into the "Antex" antenna. The impedance is closely matched to standard 300 ohm twin lead.

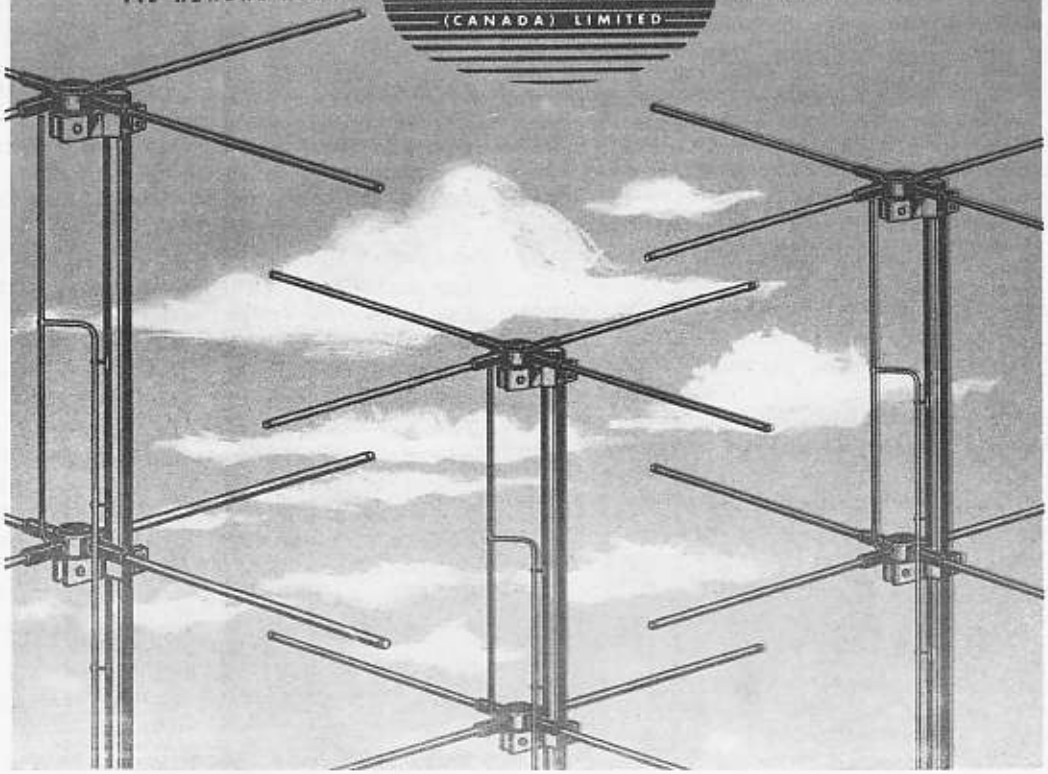
(3) PATENTED DESIGN AND CONSTRUCTION of the "Antex" is protected by patents and registered designs in Canada, U.S. and all major countries of the world, and includes the sealed waterproof connections which ensure dependable service through the years.

(4) LOW COST of the quality antenna is possible through the large volume of production, and enables you to give your customers the best in TV reception equipment.

*Registered

ANTIFERENCE (CANADA) LIMITED

148 KENDAL AVENUE TORONTO 4



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.

FOR SALE - Hammarlund Super-Pro receiver, less than one year old, absolutely new condition - $400.00, plus Express. Write W. Ihler, % Fred Hale, Box 467, Kapuskasing, Ontario.

FOR SALE - Three chassis (No 1) 6AG7 VFO and 807 doubler. No 2 is P.P. 807's, and No 3 a Pi Network. Dual power supply for above with 5U4G and 816's. All B and W coils for 20, 40 and 80. Parts for my NBFM Modulator, plate Ma and diagrams. Write VE1AN, Rothesay, N.B.

FOR SALE - Dendix TA-12 transmitter, wired for six volts. Less power supply and modulator, $45.00. FOB Dryden, Ont. Write Doug Thompson, VE3DEM, Dryden.

HALLICRAFTERS SX-71, with speaker, and in excellent condition. Best offer of $250.00 or over takes it. Also HQ-129-X with speaker in very good condition - $225.00. Write VE3DIF, Box 426, Oshawa.

GONSET TRI-BAND converter with Gonset Noise Limiter, both for $58.00. VE3VG, 47 Parkwood Avenue, Toronto, Ontario.

PRESTO PROFESSIONAL RECORDER, 33 and 78 RPM, with both inside-out and outside-in lead screws. This unit equipped with 1C head recalibrated and adjusted by Presto. Equipped with play back arm. No amplifier, $350.00 complete. This may be seen any day at 46 St. George St. in Toronto. All enquiries will be answered promptly.

R-1155 RECEIVER with 10 meter converter, power supply and speaker. Good condition and at a good price. VE3WS, 1 Ronan Ave. Toronto, Ontario.

