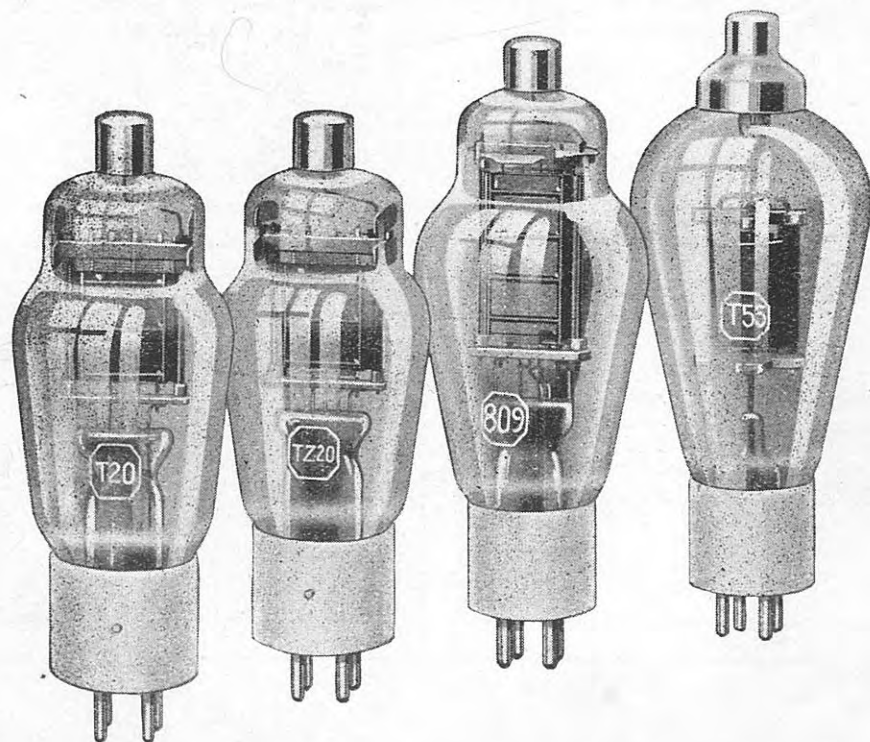


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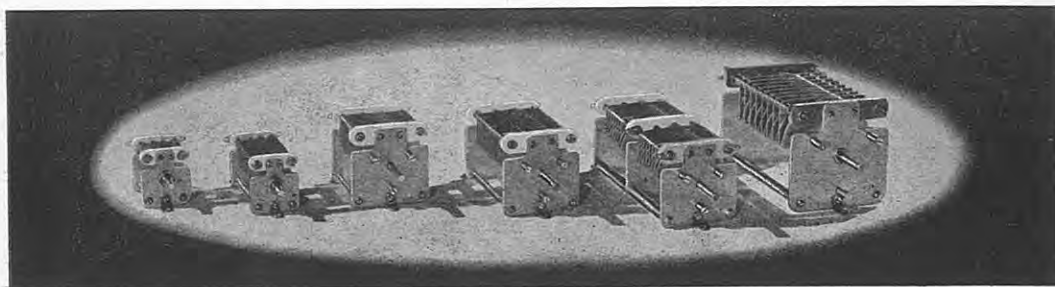
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1938



Standardize on Hammond Canadian Built Condensers



From coast to coast Hammond Condensers are fast becoming noted for their precision, construction, ruggedness, low-loss characteristics, also Isolantite and Alsimag 196 insulation. Their cost is low too!

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HAMMOND TRANSMITTING EQUIPMENT

HAMMOND MANUFACTURING COMPANY

GUELPH : ONTARIO



X T A L

PUBLISHED MONTHLY

BY

THE VE OPERATORS' ASSOCIATION

AT

106 JARVIS STREET

TORONTO, ONTARIO, CANADA



21

Speaking Constitutionally

Amongst most self-respecting organizations, it appears to be an accepted fact that a constitution is necessary to their orderly procedure and efficient functioning. The VE Operators' Association, being surrounded by an air of respectability, is not an exception; consequently, a constitution was duly adopted some time ago. In its present form, it is incomplete and inadequate for our permanent purposes, being quite sketchy, as we have previously pointed out. Nevertheless, it has given a continuity to our efforts, and has facilitated our development plans; to that extent it has proved of value.

