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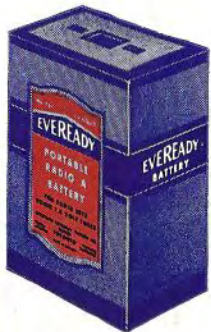
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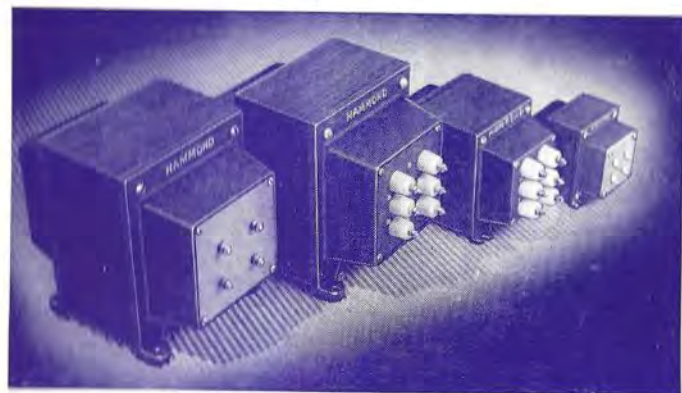
XTAL

APRIL
1946
Vol. 7 No. 3

for the

radio amateur





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			750,	675,	600,	525,	470,	420	25 cy.	60 cy.
762	880	200	750,	675,	600,	525,	470,	420	25	16
763	880	300	"	"	"	"	"	"	33	22
764	1180	200	1000,	900,	800,	700,	630,	560	34	20
766	1180	300	"	"	"	"	"	"	43	27
774	1740	200	1500,	1350,	1200,	1050,	945,	840	43	27
776	1740	300	"	"	"	"	"	"	57	38
777	1740	500	"	"	"	"	"	"	80	57
779	1740	1000	"	"	"	"	"	"	140	87
783	2320	300	2000,	1800,	1600,	1400,	1260,	1120	68	48
784	2320	500	"	"	"	"	"	"	93	65
787	2880	300	2500,	2250,	2000,	1750,	1570,	1400	80	56
788	2880	500	"	"	"	"	"	"	110	72
793	3450	300	3000,	2700,	2400,	2100,	1880,	1680	90	61
795	3450	500	"	"	"	"	"	"	140	80

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XTAL

[CRYSTAL]

APRIL
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HILITES

COVER is of three element close-spaced array at the business end of Ve3AZI. 35 feet above the rig pictured on page

20 it is tuned to 28100 kc and is of folded dipole design fed with PT-5 Co-ax cable. Rig uses a 6AG7 video amplifier tritet oscillator on 40 into an 807 buffer-doubler to 10 with an 812 idling at 70 watts doing the squirting. Fone is used 100%.

Pop Rowland claims distinction of being the oldest active ham in the gang. Takers please QSY to page 15.

Big 80 meter contest with prizes and everything. See page 18.

XTAL CONTROL

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RADIO HAMS LOSE WAVE BANDS!

HOW would you like to have a headline like that with your bacon and eggs for breakfast? Wouldn't it be a pleasant thought to take to work with you?

At Ten O'Clock in the evening the last day of March, the sinister spectre of that headline reared its ugly head. Ghoulish scratches appeared on the panoramic screen of our adapter—the stentorian bellows from the depraved throats of ninecompoopian ogres could be heard all over the 80 meter band. Such ravings as: “Superman” calling “The Man from Mars” or “This is the Early Bird calling The Worm” and “Twenty-one minutes more and we can go on the air OFFICIALLY”. In the CW portion of 80 wierd signals called CQ and signed “K9” and “UP” and “DOWN” and “VK12” and “JOE”. Remember, this is the result of a tour over 3.5 mc between 10 and 11:45 PM on March 31st! The regulations, the means of law and order in our land granted us permission to resume operating in this frequency spectrum at 12:01 on the morning of April 1st.

Even among radio amateurs, do we have thieves, and vicious law breakers? We like to think of ourselves as having a little extra on the ball—proud of our reputation for being a sort of unsung public service containing no rascals. Tamperers and illegal “bootleg” stations have been run down and brought to justice from time to time by our ever vigilant RCMP and G-men, and too with the help of public spirited citizen-possessors of amateur transmitting licenses.

We are sad in our hearts over this debacle. We are at a loss to know what breed of society is crawling among us after hearing “K9” and “UP” and “DOWN” and “The Man from Mars” at 10:47 on the evening of March 31st. We are proud of our relations with the Department of Transport and the FCC—so proud in fact that we are moving to assist in the investigation already under way to hunt down these people who do not belong to this world of ours. The monitoring divisions of both departments have demonstrated their ability to get with a situation like this and we are elated to learn as we go to press that a good number of these addlebrained heels are now cooling their lungs and fists in penitentiary or walking alone with the shame of a suspended license.

With limited facilities at our growing Headquarters it was well nigh impossible to distinguish between VEs and Ws. We do know that one local yokel lacked the powers of resistance necessary to the protection of our precious rights. We hope he was the ONLY one among over Four Thousand of us in Canada, sincerely we do. We also hope that we are never again faced with the condition that brought this nightmare upon us. In that lies the only explanation—but excuse, NEVER!

BANQUET

British Columbia A.R.A., are staging a banquet on Friday evening, May 31st, at the Georgia Hotel, Vancouver. Be sure you get accommodation by obtaining your ticket early. The cost is \$1.75 per plate. Apply to Fred Taylor, 221-11th Street, New Westminster.

HAMFEST — FIELD DAY

The Clinton A.R.C., are staging a joint Hamfest-Field Day, June 22nd and 23rd. All those in western Ontario are requested to contact VE3BER, T. A. Prest, R.C.A.F. School, Clinton, Ontario, for full particulars.

FIELD DAY

The Royal City A.R.A., New Westminster, B.C., are staging a field day on May 19th at the Whiterock Auto Camp, Whiterock. All Ws as well as VEs are invited to try and find a six meter transmitter.

A.R.R.L. FIELD DAY

The first post-war A.R.R.L. Field Day outing will take place on June 22nd, and 23rd. This is a real opportunity to try out your portable and emergency rigs, and at the same time spend a week-end, out in the open, at radio. See the next XTAL for more dope.

A Modest Signal Generator or Test Oscillator

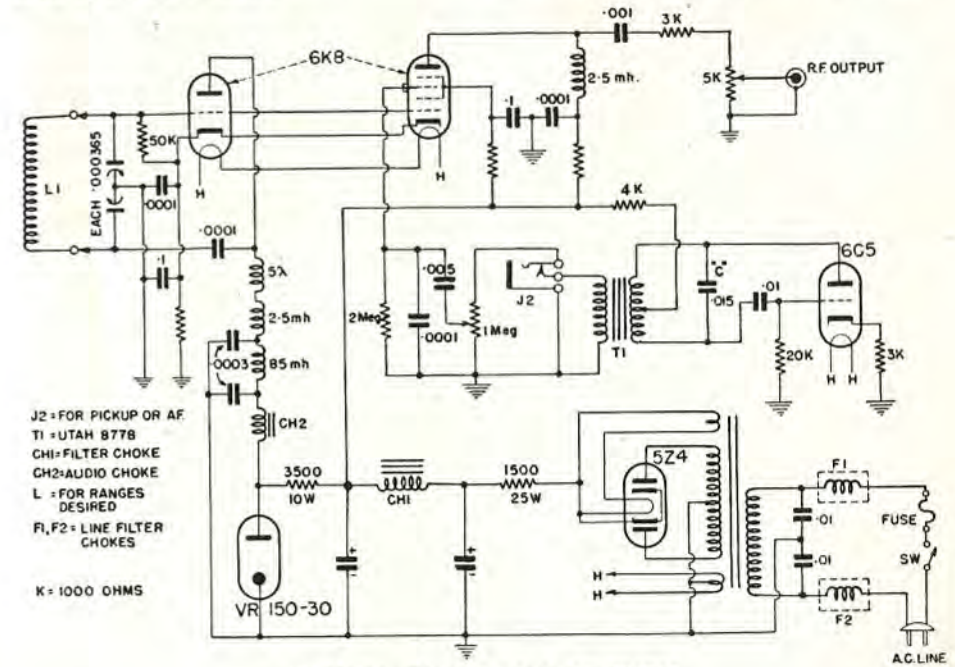
By WILF. MOORHOUSE, VE7US*

Described herein is an instrument which any amateur may build easily. It was built at VE5US during the war, when test equipment of all kinds was very hard to obtain, and meant for the civilian service man, of course.

An analysis of the existing oscillators known to the writer was shown to favour some kind of Colpitts, which would only need one coil per band. The tapped types of coils were discarded as too bothersome for the average fellow to get operating at the critical regeneration point. The coil L, as shown in the schematic, may be switched, or plugged-in, as desired by the constructor.

combination oscillator and rf buffer amplifier. The amplifier section is modulated from either an external record-player, or the built in 440 cps audio modulator. The audio output of the unit is available from the phone jack by only pushing the plug part way in. When in all the way the audio sine wave voltage is removed from the 6K8. The audio has since been checked on a cathode ray oscilloscope and shows to be of very good sine character.

A VR150/30 is used on the oscillator plate supply of the rf unit to stabilize that supply, as shown. The stability is very good, and varies less than 10 cycles at 600 kc. after a five minute warm-up



SCHEMATIC WIRING OF SIGNAL GENERATOR

The schematic should be self-explanatory, and if followed, no trouble should be encountered. The parts used were all standard, obtainable in Canada, many of which would be found in “junk boxes.” As may be expected, however, only the best parts obtainable should be used for optimum performance.

The 6K8 metal tube is used as a common* Box 242, Chilliwack, B.C.

period. Naturally, the mechanical construction should be carefully done to minimize long and loose leads which would affect the stability.

A National ACN dial makes the completed unit pleasing in appearance, and the unit delivers the utmost in satisfaction vs. price. The line filter is not absolutely necessary, but desirable in units of this type.

