

SKYWIRE

THE CANADIAN RADIO AMATEURS' JOURNAL



OCTOBER 1952

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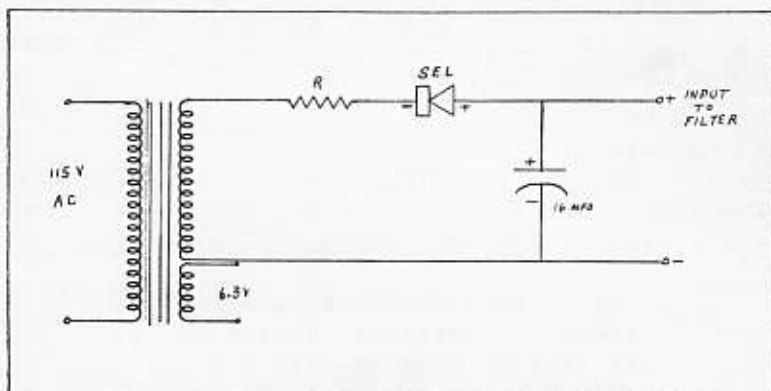
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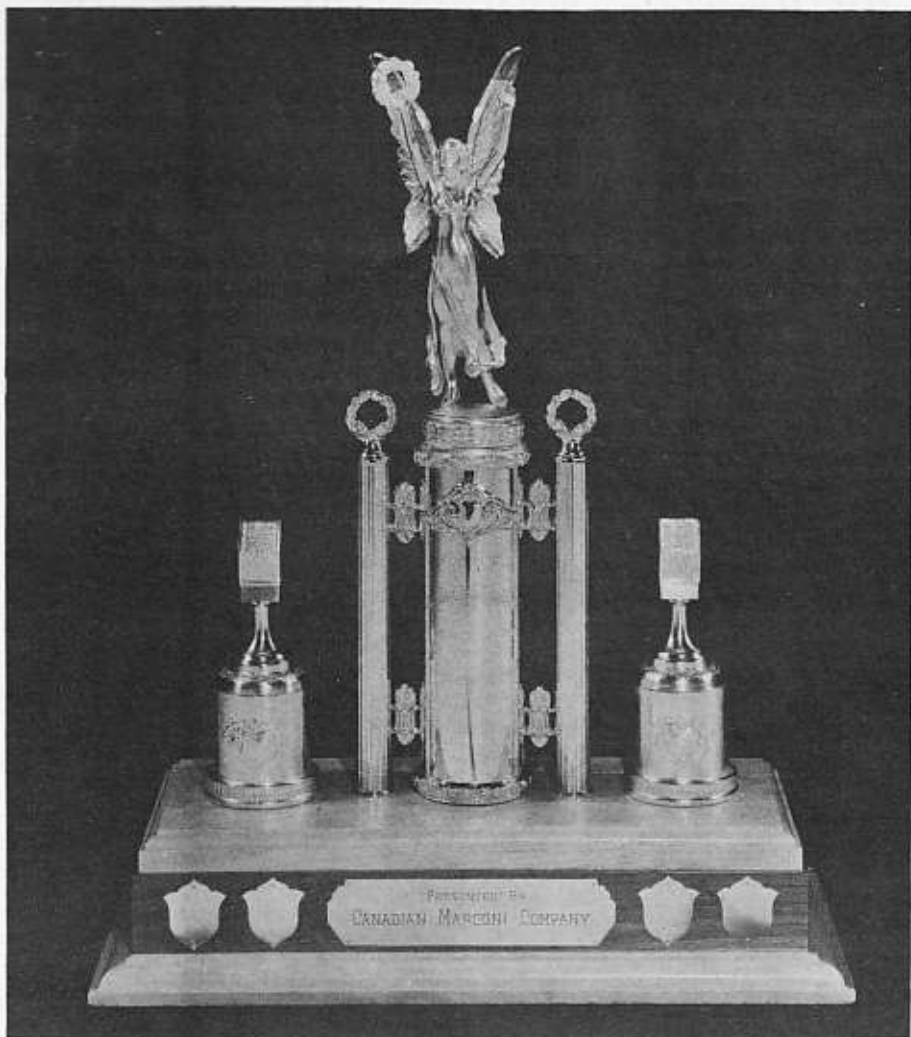


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SIDEBANDS



The above photograph is of the new Field Day Trophy which is being awarded for the first time this year, by the Canadian Marconi Company, to the Hamilton Amateur Radio Club as the winner for 1952. It's a beautiful cup, well worth the effort it takes to bring it home and a great target to shoot at for next year. YOUR club could win it for 1953!

Getting Bias for

AUTOMATIC MODULATION CONTROL

A simplified scheme of getting bias for a.m.c., automatic modulation control, is shown in the circuit diagram. The previous method has been to have about 100 volts bias in the plate circuit instead of the cathode of the diode rectifier. When the bias voltage is in the plate circuit, the speech-amplifier tube under control has had its cathode and grid circuits returned to a point about 100 volts from ground potential. This condition with a 6L7 may often result in hum difficulties, particularly if the input grid circuit is fed from a crystal microphone. The new circuit puts the 6L7 input circuit at ground potential. Another advantage is that this a.m.c. circuit can be applied to nearly any existing speech amplifier very easily.

A.m.c. is a system whereby a diode rectifier tube delivers automatic volume control voltage back to a tube in the speech amplifier in order to reduce or eliminate overmodulation. A diode such as an 879 or 866 has its filament or cathode center tap connected to the "hot end" of the modulation output transformer which feeds into a class-C r.f. amplifier. The diode plate connects through an RC filter into the suppressor or injection grid of a low-level speech amplifier tube. No current flows through the diode at any time unless the cathode becomes more negative than the plate. This can occur only when the negative peaks of audio exceed the positive d.c. plate voltage. If this occurs, the class-C stage is overmodulated since for 100% modulation the negative audio voltage peaks should just equal the plus d.c. voltage.

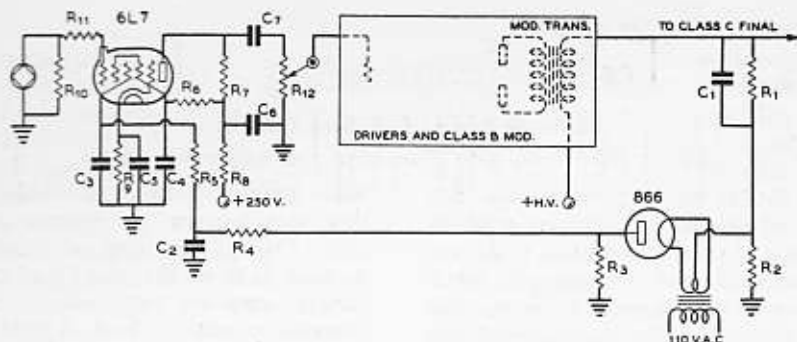
Whenever the diode cathode becomes more negative than its plate, current will flow through the plate resistor to ground. The negative voltage produced across this diode plate resistor can be applied through an RC filter to a grid circuit in the speech amplifier. Increasing the negative bias on any grid circuit will reduce the gain or amplification of that stage. The RC filter prevents audio feedback into the speech amplifier but allows a slowly varying envelope of the overload audio peak to bias the speech amplifier an amount depending upon the amplitude of overload.

In actual practice, the diode must have some positive bias at all times in order to have it begin to rectify negative audio peaks which exceed 90 to 95% modulation. By doing so, the gain of the speech amplifier will automatically be reduced fast enough, in spite of the necessary RC filter, so that modulation appreciably greater than 100% will be prevented. If the d.c. plate supply is 1000 volts, this "advance" bias should be 50 to 100 volts, in other words from 5% to 10% of the d.c. plate supply.

In the circuit diagram, this "advance" bias is obtained by means of a voltage divider consisting of a 50,000-ohm and a 500,000-ohm resistor which reduces the d.c. plate voltage applied to the diode cathode about 9%. This acts as the "advance" bias. The resistor R_1 can be of the 1-watt size for plate supplies up to 1000 volts and a 2-watt for up to 2000 volts. The 500,000-ohm resistor can be made of ten similar carbon resistors wired in series and well insulated from the chassis. C_1 , R_1 and R_2 can be mounted on bakelite resistor mounting strips or panels about one inch away from the chassis with the strip mounted on stand-off insulators. The diode filament transformer must also be well insulated between windings in order to withstand the peaks in the positive direction. The diode itself must have sufficient inverse peak rating, which means that an 866 jr. is suitable for use in sets with plate supplies up to 1000 volts, an 866 up to 2000 or 2500 volts and an 879 for higher plate supplies. Mercury vapor in the rectifiers seems to make no difference in operation at the low currents used in a.m.c. circuits.

The purpose of C_1 in the circuit diagram is to by-pass the audio peak overload voltage into the diode cathode. The diode then has the full amount of a.c. peak across it and a little over 90% of the d.c. plate voltage. C_2 can be a one-half or one μ fd. 400- or 600-volt paper condenser as long as it is mounted well in the clear of nearby grounds.

The control bias is developed across R_2 which can be of any value between 100,000 and 250,000 ohms. No condenser should be connected across this resistor unless there is



Obtaining fixed bias for the a.m.c. rectifier.