Frequently, the process of evolution has carried an enterprise from an obscure beginning to current eminence, and while a constitution will never be rated with the classics (being more likely to be accorded an interest status of S1 or 2) still, if made the subject of some intelligent thought, it can be a very creditable document of inestimable practical value. Its worth, clarity and unanimity of interpretation will be directly proportionate to the acumen and perspicacity introduced by its compilers, but it will probably have to evolve.

In its preparation, the future must be linked with the present; fairness to, and the privileges of members, as individuals, must be considered, at the same time being careful not to introduce a vulnerability whereby a minority group may wreck the whole, and yet keep within the limits of the constitution. The writing of a governing document is indeed a complex problem, the difficulties of which are accentuated in an association such as ours where members are located over an area the vastness of Canada.

It is our appreciation of the many ramifications of the problem which has restrained us from undue haste in either amending or replacing our present constitution. Further, the support of hams has, in one of its avenues of crystalliza-

tion, manifested itself in suggestions for constitutional content. These helpful and timely suggestions have all been worthy of, and have received careful study, which has taken time. Several notices of motions have been the result of these deliberations. Publication of the constitution, as promised in last issue, has been postponed till these notices have gone through the prescribed stages. However, we hope at an early date to produce the finished article, and when this is accomplished, members will receive a copy or, in the alternative, it will appear in XTAL.

In the meantime, it might be well to make reference to some of the provisions of the constitution as it is at the moment, and without considering the amendments which for the time being are still on the hook. We think it wise to do so in view of the widespread interest the subject appears to have.

To start, then, is our type of membership. At first blush, the question seems quite simple, and we thought it was, but representation has been made to us that there are in Canada a number of people who are technically minded although not licensed hams, and who desire membership in our association. We stumbled for a moment, then made our name the subject of a strict analysis and found that we are, essentially, an “operators’” association. Viewed from one angle, that seemed to put a finish to the matter, but further reflection brought a dawning light, by virtue of which we could see the existence of a degree of unfairness if we excluded a class of citizen who has a technical interest in amateur radio, and of whom many may, eventually, find themselves receiving the same pleasure from the operation of their own stations as we do to-day. So it seems that provision should be made for a type of associate member whose rights and privileges will be somewhat different from those enjoyed by the ham.

The duties which would ordinarily fall

to the executive committee are at present being carried out by a group to which the constitution loosely refers as "active." The group has been restricted in number, due to the fact that frequent meetings have been held at the homes of the respective members. The frequency of meetings has been such that considerations of economy dictated home meetings. In any event, the essence of service from any executive committee comes from its ability to assemble regularly and frequently, with such additional meetings as circumstances may require. That is a consideration which is going to occasion some concern in making constitutional provision for the composition of the executive committee. Whatever the solution, it will be the most equitable basis that can be conceived.

Closely associated with that thought is the provision that minutes of meetings shall be sent to all members not later than one week after the date of meetings. When the present tremendous pressure of association business subsides somewhat, we shall get down to a practical means of complying with that requirement. In the meantime, we feel that we shall enjoy your indulgence. The thought we had in mind about the minutes was that every member is entitled to know exactly what is going on in the association.

It is also imperative that the officers arrange for one regular night every month upon which there will be a broadcast of association news. On those occasions members of the executive committee will be on pre-determined frequencies ready to answer all questions, or to receive suggestions. In other words, the innermost workings of YOUR association will be as close to you as we can possibly make them. Once again, we have not been able to arrange for the inauguration of that feature due to a multiplicity of matters arising from your letters, and from other sources, but we'll get there as soon as possible.

Then there is authority for the publication of bulletins or other literature. Under this heading comes XTAL, and what an important part in our association life it is to play!

The other portions of the constitution, to which no reference need be made, provide in the customary fashion for the holding of meetings, and set out the duties of the officers.

This brief summary, together with last month's outline of our objects, will give our readers a slightly better conception of what we have at the moment, and of our method of progress.

Since our last issue there has been placed before us a matter which requires action pursuant to one of our objects. The question is receiving very close attention, and if the facts are found to be as related to us, your association will promptly take its first official act in behalf of amateurs. Obviously, it is impossible to make a statement at this time, or until the facts have been gathered, but at the appropriate moment we shall present you with a report should the case prove to be one requiring action on the part of the association.