Matching Antenna and Transmission Line Systems

By C. J. Bridgland

I. Transmission Line Theory

Numerous articles have been published outlining methods of loading transmitters. In most cases it is implied that an antenna offers a satisfactory stable load. Curves are also available, giving the characteristic impedance of a transmission line. This is the resistive component that could be measured at the end of an infinitely long line (so long that losses act as the load) (Fig. 1a) or of any length terminated in a resistance equal to its characteristic impedance (Fig. 1b).

Transmission lines, however, are usually short and the impedance composed of resistance and capacity or inductance depends on the characteristic impedance of

resistive and a minimum equal to the line impedance divided by the standing wave ratio. These repeat every half wave length, and vary between these limits at other points along the line but are complicated becoming capacitive and inductive. It may be seen then that by changing the value of the load impedance (in resistance and reactance) an infinite number of values may be found which will give the same standing wave and by varying the length of the line the input impedance would remain the same (Fig. 1c). Stating this more simply, knowing the impedance of a line and the standing wave ratio and phase, the impedance can be determined at any point on the line.

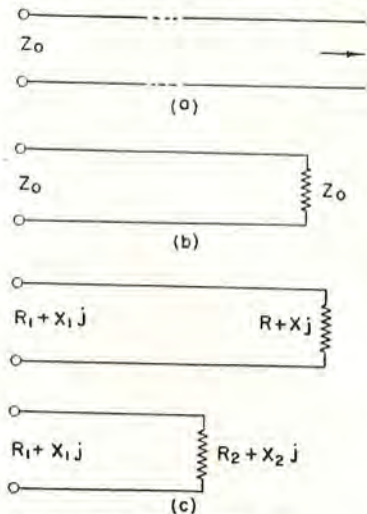


FIG. 1—LINE IMPEDANCE

the line, the length of the line and the value and phase of the termination load. Two variables determine the conditions on the transmission line, the ratio of maximum to minimum of standing waves and the phase or position of the standing waves. When the voltage of a standing wave reaches a maximum the impedance at that point on the line is a maximum and a pure resistance equal to the characteristic impedance multiplied by the standing wave ratio. When the voltage is a minimum the impedance is again purely

* Canada Wire and Cable Co. Ltd., Leaside, Ont.

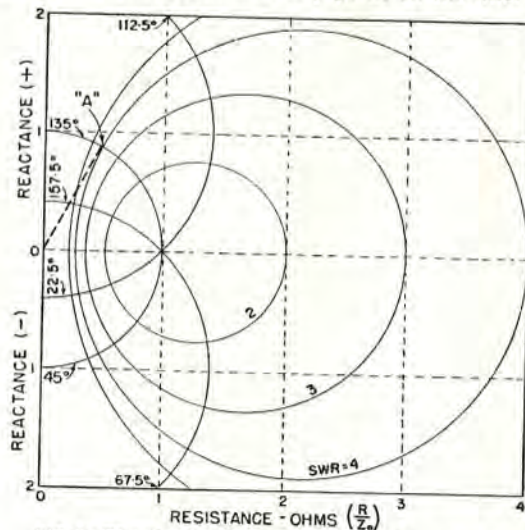


FIG. 2—TRANSMISSION LINE IMPEDANCE CHART

Several charts have been published from time to time for this purpose, differing only in the method of plotting co-ordinates. Possibly the hyperbolic tangent chart is the easiest to understand. In this eccentric circles represent lines of constant standing wave ratio. Intersecting lines indicate the distance along the line in fractions of a wave length (degrees of a full wave length), (Fig. 2). Rectangular co-ordinates represent the equivalent of a series resistance and reactance for a line of unity impedance. To transfer these to an actual value it is

only necessary to multiply by the characteristic impedance of the line.

Assuming a standing wave ratio of 4:1 it is seen that depending on the length of the line the impedance may vary from $\frac{1}{4}$ of 70 ohms to 4×70 ohms as a pure resistance. Again drawing a line from the origin tangent to the circle a point is obtained at which the worst possible phase angle of load occurs. i.e., $(.45 + .85j \times 70 \text{ ohms})$. Such variations are extremely severe as a transmitter load. The transmitter may not load up properly or might conceivably jump frequency. If the standing wave ratio increases conditions become much worse. If the standing waves are decreased the circles become smaller and closer to the 1.0 point so that regardless of the length of line the transmitter looks into a constant resistive load. To obtain this condition the load must be entirely resistive and equal to the line impedance.

II. Antenna to Trans. Line Matching

To apply this information to a definite installation the standard half-wave

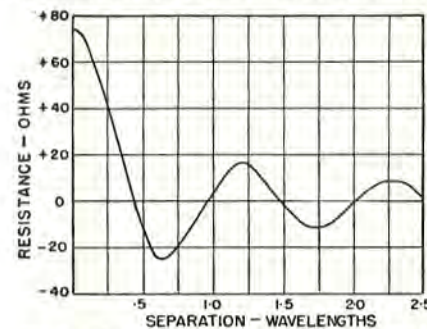


FIG. 3—MUTUAL RESISTANCE OF TWO $\frac{1}{2}$ DIPOLES

length dipole has an impedance of 70 ohms. Coaxial lines or open wire lines can be purchased which have an impedance of 70 ohms and the combination will allow good stable operation.

A full wave dipole has a center point impedance varying as much as 300 ohms to 5000 ohms depending on the cross-sectional diameter of the dipole. If a 2100 ohm full wave dipole is connected across a 70 ohm line the load impedance may vary from $\frac{1}{30}$ to 30 times the line impedance or a total variation from $\frac{2}{3}$ ohms to 2100 ohms. It is questionable whether a good short or good open on the line would destroy transfer of power much more efficiently.

To afford directional gain many types of antennae have been designed. Possibly

the most common are the various radiator and self-excited reflector and director combinations. These self-excited elements reflect positive or negative resistance and capacity or inductance into the radiator impedance, depending on their spacing and length (see Fig. 3) in a manner similar to conventional coupled circuits.

It can be seen that variations due to mutual coupling are much greater from closely spaced elements. At this point it would be well to emphasize that unwanted metal parts such as even-troughs, clothes lines, etc., can make excellent radiators, particularly if parallel to the dipole. Any efforts to place the antenna as high and as far as possible from immovable metal objects is well worth the extra trouble.

Unless one can be assured that the match between any of these special antenna and the line are reasonably good, more power may be lost due to mismatch than is being gained due to the gain characteristics of the antenna itself.

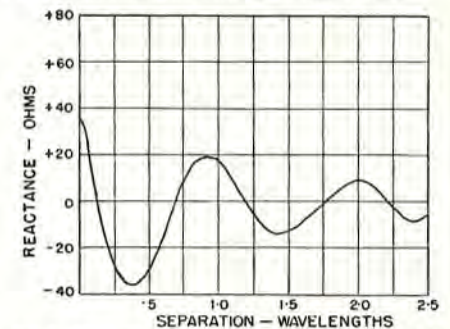


FIG. 4—MUTUAL REACTANCE OF TWO $\frac{1}{2}$ DIPOLES

This does not imply that an antenna cannot be matched to a line of different impedance. However, it is well to remember that the smaller the mismatch which has to be corrected, the less critical is the matching device to dimensions or frequency variations. Use of a quarter wave transformer is well known. However, in construction of the line or transformers which are really lines, it is well to remember that their mechanical construction is only practical over a limited value. Coaxial lines vary from 30 to 150 ohms and open wire lines from 70 to 600 ohms, except for very specialized applications. Open or shorted stubs may be placed on a transmission line and by varying the length and position on the line will create a matched condition.

Air Force Amateur Radio System

The March issue of XTAL carried a brief outline of the AFARS, along with the breakdown of the trans-continental "squadrons," and a list of the temporary Assistant Squadron Controllers for each area, who had volunteered to assist in the early organization. In view of the fact that by this reading many "flights" will probably be in early operation on the 3.5 mc. band it is felt that more details on the system's organization would be welcome.

Following the announcement in the press regarding the organization hundreds of interested amateurs and ex-service men have applied to the Minister for Air, and Air Force Headquarters, for more details. These inquiries have been passed on to the temporary ASC's for further action. Due to the impression given in the press articles, many have been lead to believe that considerable equipment would be loaned, or given, interested parties. As explained in March XTAL, the R.C.A.F. are loaning crystals for "flight" operation on spot frequencies, but no further equipment is being loaned; for the time being, at least. However, the R.C.A.F. Auxiliary Squadrons will be fully equipped with all kinds of communication and radar equipment, the use of which the Amateur members will be cordially invited to become familiar with. When these squadrons become fully active, it is also planned that classes and lectures will be held in which non-licensed members may be trained to enable them to obtain their Certificate of Proficiency, which is the minimum required in order to operate an amateur transmitting station.

Organization—AFARS

1. **Squadrons.** The system will consist of fifteen squadrons of amateurs affiliated to the R.C.A.F. Auxiliary Squadrons in the fifteen areas shown in March XTAL. From the Service side these squadrons will be administered down from the Director of Signals at Air Force Headquarters through the Chief Signals Officers of the R.C.A.F. Air Commands. From the civilian side the squadrons will be administered down from the Chief Controller (Keith Russell, VE3AL) direct to the various Assistant Squadron Controllers.

2. **Flights.** Each squadron will consist

of one or more flights to be designated "A," "B," "C," etc., flights. The composition of each flight will be up to twenty full members. The allocation of members to flights will be the responsibility of the ASC concerned, who will endeavour to provide a mixture of both near and distant members in each flight. The names of the provisionally appointed ACS's appeared in March XTAL.

Membership

There will be two classes of membership in the AFARS, full and provisional. Full membership will be open to amateur radio operators over the age of seventeen holding both an operator's license and a station license issued by the Department of Transport. Provisional membership will be open to amateur radio operators under the age of seventeen and to Canadian citizens of any age who are interested in amateur radio, to encourage them to obtain sufficient proficiency to obtain their amateur operator's license. The appointments in the AFARS, are as follows:

Squadron Controller (SC)—Is to be the R.C.A.F. Auxiliary Squadron Signals Officer of the area, or some one officially designated.