C ₁ —0.5- μ fd. 600-volt tubular	C—0.5- μ fd. 400-volt tubular	R ₂ —100,000 ohms, 1 watt	R ₁ —30,000 ohms, 1 watt
C ₂ —0.1- μ fd. 400-volt tubular	C ₂ —0.02- μ fd. 400-volt tubular	R ₃ —500,000 ohms, 1/2 watt	R ₂ —1000 ohms, 1/2 watt
C ₃ , C ₄ —0.5- μ fd. 400-volt tubular	R ₁ —50,000 ohms, 2 to 20 watts (see text)	R ₄ —1.0 megohm, 1/2 watt	R ₃ —1.0 megohm, 1/2 watt
C ₅ —10- μ fd. 25-volt electrolytic shunted by .01- μ fd. 400-volt tubular	R ₂ —500,000 ohms, 10 watt)	R ₅ —250,000 ohms, 1 watt	R ₄ —25,000 ohms, 1/2 watt
		R ₆ —200,000 ohms, 1 watt	R ₅ —500,000-ohm potentiometer

some stray r.f. present. If there should be any it must be by-passed with a small .002- μ fd. condenser. The time delay circuit should be confined mainly to C₃ and R₄, which can have values of 0.5 μ fd. and 1 megohm in most speech transmitters. Additional audio filters in the form of C₂, 0.1 μ fd. and R₄, half megohm, is generally necessary to prevent audio feedback and a "blurring" effect on high levels of speech input. These resistors can be of one-half or one watt size.

It is possible to supply a.m.c. voltage to the control grid of an amplifier such as to a 6K7 or even a 6N7. The suppressor grid of a 6C6, 6J7 and 6K7, requires about twice as much negative bias for the same reduction in gain as does the injector grid of a 6L7. It is advisable to use a 6L7 whenever possible. However, this a.m.c. circuit can be applied to nearly any existing phone transmitter with hardly any changes in the speech amplifier.

A.m.c. practically eliminates sideband splatter in all cases and prevents modulation in excess of 100 per cent. In addition it allows an average higher level of modulation which results in better signal at the receiver. Two phone transmitters of the same carrier output, one with a.m.c. and one without, both not overmodulated, will have about a 2 to 3 db difference in level. The 3 db increase available from the use of a.m.c. is equivalent to doubling the carrier signal in effect.

Some amateurs after testing a.m.c. have complained that no better reports were received from dx contacts. This can generally be traced down to the fact that the operator at all times kept his modulation level even on peaks well below 100%, thus not really making use of the a.m.c.; the audio system of the transmitter lacked gain or power output; or the transmitter was normally operated at 150% to 200% modulation without a.m.c. A.m.c. is not a cure-all unless a little intelligence is applied to its use in a phone transmitter.

One other point should be mentioned; a.m.c. will handle only from 15 to 20 db excessive level peaks without considerable audio distortion. So don't try to push the average modulation level up to 99% at all times. Use the manual gain control, too, and keep the level of modulation down to a point where it sounds right in a monitor. An oscilloscope will usually indicate 100% modulation many times a minute on an average speech when the gain adjustment is correct for good monitor quality.

A.m.c. should also reduce b.c.l. difficulties or interference with other amateurs because it does, to all practical extent, eliminate sideband splatter wherever it was previously occasioned by overmodulation of a class-C amplifier.

Testing Transmitting Tubes

A simple means of checking a thoriated filament transmitting tube is described, reactivation data shown.

The testing of transmitting tubes is an entirely different and much more difficult

problem than the testing of receiving tubes. Receiving tubes in all normal everyday applications are seldom, if ever, called upon to deliver anywhere near their peak emission. If, on a static test, the tube can be made to deliver the normal plate current for the conditions of operation desired (i.e., at normal electrode potentials) in nearly every case the tube will be satisfactory for operation.

Transmitting tubes, however, in every class of operation except as class A amplifiers, are continually called upon to pass peak plate currents that may be as much as twenty times the average value as shown by a plate milliammeter. Especially is this true in a doubler stage or class C amplifier. Biased to 4, 5, and even ten times cutoff, with the grid driven far into the positive region, the plate current pulses are of very short duration and of extremely high value. This becomes obvious when you consider the fact that while the plate current may flow over only 1/50 to 1/20 of the cycle, still, integrated over a period of time, there is an average flow (as indicated by the meter) of the normal rated plate current for the tube. It is this peak emission capability of a tube that determines its usefulness as an amplifier in a transmitter.

To check the "peak emission" capability in a static test, it is necessary to exceed either the plate dissipation or grid current rating, which is most damaging to the tube if carried very far. A low-voltage high-current static test will not result in excessive plate dissipation, but it is impossible to get sufficient space current to flow to get any kind of peak-current check without putting such a high positive bias on the grid that the grid will be damaged from excessive grid current.

To measure the actual peak emission capability of a tube is a laboratory problem requiring an extremely expensive set-up of equipment. Due to this fact, the ham who desires to measure this emission capability of a tube must do so indirectly by properly measuring the results of this peak capability. This is the only

type of a test that will actually give an idea of the worth of the tube.

The difficulty with most of these methods of test is that they require comparison with a new tube. Perhaps the best of these comparison methods is to set the tube up as a conventional class C amplifier with normal excitation and electrode potentials. First, dip the amplifier to resonance. Then cut off the plate voltage and de-tune the plate tank as far as possible from the resonant setting. Apply the plate voltage for a very small period of time, just long enough to note how far the plate milliammeter swings. Quite a high scale on the meter will be required as the current will probably be two or three times the normal plate current rating for the tube. Then compare the readings obtained with the new tube (or one known to be perfect) and the doubtful one. If the readings compare within a reasonable amount (10 or 15%) and the current flow (out of resonance) is very much greater than the rated value for the tubes, in almost every case the tube under consideration will be found to be in good operating condition. However, be *very* careful and do not allow this high value of plate current to flow for more than a second or so. A perfectly good tube can be seriously damaged in this manner.

Good operating conditions for the tube test would be: 3 times cut-off or greater bias, normal grid current, and normal plate voltage. The plate current flow must be in very short pulses if a good check is to be obtained. The shorter the pulses the better the check will be. If a very low C tank is being used it may be difficult to obtain three times normal plate current when the tank is detuned. If this difficulty is encountered it may be advisable to short the plate tank out with a short piece of heavy wire. This ordinarily should enable a larger plate current flow to be obtained. If the tube shows satisfactory in the above test, the chances are very good that it will give satisfactory service. If it does *not* show up well, the following test should be made. Set the tube up as before and raise the filament voltage about 10% or 15% and check again. An increase in plate current should be

noted. Then allow the tube to stand for a few minutes and check again. If a further increase is noted, there is a possibility that the tube is satisfactory but that the filament has been temporarily damaged by improper operation. However, if a further increase is not noted after the wait of a few minutes, more than likely the tube is plain "tuckered out", and the tube's useful life as a thoriated filament device is ended.

If the tube is a large one, satisfactory operation for some period of time can be obtained if the filament voltage is raised (25 to 40%) until enough emission is obtained. The larger the increase above the normal filament voltage, the shorter will be the life of the tube as a tungsten filament device. In most cases, if this latter procedure is followed, the tube will be satisfactory only as a c.w. amplifier; the peak emission required for phone work will be lacking at rated plate input.

Reactivation

If, however, the emission seems to continue to increase on standing with raised filament voltage, there is a good possibility that the filament has been "poisoned" and can be brought back by proper treatment. The procedure for reactivation has been described many times before but is covered here once more. The procedure is simple enough:

Disconnect all plate and grid voltages and raise the filament voltage to about 20% above normal. Allow the filament to burn in this manner for a few minutes and then check the tube again in the test circuit. If an increase is noted, repeat the burning process time after time until further burning gives no apparent increase in emission. If continued burning seems to have no beneficial effects and the filament still will not emit properly, there is one last resort before the tube is discarded. The filament, with all other voltages disconnected as before, is "flashed" for 10 to 30 seconds at 50% above normal filament potential and "cooked" at 20% above, as described before, for 15 to 30 minutes. If this last procedure obtains no results, the tube is really defunct and had best reside the rest of its days in the junk box. One thing should be remembered, however; each test or operation should not be tried unless the one before has given negative results after repeated trying.

Lastly, it should be mentioned that unless there has been some indication of the tube's

demise, it is always a good idea to let well enough alone and wait until something leads you to suspect definitely the tube's ability to take care of the job wherein you are using it. One of the earliest indications of loss of emission is obtained when the tube is operating as a class C amplifier, and a pronounced falling off in grid current is noticed when the plate voltage is applied. A "fall-off" of from 10 to 30% in grid current is normally obtained on applying the plate voltage to a properly loaded amplifier. Anything much greater than this is abnormal and indicates some unfavorable condition and, while something besides the tube may be at fault, the tube should be checked. Another sign that may indicate "flattening out" of the tubes in a class B modulator is distortion or the inability to drive them up as far as was previously possible or as should be expected. While there are a dozen other things that may be at fault: improper driver, high resistance bias batteries, poor regulation in the plate supply, wrong load impedance, etc., in a case where trouble is being had and it is known that all these other things are right, it is then a good idea to look to the tubes.