Undoubtedly, such occasions will arise from time to time, and you may rest assured that the VE Operators' Association is not going to be asleep, but, on the contrary, will be closely in touch with all sections of the country. It is neither Toronto nor sectional, but is national, and is ready to assist in the east or west. For that reason, we wish to be careful with the preparation of our constitution in order that our prestige shall not be lowered, or our members find cause to complain. We want the association to have an appeal to you, and the constitution to be acceptable, so that we may enjoy your confidence, then with our steadily increasing membership (which has reached proportions we had not anticipated would have been attained for some time to come) together with a thoroughly business-like constitution, we shall truly enjoy the status of being representative of Canadian amateur radio.

We are inclined to the belief that the ready acceptance of the association by Canadian hams is due to the out-and-out democratic type of organization we are determined to make it and keep it, and that is as it should be — speaking constitutionally.

The members of the executive are hoping to meet many out-of-town members during their holiday and Exhibition visits to Toronto. Their phone numbers are: ACI, LO. 4575; ADO, JU. 3016; APS, HU. 2217; GR, HO. 1575; GT, RA. 6536; PL, KE. 6612; RF, HO. 2016; SG, GR. 1779; VA, LL. 7438; VD, LA. 7200; WK, GR. 8489; ZE, HO. 1973.

BRANTFORD PICNIC

The Brantford A.R.C. is holding its annual picnic on Sunday, July 17th, at Mohawk Park, Brantford. There is no ticket charge. Bring sandwiches; tea will be supplied. The Brantford gang's hospitality reputation assures an enjoyable outing. See you there.

The 1938 Canada - U.S.A. Contest

By Fred H. B. Saxon, VE3SG

Believe it or not, 2396 VE and W stations took part in the contest by exchanging message preambles. Two hundred and eighty-two logs were received, which is a 30 per cent. increase over last year's contest. As I sat here night after night and day after day putting down the information contained in each log, I tried to visualize the net that was

and goodwill. I was thrilled by the enormity of it all. YL and XYL operators had no small part in the contest. VE2HI, in Montreal, Quebec; VE3HE, in Stratford, Ontario; and VE5NG, in Vancouver, B.C., are three that I have positive proof of. There may have been more.

A little explanation of the long contest period. In setting the date, the Easter weekend was the only one which was clear of some kind of contest or activity, and in having the contest spread over five days, the idea was to give as many as possible a chance to participate and NOT to make it a contest of endurance.

W9FOQ leads South Dakota again this year, making it four times in a row. W6MVK has made it three times for San Joaquin Valley, while the following stations lead their sections again this year: VE5QP, British Columbia; W3FQZ, Md-Del-D.C.; W3FAX, Southern New Jersey; W9MUX, Illinois; W5KC, Louisiana; W2IOP, N.Y.C. & L.I.; W9YAH, Kansas; W1TS, Connecticut; W1RY, E. Mass.; K6CGK, Hawaii; W6ITH, East Bay; W6NEN, San Francisco; W9YAD, Colorado; W4DIQ, Eastern Florida; W5DQD, Northern Texas; W5FZD, Southern Texas. Congratulations to you all.

The Canadian prize winners follow:

First prize — Cup, donated by the Canadian General Electric Co. Ltd., Toronto, won by VE2EE, Montreal, Quebec.

Second Prize — RCA 804, donated by the Canadian Marconi Co. Ltd., Montreal, Quebec, won by VE5QP, Eburne, B.C.

Third Prize — 100 mmfd Transmitting Condenser, donated by Hammond Mfg. Co., Guelph, Ont., won by VE3IR, Agincourt, Ont.

Fourth Prize — RCA 809, donated by Canadian Westinghouse Co. Ltd., Toronto, Ont., won by VE5VO, Vancouver, B. C.

Fifth Prize — RCA 809, donated by Canadian Westinghouse Co. Ltd., Toronto, Ont., won by VE2EP, St. Lambert, Quebec.

Special Prize for VE Placing 23rd — 1 KBX Crystal, donated by the VE Operators' Association, Toronto, Ont., won by VE2DJ, Montreal, Quebec.