Assistant Squadron Controller (ASC)—is to be appointed by the Chief Controller and will be the civilian aide to the relevant SC.

Flight Leader (FL)—Is to be a licensed radio amateur. Is to be able to transmit and receive morse code at 22 wpm. Is to know both cw and phone signalling procedure. Is to own his own station. His appointment is to be recommended by the ASC and approved by his SC.

Member: Group 2—Is to be a licensed amateur. Is to be able to copy code at 18 wpm. Is to own, or have access to an amateur station. Shall have passed a suitable procedure test. Is to be recommended by his FL.

Member: Group 1—Is to be a licensed amateur with the same qualifications as Group 2, except to be able to handle Morse at 15 wpm.

Member: Provisional—All other members.

Duties of Members

SC—Will be jointly responsible with his ASC for the efficiency and smooth functioning of his squadron.

ASC—Will be jointly responsible with his SC for the efficiency and smooth functioning of his squadron and will report progress directly to the CC, as directed. He will be required to be active on the Transcontinental trunk line for at least two nights each month and will be responsible for transmitting the Official Broadcasts of his squadron, on the first and third Wednesday of each month.

FL—Will be responsible for the efficiency and smooth functioning of his flight, and will report progress once a week to his ASC. He will be required to be active on the Transcontinental trunk line for at least two nights each month.

Members: 1 & 2—Will be required to attend at least three flight drills each month, and to send and receive at least one message during each drill period. Are to use Service Procedure at all times on the flight frequency during drill periods.

Members: Provisional—Will be required to indicate their continued interest by

contacting their FL, at least once a month.

Sample Drill

- "CQ AF" by Flight Leader (Net Controller).
- Answers by call sequence (Net roll call) (Followed by number of messages on hand).
- An example of procedure and demonstration of same (if necessary).
- Accept messages from flight operators.
- Round-robin rag-chews and swap of suggestions.
- Check for those members going over to phone net at end of drill.

Note 1. FL to maintain good discipline on his net.

Note 2. ASC's to frequently look in on flight nets and record breaches of discipline.

Note 3. FL's to pass roll calls to their ASC each month.

Note 4. ASC's to pass consolidated roll calls to their SC each month.

DRILL SCHEDULES

Day	Net	1930 to 2130 hrs. local	2130 on.
Monday	All "A" flights	cw	phone
Tuesday	All "B" flights	cw	phone
Wednesday	All "C" flights	cw	phone
Thursday	All "D" flights	cw	phone

Friday) Transcontinental Net—cw or phone—from Midnight GMT on.
Saturday)

FREQUENCY PLAN

(Subject To Change)

SQUADRON	FLIGHT NET FREQUENCIES			
	A	B	C	D
1. HALIFAX	3835	3655	3685	3505
2. QUEBEC	3775	3685	3555	3645
3. MONTREAL-E	3755	3815	3695	3595
4. MONTREAL-W	3735	3785	3675	3555
5. OTTAWA	3835	3715	3655	3535
6. TORONTO-E	3715	3735	3545	3675
7. TORONTO-W	3815	3765	3645	3615
8. HAMILTON	3775	3835	3505	3655
9. LONDON	3755	3685	3595	3505
10. WINNIPEG	3765	3545	3615	3675
11. REGINA	3815	3595	3555	3645
12. CALGARY	3715	3505	3655	3572.5
13. EDMONTON	3735	3645	3685	3535
14. VANCOUVER	3755	3765	3615	3545
15. VICTORIA	3775	3655	3555	3505

Special Nets

It is planned to institute a Transcontinental trunk line (TCT) for the purpose of handling inter-squadron traffic, and also as an alternate long-haul circuit in case of emergency. All ASC's and FL's will be provided with 3625 kc. crystals and will be required to be active on the TCT at least two nights per month. For the purpose of drill on the TCT, at least one message should be passed from coast-to-coast, in each direction, on both weekly TCT drill nights. The call "CQAF" followed by the VE call area required should be used by operators on the TCT. All operators on the TCT are to bear in mind that the circuit is a very important line of communication; that it is the AFARS main line and is reserved exclusively for traffic and official broadcasts. It is not intended for general rag-chewing. Operating on the TCT is to be of the highest calibre; operators should be constantly on the alert for calls directed to their area, and should, at all times, avoid unnecessary transmitting. SC's and ASC's are to maintain rigid supervision of the TCT within their area.

To provide for emergencies, all AFARS members are encouraged to become equipped with portable gear and secondary sources of power. Each SC, in collaboration with his ASC, is to organize an emergency net within his squadron so as to provide communication between the larger population centers in his area when called upon during any emergency.

Official Broadcasts

Command Official Broadcasts will consist of matter for transmission to members originated at AFARS headquarters. The matter will then be passed over official channels to the Command Headquarters concerned and be broadcast by the Command on a date, time, and frequency to be advised later. It is probable that the Command Official Broadcasts will be transmitted over Service frequencies close to the 3.5 mc. band, in order to get the benefit of a clear channel. Such transmissions will consist primarily of general information directed to the AFARS as a whole, or to a particular Command. All ASC's are to copy these broadcasts for the purpose of re-broadcasting them in whole, or part, on their squadron official broadcasts.

Squadron Official Broadcasts will be made on the first and third Wednesday

of each month, commencing at 1900 hours local time, and at a speed of fifteen wpm. ASC's are to provide these transmissions on the AFARS general frequency of 3625 kc. These broadcasts will consist of matters from the Command broadcasts, and, in addition, will contain such matters as pertain solely to their particular area. Local matters will consist of items such as: additions to membership; elections from membership; changes or re-assignments of members of flights; squadron orders, etc.

Conclusion

It is suggested that all those who have already applied for membership in the AFARS, or those who are interested, should listen on 3625 kc. each Wednesday at 1900 hours local time for further information. As many AFARS stations will be active across Canada, communications may be directed over the air to ASC's etc., through any of these stations.

As outlined in March XTAL, membership in the AFARS does not obligate one in any way with the Service. The main purposes of the AFARS are to encourage good operation in R.C.A.F. procedure; to familiarize the amateurs with the R.C.A.F.; to provide a source of trained operators for any occasion, and to enable the existence of an excellent communication system in time of emergency.

Look for further interesting details in the May issue.

APPLICATION FORM

I hereby make application for (renewal) (new) membership in the Association. One dollar is enclosed which entitles me to membership and subscription to XTAL for one year from date of application.

NAME

ADDRESS

CALL DATE

PROF. CERTIFICATE NO.

Pop Rowland VE2BN at Controls of rig. His most recent in 72 years hamming!

IT'S BEEN A LONG, LONG TIME



A FEW editions ago that far reaching pillar, Report From The Nation carried a request for members of The Quarter Century Club to come forth and brag about the good old days 'way back when. That far reaching pillar reached just one, so far. Much too interesting to be included elsewhere in XTAL we decided to hand it on to you as a feature, as Webster would say, *verbatim*. Its author, Mr. A. E. Rowland of Ste. Eustache Sur Le Lac, Quebec, has been with us since 1908 as a ham and has very kindly given permission for publication. He modestly omits just how long he presaged 1908 but we reckon that a lot of Quebec winters have since settled gently upon that distinguished crown. Shades of TOM's Kitty are hovering menacingly about as we take you into the shadows to read on.

Watch out young squirts! In most part it goes like this: . . . "you asked for a few lines from the Old Timers and as I am one of that category I venture to take up some of your valuable space, not with any new circuits or ideas for beam antennas. But to start the ball rolling on the question: "Who is the Oldest Old Timer amongst the VEs?" Here is a brief record of my own experience as a Ham. I went on the air in 1908 with a quarter kw Spark Coil, with tape helix and rotary or quenched gap as the spirit

moved. Home wound receiving coils on Quaker Oat boxes with two inch brass tubing cut so that one piece would slide inside the other for variable condensers. A six wire cage aerial and several kinds of crystals (galena to you YS). There were at that time about five hams in the Montreal district and none were licensed. My call letters were ALF, others were BEN, JOE, etc. I used to sit up nights copying press from Cape Cod at twenty words per minute and repeated for correction at thirty per—that is how I learned the code! In 1915 came the first Great War. En route overseas I took watch as Wireless Operator on the troopship SS Herschel the ship carrying our regiment . . ." At this point in Mr. Rowland's story we insert an excerpt from a letter to Mrs. Rowland written while on the high seas . . . "Just a few lines to let you know that all's well up to now and in about five or six more hours we hope to land in Plymouth (censors weren't so particular those days). You will perhaps be surprised to learn that I have been wireless operator on board for the voyage. As they only had one operator when leaving Canada, and having to keep a good lookout I was put here to operate during the night so you see that I have made a deep impression on the officers here to start with . . . yesterday we were joined by two Torpedo De-

strovers and there is one now escorting us through the danger zone. I have a nice bed in a neat room and I had chicken for supper last night, of course the other sappers don't get that, I get it because of my wireless job! SO YOU SEE I HAVE GOT SOMETHING IN RETURN FOR STAYING IN MY LITTLE BACK ROOM PLAYING WITH MY RAT TA TA TA it's only chicken for supper once in awhile . . ." Wonder if anyone has XYL trouble today—we wonder! At any rate, let's go back to Mr. Rowland's story . . . "Got back home in 1919 and took out a ham license in 1920 with call VE2AM. Went out of radio to train football teams in 1925 and 1926 and then renewed again in '27 getting VE2BN, my present call. Have worked consistently on 20 meters phone and cw but the old fist is not as steady as it used to be. So now that I am in my seventy-second year of my youth I will stick to the fone and copy occasionally to keep up my reading at 25 wpm. (take note YS). The old rig is all set to go on 20 and 40 as soon as we get the green light. I would go on ten if I had coils for my old FB7 with two stage preselector. The letter to wife is enclosed as added interest and will perhaps verify a few statements! . . . an old Timer who wishes every success to XTAL . . ."