MOBILE POWER VIBRAPACK delivers 420 volts at 150 mils, or 210 volts and 420 at same total current simultaneously. This is brand new and complete with dual rectifiers and vibrators. Built for very rugged duty. What offers ??? VE3WO, 4 South Street, Brampton, Ontario.

Have one National ICN (Illuminated type) dial, brand new that I can't use. The first five dollars and a half that gets here, gets it, postpaid, VE3WO, 4 South Street, Brampton, Ontario.

TRANSMITTER - 150 watts, all bands, 10, 15, 20, 40, 80 with 4-65A final. VFO and crystal, AM and NBFM. New set tubes recently installed. Rig is TVIed. Reason for selling - have higher power rig. See it at VE3VG, 47 Parkwood Ave., Toronto.

FOR SALE - ATTENTION HAMS!! Dynamotor six volts DC input 200 mils at 600 volts output - $40.00. Voltage regulator with ten outlets - $35.00. Guardian Time Delay - $8.75. Vomax Vacuum Tube Volt-Ohm-Milliameter as new - $39)00. Desk cradle phone minus dial - $15.00. 10 Hammond chokes, 100 and 150 mil capacity, as new for two bucks each. Eight large single and double stator condensers - $25.00 for the bunch. New R9'er with both 10 and 20 meter coils - $30.00. Transmitter single 813 Hammond cabinet and chassis, phone-CW, VFO - $275.00. For further information, contact VE6FF, E.M. Broadfoot, Box 650, Camrose, Alberta.

WANTED TO BUY - ATR-5 in good condition. VE7DV, 3307 Browning, Victoria, BC.

Skywire Hamads get proven results.

Skywire

HOW'S UR OBS IQ?

Official Bulletin Nr 350, July 27th, 1952. A.R.R.L. has prepared a revised and up to date bibliography of all articles dealing with TVI reduction that have appeared in QST. Amateurs engaged in clearing up such difficulties will be interested in obtaining this reference list from League Headquarters. Please address communications to the Communications Department of A.R.R.L., West Hartford, Connecticut.

Official Bulletin Nr 355, July 30th, 1952. U.S. amateurs desiring to operate in Canada, and Canadian amateurs desiring to operate in the U.S. may now secure authorization to do so. U.S. amateurs secure, fill out and file forms through Radio Division, Department of Transport, Ottawa. Canadian amateurs secure, fill out and file forms through F.C.C., Washington 25, D.C. Appropriate authorization will then be issued thro the respective government agencies and should be shown to customs authorities at the border.

Special Bulletin to all Canadian Amateurs. Canadian Director Reid, VE2BE, announces that Canadian D.O.T. effective immediately authorizes licensees of amateur experimental stations with unrestricted radio-telephone privileges to use A3 and F3 emission on the 21,200 to 21,450 kc band. Also restrictions which require Canadian licensees to obtain authority from district radio offices to continue mobile operations for periods beyond one month and which limited operations to four months in any fiscal year, have now been removed entirely.

Official Bulletin Nr 360, Aug 22nd, 1952. Operating provisions under the new reciprocal operating treaty between the U.S. and Canada are reported in detail in September QST. The F.C.C. on August 21st announced an amendment of its amateur rules to make exception with regard to Canada of that restriction which limits all operation by U.S. amateurs outside the continental limits of the United States to the 28 to 29.7 Mc Band. The F.C.C. amendment to its regulations now permits U.S. amateurs who have requested the reciprocal privileges, of the Canadian government and received the proper permit, to use all customary amateur frequency bands permitted Canadian amateurs, while operating in Canada.

Official Bulletin Nr 361, Aug 29th, 1952. A.R.R.L. invites application for an Official Observer appointment. League members residing in any U.S. or Canadian sectionare now eligible. The various classes of Observer appointment include categories for phone and CW checking which require only receiving equipment and individual skill, Especially needed are new Observers who can assist the program of identifying any stations of other services that get in our bands, so the League can help keep these clear. All interested amateurs are requested to write A.R.R.L. H Q for application blanks, a sample Bulletin and full information on how to qualify for this valuable type of appointment.

Official Bulletin Nr 363, Sept 11th, 1952. The first two meter DXbeyond one thousand miles to be reported in 1952 was worked during the night of Sept. 8th and the following day. Complete details are not yet available and participants are urgently requested to report their work to A.R.R.L. so that full details can be shown in QST. Best DX so far reported is W1RFU working WØEMS, Iowa, for nearly 1200 miles. Several other records for 220 and 435 mc were set that same night. You could make history on VHF

Skywire

ESICO

ORANGE LABEL LINE

HIGH GRADE

Electric Soldering Irons

No. 61
25 watt
Tip ⅛" dia.