The ten highest scoring Canadian and United States stations:

(Continued on page 8)



woven by the contacts of all these stations, from Alaska to Cuba and Porto Rico, from Halifax to San Diego on the continent, out over the Pacific to Hawaii and on to the Philippines, each contact bearing its little message of friendship

The Multivibrator Frequency Standard

By JOHN J. LAWSON

For several years the author has been keenly interested in frequencies and their measurement. Although a good reliable signal generator has been built and used for that period, the question always arose as to whether it was accurate to the required degree. Around the first of this year it was decided to build a crystal-controlled standard frequency generator. The choice most naturally fell on a 100 kc crystal bar as the control unit, and after considerable correspondence with Bliley Electric Co., an SOC-100 unit was purchased. This unit employs a 100 kc bar mounted on silver-plated knife edges and enclosed in a shielded container along with the proper value of tank inductance. The crystal has a temperature coefficient of 3 cycles per mc per degree Centigrade, and when used in the recommended circuit will have practically no temperature rise due to operation, as the measured plate and screen voltages are 9 and 15 volts respectively. The crystal current could not be measured on a sensitive R.F. galvanometer. It is therefore apparent no heating time need be allowed for, and the only change from day to day will be the ambient temperature.

The second decision made was to use a multivibrator to give frequency division from 100 kc downward. The word multivibrator is little used and less understood in radio than any other term, and the writer hopes that the following non-technical discussion of this circuit will help those who are not conversant

with it. Any tube will oscillate if the plate circuit is coupled back into the grid circuit. Take now two tubes, resistance coupled in cascade, and feed the plate circuit of the last tube into the grid circuit of the first tube. We now have the oscillating condition magnified. The result is a powerful oscillator, but with very poor stability, as may be seen by placing the hand two inches away from any part of the circuit. Some idea of this instability may be had by remembering that at 7,000 kc the average self-excited oscillator will tolerate the hand being held within one-quarter inch of the grid lead before a change in beat note can be detected in a suitable receiver. As the circuit we are dealing with is operating at one-hundredth of this frequency, from past experience with low frequency oscillators we might expect it to be very stable—but quite the reverse is the case. As the multivibrator has no tuned circuits, the frequency determination is governed broadly by the resistance and capacity in the grid circuits. Sufficient to say here that increasing the resistance or capacity causes the multivibrator to operate at a lower frequency—in effect, the resistance takes place of the usual inductance.

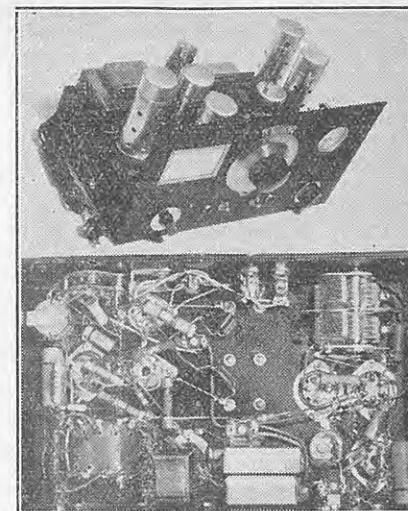
Now to make use of this instability: Suppose we have a multivibrator tuned to approximately 100 kc and feed into either the grid or plate circuits a crystal-controlled radio frequency voltage at exactly 100 kc, the multivibrator at once swings to 100 kc and locks with the

exciting voltage and maintains this condition indefinitely. Now let us increase either the resistance or capacity in the multivibrator grid circuits until it is tuned to approximately 50 kc. At some point, as this frequency is approached, the multivibrator will jump from a fundamental of 100 kc to a fundamental of 50 kc and *still* remains crystal-controlled. The reason for this is, the multivibrator is so sensitive to outside influence that a strong R.F. voltage introduced into the circuit and falling on one of its harmonics—in this case the second—will control the multivibrator back on its fundamental. This condition can be carried much further back by properly proportioning the values of resistance and capacity. The writer has made the multivibrator under discussion operate on 2.5 kc; that is, the multivibrator was being controlled by virtue of the fact that its 40th harmonic was falling on 100 kc. For all practical purposes a division range of from 1 down to 10 is adequate and has been used. This enables us to generate R.F. carriers spaced 100 kc apart and down to 10 kc apart anywhere from the fundamental frequency of the multivibrator up to 60 mc.

With apologies to previous writers on the subject, it would appear from actual trial that all multivibrator circuits have something in their favor, but usually several features which leave much to be desired. Some systems tune the multivibrator to various dividing points by altering the grid resistance, some by changing grid capacity, others by having both resistance and capacity fixed and varying the magnitude of the control voltage. After weeks of experimentation in what he feels was a logical manner, the writer finally used the system of varying the capacity as well as the resistance (he was, perhaps, swayed by the fact that he had a National Type "N" dial not in use).