ALBERT E. ROWLAND, Ve2BN,
Better known as "Pop,"
24-9th Avenue,
Ste Eustache Sur Le Lac, Que."

We are grateful to Mr. Rowland for allowing us to publish these letters and although we do not intend to make a feature of every letter received from the OTs we do wish to compile a list and print highlights from time to time in an effort to keep alive the spirit and respect due the pioneers in the gentle art.

LOST MEMBERS

XTALs sent to the following members have been returned to HQ by the PO, for want of forwarding addresses. We would appreciate having the address of the following: VE2EE, J1LC, MP,OF, 3ACQ,ALN,AMG,ASU,AXL, CE, CQ, DA, ST, VA, YQ, 4AEM,AF,AFB, AGM,ARE,BF,NL,NQ,OM,RE, 5 A A A, AAK,AEM,AHU,BM,KP,NG,PI.

SALUDOS

K4ESH, of Santurce in Puerto Rico, a regular on the Ten meter band pushed such a booming signal in all directions that a new supply of QSL Cards became necessary. Back from the printers came One Thousand brand new shiny ones with K4ESH emblazoned thereon. Mean-time FCC up and changed his prefix to KP4 and now the first feller that asks Juan for a QSL gets all Thousand 'of the K4 variety!'

W4FAY/K4, another of our pals in Santurce, graciously entered the hall of unsung heroes recently. It's like this. Nine years ago there came from Puerto Rico's beautiful isle a young couple to seek their fortune in Toronto. He, a native Canadian, and a Ham is known far and wide on Ten as Ve3AZI. She is a charming Puerto Rican to whom Canada's customs and language were as much a mysticism as was Amateur Radio, at that time. Far from the swaying palms and romantic Spanish scene Mrs. Gillier looked longingly at the potential ties of Ham Radio as a means of hearing the voice of her native land once again. Husband Alf grasping the tenor of situation pored over handbooks and other media for dope on how to squirt a signal into Puerto Rico with sufficient wallop and consistency to meet all the demands of such a longing heart, and too, to maintain the status quo at home! Since the rig itself was perking FB, the problem seemed to lie in an antenna system. Deciding finally on a three element directional array no time was lost in adding the finishing touches to this little dramatic set. Swinging the beam dead on Santurce a CQ brought a whopping report from W4FAY/K4 and the voice of Jack Haley its owner. What happened from here on was histrionic. Haley arranged for Mrs. AZI's family to be present at the next scheduled QSO. It clicked 100%. An attempt at description of its dramatic results would be stupid. We heard it and can only wish now that recording facilities were at hand just to play back to those who go about with tongue-in-cheek regarding Ham Radio as such and such. Saludos for Mr. Haley's splendid understanding and co-operation which now brings The Isle of Enchantment to Meriam, Penny, Dee and Alf Gillier of 3AZI once a week!

Communications - TFC - DX - Etc.

XTAL'S article on an All-Canadian traffic organization in March brought forth some splendid response. Some of the good old dyed-in-the-wools such as Ve2DR, Ve1KS, Ve4AT and others came out in fine strength and support of the proposal. Needless to say, we are greatly encouraged and are proceeding at once to get a Field Organization whipped into shape.

Volunteers are still very welcome, as much so as are suggestions concerning this project.

We would ask those interested in obtaining appointments as District Relay Stations to communicate with the following District Communications Managers who are now supervising organization in the following districts:

- Ve1 Maritimes—Ve1KS Ron Hesler, Sackville, N.B.
- Ve2 Quebec —Ve2DR C. W. Skarstedt, 3821 Girouard Avenue, Montreal 28, P.Q.
- Ve3 Ontario —Ve3WX R. C. Hunt, 103 Garfield Avenue, London, Ont.
- Ve4 Manitoba —Ve4AT C. Vermander, 366 LaRiviere Street, Norwood, Man.
- Ve6 Alberta —Ve6EO. Wm. Savage, 329-15th North Lethbridge, Alta.

Attention is drawn to the understanding that these volunteers and subsequent DCM appointments are temporary pending the CAROA general election this fall.

Activity reports and traffic totals will be welcomed by the DCMs outlined and to expedite and simplify correlation of this information for future issues of XTAL please report direct to the QTHs listed, by the 15th of each month.

MARITIME

DCM—Ron Hesler, Ve1KS

The following phone boys in this district have been heard since the opening of 75 in April: 1KU, 1CN, 1MA, 1QF, 1LZ, 1DW, 1DU, 1KE, 1FL, 1DZ, 1NA, 1EK, 1BW, 1CI, 1KQ. DZ is attempting to form a local radio club in Trenton—Good luck Jim and if we can be of any help, don't hesitate to give us a buzz. CI in River Hebert is planning to go high power with a pair of T-55's. QF in Sackville now has 200 watts phone on 75; quite a contrast to the 10 meter rig eh Ron? GH (Merril Young of Lunenburg fame!) has about decided to tear

himself away from his new hobby photography for a few minutes to throw together a rig for 75. Make it soon Merrill, the boys really miss you. JU now has a new Hallicrafter Sky Champion. GP is having his worries over a new super duper 75 antennae. IE is now located in St. John. VO2KJ (ex Ve1KJ) is heard quite regularly over here on the mainland, he expects to be back to his VE1QTH real soon. The grape vine informs me that the Halifax Amateur Radio Club were considering very seriously a Maritime Hamfest for this year; however, for many reasons (mainly hotel accommodation) it was decided to postpone it until 1947. IS is planning to get back on 75 phone soon; he has just completed construction of a truly fb superhet. KU is very active on 75 and 10 phone and cw.LH will be back on 75 phone as soon as he manages to get a new xtal and new sky hook up.

This is our first district report and this time it has been compiled by your D.C.M. Please remember fellows, for future editions of XTAL, that this is YOUR section and to make it really good it needs the support of every VE1 ham in reporting to his D.C.M. by the 15th of every month his monthly activities and traffic totals. I am hopeful that in the not too distant future we will be the first district in Canada to have her field organization established. This means traffic trunk lines, District Phone Stations, District Relay Stations, Emergency Organization, etc. For this I will really need your backing and helping hand. Would all those interested in appointments offered by the Communications Department and those interested in traffic work please drop me a line, so we can get things rolling. In the next issue of XTAL, I will advise you of the names of the District Traffic Manager and District Phone Activities Manager. Let's go fellows—if we all put our shoulders to the wheel, we can and we will have the first organized district in our organization. Remember, one, two, or three fellows cannot organize this job alone. It takes teamwork to put it across.

ONTARIO

DCM — R. C. Hunt, Ve3WX

Ontario District report of activities is being written this first time direct from Headquarters Ve3CAR. Being a visitor to Toronto at anytime near the deadline as XTAL goes to press, one almost takes one's life in one's hands. I was literally scooped from the streets and whisked away to HQ shack and told to

80 METER CONTEST

7 P.M. TO 3 A.M.
SAT., JUNE 8 TO **SUN., JUNE 9**
 Local Time Local Time
TOTAL OPERATING TIME NOT TO EXCEED 10 HOURS

GENERAL CALL: "CQ CAR"

We are indebted to Ve2DR, DCM of Quebec for this novel and clever idea. It's a sort of radio HAMOGRAM contest and should make for some lively and interesting competition. It is open to VEs interested and contacts with off-continent hams will be counted in the final score.

USING ONLY THE LAST LETTER IN THE CALL OF A STATION WORKED — SPELL OUT THE FOLLOWING:

"ARE YOU A MEMBER OF CAROA"

I.E.

Ve1cA	Ve5eA	W2gO
Ve3qR		D4aaF
Ve2eE	W6aM	
	Ve5gE	Ve3bC
W4faY/k4	Ve4hM	Ve1eA
Ve4aO	G5uB	Ve2hR
W6aU	Ve4hE	W6jO
	Ve3atR	W6sA

20 stations with the correct last letters are necessary. Tough? You bet, BUT to avoid snubbing the poor fellow whose call ends in "Z" or some other letter not necessary to the completion of the text, 5 POINTS will count for EVERY QSO. No station can be worked twice.

The Canadian General Electric Company have donated **813s AND 826s** for prizes. Here's something worth shooting for. Let's all get in the swim!

ADDED ATTRACTION: All stations working Ve3CAR will be tossed into a hat (or sumpin) and Frances (see page 20) will draw a lucky ONE to be awarded a special prize selected by our comely secretary! Hubba Hubba!

FORWARD REPORTS TO CAROA H.Q., 46 DUNVEGAN ROAD,

TORONTO 12, ONT., BY JUNE 20TH

write or else! Fortunately I had most of my gleanings from doings in the district with me. Here they are: WA is having landlord trouble. TM can't keep skds until 8 PM cuz he has to bathe and bed the baby! OI bends elbows with BC. CP was usher at Bill Allen's wedding. Bill had hopes of being a Ham someday (we say HAD). HI works VK on Ten and has new xtal for AFARS Fone Net. TM is Flight Leader AFARS Flight B. DU is on as AFARS Flight Leader in A AIU is active in Goderich, as is JH in the Soo who will be link in Transcon Net. AJP should barter calls with KP becuz he's on from the kitchen most of time. AEP listens to wedding bells at same hitchin as CP. BEV is former DCM ARRL back in 1922 along with AL waste time on Ten. AJE ponders new QTH for 132 footer. Is in line for new chompers. ALE no relation to liquid of the same name is rebuilding again. BER in Clinton is going concern. ATR has little 5 watter anxious to have tfc skeds. ATM warns CAR of WX's approach. AQB eyes AFARS and should follow. ACL plays with commercial fm xmtr in trunk of Plymouth. FP is on fone and twiddles dials at CKLW for a living. MB should be clearing the hooks for tfc soon. NX is AFARS A Flight. GG pops up in Willowdale KE handles flock of UGANDA tfc. BZ like SG is grooming slick chicks, feathered variety. CI back on fone. HK is heard again on 80.