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TRIBUTE TO A TRANSMITTER

Don't ask me how, but after working in a radio store as long as I have you can spot a b.c.l. from a ham without even talking to them. Maybe it's because the hams acquire such a dumb look. Or maybe because the b.c.l.'s look still dumber; I dunno.

Eddie and Bill were busy waiting on customers and I was arguing with a fellow who had brought in an ancient bottle for replacement. I had just about convinced my protagonist that we couldn't do anything for him on his "defective" tube when this bird walks in. He hadn't been in the store two minutes before I could tell that he wasn't a ham. And when I got around to waiting on him I had a feeling I had seen him some place before.

"I'm interested in getting a transmitter on the air," he explained. "If the stuff doesn't come to too much money I'd like to get a 100-watt transmitter going—both c.w. and phone."

"Surely," I replied, wondering if I'd been mistaken in my guess that he wasn't a ham. Sometimes, when they just have received their ticket, I get fooled. I hauled down a handbook and some manuals put out by various manufacturers, still trying to place this fellow. "I imagine that you are interested in building one, rather than a factory built job?"

"Yes, I think I'd like to take a crack at building my own. I left the air in 1926 when I got married, and while I kept up on ham radio till 1928 by reading the mags, I haven't done a thing with it since. Or rather until a couple of months ago when we got a new radio with short-wave bands on it. After tuning around a few evenings and listening to the amateurs I got the bug again. So I brushed up on the laws and went down and took the exam. My code is still pretty good—it came right back to me after listening a couple of evenings on 40 meters—and I figured that Ohm's law is still Ohm's law. So I didn't bother to polish up either my code or theory."

I wondered what would have happened if back in 1927 or '28 a ham were handed a bunch of the questions that they throw at you today. This was worse; the fellow had to go back 12 years in his memory for what knowledge he did have. "I hope you pass all right," I offered in the most cheerful voice I could muster. I figured I'd better sell him all the stuff I could before he got notice of his failure to pass the exam.

"Oh, I passed all right. I got my ticket

today, W2XYZ. I figured I'd better wait till I got my ticket so I could get the 40% ham discount. I don't suppose I made 100%, but it was good enough to get by." Proudly he opened his billfold to show me his ticket. "They asked one question on carrier shift that I just had to leave out, but I didn't have much trouble with the rest of them."

I attempted to cover up my amazement with: "Well, that's fine, just fine. Now let's look at some of these transmitters described here and see which seems to be the one best suited to your needs. Here's a nifty little number using a pair of 809's in class B to modulate an 808. It's got a harmonic oscillator, inverse feedback, peak compression,—everything you could want in a rig. Luckily we have all the necessary parts for this job in stock." (That's why I showed it to him first.)

"Well, you see," he offered apologetically, "I sorta would rather build one that I can understand. I don't have much time to study, and I wouldn't be able to get that kind of a rig tuned up without someone to help me, even if I did manage to get the thing built properly by making a Chinese copy of the one shown. I thought I would build the one I drew for my examination. It doesn't use any of these new-fangled tubes or circuits but it must be okeh or I wouldn't have passed the exam. And then too I'd have an understanding of the thing."

Out of his pocket he fished a pencil diagram that obviously had been drawn on a street car or bus. Some of the resistors looked like coils and vice versa. But after studying it a minute I had a pretty good idea of the lineup. It was truly a noble rig: a 112-A crystal oscillator into a 45 buffer into a 210 doubler or buffer and a 203-A final, modulated class A by a pair of 845's in parallel which were driven by an impedance-coupled 210. The speech consisted of a double-button mike and a pair of 27's. The whole r.f. section was capacitively coupled, and the 210 and 203-A were neutralized by virtue of a tap placed about a quarter of the way up from one end of their plate coils.

No, there wasn't anything *wrong* with the rig. I'd like to have seen the expression on the face of the fellow who corrected the exam paper when he came to the diagram of that museum piece and tried to find something actually wrong with it.

As tactfully as possible I tried to show him

why he should build a more modern rig. I tried to explain the advantages of link coupling, split stator condensers, low-C tubes, class-B audio, peak compression, pentode crystal oscillators. I could see that my suggestions were falling on deaf ears. I thought maybe I could reach him through his pocketbook, not that I wouldn't just as soon sell him a more expensive article, but I figured that he had just about so much to spend and that we would get that and that that was that.

"Look, 845's cost \$10 each; 809's cost \$2.50 each. And a pair of 809's in class B will put out twice as much audio as a pair of paralleled 845's in class A." Certainly he couldn't ignore such a convincing argument as that.

"Only \$10 for an 845?" His face lit up. "Gee, that's swell. I can remember when those tubes cost real dough. That's just dandy. And I suppose 203-A's are cheaper now too."

I gave up, and decided to humor any whim he might have. "Yep, they are only 10 bucks now too."

"That's fine. Only 10 bucks! I paid over \$30 for the last one I bought, and it certainly wasn't built like these new ones you have here." He gazed fondly at a couple of graphite plate 203-A's in the display case.

"Of course I appreciate your efforts to help me," he went on. "But it's just that I'd have more confidence in this rig I've planned on. I guess this new stuff is all right if you have kept up on things and know what it's all about, though."

"When I sold my c.w. junk in '26 when I got married it was partly with the idea that when the honeymoon was over and we got settled around in a permanent location I'd build a better rig, one that would also work phone."

"But I guess you know how that is." He laughed. "I guess lots of other fellows have found that's not so easy to get on the air right after you're married. But during '27 and '28 I would spend odd moments studying the various mags and designing the transmitter that I wanted. The rig I evolved was the one I have drawn here, and I had my heart set on it to the extent that nothing less would do."

"Well, in '29 I lost everything but my shirt and couldn't have afforded even a 10-watt c.w. rig. So far as I was concerned ham radio was not for me. But now that I can afford it there's nothing against my getting interested again, and danged if I'm not going to have the exact rig I used to lie awake scheming about. I remember one night I didn't get to sleep till 2 a.m., trying to decide whether a single 212D modulator would be better

I was beginning to understand the fellow better. It didn't seem so crazy after all. And I figured the rig probably would work all right — after a fashion. I spent the rest of the afternoon picking out the necessary stuff for him to put his baby on 40-meter c.w. and 160-meter phone.

I stayed 10 minutes past closing time to get him every last thing he needed, except the copper tubing he insisted upon for the 40-meter tank coil.

After he left I locked up and walked down to the corner to catch an "R" car. My customer pulled up in his sedan to wait for the signal to change, and saw me waiting.

"Get in," he offered. "I live out near the end of the "R" line. I'll take you home." Thankful for the chance to ride home sitting down for a change, I hopped in.

"Where 'bouts do you live?" he inquired.

"Near Lincoln and 37th," I replied.

"Say, I *thought* I'd seen you some place," he exclaimed. "We live in the same neighborhood." Then I realized why his face had looked familiar.

When he let me out at my house I thanked him and offered to help him if he should run into any trouble with the rig. I figured that I was sticking my nose out for sure with the offer, but after all we had sold him nearly \$300 worth of parts, and besides I had come to like the fellow.

"Thanks," he offered, "I don't think I'll have any trouble. But I'd like to have you come over and see me some time anyway; I live up the street at 3859. My friends call me Speck."

About a week later Speck called me on the phone. "Aha," I thought, "I knew he would need some help with that antique nightmare." But it wasn't that kind of assistance he wanted; he needed someone to help him raise his poles.

I consented to give him a hand come Saturday morning, and when the time rolled around I was amazed to find stretched out in the lot next to his house two neatly painted sticks, one about 60 feet and the other around 80, with a trick arrangement of pulleys and tackle which he claimed would permit the two of us to "raise them in a jiffy."

Somewhat skeptical, I followed his directions, and darned if we didn't have the two poles up inside an hour. We could have had them up in even less time except for the presence of a fan counterpoise. (I guessed that's what it was by recalling illustrations I had seen in old books.) Stretching out over most of the lot, it hampered our operations

I wanted to stick around and help him haul up the four-wire flat top he had all rigged up in the back yard ready for raising, but his wife reminded him in no uncertain terms about then that it wouldn't be a good idea for him to forget that he had promised to take her over to visit her mother. So home I went to do a little more pruning on the element lengths of my new rotary.

Well, Speck finished the antenna job himself, and got the rig all finished and tuned up by himself, though I tried to convince him that he shouldn't put so much stock in the antenna ammeter that I tried to dissuade him from buying. But how can you argue with a guy that works more dx with 200 watts on 40 meters than I do with a rosy cheeked kilowatt on 20? He uses that flat top and fan counterpoise contraption on a harmonic on 40 and boy do the J's and PK's and such know when he is on the air!

On 160 the W6's all report him as having about the best east coast signal, and all accuse him of running more than the 150 watts he uses on phone. His quality is about the

crispest and his signal about the cleanest on the band. The highest form of compliment on your quality if you live around here is: "You really sound swell, o.m., almost as good as W2XYZ."

One ham who spent two years and close to \$1000 trying to get a high-powered 160-meter phone rig to sound right and get out the way it should threw the whole mess out and built an exact duplicate of W2XYZ's rig, right down to the last by-pass condenser, after listening to Speck's signal a few times and to some of the reports Speck got from California.