No. 62
60 watt
Tip ¼" dia.

No. 63
100 watt
Tip ⅜" dia.

No. 64
130 watt
Tip ½" dia.

No. 65
200 watt
Tip ⅝" dia.

No. 67
300 watt
Tip ¾" dia.

No. 69
500 watt
Tip 1⅛" dia.

SEE THEM AT YOUR SUPPLY HOUSE

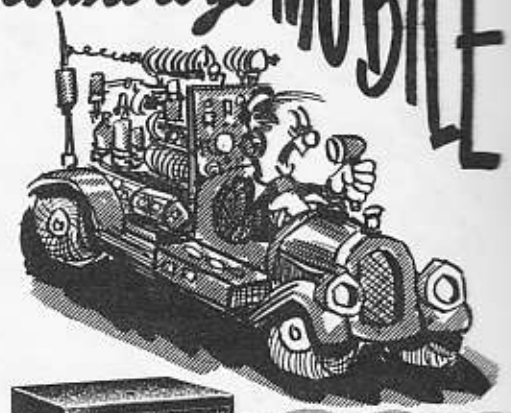
Represented in Canada by

CANADIAN MARCONI COMPANY

861 BAY STREET, TORONTO, ONTARIO

VANCOUVER WINNIPEG MONTREAL HALIFAX ST. JOHN'S NFLD.

Want to go MOBILE



GET YOURSELF A Harvey-WELLS BANDMASTER

40 TO 50 WATTS

THE WORLD'S MOST VERSATILE X'MTR FOR MOBILE OR FIXED OPERATION, NOVICE OR EXPERT

BANDMASTER SENIOR . . .

A complete ready-to-go phone transmitter including new crystal-oscillator — vfo switching circuit — Phone or CW — 100% break-in-operation — Eight bands: 80, 40, 20, 15, 11, 10, 6 and 2 meters — No plug-in coils — completely wired and tested. Tubes: 6AQ5 Crystal Osc., 6AQ5 Buffer Mult., 807 Final, 2-6L6 class B Modulators. Sturdy Steel Cabinet 12" x 8" x 8". **$169.50**

BANDMASTER DELUXE . . .

The last word in a versatile small transmitter for amateur, civilian defense and commercial use. Has built-in three tube preamplifier for use with crystal mike PLUS all the features of the Bandmaster Sr. **$209.50**

SEE IT AT YOUR LOCAL JOBBERS

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CANADIAN MARCONI COMPANY

861 BAY STREET, TORONTO, ONTARIO

VANCOUVER WINNIPEG MONTREAL HALIFAX ST. JOHN'S NFLD.

If the Sound is Audible — RCA Can Record It!

Birds, Beetles, Bells and Babies are on the Long List of Custom Record Performers.

By James P. Davis, Manager
Custom Record Sales Division
RCA Victor Record Department

WHETHER it be a recording of the voice of the historic Liberty Bell or the gentle sound of a fly walking across the ceiling, General MacArthur's impressive address to Congress or the mating call of the Canadian moose that is needed, the RCA Victor Custom Record Division can fill the order.

These are only a few of the thousand-odd assignments that are completed each year in RCA's studios in New York, Chicago and Hollywood. During 1950, the Custom Record Division alone made nearly 10 million transcriptions and recordings to meet the unusual requirements of phonograph and transcription producers, individuals, manufacturers, radio stations and promotional campaigns. Virtually every sound capable of being recorded has been put on discs of varying speeds, ranging in size from a 6½-inch "Spinner" to a 16-inch transcription.

For education and for fun, in sales campaigns and medical research, custom-made records have become increasingly important. They can help your canary sing, announce the birth of your baby, or tell the world about your better mouse trap. There is no known instance of a bashful swain proposing by disc, but if any such reluctant Romeo does get the idea, Custom Sales will send him away happy, though not with any guarantee of success.

One man in Connecticut was annoyed by a flock of starlings that developed a fondness for the area under the eaves of his house. All else failing, the harassed homeowner hit on the idea of recording the hostile hoots of an owl. Presto! the birds took off for parts unknown. Now, whenever a new family of starlings stakes out a claim under the eaves, out comes the RCA record. It never fails to send the intruders packing.

Out in Hollywood, where the bizarre is commonplace, a famous cinema star had RCA record a dog barking furiously. Whenever she hears a Beverly Hills tomcat meandering on her estate, she plays the record and "Tom" heads for a quieter and safer haven.

Animal sounds are reproduced for a wide variety of reasons. Duck calls were once very popular with hunters, but a recent regulation bans their use. Owners of reluctant canaries have found that their pets are put in a singing mood when they hear recordings of their feathered friends trilling happily.

The Chicago studio filled one unusual order, evidently from a retired fox hunter, for the baying of hounds to harp accompaniment. On the reverse side of the same disc were the frenzied sounds of the hounds chasing and cornering the fox.