Please refer to page 6 March XTAL and read about CAROA's new Communications Department. There are a number of appointments open in Ontario that are fully explained in that issue. I would greatly appreciate your co-operation and your reports of traffic, activities, DX, etc., by the 15th of each month for publication in XTAL the following month. Likewise on Page 17 of March XTAL and elsewhere in this issue may be found information on how to become a participant in AFARS. I shall be glad to help you in any way. Xtals for AFARS fone net are now released and may be obtained in anticipation of the opening of Ve fone frequencies soon. Please report monthly traffic totals to me direct at 103 Garfield Avenue, London, Ontario. 73 'til next XTAL.

Traffic—Ve3KE 156, CAR 48, SF 8, AXQ 7, GT 6, TM 5, OI 4, ATR 3, IR 2.

DX

DX reports are scarce this month, but the keen eared gang seem to be snagging lots of new countries on ten. DX on 80, even at this time of year, is possible, because 3DU heard ZL4CK calling cq and heard VE7ZM call him back at 5.35 a.m. Also Guam has been worked by VE6GD. VE6IX worked W3GNU/VE5 on 80. This is the first time we've heard a W on the air in Canada! But, to get back to real DX, 3LZ reports working the following during March on ten, HK1AB, XE1JF, VKs 5FM, 3NC, 2NY, 4CG, Gs 8VG, 5SK, 6WN, 6WY, 8RI, 2FOS, 3II, 2OL, 6KS, 8OJ, 2BH, 8SM, 3MG, 3VO, 5UX, 6RB, 8JB, 4PR, 5YV, 2PN, 2XC, 8BQ, GQ8UH, GI6WG, GM6MD, OZ1W, YR5A (Nice dx, considering 3LZ is at Sioux Lookout, near Manitoba) also ZS1T, ZS2AW, ZS2AI, D4APX, GM4MF, W4EPT/K6, W7AGF/KY, ZS1BF, W9KIE/K6.

3KE reports nothing much doing lately in way of DX but also reports snagging VS7CX in Ceylon (28095) on Easter morning for WAC. ZSs, LUs, and the usual run of Europeans have also been worked, the special ones being: ZA2X, Albania (28060), CX4CZ, Uruguay, YR5A, Roumania (28015), XACD/SV, Greece, (28095), VK5JT (28050), OA4S (28040), XACF, Sardinia (28045). Reports from any VEs working DX will be appreciated. Please give the approximate frequency of the station heard or worked. There are a lot of us who would like to get some of those elusive countries. FLASH!! 7ZM only needs South Africa for WAC on 75 phone!

HAMILTON'S CENTENNIAL WEEK

During Hamilton's Centennial Week, commencing June 29th, the Hamilton Amateur Radio Club, VE3HCC, expect to handle a large volume of traffic. Traffic nets under way now are organizing to take 3HCC's traffic. All Ontario stations on 80 are requested to listen periodically for 3HCC in order that traffic may be moved to the smaller centres not serviced by the nets. See next XTAL for full particulars.

Ve3CAR Summer Operating Sked

Effective April 30th Ve3CAR will be found on 3760 kcs the following hours:
 Tues.-Thurs. 7-11 p.m. E.S.T.

SPEAKING of PICTURES

Xtal needs pictures, send 'em in.

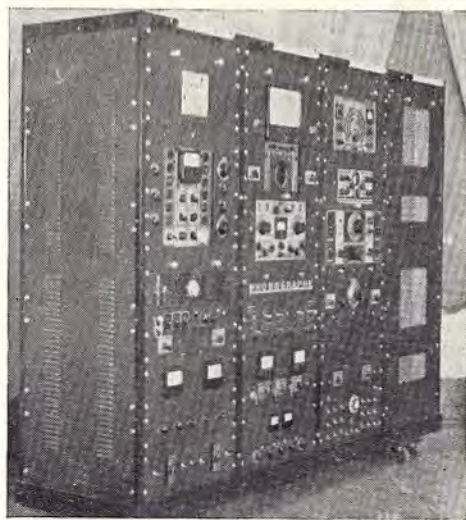


F. Elliott "for Secretary"
—found on all membership cards from 1583 on. Name's Frances, only photogenic member of Headquarter's staff. Single. Hobby: new members, country houses, lovely smiles and kittens.



Ve3AZI, the mighty atom, with operator Alf Gülier behind the mike. Featured in story on page 16. Twiddles beam pictured on cover. Has lovely wife Merriam and two of hamdom's cutest kids. Sells complete kitchens . . . (plug)!

Up for a QSO with the trusty corncob is **Ve3LT's Ed. Sheppard**. Shep seems to be enjoying the fruits of the Italian campaign. The shoulder flash is RCCS, the tan is of the Massina variety.



Ve2QK is impressive looking rig of Elmer Asselin's in Montreal. So modest is M. Asselin that he fails to tell us what makes it go!

Airborne Distance Indicator

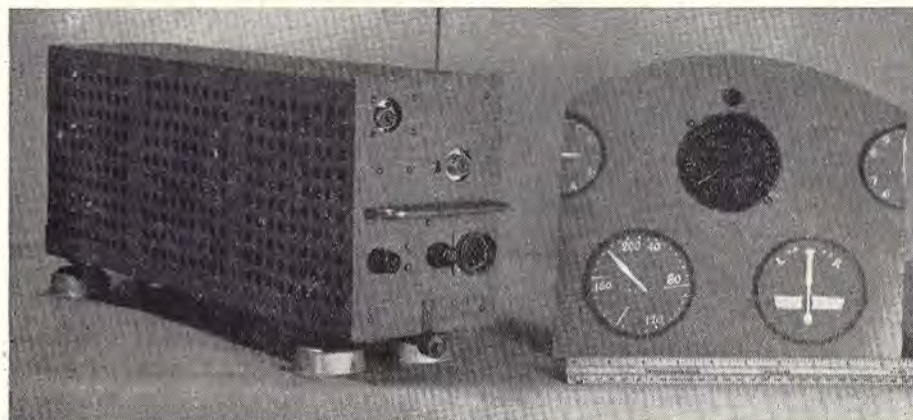
By DR. D. R. MCKINLEY, VE3AU*

The main reason for putting in this blurb on the Airborne Distance Indicator, developed by the National Research Council, is to attempt to explain to the howling hams why they didn't get the band 220-225 mcs., but are getting the band 235-240 mcs. instead, as announced on 23rd March. It's like this:

Back in November, 1944, the Second Commonwealth and Empire Conference on Radio for Civil Aviation (long-haired boys) met in Ottawa and, among the things discussed, it was agreed that Canada would go flat out to produce a reliable distance indicator system for commercial aircraft, working on radar principles. This was done—a simple statement covering a multitude of headaches

the superiority of the 200 mcs. stuff. The main reasons for the better performance lie in the use of standard components and techniques in the 200 mcs. job, whereas the 1000 mcs. apparatus uses special lighthouse tubes and experimental techniques. In short, the Canadian set can go into production now, while the American set will require a couple of years or more to get rolling. If civil aviation wants a distance indicator now—and the airlines in Canada, U.K. and U.S.A. have emphatically indicated that they do want it now—then 200 mcs. is the answer. (Plug!—see my letter at back of March, 1946 "Electronics").

Incidentally, we were pushing for 200-225 mcs., but the U.S. Government



and troubles encountered by the N.R.C. gang, headed by Harold Ferris (now of T.C.A.)—and the system was demonstrated in Canada, in the U.S.A. and at the Third C.E.R.C.A. Conference in London, August, 1945. C.E.R.C.A. liked it so well that it was recommended for international standardization. But here came the rub. The Americans had also developed a distance indicator in the band 950-1150 mcs. (ours used 200-225 mcs.) and they were plugging theirs for all it was worth—and more! The arguments went on and on, and it was not until a show-down demonstration was put on between the Canadian and American equipment, at Washington, in January, 1946, that we proved to all concerned

thought it wouldn't be able to hold off the blast from the well-heeled television interests who had been promised up to 216 mcs., so we were assigned a compressed band from 216-231 mcs. for distance indicators in the Empire. The Government point-to-point band was moved up to 231-235 mcs. and the hams now have 235-240 mcs. So that's the why of it.

Now, what is it? Well, space is short, but we'll whiz over the basic principles. You chaps who encountered IFF beaconry in any of its forms during the war will know all about the fundamentals of the system—the N.R.C. development has just prettied the job up, put the display

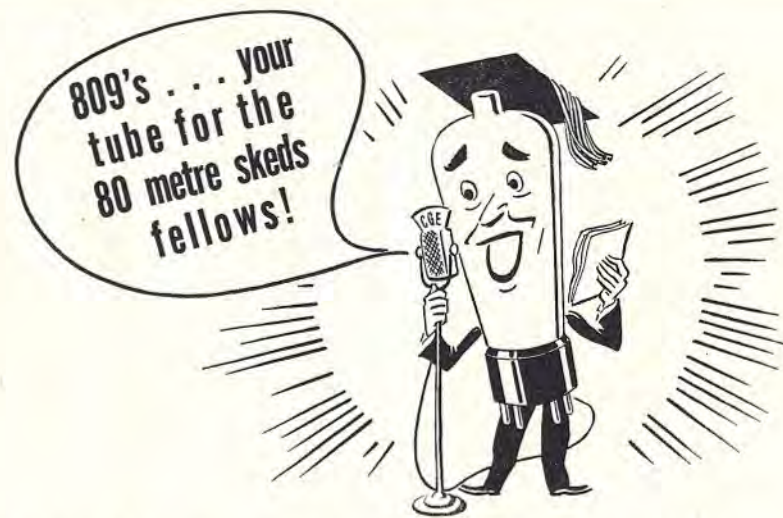
*National Research Council, Ottawa, Ont.