In fact, one of these days I'm going to put Speck's rig on 20 for him and see if it perks as well as it does on 40 and 160. If it does I'm going to build one too; Speck generously has offered to help me.

You see, I've lately been receiving some unappreciated compliments on my signals when I go up on 160. They tell me I sound almost as good as W2XYZ, and almost as loud, too.

The controlling factor in the quality
of your home music system . . .

R&A

What the Eye Doesn't See

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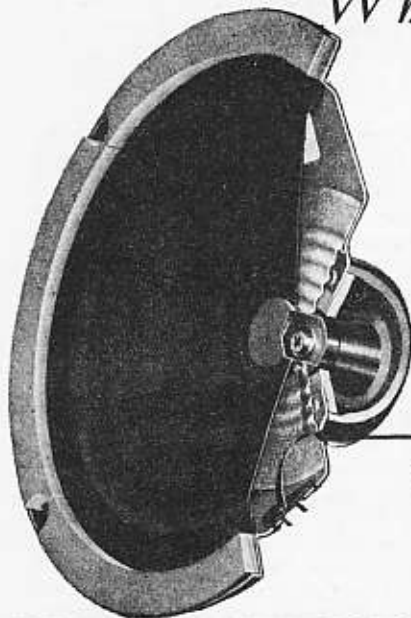
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Skywire



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 $.02 \mu\text{F}$ (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

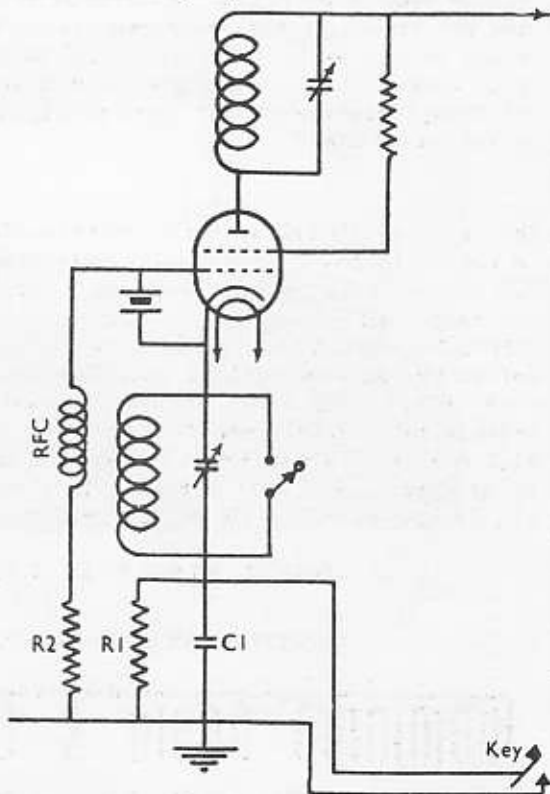
The DC in the valve must pass through R1, 10,000 ohms (or other as may be available). As is the case with a resistance in the cathode feed, there is a voltage drop negative at the earth end. This voltage appears on the grid, as bias, by way of R2 and the RFC.

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 $2\frac{1}{2}$ 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 $.02 \mu\text{F}$. It involves a small standing current on the valve to produce a self-biasing voltage.

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This set has 30 tubes in the chassis. It's one of the most advanced TV chassis in the world today. Originally, this model sold seven hundred dollars. Yessir 700bucks. Our agreement does not permit mention of the trade name - but there has only been one set on the market with a 23 inch picture - AND WITH A SQUARE CORNER PICTURE AREA. You'll know it the instant you see it - and you'll bust before you go home without one. Happily, it won't bust you to do so. These are rock bottom priced and the most sensational bargain you'll ever see in this television conscious world. Brand new, original makers packing - cabinetry that will make the Little Woman happy to spend for one - come in - write in - phone in or wire in for full details. They're going fast and if you want one, don't sit around thinking about it for a week, or you'll miss the boat this time.

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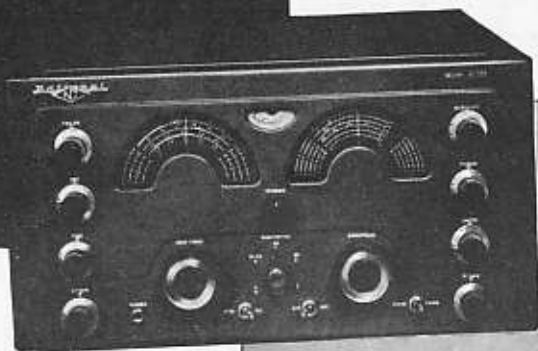
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LOCAL JOBBERS

TERRIFIC

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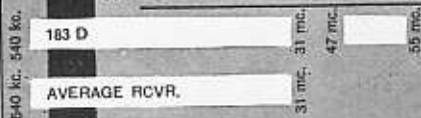


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National proudly announces a brand-new receiver — the NC-183D — every feature you want in a truly modern receiver! Dual conversion on the three highest ranges (including 6, 10, 15, 20 and 40 meter ham bands) no "birdies"! Steep-sided skirt selectivity with 3 I.F. stages (16 tuned circuits on the 3 high bands — 12 on all other bands, compared to 6 normally used) plus a new crystal filter. Approximately 1 microvolt sensitivity on 6 meters for a 10db signal-to-noise ratio! New, indirectly-lighted lucite dial scales! New miniature tubes for improved sensitivity! Bandspread on all bands, including new 15-meter band! New bi-metallic, temperature-compensated tuning condenser for drift-free operation! Plus all the time-tested features of the famous NC-183!

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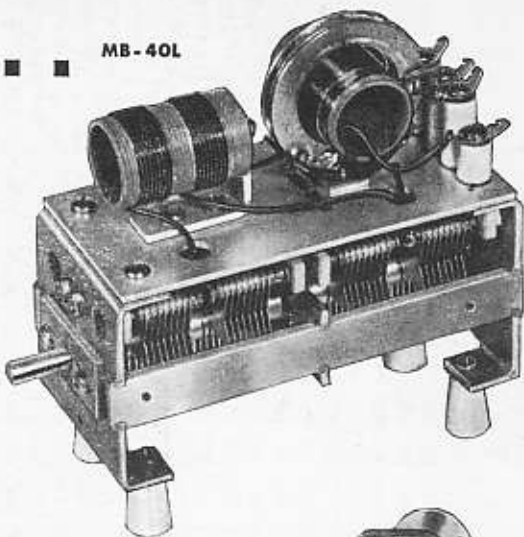
VANCOUVER WINNIPEG MONTREAL HALIFAX ST. JOHN'S NFLD.

START RIGHT. . .

MB-40L



The MB-40L may be used in the grid circuits of tubes employing the MB-150L in the plate circuit. Will handle 40 watts if link is kept loaded.



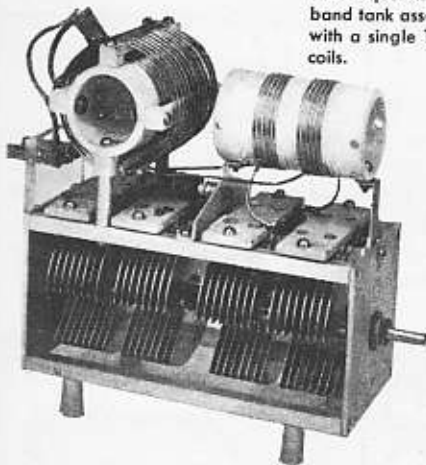
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MULTI-BAND TANK ASSEMBLIES

The unique MB-150 high-power and MB-40L low-power multi-band tank assemblies will tune all bands from 80 to 10 meters with a single 180° rotation of the capacitor without changing coils.



HRS-1



MB-150



The MB-150 is intended for use in plate tank circuits having an input up to 150 watts. It is ideal for a pair of 807's, 809's or a single 829 B.



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VANCOUVER WINNIPEG MONTREAL HALIFAX ST. JOHN'S Nfld.



DX PREDICTIONS

Prepared by: C.P. McKee, Engineering Division, CBC International Service

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!