A wide range of activity in the audio-visual education field is covered by RCA's custom-made transcriptions. Practically every subject and hobby from music, language-study and stenography, to hygiene records for school health programs, has been put on discs.

The wife of an internationally-known opera star was virtually cured of an almost total deafness in one

A telephone booth provides the minimum atmospheric noise for recording the delicate sounds of beetles chewing leaves.

ear by the use of recorded warble frequencies, ranging from the growl of 50 cycles to the shrill whine of 10,000 cycles. The Veteran's Administration also has been very successful with these discs, using them to correct hearing deficiencies which may occur at different points of the audible spectrum.

A group of doctors recently ordered a series of records featuring the sounds of various normal and abnormal heartbeats. The recordings were made for the benefit of general practitioners in outlying sections to help them diagnose heart ailments. Similar discs have been used by the American Heart Association, and in school health programs.

Custom records have become valuable aids in the instruction and entertainment of the blind. The Library of Congress maintains a circulating library of records on which complete stories have been recorded for blind persons. The New York Guild for the Jewish Blind had a series of albums made, accompanied by braille directions, which aided sightless people in learning to play simple musical instruments.

RCA recordings of the languages and musical culture of the Eskimos, Mayan and American Indians, African natives, and many other colorful foreign peoples are in constant use by lecturers, schools and museums. The Library of Congress maintains a special section of such unusual and valuable recorded material.

The resounding tones of the world's most famous carillons and church bells have been recorded for posterity, just as such important contemporary events as the speech to Congress by General of the Army Douglas MacArthur. Disc reproductions of the bells of St. Peter's in Rome, the carillon at Copenhagen, the famous chimes of Big Ben and of French cathedrals have been purchased by numerous churches for playback through their own belfry public address systems. These records are also used as sound effects by broadcasting stations.

Several branches of the armed forces employ RCA records as an integral part of indoctrination and training programs. The U. S. Air Force ordered reproductions of aircraft sounds for use in identifying the many types of combat and transport planes, and for the scientific study of motors and plane vibrations.

Similar work has been done for the Navy Department, including a series of records entitled "Sounds of Battle" for indoctrination of personnel. Another group of technical transcriptions had to be recorded under water and in submarines. These discs were cued to tell what each sound was. For example: "This is a heavy cruiser passing overhead from 500-foot depth", or "This is three PT boats at vector 270 travelling at 40 knots."

The Chicago studio filled one unusual order for a customer with an enterprising commercial scheme. Wall plaques were made from plain records moulded into the shape of a scalloped dish, the center of which was decorated with leaves, fruit, etc.

Most intriguing of all the unique "stars" of RCA custom records were the Japanese beetles that obligingly nibbled on leaves while the microphone caught every faint crunch. This order came from the DuPont Company's advertising department for use in an entomology lecture. Another RCA client in Chicago had records made on "Teaching Parakeets to Talk." Only slightly less bizarre was the assignment to record the sound of flies walking across a wall. This was accomplished by putting the insects into a cardboard box located on top of a microphone.

Aside from the spectacular and unique orders filled each year, a sizable portion of RCA's custom-record business is comprised of electrical transcriptions for radio stations, program producers and advertising agencies, as well as sound tracks for slide films. In addition, commercial phonograph discs are produced for over 100 small, independent companies which don't have their own recording facilities.

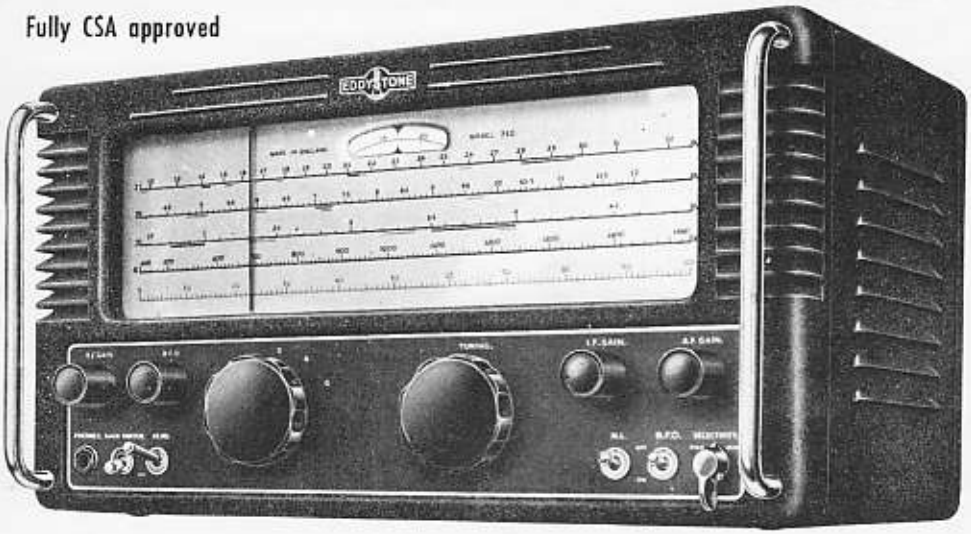
Skywire

NOW IS THE TIME

Yep, time to get ready for fall DX .. EDDYSTONE 750

WORLDS FINEST COMMUNICATIONS RECEIVER

Fully CSA approved



"Puts Perfection into Performance"