QSY to page 26

Report From The Nation

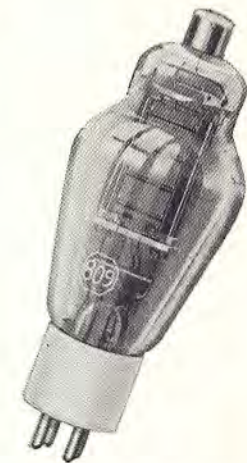
ONE HUNDRED AND TWENTY-FIVE KILOCYCLES ALL TO OURSELVES IN THE 80 METER BAND! Here is Heaven on a platter. How many of you fellows have mused over the possibilities and potentialities of an All-Canadian spectrum of frequencies? What a proving ground for power limitation. Again you can dust off your arguments about high power versus low power and one will get you ten that the guy with the blooper wins! DON'T FORGET FOR A MINUTE that this is a special concession, while it lasts. DON'T QRM United States Army Services. Again we repeat LISTEN BEFORE YOU TRANSMIT and make sure that your frequency is clear of official channels. Low power with an extra super dooper antenna system can be just as bothersome and disastrous to official transmissions as a California Kilowatt. Let us show how appreciative we can be with all the respect and dignity we can muster. We are exceptionally fortunate to be on the air at all what with espionage trials and international problems still before us . . . which reminds us that Jim Smalley radio parts peddler west o' here . . . otherwise known as ex4GD, now VE6GD tells us that XTAL is even getting deep in the heart of Texas cuz a W5 was saying how well he liked it!! . . . Doug Johnson 1PQ is QRL spring exams at Dalhousie and is beside himself with work . . . another college man is 1OT at U of N.B. presently wrestling with E.E. . . . 3GN is up at Powasson now and wants skeds . . . RR#2 will get him by mail, P. E. Bernard is the handle . . . 4UA-ADJ and AMH in Oyen, Alta., are all active and AMH sez his new call is 6AM . . . ya got a famous one George, W6AM is Don Wallace in Long Beach there are fewer better known calls in ham radio . . . 3UO is QRL from recent visit by that bird . . . number six was a sweet lil bundle from Heaven, a YL . . . Len Walker 3JI guides the destinies of dollars and cents when not hamming . . . 1EP has 25 countries towards DX Century Club . . . 4IO keeps the Peg hams happy with new parts . . . when he can get 'em . . . 3BCF sends FB article on simple centre fed multiple frequency antenna system . . . old ex3UQ is in Electronic game in Owen Sound . . . the

boss man of the outfit too and expects to be on with new call soon . . . 1PB is still in the Navy and hurtles 400 watts around the globe on Ten . . . he was 3OF before Adolf went on a rampage . . . 4OG sends copy of "RF" publication of The Southern Alberta Amateur Radio Club and Editor Bern Clancy 4AHD is to be congratulated on such a FB and meaty little bulletin . . . from its pages we learn that Bill Savage at 6EO is President of the SAARC . . . that 4ZI sez that the Baron's gang are all rebuilding 'cept himself and he uses a string of doublers 6 feet long to get from an 80 meter xtal to Ten not to mention the fact that he uses same motor to run rig that cleans his wheat! . . . that 4DB is in YT with the Air Force . . . that 4ALI teases the boys with his ground wave . . . that 4OF and 4AHD are designing a joint antenna system . . . that OF, AHD, AIP, ARE are all on the same street and are competing with the BCLs who have decided to buy record players and give up BC! . . . that 4VR is on diet and grinds xtals for lunch instead of steaks . . . that at recent birthday party the Jr OP at 4OG sed that "we cant pin the tail on the Donkey, Daddy's having a nap!" . . . we'd sooner be called just plain "ham" . . . 3AAZ comes forth with FB letter and promises article soon . . . Usual nice note from 3ANE . . . 3GS thinks XTAL is doing good job and wants twelve copies and a membership . . . 4AJF is looking forward to getting on the air from Vancouver . . . 4KW is buying Wheat for the Saswheatpool . . . hopes to have it all bought soon so's he can go back on the air again . . . 5HQ and 5QP are brothers and keep FB daily sked between Eburne and Pitt Meadows, B.C. . . . Victoria Short Wave Club is its usual active self . . . latest dope from Dave Scholes sez that they have ladies and everything at meetings now with prizes, eats, and fungalore . . . Tom McRae in Beatty, Sask., is now 5TM and is grateful for the D of T's generosity with his initials . . . Windsor's Frontier Radio Club has elected 3CP Pres., 3ADN Vice-Pres., 3MY Treasurer, and 3AEP Secretary, and has big doings in store . . . From 2HF comes news of the Montreal Amateur Radio Club . . . wonder if 3WJ is a member . . . Sarnia's Amateur Radio Club is headed by Wes



GENERAL ELECTRIC TRANSMITTING RADIOTRONS LOW DRIVE **809** TRIODE

The 809 is a swell bottle on the 80 meter band and will operate at 100% efficiency up to 60 mc. Order General Electric 809's from your local dealer now.



Class C ICAS Ratings

Filament Voltage	6.3V
Filament Current	2.5 amps
Amplification factor	50
Plate dissipation	30 Max Watts
D.C. Plate Voltage	1000 Max V.
Driving Power (approx)	3.8 Watts

CANADIAN GENERAL ELECTRIC CO. LIMITED
HEAD OFFICE: TORONTO.

Monk, 3AAN, as President, aided by Emery Hare, 3MW, as Sec.-Treasurer . . . MW thanks XTAL for getting him in touch with game again . . . Up in the land of ice and snow the Whitehorse gang have formed a club known as the Yukon Amateur Radio Club with ten members at present . . . Chairman Turnquist handled the gavel at the first meeting and was elected permanently . . . his Secretary is Bob Williamson 5AGT . . . Vice-Chairman is Jack Spall, 3ER, and we think it's FB to know that Ham Radio is on hand to help an otherwise pretty dull existence after hours in the land of the midnite sun . . . 3WX has new chompers, new office, new net, and new job as ASC in AFARS System . . . busy guy . . . Up turns old Harry Crowder 3KK . . . long time no see . . . Bill Sutherland is with D of T in Port Menier, Anticosti, P.Q., will be on soon with a 2 call after signing 1LE for many years . . . 3KE is busy working contests and DX . . . his letter looks like a report from an international monitoring station . . . Key Klix Klub in Toronto elected Joe Jordan, 3AID President, AWC as Vice-President, Sid Prior as Sec.-Treas., and Bob Haslett 3RH as Engineer, Publicity Man is Art Wendle . . . Broadview Y.M.C.A. is their Headquarters . . . nice note from 1IM another old timer . . . 5VP is traffic leader in B.C. handling trans-Pacific stuff . . . Haligonians elected to office in the Halifax ARC are 1EY Pres., 1ET Vice-Pres., 1JH Secty., 1OB Treas., . . . 1OB had transportation troubles and had to turn the job over to 1LZ . . . we stand corrected Mac . . .

VE5	VE6	VE7
TRY		
VE6GD's		
PARTS	GYP	
TUBES		JOINT
RECEIVERS		
TRANSMITTERS		
VE6GD		VE6TM
523 - 8th Ave. W. CALGARY		
Large Stock War Surplus Parts		

howzat? . . . Since we're on clubs, along the peak-fringed Alaskan Highway is Dawson Creek's Amateur Radio Club lamenting the fact that they're too far away from civilization to get a crack at War Surplus bargains . . . 3LZ needs a J for WAC . . . 5AL is back with us . . . remember him as SCM way back in days of yore? . . . sure glad to see you King . . . Sgt. Willis is now at 6th District Sigs in Halifax . . . wants to get going soon . . . 4RN got the old bug again from 4ACL one day while he was giving him a hand with buggy recvr . . . 3AWJ is now in Winnipeg and with 4QV and 4ACR is in RCMP . . . Pete Kushnir got his initials too from DOT and is now 5PK . . . keep those nice letters coming Pete . . . 2PF is working DX . . . XACM and FA8B are his two latest prize catches . . . 3AFY will be on by this reading. Interesting note from Dr. J. S. Cull of Victoria who was on years ago when calls weren't required . . . how about some notes on those old experiences and an outline of what transpired in the interim . . . 1EY wants to get in touch with 3AME . . . 1CO is going to town on TEN . . . 1CW has power main facilities now and worries not about windchargers, batteries, etc., as in days gone by . . . ex1AP let his call lapse and is awaiting new one Summerside is quite a ham town . . . Jim Wetherill, G5UB spent a couple of days at HQ here before going back home to England . . . 3AOM in Tillsonburg wants dope on low power fone and cw rigs . . . 4FG in the land of liquid sunshine at Prince Rupert, B.C., has high hopes of getting back on the air to work some of the VKs he hears nightly . . . Recently back from a sojourn in Holland is 3LT . . . Donkin, Cape Breton, N.S., boasts plenty of activity and a nice note from 1DR tells us that 1NX is on fone and cw, 1IO is making loud noises, 1JA is getting with high power, 1DL still QRL RCAF, 1AB now on 75 fone, 1GZ only is seen in person, 1DR is on 6, 10, 15, and 75 meters . . . 1AM is old timer from 1924 . . . but like most others is bashful . . . or too modest . . . Rpt Fm The Nation chased 3OI out of hiding and brought forth a good report with old co-operation offered in the same fine style . . . thanks Brock . . . keeps him busy looking after fizzy fuzzes . . . 3TM is back on 80 looking for Pip 3DU . . . 4ARN sends in FB contest report . . .

QSY to page 34



QSO No. 1 of a Series.

I.R.C. rag-chews with XTAL readers

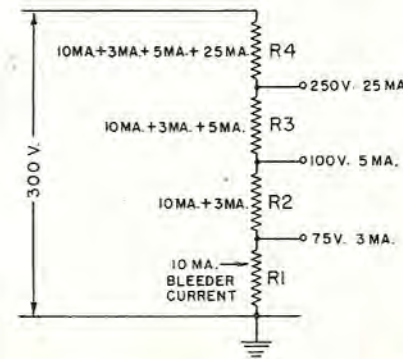
PROCEDURE FOR THE DESIGN OF BLEEDER VOLTAGE DIVIDER CIRCUITS

The first consideration is the amount of "bleeder current" to be drawn. It is also necessary to determine the exact current and voltage to be drawn at each tap of the voltage divider.