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

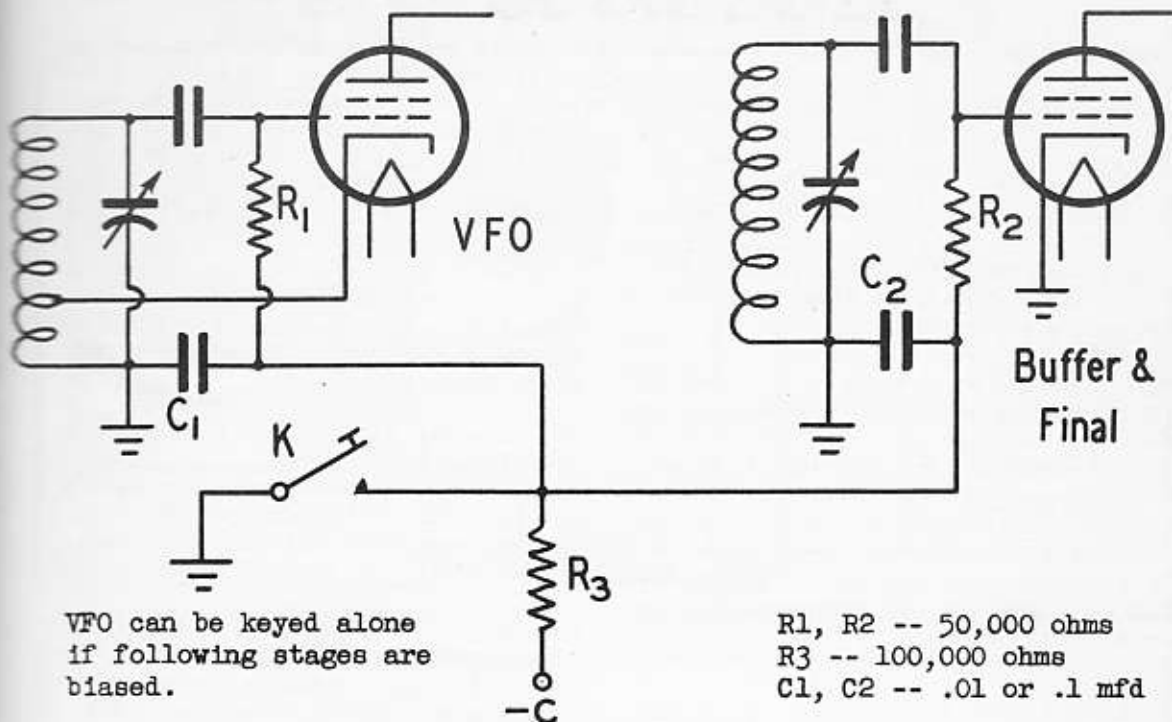
	00	02	04	06	08	10	12	14	16	18	20	22
Montreal to: EST	7	7	7	7	7	7	7	7	7	7	7	7
Europe	7	7	7	7	7	7	7	7	7	7	7	7
Africa	14	-	-	-	-	-	-	-	-	-	-	-
Caribbean	7	7	7	7	7	7	7	7	7	7	7	7
S. America	7	7	7	7	7	7	7	7	7	7	7	7
Australia	7	7	7	7	7	7	7	7	7	7	7	7
U.S. - West	14	7	7	7	7	7	7	7	7	7	7	7
U.S. - Central	7	7	7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

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

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

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

WHAT IS YOUR PROBLEM?



Believe it or not, a number of the boys have asked how to achieve successful keying of their mobile and portable rigs. We've actually seen one boy with a key strapped securely to the steering wheel post of his car. He uses it both for keying his horn and his rig. The simple circuit shown above is the one he uses, and is actually a modification of the ARRL Handbook blocked grid keying suggestion. It can be modified for most rigs and may be the answer to your problems.

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Milliammeters, Voltmeters, Tube Testers,

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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.

Presto Professional Recorder - 33 and 78 RPM with both inside-out and outside-in lead screws. This unit equipped with IC head recalibrated and adjusted by Presto and equipped with play back arm. No amplifier - \$350.00 complete. Has Audak playback pick-up and cutting microscope. This may be seen any day at 46 George Street in Toronto. All enquiries will be answered promptly.

TA-12-G Bendix transmitter, complete with power supply for it, delivering 600 volts, 250 mills, from 25 cycles. Almost new, and working now. Also Three Speed record player with own amplifier, Rack and Panel 5½ foot caster mounts with cabled plate switch etc. RA-10DB receiver, converted for six volt mobile complete with long cables. 75 meter mobile transmitter, 807, complete with aerial, 10 meter mobile transmitter, complete with generator. Xtal mike, new. RCA pre-amp, RCA - 1 KW modulation transformer. Plate transformer, 25 cycle primary and 2200 volts at 500 mills on the other side, 813 tube brand new. Six volt vibrator supply for receiver. See VE3BE, 480 Winderemere Avenue, Toronto or phone Junction 3787.

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 mills, 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.

For sale or exchange for receivers. Two Transceivers, SCR-522, new, complete with cables, remote unit, dynamotors, and crystals. Also one BC-375 transmitter, complete. Make an offer on the group. VE2BJ, 251 Fourth St. Quebec, PQ.

For Sale - Receiver, National Company type 2-40-D. Must sell. Moving to West coast. It's in top shape - what offers? John Pencer, VE5PS, Moosejaw, Sask.

Communications receiver, RME-84, like new - \$110.00. Also LM-8 Frequency meter - \$40.00. Have surplus spring wound cartridge type 16 mm movie camera and F-3/5 split Dehel Camera. What will you offer on these in trade. Joh Thomas, 2 Jane Street, Lindsay, Ontario.

For sale - BC-312 with new 60 cycle power supply - 1.5 to 18 megs in six bands - \$90.00. John Somerville, at Kearney, Ontario.

Gonset - Triband converter with Gonset Noise Limiter, both at a reasonable price. VE3VG, 47 Parkwood Avenue, in Toronto, Ontario.

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

Skywire Hamads get proven results.

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ENCLOSED RELAY RACKS

A beautifully streamlined designed rack for transmitters and public address systems. Front vertical; corners rounded. Back is fabricated of 20 GA. cold rolled steel; panel mounting angles of 1/8" steel. Accurately drilled for either Amateur or Western Electric type panels. Panels fit into recess so wires are not exposed. Screen ventilation on rear door and louvers on sides afford proper ventilation. Rear door hung on sturdy hinges and equipped with two flush mount catches. Shipped "KNOCKED DOWN" with all necessary hardware. Finished in Marine Gray Ripple Finish. Black Ripple furnished only if specified.

No. 3870	Overall Size	42" x 10" x 10 1/2"
	Panel Space	36 1/2" x 10"
	Interior Width	37 1/2"
	Interior Depth	15 1/4"
	Shipping Weight	97 Lbs.
No. 3872	Overall Size	46 1/2" x 10" x 10 1/2"
	Panel Space	41 1/2" x 10"
	Interior Width	42 1/2"
	Interior Depth	15 1/4"
	Shipping Weight	145 Lbs.
No. 3872	Overall Size	52 1/2" x 10" x 10 1/2"
	Panel Space	47 1/2" x 10"
	Interior Width	48 1/2"
	Interior Depth	15 1/4"
	Shipping Weight	172 Lbs.



ICA MULTI-USE METAL CABINETS



An ideal unit for public address systems, transmitters, receivers, test equipment, etc. Has rounded covers on front of Cabinet. Trained with handsome chrome trim moulding. Equipped with hinge doors, and nickel-plated snap locks. Completely assembled, ready for use. Finished in Black or Marine Gray Ripple Enamel. Black will be supplied unless Gray is specified.

SINGLE UNITS

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QUADRUPLE UNIT

OPEN FACE RELAY RACK

For standard 19" Rack Panels. Black Ripple Finish. Equipped with top cross-brace and vertical sections strongly welded. Designed for P.A. units, various types of transmitters, etc. Sturdily made of 3/4" thick steel. Max. depth: 22". Accurately drilled mounting holes. Includes rack screws and cap washers.

No.	Size Overall	Panel Space
3912	13 1/2" x 20" x 20 3/4"	7 1/4"



TABLE MOUNT RELAY RACKS

Sturdily constructed heavy duty table rack with one piece base. Accurately drilled mounting holes universally spaced for E.M.A., Western Electric or Amateur panels. Finished in Black Ripple. Shipped "KNOCKED DOWN" with all necessary hardware.

No.	W.	H.	D.	Panel Space
3910	11"	25"	15"	21" x 20"
3911	21"	25"	15"	25" x 15"

ICA DE LUXE TRANSMITTER RACKS

New modern design, streamlined transmitter and public address racks. Removable vertical cabinet mouldings are provided and completely cover panel edges and mounting screws. Closure trim. Rack is made of 1/16" cold rolled steel. Panel mounting angles drilled for either Amateur or Western Electric type panels. Screen ventilators on rear door and louvers afford ample ventilation. Easily assembled. Shipped in Marine Gray Ripple Finish. Black Ripple finish furnished only on specification.

No. 1865	Overall Size	42 1/2" x 22 1/2" x 10"
	Panel Space	36 1/2" x 10"
	Interior Width	37 1/2"
	Interior Depth	16 1/4"
	Shipping Weight	110 Lbs.
No. 3866	Overall Size	46 1/2" x 22 1/2" x 10"
	Panel Space	41 1/2" x 10"
	Interior Width	42 1/2"
	Interior Depth	16 1/4"
	Shipping Weight	162 Lbs.
No. 3867	Overall Size	52 1/2" x 22 1/2" x 10"
	Panel Space	47 1/2" x 10"
	Interior Width	48 1/2"
	Interior Depth	16 1/4"
	Shipping Weight	190 Lbs.



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Westinghouse

RADIO TUBES

For better reception!

CANADIAN WESTINGHOUSE COMPANY LIMITED
HAMILTON, CANADA



Skywire

Astatic's Synabar Model DR-10 Unidirectional Cardioid Crystal Microphone

ASTATIC'S Synabar Microphone uses a special sintered metal to cancel out 15 db front to back, making it, for practical purposes, dead to sound from the rear. Excellent frequency range, from 50 to 10,000 c.p.s., is further enhanced by a Response Selector switch, which provides choice of ideal pick-up characteristics for either crisp voice or general voice and music. The Synabar's crystal element has a special METALSEAL protection against moisture or dryness. A high impedance microphone, it has an output level of -54 db. It has a satin chrome finish, is furnished with detachable cable connector and 20 feet of single conductor shielded cable, and is available in models with or without off-on switch.