Write today for an illustrated brochure giving many more important reasons why you'll be glad you waited for the Eddystone 750. Hear it and see it—the most beautiful communications receiver built—before buying any.

ASTRAL ELECTRIC COMPANY

CANADIAN DISTRIBUTOR

44 DANFORTH ROAD TORONTO, ONTARIO

Four huge vans comprise the modern "TV station on wheels" developed by RCA for the U. S. Army Signal Corps.

"TV Station on Wheels" for Army

THE most complete television station ever mounted on wheels has been constructed for the U. S. Army Signal Corps by engineers of the Radio Corporation of America, and delivered recently to the Signal Corps' Fort Monmouth, N. J., Laboratories.

The mobile television caravan, which was built in close cooperation with Signal Corps engineers, consists of four special 10-ton trucks, each 31 feet long. Two of the trucks are fitted with a complete line of TV transmitting and monitoring equipment, three TV field cameras, ten receivers, a large-screen TV projector which will show life-size pictures, and a radio intercommunication system. The other two trucks contain power supply generators.

The caravan will be used to explore the feasibility of television for field instruction, and to develop instructional techniques via TV. The equipment may prove extremely valuable in televising intricate field exercises and "piping" the picture to expert observers, maneuver umpires, or to classrooms.

Programs picked up in the field, will be "piped" to military classrooms, or to a broadcasting station, by microwave radio link or coaxial cable. If they go to a broadcast station, the programs will then be transmitted in the usual manner; if they are conveyed to classrooms, the programs will be carried to a mobile display unit equipped with both direct-view and projection-type television receivers.

The first vehicle in the television fleet is equipped with three complete TV field camera chains, a microwave transmitter for video signals, and a 46-watt FM transmitter for transmitting sound signals. Associated monitoring and switching control equipment is utilized in accordance with standard TV broadcast practice. Four microphone inputs, and tape and disc recording equipment — all with latest amplifying units — are among the audio facilities. The unit also houses a separate monitor-announce position, and an order-wire radio communication system, utilizing an RCA 15-watt Carfone two-way mobile installation.

The custom-built body of the vehicle houses a complete transmitting studio, which is equipped with a specially-constructed operating desk for portable monitoring, control and power supply units used with the TV field cameras. All equipment is shock-mounted to guard against damage, including lockers provided for transporting the cameras, tripods, cables, and transmitting units. The operating desk is mounted in the rear of the unit, facing large shatterproof glass windows which give a clear view of pick-up activities outside.

The roof of the truck is reinforced to support the weight of both equipment and operators when they

CLAROSTAT MFG. CO., INC.

the House of Resistors

GREENOHM JR. POWER RESISTORS (Series GJ)

C7GJ, 7-watt, 0.5 to 5,000 ohms.
C4GJ, 4-watt, 0.5 to 1,000 ohms.
Standard resistance tolerance ± 10%.
Breakdown voltage between surface and resistance element, > 2500 volts A.C.
Ceramic tube casing. Inorganic materials throughout. Pigtail terminals, standard.

Engineering Bulletin No. 110

WIRE-WOUND CONTROLS (Series 43)

1-1/8 DIA.

Linear, 1 to 10,000 ohms.
Tapered, submit your requirements.
Rated at 2 watts, for linear units.
Mechanical rotation 300°. Electrical 280° without switch; 260° with switch.

Engineering Bulletin No. 116

GREENOHM POWER RESISTORS

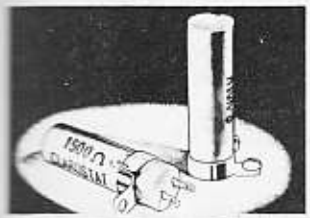
Fixed, 4 to 200 watts; adjustables, 10 to 200 watts.
10% plus/minus; 1%, special.
Intermediate taps, special.
Widest choice of mountings and terminals.
Non-inductive units made to specifications.

Engineering Bulletin No. 113

WIRE-WOUND CONTROLS (Series 58)

Linear, 1 to 50,000 ohms.
Tapered, 5 to 25,000 ohms.
Non-inductive 1 to 12,000 ohms, linear only.
Linear, 3 watts.
Mechanical rotation 300°. Electrical 280° without switch; 260° with switch.