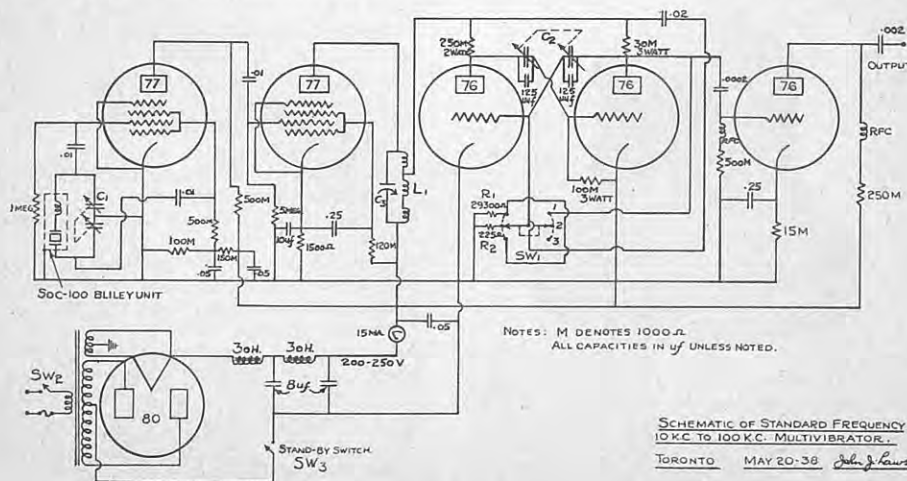
The three-position switch Sw1 handles the two wire-wound resistors R1 and R2. If permanency of operation is desired, it is essential that these be wire-wound. On Position 2, the 100 kc standard is divided from 2 up to 5 times, depending upon the setting of C2. On Position 3, the division is from 4 up to 10. Position 1 gives *only* 100 kc output, irrespective of the setting of C2. This is invaluable in identifying the 100 kc points without altering the multivibrator frequency.

Referring to the schematic diagram, most of which is self-explanatory, the 100 kc oscillator is at the extreme left.



The condenser C1 is a standard 360 mmfd. dual broadcast type by means of which the crystal can be tuned to plus or minus 8 cycles from the fundamental. The output of the oscillator is resistance coupled into a pentode amplifier, in the plate circuit of which is the common coupling impedance L1 to the multivibrator. L1 consists of three 175 kc I.F. coils mounted on a single dowel spaced one quarter inch apart, a tap being brought out as indicated. C3 may be any padding condenser which will peak this circuit at 100 kc. A one-mil meter connected temporarily in the cathode circuit of this amplifier will indicate resonance. The function of the amplifier is to prevent the multivibrator from reacting on the control oscillator, although the circuit employed gives a voltage amplification of more than 40 to 1.

The only point to mention in the multivibrator proper is the variable condenser C2. The one used was a United Scientific straight line frequency, 420 mmfd. per section dual, with a slight change made to insulate the rotors from each other. The output amplifier isolates the multivibrator from any changes in loading due to different test circuits being coupled to the output terminal. This in part explains the use of the .0002 mfd. condenser between the multivibrator and the output amplifier. The reactance of the .0002 mfd. condenser at 100 kc. is some 6,000 ohms and quite serves the purpose for which it was intended. The R.F. chokes in the grid and plate circuits accentuate the higher harmonic frequencies and tend to level the output over the fre-



quency range covered. The output is quite strong and readily detected up to the 600th harmonic on 60 mc. At 7 mc the 100 kc output is approximately 5 millivolts when a 250 volt power supply is used.

The power supply is quite conventional and needs no mention except that the filter should be adequate, particularly in districts where the supply frequency is 25 cycles. At the very high harmonic frequencies, any ripple voltage at all will modulate the output considerably. The filter shown will be sufficient, as the total current for the 5 tubes is only 12 M.A.

As regards the accuracy to which the instrument can be set and maintained, this would be difficult to measure. When adjusted to WWV transmission on 10,000 kc to within one cycle—and this is quite possible—the original accuracy is one part in ten million, assuming WWV to be absolute. Suppose next day the ambient temperature is 5 degrees C. or 9 degrees F. higher, the total change in frequency would be only some 200 cycles (at 10,000 kc). This deviation can be corrected by retuning the crystal and re-checking with WWV if extreme accuracy is required.