See it at your jobbers soon
MANUFACTURED IN CANADA
Serviced In Canada

Now Available
For Immediate
Delivery



Astatic Crystal Devices
Manufactured Under Brush
Development Co. Patents

CANADIAN LIMITED

ASTATIC
TRADE MARK REGISTERED

2273 DANFORTH AVENUE TORONTO 13

HOW'S UR OBS IQ?

Official Bulletin Nr 368, Oct 16, 1952.
Lebanon has been removed from the list of countries with which QSO's are forbidden. Refer to page 23, February QST and page 24 May 1952 QST. ARRL will now accept for the DXCC, cards from OD5 stations confirming QSO's which took place on or after October 15, 1952.

Official Bulletin Nr 366, Oct 3, 1952.
Amateurs serving overseas in the military who will have held a General Class license for at least one year by Dec. 31st, 1952, may take the Advanced Class examination by mail, anytime between now and December 31 of this year. This is an expansion of the regulations change reported on page 35 of QST for September, 1952. Applications

Special Canadian information - Oct 1st.
There's a new name among the Toronto radio parts jobbers as perhaps some of you have now learned. The entire staff of C.E.S. has joined the new organization - named Electro-Sonic, and located at the famous address - 543 Yonge Street in the Queen City. The entire gang, so well known to hams and service personnel are still on deck. If you phone, you'll still be able to talk to your friends, such as Jim Christie, Ted Bodman, Len Finkler, and all the rest of that familiar bunch. You'll find that they're all together on one thing-giving the best radio service on the continent, and they have the stocks to make this possible. Remember the name Electro Sonic because it will be one of the largest and best houses in Canada.

Skywire

WE'VE SAID IT NOW - 32,969
TIMES AND WE'RE PROUD
TO SAY IT AGAIN! WE LEAD
EVERYONE IN



ACTUAL
SIZE

This is the new Turner 80 — a crystal microphone so tiny it hides in the palm of your hand, yet so strikingly designed it is the very picture of scintillating symmetry. Weighs less than five ounces, yet its high output and unusually fine response characteristics make it a natural for announcing and mobile public address systems, for home recording, dictating machines, amateur communications, portable recorders and dozens of other applications. Finished in beautiful satin chrome. Level: Approximately 58 db below 1 volt/dyne/sq. c.m. Response: 80 — 7000 c. p. s. 7 foot attached single conductor shielded cable.

exciting low price

\$14.00

amateur net.

Astatic Model 54M3, it is a high output unit, (-51 db below 1 volt per microbar) in a simple but radical styling.

AMATEUR NET - \$9.60

Astatic Corp Introduces
New Miniature Mike

543 YONGE ST. TORONTO ONT. CANADA M1 2481



ELECTROSONIC

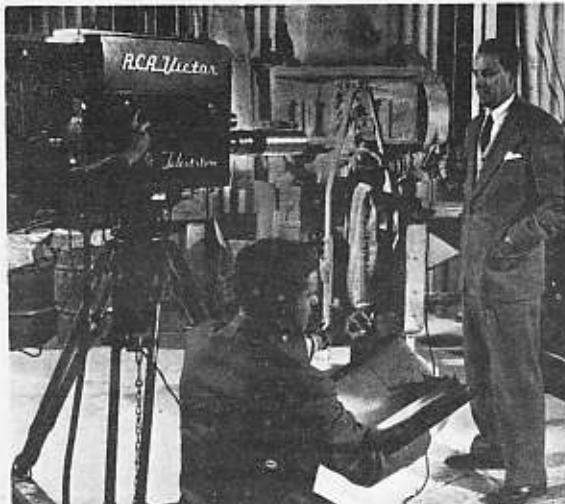
SUPPLY CO. LTD.

SERVICE

NEW
IDEAS

IN
STOCK





A TV camera and commentator go into the plant of Foote Mineral Company to explain factory operations to a meeting of the firm's stockholders.



From this monitor room, set up at the Foote Mineral factory, program directors control the TV camera pickups and the film sequences.

Stockholders "Tour" Their Plant Through Eyes of TV Cameras

SETTING up and running a 10-ring circus for a one-day stand in a busy industrial plant might seem to enjoy top rating as the neatest trick of the year. But those who watched the preparation and production of the first televised plant tour for a stockholders' meeting, staged February 21 at the Exton, Pa., plant of the Foote Mineral Co., would have the facts to argue any such contention.

Robert D. Drake, Foote's advertising manager, conceived the idea of the unusual telecast when he saw an RCA Victor TV demonstration last fall at the Exposition of the Chemical Industries in New York. He explored the idea with Richard H. Hooper, manager of the RCA Victor Shows and Exhibits Division, and detailed plans, charts, and script were then worked out. Arrangements were coordinated for Foote by Otto W. Renner, Jr., of Renner Advertisers, Philadelphia.

In undertaking the job, RCA Victor's globe-trotting TV production crew, despite a wide and varied experience, was stepping off on new ground. But the field was recognized as one of substantial promise, and that promise has certainly been expanded by the success of this debut performance.

The closed-circuit (wired) telecast enabled more

than 250 stockholders to see new facilities and watch key operations at widely separated locations on the 81-acre Foote property without leaving their seats in the plant cafeteria, where the meeting was held. One sequence of the show, made possible by televised film, brought the stockholders a glimpse of activities at Foote's new Kings Mountain holdings, near Charlotte, N. C., where the company "bought a mountain" containing the nation's largest known source of spodumene, an ore from which lithium is extracted.

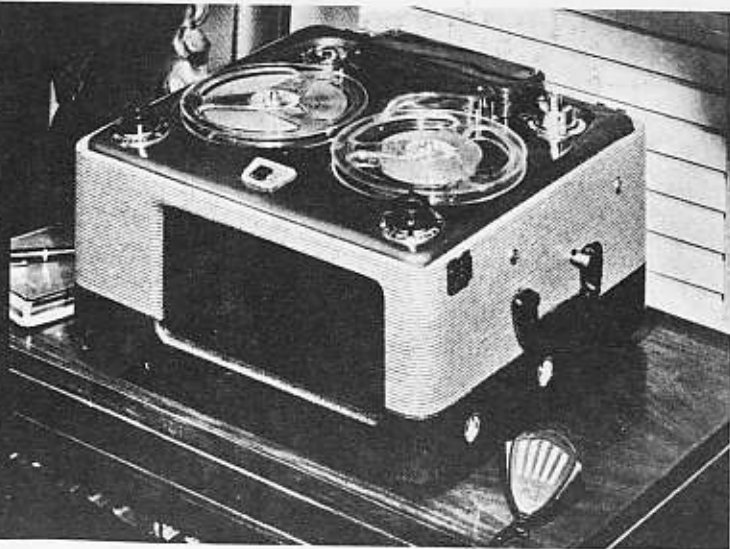
To stage this initial stockholders' TV tour, RCA Victor installed and operated the largest closed-circuit system yet employed for a service of this type. The equipment, valued at more than \$80,000, included four image orthicon field cameras, 1800 feet of camera cable, 1200 feet of microphone line, a TV film camera chain, twelve 17-inch home TV receivers, and all the auxiliary equipment needed for a complete control and monitoring station.

Four Cameras Covered Seven Locations

The cameras were initially set up in four strategic locations, and some were swiftly moved when the script permitted, according to a time schedule carefully worked out in advance, to permit coverage of a total of seven

Skywire

now... the
professional-type
tape recorder for
quality



Preserves Precious Memories

The perfect unit for starting and compiling your Precious Memories Album! Preserves all the moments you hold dear—weddings, anniversaries, baby's first words, birthdays, holidays—forever! Enjoy them over and over again in their true, life-like sounds!



Fun at Home

Record the voices of your friends, or the fun at parties and family gatherings. Hear your voice, or the voices of others, in their true to life sounds—with crystal-clear high fidelity. There's just no end to the fun you can have with the Webcor Tape Recorder!



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There's no better way to build a library of the finest in the world of music! Record complete musical works in all their rich concert-hall tones from the radio, television, live performances, or other recordings. Up to two hours of uninterrupted listening on one reel.



Profitable in Business

Use the Webcor Tape Recorder to capture every word and thought of a conference or interview—or use it for attention-getting sales presentations or practising speeches. And all of your recordings can be filed permanently for later review and study.

WEBSTER-CHICAGO

The greatest name in magnetic recorders
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ESTABLISHED 1903

861 BAY STREET, TORONTO, ONTARIO

VANCOUVER WINNIPEG MONTREAL HALIFAX ST. JOHN'S Nfld.





An RCA TV camera makes it possible for stockholders to witness the complex processing of rare elements at the Foote Chemical plant.

plant locations without breaking the program's continuity.

L. G. Bliss, vice president in charge of sales of the Foote company, furnished the commentary from a narrator's desk, covered by one of the field cameras, in a plant building near the cafeteria. Also located in this building were the control station and the TV film camera chain.