Engineering Bulletin No. 118



"STANDEE" RESISTOR (Series KS)

ABOVE-CHASSIS-MOUNTED

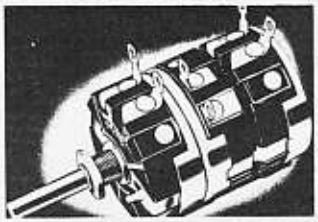
Rated, 10 to 25 watts.
Resistance range, 0.25 ohms to 15,000 ohms.
Taps can be furnished on special order.
Resistors are so designed to be above-chassis mounted for heat dissipation.

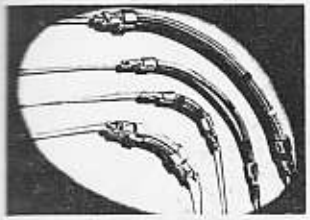
Engineering Bulletin No. 146

CONSTANT-IMPEDANCE PADS (Series CIT-58)

Continuous range Zero to 30 db.
Approximate attenuation in 90° rotation, infinite attenuation last 10°.
6 to 2,000 ohm values. Below 6 and above 2,000, up to 10,000 ohms, special.
2.5 watts continuous D.C. rating.
Series CIB rated at 10 watts.
"L"-Pads, Bridged "T"-Pads, Bridged "H"-Pads available.

Engineering Bulletin No. 102, and Bulletin No. 111





GLASOHM FLEXIBLE RESISTORS (Series FXG and FYG)

Used as resistors and also as miniature heating elements.
Ratings per winding inch: FXG, 1-watt; FYG, 2-watt.
Clinch-grip ferrule ends with bare pigtail terminals. Other terminals, special.

Engineering Bulletin No. 105

COMPOSITION-ELEMENT CONTROLS (Series 47)

15/16 DIA.

Linear and tapered, 1,000 ohms to 5 megohms.
Rated at 0.25 watt for linear units. Standard taps at 30% or 70% of effective rotation.
300° rotation without switch; 330° with.

Engineering Bulletin No. 117

POWER RHEOSTATS (Series PW-25 & PW-50)

Full power rating even at fractional settings.
25-watt, ½ to 2,500 ohms; 50-watt, ½ to 5,000 ohms. Linear and tapered.
Tandem units available.
PW-25G and PW-50G approved under AN-R-14a specifications.

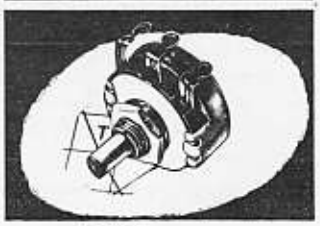
Engineering Bulletin No. 115

COMPOSITION-ELEMENT CONTROLS (Series 37)

1-1/8 DIA.

Linear and tapered, 1,000 ohms to 5 megohms.
Rated at 0.5 watt for linear units. Standard taps at 37½, 50 and 62½% of effective rotation.
300° rotation without switch; 330° with.

Engineering Bulletin No. 112



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Represented in Canada by

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ESTABLISHED 1903

861 BAY STREET, TORONTO, ONTARIO

VANCOUVER WINNIPEG MONTREAL HALIFAX ST. JOHN'S NFLD.

CLAROSTAT

wish to use it as a vantage point for cameras or the relay transmitter. A ladder with hand railing is provided for access to the roof through a self-locking waterproof hatch. Provision has been made for roof-mounting the four-foot parabolic antenna of the relay transmitter as well as whip antennas for the FM audio transmitter and intercom radio system.

The second mobile unit contains the transmitter power supply equipment, which consists of two powerful gas driven generating units. One of the generators is designated for standby use, or to supply power to special lighting equipment for illuminating the scene to be televised. By means of a special switch, the truck batteries are able to supply power to the two-way radio communication system when the caravan is in motion and the generators are not in use.

A receiver-display unit forms the third coach in the caravan. In addition to housing the FM and microwave receiving equipment, it contains ten 16-inch picture monitors, a 16mm TV projector and film camera, slide projector, a large-screen television projector, and a video switching panel for selecting any of several TV signal sources.

The self-contained power supply for the receiver-display coach is housed in the fourth truck. It is similar to the transmitting power supply unit, except that it contains only one generator.

The entire caravan has been carefully built and styled to Signal Corps specifications. Every vehicle is equipped with necessary test equipment and spare parts. Each of the coaches bears the Signal Corps insignia and is painted in traditional Army olive drab, with attractive aluminum strip. The units are completely weatherproofed, with cooling and heating units to condition the interior for all-weather operation.

21-inch Kinescope Uses Full Screen Area

THE television industry's largest metal, rectangular picture tube, a 21-inch kinescope, has been announced by the RCA Tube Department. The new kinescope employs the metal-shell construction, first introduced by RCA over two years ago as a major innovation in the 16-inch round metal tube.