Let us assume that we are going to design a combined bleeder resistor and voltage divider for a receiver power supply. Let us also assume that the supply will deliver 300 volts and is conservatively rated to supply all needed current for the receiver plus the bleeder current.

The bleeder current for a supply of this type is usually about 10 Ma. It would not normally be necessary to select a value for the bleeder current in excess of 25 Ma.

The following schematic will illustrate a typical circuit.



The required voltage drop across each resistor is as follows: VR1 = 75 volts, VR2 = 100 - 75 = 25 volts, VR3 = 250 - 100 = 150 volts, and VR4 = 300 - 250 = 50 volts.

Now with the above values determined, it is only necessary to apply Ohms Law:

$$R1 = \frac{E}{I} = \frac{75}{.01} = 7,500 \text{ ohms}$$

$$R2 = \frac{E}{I} = \frac{25}{.013} = 1,923 \text{ ohms}$$

$$R3 = \frac{E}{I} = \frac{150}{.018} = 8,333 \text{ ohms}$$

$$R4 = \frac{E}{I} = \frac{50}{.043} = 1,163 \text{ ohms}$$

Total resistance of bleeder . . . 18,919 ohms

The power dissipated in each section of the resistor is calculated by the following formula:

$$P = I \times E$$

when: P = power in watts.
I = total current flow in each section.
E = voltage drop across each section.

i.e.: P = .01 x 75 = .75 watts
P = .013 x 25 = .325 watts
P = .018 x 150 = 2.7 watts
P = .043 x 50 = 2.15 watts

This can be achieved by using: (a) four separate resistors of the resistance value and wattage rating calculated above or (b) one larger single resistor having approximately the total overall resistance value calculated above with three adjustable taps, and a wattage rating as calculated below. The single unit would ordinarily be used because of the difficulty in procuring four separate resistors of the exact values indicated. Also trimming adjustments of the tap voltages is possible to compensate for small errors in the value of current estimated for each tap.

The wattage rating of the single resistor is determined by the maximum current in any section, in this case 43 MA. in R4 section $P = (I \text{ max})^2 \times R = 43 \times 43 \times 20,000 = 36.93 \text{ watts}$. In this case a 40 watt resistor would be satisfactory.



(Continued from page 11)
on a meter, and made it suitable for civil aviation use.

A small transmitter in the airborne set fires out a pulse on 218 mcs. about 100 times a second. Pulse length is 2 microseconds and peak power of the pulse is about 200 watts. This pulse is picked up by a receiver located at a selected ground point, detected, and used to trigger off the ground transmitter which gives with a 5 microseconds pulse of about 10 kw. peak power, on 228 mcs. The airborne

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receiver detects this pulse, and the usual timing circuits and strobes go into action to measure the time (same thing as distance) between the pulse emitted from the aircraft and the pulse received back. The answer comes out linearly in volts or amperes and is socked on to a 270°-reading milliammeter on the cockpit panel. The meter is graduated either 0-25 miles or 0-100 miles. The complete airborne installation, soup to nuts, weighs 22 pounds. The airborne transmitter-receiver-timing-circuits box weighs 15 pounds (see photo). The ground equipment is in duplicate, with automatic switch-over in case anything goes haywire with the operating set.

In practice, the pilot "tunes in" the local distance beacon after he takes off. This "tuning in" is done by turning a knob which runs a strobe circuit out in range until it reaches the distance of the ground station he wants. At this point the indicator lamp lights, and the ground beacon may also be identified. The pilot then switches the set over to automatic following and from there on the needle shows him his distance from that ground station. If there are other ground beacons within his range that he wants to use (all ground beacons are on the same r.f. frequency) he merely twiddles the distance selector knob until he finds it, and then locks on as before. One characteristic of the system is that if two beacons cross each other at the same range, the meter needle will follow the nearest when they separate. That is, if the pilot "tunes in" Ottawa, he will pick up Montreal at the half-way point and follow the Montreal beacon in, without touching the controls.

There are several applications of the distance indicator system. The first one proposed is to instal ground beacons at all the radio range stations, so the airlines will have a complete airways system, giving them both track guidance and their exact position on that track. In the future it is proposed to use distance indicators with blind landing systems as well. The distance indicator is but the first of many applications of wartime radar techniques to civil aviation.

Here's hoping the story has been made reasonably clear, and that, if you're flying T.C.A. some time in stinky weather, you may bless the help the distance indicator can give the pilot.

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20 JCL		25 "	
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40 JVL		25 "	
20 JVL		25 "	
10 JVL		25 "	

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CLUB ACTIVITIES

Throughout Canada club activity is greatly stimulated. Our Club Directory now lists forty-two VE clubs. Besides those mentioned in Report From The Nation a brief summary of other club activities follows.

The Intercity A.R.C. is composed of 67 members from London, St. Thomas and surrounding towns. Meetings are held the second Thursday each month, in St. Thomas during May, July and Sept., and in London during June, August and Oct. 3HI is president.

The West Side R.C., Toronto has 3JJ on the air and best dx is VE8AR in Y.T. 3JJ broadcasts to members on ten after the band closes.

The East Kootenay A.R.C. has re-organized since the "silence" and Cy Ramsay, 7ACW, is guiding their destiny from Cranbrook.

3QO was the host at an organization meeting of the boys in Oshawa-Whitby, Ontario, district and through his phone station, prodded by 3BBV, and 3AFI, rounded up a surprisingly large number. A committee was appointed to locate quarters for the club and its station. Election of officers will take place later.

With the help of 4BQ and 4SO the Winnipeg amateurs met in the Free Press Building, 75 strong. It was unanimously decided to have one large club in the Winnipeg area known as the Winnipeg A.R.C., instead of the five smaller clubs of pre-war. Jack Green, 4BQ, was elected president, and Miss Frances Dodd treasurer (she awaits her call letters). May 8th has been set for a banquet at the Marlborough Hotel.

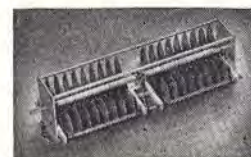
The Key Klix Klub, Toronto, have found a spot for the Field Day in June. It's Stop 25, Kingston Road. Art Windle suggests that other clubs advise their F/D locations to avoid embarrassment and QRM. They are planning to have several good rigs on the air, and are going after the cup won last by the Hamilton A.R.C.

VE3BER, the Clinton A.R.C. station is now operating on restricted hours, and expect to move into their new quarters soon at the RCAF school. They are staging a combined hamfest and Field Day June 22nd. A resolution was passed that any amateur within 25 miles of Clinton may become an honorary member, and without fees may use the facilities of the club. Another good idea

VARIABLE CONDENSERS

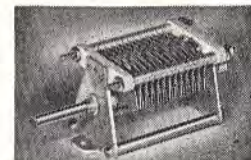
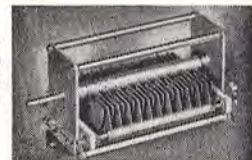
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they have inaugurated is that officers be elected every six months. This gives many more members an opportunity to participate in executive matters.

The Annapolis Valley A.R.C. has recently been formed at Berwick, N.S. IID, D. B. Burgess is president. An aggressive summer program has been planned with a view to promoting good public relations.

The Progressive A.R.C. is made up of members from the district of Kitchener, Waterloo, Preston, Galt, Hespeler and Guelph. Their May meeting will be held at the O.A.C., Guelph. President is Blackie Taylor, 3ABZ.

It should be pointed out again, that all clubs from coast-to-coast extend a hearty welcome to new members. This applies both to licensed amateurs and hams-to-be. Contact the secretary of the club nearest you for full particulars regarding meetings, etc. Please use the Club Directory.

CLUB DIRECTORY

A.F.H.Q., A.R.C., Ottawa, Ont., W. J. Yeo, 3BFL, Room 3145, Lisgar Bldg.

Les Amateurs Canadiens Francais de la T.S.F., Montreal; Georges Forest, 2EU, 6325 St. Denis St.

Annapolis Valley A.R.C., Berwick, N.S., A. S. Watters, 1FG, Union St.

B.C.A.R.A., Vancouver; Fred Taylor, 7HA, 221-11th St., New Westminster.

Cdn. Lakehead Wireless Experimenters, Ft. William; Ray Greer, 720 South Norah St.

Central Radio Club, Toronto; L. J. Kerswell, 48 Vermont Ave.

Clinton A.R.C., Clinton, Ont., 3BER; T. A. Prest, 4MX, R.C.A.F. School.

Dawson Creek A.R.C., B.C., Stan Carnell, 5ALG, Box 1143.

East Kootenay A.R.C., B.C., J. G. Graham, ex-5NB.

Frontier Radio Club, Windsor, Ont., G. D. Wood, 3AEP, 327 Ouelette St.

Halifax A.R.C., Ed. MacLaughlin, 1JH, 78 Harvard St.

Hamilton A.R.C., C. O. Mogk, 3AXV, 37 East 12th St.

Intercity A.R.A., London-St. Thomas, Geo. Sanders, 3QC, 671 Dundas St., London.

Key Klix Klub, Toronto; Sid Prior, 11 Cedar Ave.

Kirkland Lake A.R. League, Ted Barker, 3ALU, 7 Baron St.

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Type 206-RF 40 meter) five
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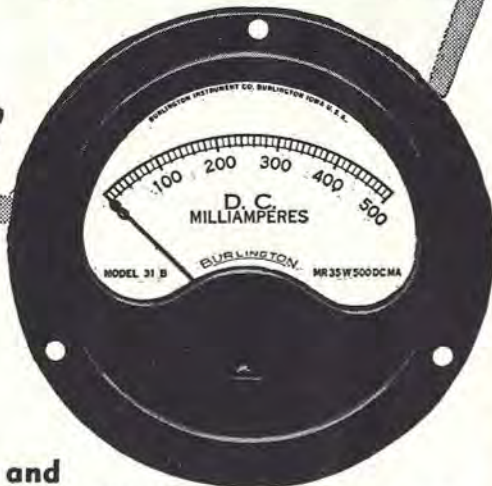
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North Shore Radio Club, Whitby-Oshawa, Ted Brant, 3ADD, Box 427, Whitby.