One objective at the outset was to eliminate the confusion and inconvenience which would be unavoidable if the stockholders were guided physically through the far-flung plant from one installation to another. Another was to give the stockholders a more concise and understandable view of the company's activities than they could hope to get by actually touring the area. Both aims were accomplished.

The equipment was installed and the show was staged by a crew of eight, including six RCA Service Company engineers and two members of the RCA Victor shows and exhibits group.

Half-mile of Cable Required

Although members of this group have demonstrated television and pioneered new applications of the medium throughout the United States and in many foreign countries, they were confronted by several unusual challenges to their ingenuity in carrying out the Exton program. One was the necessity for stringing a total of approximately 3000 feet of cable and "mike" line, most of it overhead. Another was split-second timing of camera movements, which meant shutting down a camera, moving it to a new location, and putting it back in operation

without the usual time for warming up the tubes. Particularly difficult were the quick shifts from indoor to outdoor light levels, and vice versa.

To speed up camera movements, the crew used a special truck with a hydraulic lift on the rear end. When a camera completed one sequence and a camera in another location took over, the first camera would be rolled onto the lowered lift of the waiting truck, tripod and all, without dismantling. It would then be hoisted to the truck floor and hauled to the next location. There, the lift would be lowered and the camera rolled into position. The longest distance covered by such a shift was about 450 feet.

The equipment—five tons of it—hauled by truck from RCA Victor headquarters in Camden, N. J., was packed in 38 large wooden boxes. Uncrating and setting it up took only four hours, but stringing the half-mile of cable consumed eight hours.

To avoid blocking plant streets and drives and to eliminate the risk of damage to the cable by passing vehicles, most of the line had to be run overhead. This also obviated possible damage to insulation from puddles and wet ground, in many cases bearing lithium salts and other chemicals. At one point, the line crossed a spur of railroad track, and the railroad stipulated that it must be hung at least eight feet above the tops of freight cars.

But all these problems had been solved when the hour arrived for the show to go on.

On the receiver screens in the cafeteria, the stockholders saw first the processing of lepidolite ores from Africa to obtain lithium products used for many industrial purposes, including the preparation of special types of glass for TV picture tubes. Other important uses are found in the manufacture of lubricants, ceramics, and air-conditioning systems.

Many Chemical Processes Observed

Next, by means of the televised film, they were shown the quarrying and processing of spodumene, a source of lithium salts, at Kings Mountain. Returned to the Exton plant by the flip of a control switch, they saw more lithium processing operations and the activities in progress in a pilot plant where a new process is being evaluated.

This was followed by detailed close-up action views of complex operations and equipment used in processing zirconium, used for its high corrosion resistance and high strength-to-weight ratio in radar, television, and jet engines, for its low neutron-absorption characteristics in atomic reactors, and for its high gas-absorption factor as a means of increasing vacuum in vacuum tubes. The tour closed with a visit to the plant area where various minerals are processed to produce welding electrode coating materials.

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HIGH GRADE

Electric Soldering Irons

No. 61
25 watt
Tip $\frac{1}{8}$ " dia.



No. 62
60 watt
Tip $\frac{1}{4}$ " dia.



No. 63
100 watt
Tip $\frac{1}{4}$ " dia.



No. 64
130 watt
Tip $\frac{1}{2}$ " dia.



No. 65
200 watt
Tip $\frac{3}{8}$ " dia.



No. 67
300 watt
Tip $\frac{7}{8}$ " dia.



No. 69
500 watt
Tip $1\frac{1}{2}$ " dia.



SEE THEM AT YOUR SUPPLY HOUSE

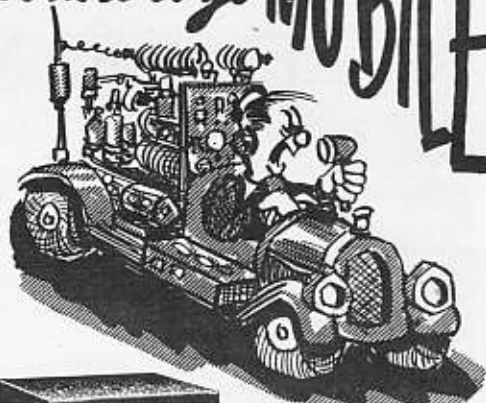
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Want to go MOBILE



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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, \$169.50 2-6L6 class B Modulators. Sturdy Steel Cabinet 12" x 8" x 8".

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

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861 BAY STREET, TORONTO, ONTARIO

VANCOUVER WINNIPEG MONTREAL HALIFAX ST. JOHN'S Nfld.

Electronic "Detective" Spots Foreign Metal Particles

NEW metal detection equipment for more efficient and speedier location of the most minute metallic particles contaminating non-metallic products, was introduced recently by the RCA Engineering Products Department.

Product lines in which the equipment will have applications include meat, bakery products, candy, plastics, paper, rubber, tobacco, textiles, and explosives.

The new metal detectors, called the "Utility Series", feature four types of small-aperture inspection heads, which will indicate the presence of tiny particles of metals or alloys, whether magnetic or non-magnetic, regardless of their depth in the material. The products pass through an inspection aperture on an endless conveyor belt, or through a chute at rates of 10 feet to 1000 feet per minute.

The detectors can be used to light a warning lamp, ring a bell, stop a continuous process, mark the contaminated object, or deflect it into a special channel or receptacle for rejects. The new equipment is the Company's latest industrial tool for quality control. It is also invaluable as a means of preventing machinery damage, eliminating fires and explosions resulting from tramp metal, and reducing lost production time in industrial processing.

The "Utility" detectors consist of two units. The control unit, which weighs 20 pounds, and is the same for all models and applications, has an overall measurement of 8¼ inches high, 6¾ inches wide, and 10 inches deep. The second unit, the inspection head, is provided in four different styles to meet specialized installation requirements. Two of the box-type heads have rectangular apertures—one measuring 2½ x 7½ inches; the other, 4 x 5 inches—and are designed for detecting metal in candy, chewing gum, pharmaceutical products, and other items that can be carried on a small conveyor belt during processing. The others have smaller, box-shaped heads with round apertures—one measuring 1½ inches in diameter; the other, 2 inches in diameter—and are suitable for ground meat, liquids carried in glass tubes, cigarettes, and similar items that can pass through the small head in a nonmetallic tube or trough.

Materials passing through the inspection aperture

are screened by a high-frequency electromagnetic field, generated by scientifically-designed coils embedded in a water-proof material. High-frequency power is fed to the coils from a self-contained electronic oscillator, and the reaction caused when metal is present in the material being screened operates a relay which triggers either a signaling device (lamp or bell) or an automatic marking or ejecting mechanism.

The equipment is practically immune from building and conveyor vibration, while electronic voltage regulation assures freedom from effects of line voltage fluctuations. The units are not affected by normal humidity and temperature changes, and are sealed against dirt, lint, and dust.

Pieces of candy passing through the portals of this electronic detector are rejected automatically if metallic particles of any size are present.



Plastic "Props" for Television Shows

A NEW concept of television staging through the use of plastics, the result of six months of experimentation in collaboration with the Studio Alliance, has been put into active use by the National Broadcasting Company in its New York studios.

The project, developed by Studio Alliance, was brought to NBC in its early stages and the company then joined forces with the studio in its development. Some of the qualities of the plastic which make it superior to other materials previously used for sets, props and even costume accessories are:

It is waterproof, fire-proof, shatter-proof and warp-proof.

It can be repainted repeatedly for use in different colors. The plastic, while tougher and lighter than wood, has wood's desirable qualities in that bolts and screws can be inserted easily and it can be cut, planed and sanded. Some of it is flexible.

Some items are translucent, with the appearance and texture of marble. Color can be impregnated into such forms as desired.

The newest thing is the perfection of a transparent plastic for use in making "crystal" chandeliers and the like.

Items with joints or seams, once a problem, now are being made in one piece, with a consequent increase in strength and durability.

Many units are made in sections so that any one segment or combination of segments or the entire unit may be used as needed.

Museum pieces, which sometimes can be rented at relatively fabulous rates and which carry heavy insurance for damage risks because of their extreme fragility, can be duplicated in plastic to become part of the permanent property stock. An antique pottery vase, for instance, which is delicate and heavy, can be made in sturdy plastic which will weigh one fourth of the original.

Another example in this category is an antique, carved wooden picture frame from Italy. A replica in wood and plaster would cost about \$125 and would require careful handling because of its tendency to break apart. Reproduced in strong plastic, it would cost only half as much and would last indefinitely. It could be painted in any color, washed off and repainted as often as desired.

Window draperies can be made in three sections so that one, two or all three may be used, as required. They need no fire-proofing, dry-cleaning, mending or special



Plastic stage "props" look like the original articles but weigh only one fourth as much.

handling. Like the other items, they can be repainted with ease and repeatedly.

Experimentation with flexible plastic has produced authentic reproductions of ornamental gold braid and similar items for uniforms and other costuming, which can be sewed and handled in the same manner as fabric but never tarnishes or requires repairs.

Through the use of plastics, a standard stage wing has been reduced in thickness by one third, thus making it easier to handle and less bulky for storage. A 100-pound wing can be prepared in plastic at 57 pounds.