The new kinescope utilizes the full screen area, producing a picture 18⅜ inches wide by 13-15/16 inches high, with slightly curved sides and rounded corners. Providing pictures with high brightness and good uniformity of focus over the entire picture area, the tube has a white fluorescent screen on a relatively flat face made of frosted Filterglass, which minimizes reflection of bright objects in the room and increases picture contrast.

Conforming to proportions of the transmitted picture, the tube's rectangular shape avoids waste of screen area. This permits the use of a cabinet having about 20 per cent less height than is required for a round-face tube providing pictures of the same width. In addition, the chassis need not be depressed or cut out under the face of the tube, and controls can be located as desired beneath the tube.

Employing magnetic focus and magnetic deflection, the new kinescope is designed with a funnel-to-neck section which facilitates centering of the yoke on the neck. This feature, in combination with improved centering of the beam inside the neck, contributes to the tube's good uniformity of focus.

Other features incorporated in the new 21-inch picture tube are short over-all length, substantially lower weight than that of a similar all-glass tube, a higher-quality faceplate than is commonly used in all-glass tubes, and an ion-trap gun requiring only a single-field, external magnet.

This 21-inch kinescope, developed by the RCA Tube Department, is the industry's largest metal rectangular picture tube.

DO NOTHING TILL YOU HEAR FROM US !

OUR NEW CATALOGUE HAS JUST GONE TO PRESS. MAILING WILL COMMENCE TOWARDS THE END OF SEPTEMBER.

IF YOUR NAME IS LISTED IN THE LATEST AMATEUR CALL BOOK, YOU'LL RECEIVE A COPY AUTOMATICALLY.

IF YOU HAVE RECEIVED OUR PREVIOUS CATALOGUE, YOU WILL RECEIVE A COPY AUTOMATICALLY

SO HOLD EVERYTHING, IT WON'T BE LONG NOW!

P.S. LIMITED QUANTITIES OF :

Utah complete recording mechanism ---------- $38.50
Utah 6 tube amplifier 100V/60cy for above ----- $18.95
Crystal microphone---------- $9.75
Utah cabinet for complete tape recorder ------- $9.75
(See May issue Skywire for details)

PARTS FOR AMATEURS AND SERVICEMEN

The RADIO CENTRE 72 CRAIG ST. WEST, MONTREAL

HUNTS Twist Prong or Screw Base Electrolytics

FOR EVERY REPLACEMENT

T.K Max. Temperature 71°C.

150v. working 200v. surge

Catalogue No.	Cap. µf.	D.C. Wkg. Volts.	Dimensions D.	L.
TK 20+20/150	20+20	150	1	2
TK 40+40/150	40+40	150	1	2½
TK 40+40/25 150/25	40+40/+25	150/25	1	2½
TK 50+50/25 150/25	50+50/+25	150/25	1	2½

450v. working 525v. surge

Catalogue No.	Cap. µf.	D.C. Wkg. Volts.	Dimensions D.	L.
TK 16/450	16	450	1	2
TK 20/450	20	450	1	2
TK 40/450	40	450	1	3
TK 10+10/450	10+10	450	1	2
TK 10+10+10/450	10+10+10	450	1	2½
TK 20+20/450	20+20	450	1	3
TK 40+40/450	40+40	450	1¼	3½
TK 10+10/25 450/25	10+10/+25	450/25	1	2½
TK 20+20/25 450/25	20+20/+25	450/25	1	3
TK 20+20+20/20 450/25	20+20+20/+20	450/25	1¼	3½

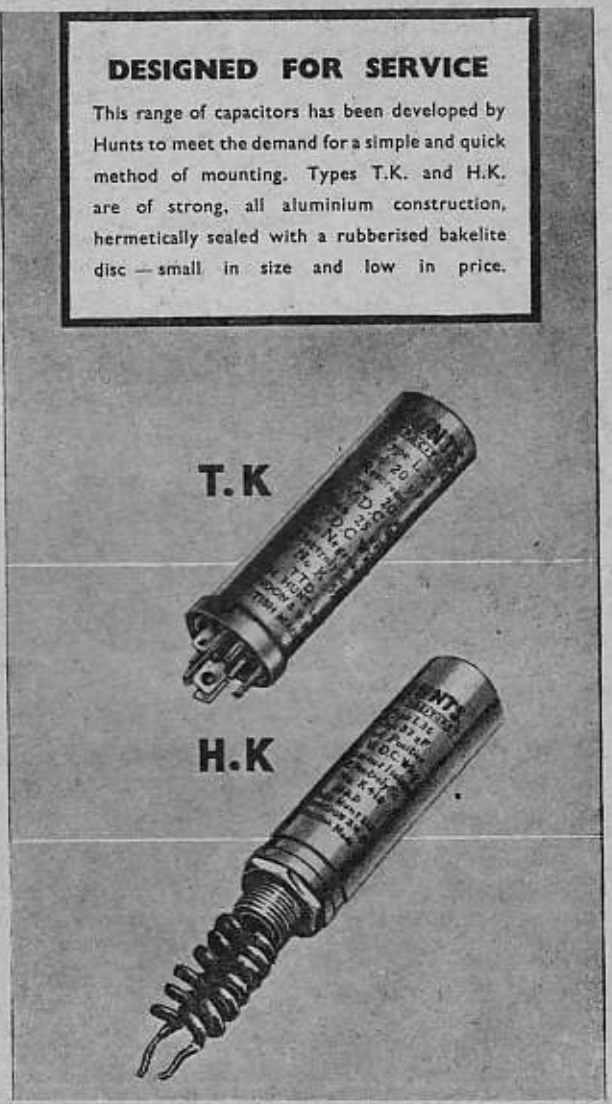
H.K Max. Temperature 71°C.