The physical layout is not extremely important and can be a matter of individual preference. While all R.F. leads should be kept as short and direct as possible, long leads will not appreciably affect the operation. The panel is 14" by 7½"; the chassis is 13½" long, 7½" wide and 3" deep. Needless to say, a rigid mechanical job should be made. The power supply is self-contained. The variable condenser C2 controlling the multivibrator is located on the centre line of the chassis and panel. The crystal oscillator and its amplifier are to the left of C2. The multivibrator and its output amplifier are to the right. The crystal tuning condenser C1 is located directly below the SOC-100 crystal unit, underneath the chassis.

It is intended in the forthcoming issue to enlarge on this article with notes on preliminary adjustment of the multivibrator, as well as to give details of its various uses. As a frequency standard it is thought that this unit makes an extremely satisfactory device for the amateur who takes pride in his station equipment.

The author wishes to express his thanks to Bliley Electric Co., Erie, Pa., and H. W. Kenmare, of Powercut Crystal Laboratories, Toronto, who first started him thinking seriously of the multivibrator; also to VE3TA for his untiring criticism during its construction.

VE/W CONTEST RESULTS

(Continued from page 5)

Canada

VE2EE	39468	VE3SF	31089
VE5QP	38001	VE3GT	30213
VE3IR	34642	VE3ES	30150
VE5VO	32604	VE5QA	25177
VE2EP	32220	VE3NA	23963
	VE4SH	23963	

United States

W6MVK	30145	W9IU	15998
W9MUX	16726	W2IOP	15687
W3BES	16070	W3GPG	14931
W9RXL	16065	W3FQZ	14080
W1TS	16065	W9YAD	14013

The splendid score of VE2EE was made by having 353 contacts in 52 sections. W6MVK again leads the United States with 30145 points made by contacting 161 VE's in all seven sections; he used the low-power multiplier for 95 watts. W9RSO called CQ VE and got VU2BT; another night he got K6BAZ-6 on Howland Island.

VE3DA and VE3AD must have had some kind of working agreement, for it is astonishing how often they followed each other on W logs. W7GLH, of Vancouver, Washington, made 11 QSO's with Vancouver, B.C. W7FIV pats the VE's on the back for friendliness and goes on to say that he almost wore out a set of key contacts calling and answering CQ's of VE5NG, but that SHE spurned him during the entire contest. VE5VO had a very interesting log, 10 and 20-meter fone, 20 and 40-meter C.W., with contacts made all over the place. VE1MA did all his work on 160-meter fone. The Californian sections were a great stumbling block to a great many VE's; in all there were 59 Californians that did not designate their sections. A complete fadeout of radio signals was noticed during the contest, with varying length of duration in different localities. VE5QA has noted the shortest time of duration, from 11.30 p.m., P.S.T., April 15th, to 12.30 a.m., April 16th. VE4NQ, station of the Calgary Radio Club, turned in a nice log. The Lafayette Radio College Club station, W3GPG, also had a very nice log, but were not quite able to win for Eastern Pennsylvania section. The Michigan 9's were in there fighting this year, but, sorry to say, no logs were received. While every section of the 70 had participants this year, there are eight sections from which no logs have been received. Two of these sections, Alaska and Philippines, may have entries yet, as mail takes a long time to get here. W6NEN (San Francisco) says: "The usual sloppy antenna was used in

the contest. It is a 133-foot end-fed affair wrapped around posts and going at all angles. This antenna has been used ever since I got my ticket with unreasonable success." Don't change it, lad, or you will lose your luck. On the other hand, W8KZL-6 (Tucson, Ariz.) used a 500-foot long wire for 20 meters and a 66-foot doublet for 40 meters.

For the benefit of those who wondered where all the VE's were, the following might be of interest: Maritimes 27, Ontario 134, Quebec 43, Alberta 30, British Columbia 76, Manitoba 33, Saskatchewan 23, making a total of 366, which is 10.6 per cent of VE calls issued.