TV and Radio Expand In Dominican Republic

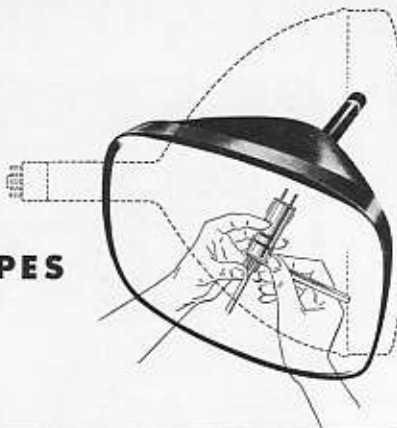
The first phase of extensive plans of the Dominican Republic to modernize and expand its communications services has been completed with the opening of a country-wide radio broadcasting network. In making the announcement, Meade Brunet, a Vice President of the Radio Corporation of America and Managing Director of the RCA International Division, said that the new radio network, equipped throughout by RCA with the latest types of broadcasting apparatus, links Ciudad Trujillo, the capital, with Santiago, the nation's second city, by means of automatic repeater stations at La Cumbre and Santo Cerro, operating at very high frequencies.

HOW

RCA

KINESCOPIES

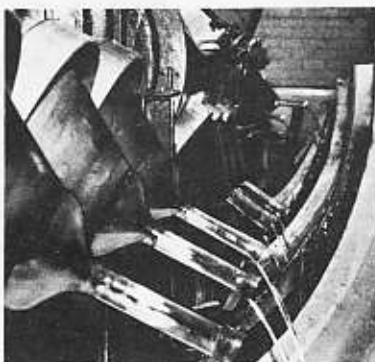
are made



Manufacturing process begins with inspection of all parts comprising the tube, whether glass or metal-shell type.



Metal tubes are placed on a crawling conveyor belt to permit the phosphor to settle on the face-plate.



At the end of the settling belt, automatic machinery tips the tube and decants the remaining liquid.



Kinescopes are baked in huge ovens to "boil" out impurities and to dry the inside graphite coating.



As a tube approaches completion it is tested for picture brightness under home lighting conditions.



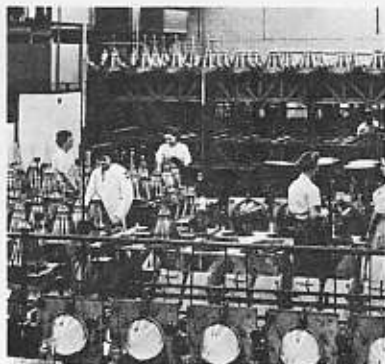
Final tests are made to insure that the tube will give a well-centered perfectly-focused picture.



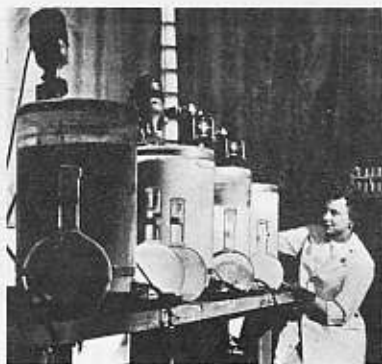
After the tube has passed all tests it is given its final washing before paint is applied to the outside.



Seals between glass and metal parts are checked by polarized light, and by air under high pressure.



The phosphor solution is poured into the envelope where it settles to form the tube's luminous screen.



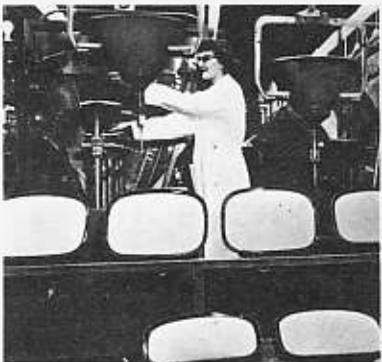
Purity of the phosphor solution is rigidly inspected to prevent the entrance of injurious foreign material.



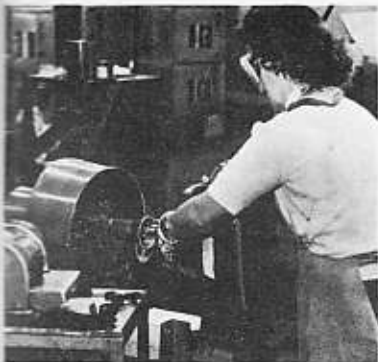
Electron guns are assembled here then microscopically tested to watch-makers' rigid specifications.



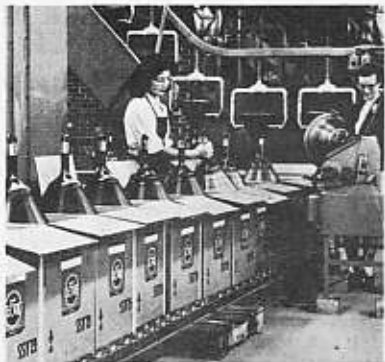
In this rotary machine the stem supporting the electron gun is sealed into the neck of the envelope.



The tubes are now ready for the pumping system which removes all air and gases.



The kinescope is now branded with the RCA trademark, which is a warranty of top-quality picture tubes.



Having received the stamp of approval, the tube is given a final polish and placed in its shipping carton.



The RCA kinescope is now ready to provide the customer with the best picture his set can produce.



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RADIO ET T.V. EN GROS

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

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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)	

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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. μ f.	D.C. Wkg. Volts.	Dimensions	
			D.	L.
TK 20 + 20/150	20 + 20	150	1	2
TK 40 + 40/150	40 + 40	150	1	2 $\frac{1}{2}$
TK 40 + 40/25 150/25	40 + 40/+25	150/25	1	2 $\frac{1}{2}$
TK 50 + 50/25 150/25	50 + 50/+25	150/25	1	2 $\frac{1}{2}$

450v. working 525v. surge

Catalogue No.	Cap. μ f.	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	2 $\frac{1}{2}$
TK 20 + 20/450	20 + 20	450	1	3
TK 40 + 40/450	40 + 40	450	1 $\frac{1}{2}$	3 $\frac{1}{2}$
TK 10 + 10/25 450/25	10 + 10/+25	450/25	1	2 $\frac{1}{2}$
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	1 $\frac{1}{2}$	3 $\frac{1}{2}$

H.K.

Max. Temperature 71°C.

450v. working 525v. surge

Catalogue No.	Cap. μ f.	Dimensions	
		D.	L.
HK 8-450	8	1	3 $\frac{1}{2}$
HK 16-450	16	1	3 $\frac{1}{2}$
HK 24-450	24	1	3 $\frac{1}{2}$
HK 32-450	32	1 $\frac{1}{2}$	3 $\frac{1}{2}$
HK 8 + 8-450	8 + 8	1	3 $\frac{1}{2}$
HK 24 + 24-450	24 + 24	1 $\frac{1}{2}$	3 $\frac{1}{2}$

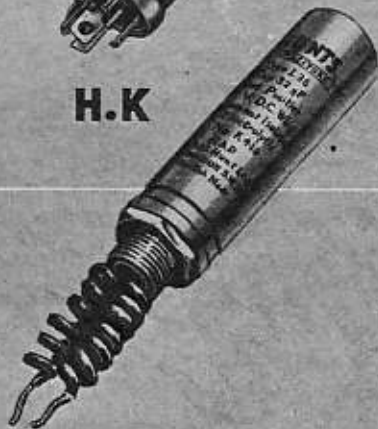
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This range of capacitors has been developed by Hunts to meet the demand for a simple and quick method of mounting. Types T.K. and H.K. are of strong, all aluminium construction, hermetically sealed with a rubberised bakelite disc — small in size and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

T.K.



H.K.



TRADE MARK
HUNTS
CAPACITORS

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Established 1903

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TRADE MARK
HUNTS
CAPACITORS

JACKSON*Radio Testing Equipment*

SEE IT AT YOUR LOCAL JOBBERS

"SERVICE ENGINEERED" TEST EQUIPMENT FOR SERVICEMEN

Another development in the JACKSON tradition of excellence is the Model 710 Selenium Rectifier Test Set. This high quality pocket size unit incorporates all features required by the modern serviceman to quickly and completely test ALL selenium rectifiers used in radio and TV applications. Each instrument is sturdily built and individually adjusted at the factory with precision instruments to give you long lasting dependable service. Check your idea of the perfect test unit with the following JACKSON specifications.

SPECIFICATIONS

- Tests all selenium rectifiers rated from 20 to 650 ma.
- Variable indicated voltage range from 25 to 300 volts ac.
- Designed to operate on 110 to 125 volts ac.
- Includes "Line Adjust" control to give you more accurate readings.
- Easy to use—tells you immediately when rectifier should be replaced or is safe for continued use—just choose correct meter range, connect rectifier to test set, and press test switch.
- The easy-to-read scale indicates open, shorted, or erratic rectifiers on a "GOOD"—"REPLACE" meter dial.
- Gives a voltage drop grading across rectifier due to internal resistance at approximate load currents.
- Uses heavy duty multi-tap transformer and high quality parts.



JACKSON MODEL 710
SELENIUM RECTIFIER TEST SET

Represented in Canada by

CANADIAN MARCONI COMPANY

ESTABLISHED 1903

861 BAY STREET, TORONTO, ONTARIO

VANCOUVER WINNIPEG MONTREAL HALIFAX ST. JOHN'S Nfld.