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Point Grey A.R.C., Vancouver, D. E. McLennan, 7JY, 780 Beatty St.

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Royal City A.R.A., New Westminster, Fred Taylor, 7HA, 221-11th St.

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Sarnia A.R.O.C., G. E. Hare, ex-3MW, 291 Queen Street.

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South Shore Wireless Ass'n, St. Lambert, P.Q., F. W. Grant, 2BI, 333 Mercille Ave., Montreal 23.

Thousand Is. A.R.A., Brockville, Ont., H. Fairbourn, 3WG, 176 Pearl South.

Totem A.R.C., Vancouver, B.C.
U of B.C.A.R.O.A., Vancouver, Ralph Gordon, 6150 Carnarvon St.

Vancouver A.R.C., Tom Grant, 4535 West 9th Ave.

Victoria S.W.C., David Scholes, 7DY, 1614 Pinewood Ave.

West End A.R.C., Vancouver, B.C.
West Side Radio Club, Toronto, Ed. Brown, 3AHV, 79 Boustead Ave.

Winnipeg A.R.C., G. G. Williams, 4SO, 234 Sackville St.

Wireless Ass'n of Ont., Toronto; Art. Potts, 3MT, 33 Haddington Ave.

Yukon A.R.C., Whitehorse, Y.T., W. R. Williamson, 8AK, Box 137.

(Continued from page 24)

3IR was on looking for Booby prize . . . 3ACS dropped in on XTAL last month and told us all about Black Donald . . . 3AHE has FB location and with lovely wife and family was most gracious host to Report From The Nation on the memorable premiere of 80 . . . Mrs. AHE is topelite artist with charcoals and pastels



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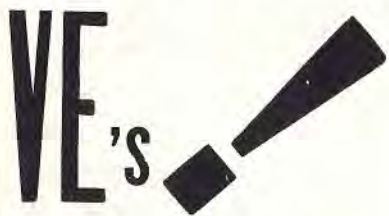
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DEAR OM

It was a real pleasure to read your interesting and friendly letter. Over here I have been quite out of touch with the ham situation and I certainly appreciated being brought up to date on the re-opening of our former frequencies. From what I was ever able to hear on ten I didn't think it would be very satisfactory for reliable communication, though excellent DX has been worked during freak conditions. Prior to the suspension of ham licenses in Canada I was operating a low powered transmitter on the 40 meter band. One crystal frequency was 7296 kc., so I am hoping to get in touch with the boys soon as 40 opens again.

OK on hearing D4AAU and D4ABC on this side of the water. I had heard that some GIs were operating ham stations in the area but thus far I haven't heard them. Matter of fact I've gravitated to photography lately and have been spending a lot of time in the dark room.

Recently I was doing a bit of fooling around with a Jerry Wehrmacht transmitter. It sure delivers a fair amount of soup to the antenna coil; enough to light up a 20-watt bulb to more than full brilliance. With the key circuit closed the plate current in the final stage is 175 ma. and the plate voltage is 750 volts which works out to about 130 watts input. However, I didn't have the transmitter long enough to figure what frequencies it was operating on. It had three bands, set with a switch.

In this letter I am enclosing a clipping from today's "Maple Leaf". It shows that at least one of the Canucks are in there. Occasionally I get up to Oldenburg on business so I'll try to visit F/O Webb if possible. As you have probably seen in the papers the CAOF is folding up shortly, so there isn't much time to set up anything over here at present. I, however, do hope to get back on the air as soon as possible after I get back to Canada. You can count on my 100% support for the CAROA. It is an organization with the unity we need in our hobby.

It has been fine to QSO with a VE3 again and I certainly hope I'll be able to meet you on the air and personally some day.

Bill Wight,
3/HLI of Canada,
CA Overseas Force, Germany.



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8310	108	4600	3.71	8125	240	4600	2.92
8315	162	4600	4.68	8135	341	4600	3.12
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Genial CHARLIE BOUGHNER, VE3IM, will be glad to talk with you about his FB Field Strength Meter article in March Xtal. Drop in.

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Editor XTAL:

I have been receiving XTAL maga-
zine for some months and as I have
not subscribed for it I must tell you
the situation here.

I don't know if I will be able to get
my transmitter on the air this summer
or not. I wrote the Department of Trans-
port to see if I could use our broadcast
receiver on the transmitter license and
they say not. I can't afford to get two
licenses at present so I guess I will have
to do without the old rig, on account of
having a fire and losing our house some
time ago we have to cut expenses so I
am sorry to say that I can't subscribe
to XTAL at present either, as much as
I like the magazine.

Thank you for all favours . . .
Cecil Hebb,
Box 212,
Bridgewater, N.S.,
(was VelHQ).

Editor XTAL:

I had written to you about my not re-
ceiving the latest issue of XTAL. It
came today, so please disregard this
note in that connection. The magazine is
one of the things I look for mostly around
here.

You repeatedly ask for news from all
over the nation. I cannot give you very
much because there are no amateurs in
the district. So I will blow about my
own set-up here and you can perhaps
pick out excerpts and use 'em for the
column.

I live on the farm here so I have to
use 6 volts for power. A wind charger
is used and 2 batteries in parallel. The
transmitter uses a 6L6 E.C.O., 6L6G
doubler, 6L6G final, running at present
at about 18 watts input. The oscillator
and doubler are run from a 200-volt
vibrator supply, while a 300-volt pack
furnishes power for the amplifier. The
antenna is a 40-meter half-wave, fed in
the centre by a tuned line, quarter-wave
long. Parallel tuning is used for 28 mc.
The receiver is an adaptation of the
circuit found in February QST using 1.4
volt tubes.

The layout works very nicely. I took
part in the BW Contest and worked up
quite a score. Had 116 contacts in about
28 sections. S9 reports are received from
many points including Alaska and an S8

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from a portable W9 on Shemya, near Attu. VE1s are about the only Canadians heard and worked here. I can hear VE4RO usually, as if from a very distant point. He's about 250 air line miles away.

The following DX has been worked with fairly good reports with only 18 watts: GM6, LU9, W4ESR/J5, K7 and all Ws but the 7th district and odd VE5 and VE2 is heard. I hear lots of DX like G, D4, GI, HK, HC, CO, K6, and two or three Js. W4ESR/J5 in Okinawa come in quite well the day I snagged him. The band usually folds up here about 1800 CST with only K6, KB6 and J coming in for a time after that, lasts till about 2100 sometimes.

Seems to be all around here at present. I wonder how many of the boys have to put up without AC line power. Those articles you promise in XTAL regarding portable and battery powered equipment would be very much appreciated by us all.

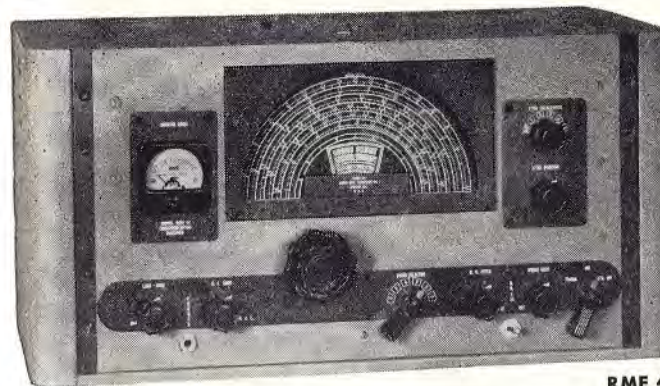
VE5PK ex4AJT

Peter Kushnir, Hamton, Sask.

EMBLEM CONTEST

Many of our members have written recently asking for an association emblem for use on QSL Cards, Pins, Stationery, etcetera. Frankly we had hoped to shove this little problem onto the broad shoulders of our "department in charge of brainstorm"—BUT—and it is a big BUT, the DICB is very very QRL figuring out Field Day Transmitters, writing letters, getting the next XTAL ready for the press, whipping the new Communications Department into working order and a dozen other jobs. SO, since it's YOUR Association, and it's gonna be YOUR Emblem, why shouldn't YOU design it? The prize will be a big, brand new 813 for the best design submitted. Give us a rough sketch, or a finished drawing. Remember, you don't have to be a Loewy, or a Geddes, or some other streamliner-with-a-pencil. What we want is the idea. Judges will be the Headquarters Staff and everybody will get a fair deal. Designs must be submitted by June 15th to be eligible.

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Ignition QRM—Ignition QRM on ten meters has long been a stumbling block to 100% QSO's on high frequencies. Not so with an RME 45. This modern receiver incorporates a highly efficient automatic noise suppressor which is always in the circuit—always on the job.

Little wonder that thousands of hams are insisting on the new RME 45!

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- Relay rack mounting panel.
- Six bands, 550 to 33,000 K.C.

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It IS the "Glacier Eagle".

SWAP dual Triplet meter, 0-1 ma DC-0-10 v AC. Also one 0-1 ma. and one 0-500 microamp Beede fan type meters, for equiv. value round case 0-100 or 0-200 ma. One HF200 new, would like its mate or swap for something useful. G. Blanchett, VE3BAD, Box 73, Oshawa, Ont.

For Sale: Power xfmr 2200 V. at 250 ma. c.t. 25 cyc. (50 lbs.) \$25.00. NEW tubes; 813 \$10.00, 814 \$9.00. Meters; Jewell 0-½ amp. thermo-clpd R.F. \$3.50; Jewell 0-15 ma. \$3.50; Weston 0-5 amp. thermocpld R.F. (bakelite) \$5.00. Bob Ross, VE3TM, Box 532, Leamington, Ont.

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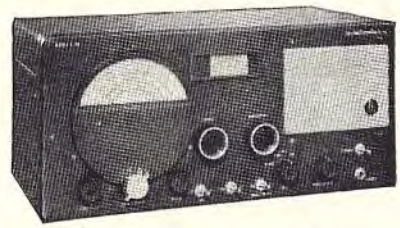
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