450v. working 525v. surge

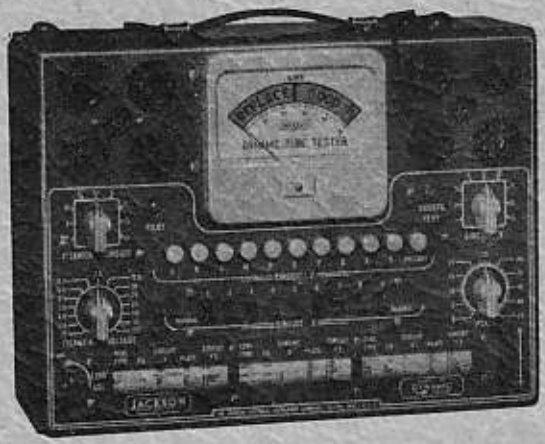
Catalogue No.	Cap. µf.	Dimensions D.	L.
HK 8/450	8	1	3½
HK 16/450	16	1	3½
HK 24/450	24	1	3½
HK 32/450	32	1¼	3½
HK 8+8/450	8+8	1	3½
HK 24+24/450	24+24	1¼	3½

DESIGNED FOR SERVICE

This range of capacitors has been developed by Hunts to meet the demand for a simple and quick method of mounting. Types T.K. and H.K. are of strong, all aluminium construction, hermetically sealed with a rubberised bakelite disc — small in size and low in price.



only $109.50 for this "Challenger" tube tester by



JACKSON

Here is a fine instrument you can always depend upon for engineering service or laboratory use.

■ As the name implies, we ask you to compare our "Challenger" instruments with any and all others at anywhere near the price.

In the Model 115 "Challenger" Tube Tester, the famous Jackson *Dynamic*® test principle is employed. Separate voltages are applied to each tube element. Tests can be made under actual use conditions.

A feature of this instrument is the high voltage power supply. It affords more accurate results because of high plate voltages—over 200 v. for some types of tubes.

Spare socket positions are provided for future use, thus avoiding obsolescence. Push-button and selector switch controls simplify operation. The 4-inch-square meter is easy to read. The instrument gives complete short tests. It is applicable to over 700 types of tubes including TV amplifiers and rectifiers. The built-in roll chart is frequently revised to provide data on new tubes. This service is free for one year.

Finish is attractive Challenger Green with harmonizing knobs, meter cover, and push-buttons. Size, as of all "Challenger" instruments, is 13" x 9½" x 5½". Weight, 11 lbs.

Each of these "Challenger" instruments

$95.65

Condenser Tester Model 112

Push-button controlled. Provides quick positive range selection for capacity and leakage tests. Shows up all types of faulty condensers, using a new method for detecting leakage. No need to count flashes on the electron ray tube indicator! Test voltages from 20 v. to 500 v. in six steps. Glass-enclosed dial with Jackson "Scale Expander" pointer which doubles effective scale length. Power factor measured on Direct Reading Scale calibrated from 0 to 60%. Ranges from .00001 to 1000 mfd in four steps.

Test Oscillator Model 106

Here's a "Challenger" instrument for testing AM and FM radios. It is also used as an auxiliary TV marker generator. Range of fundamental frequencies is 100 kc to 54 mc . . . Harmonics calibrated 54 mc to 216 mc. Two-circuit attenuator controls signal strength. 400 cycle audio modulation, or may be used for straight RF unmodulated signal. Accuracy is ½ of 1% in all ranges. Same finish and dimensions as other "Challenger" instruments. Compare this instrument with any low-priced signal generator or with any so-called kit.

"Service Engineered" Test Equipment

AT YOUR LOCAL JOBBERS

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Ask your Jackson Distributor or write for free bulletin.

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Truly another "Service Engineered" electronic instrument.