Maritimes

	Points	QSO's	Sec's
VE1KN	4488	73	22
CW	4350	77	20
MA	842	26	11
KY	3	1	1

Quebec

VE2EE	39468	353	52
EP	32220	179	60
FG	23436	188	42
KM	22756	195	39
DJ	17025	137	43
DR	16758	133	42
AA	8118	85	33
JT	6351	75	29
NT	5628	68	28
OI	4131	51	27
HI	1260	30	14
FF	481	19	13

Ontario

	Points	QSO's	Sec's
VE3IR	34642	222	53
SF	31089	244	43
GT	30213	194	54
ES	30150	206	50
NA	23963	193	45
AD	22734	219	36
EK	22563	166	46
HE	21648	191	41
9AL	18159	200	49
3DA	17376	188	48
AOG	16284	139	46
AGX	13662	128	36
AET	12912	157	32
AQC	8541	127	26
MI	8502	109	26
ZE	8465	110	27
ANE	8178	94	29
WS	7575	112	25
BG	5365	74	37
ALL	5056	79	32
ARK	4212	55	27
DH	3492	50	24
IW	3354	47	26
JO	2961	50	21
YX	1575	35	15
AE	1248	29	16
AGC	1125	25	15

RF	1057	24	15
PE	570	19	10
HU	264	11	8
DU	168	8	7
XY	168	8	7
SG	168	8	7
AKK	90	6	5
APS	12	2	2

Manitoba

	Points	QSO's	Sec's
VE4SH	23963	187	45
MJ	20355	156	46
SO	18428	138	45
TR	12302	148	42
LZ	5692	60	33
GJ	1035	23	15

Saskatchewan

	Points	QSO's	Sec's
VE4ZC	7524	77	33
ABR	5460	76	32
QZ	4374	55	27

Alberta

	Points	QSO's	Sec's
VE4KI	20640	169	43
NQ	9747	93	38
EO	9512	117	41
ADW	7803	78	34
ALU	4725	63	25
FK	2376	42	22
TY	1980	33	20
ADD	1080	30	12

British Columbia

	Points	QSO's	Sec's
VE5QP	38001	256	53
VO	32604	220	52
QA	25177	203	45
OJ	19932	151	44
SW	15151	138	39
FZ	14742	117	42
TR	9120	127	40
PO	4568	82	21
PX	4239	97	18
UK	2052	38	18
AG	1980	33	20
RI	12	2	2

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160 Meter Y cut, unmounted \$1.85
 80 Meter X or Y cut, unmounted 1.85
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The 56 MC Bootleg Problem

The advent on the Canadian market of low-priced transceivers has caused an alarming amount of bootleg operation on 56 mc. The condition in Toronto on this band is probably duplicated in greater or lesser degree in every city in the country. To the end that the situation shall not attain the seriousness it has reached in some United States cities, steps should be taken immediately to nip things in the bud. Fair warning is hereby given to bootleggers that the Toronto members of the VE Operators' Association start a clean-up campaign this month, and prosecution will follow if warning to cease operation is not heeded.

The problem is complicated by the fact that many of the bootleggers are irresponsible youngsters, prosecution of whom would punish only their parents. In these cases the parents will be interviewed first, and if operation is persisted in, prosecution must follow for the preservation of the band.

It is considered that some control of the sale of transceivers would be of great benefit, since those unable to do their own wiring cannot operate equipment they cannot secure.

At a VE Operators' Association meeting on May 18th, the following resolution was passed unanimously:

"Whereas it is the duty of all radio amateurs to do all in their power to prevent use of amateur bands by unauthorized persons;

"And whereas at present a dealer is required by law to ascertain whether a purchaser is in possession of a broadcast license before completing sale of a broadcast receiver;

"And whereas completed transceivers are now being marketed;

"Therefore be it resolved:
"That the proper authorities be respectfully requested by the VE Operators' Association to require any vendor to verify purchaser's possession of a transmitting station license before selling assembled and wired transceivers;

"And that the support of all licensed Canadian amateur radio operators to this resolution be solicited through XTAL."

We urge every ham, in his own interest, to sign and return his endorsement

I support the resolution of the VE Operators' Association regarding license requirements for transceivers.

Name

Address

Call

CORRECTION

In last issue's article on "May Day Activity on 56 MC Band," the reference to "the station of VE3XJ, Hamilton, Ont.," should have read "station of VE3XZ."

TORONTO AMATEUR RADIO ASSOCIATION SECOND ANNUAL

The second annual picnic of the Toronto Amateur Radio Association will be held at Area A, Hanlan's Point, on Saturday, July 16th, at 2.30 p.m.

Tickets and information may be obtained from your club executive.

Persons interested in 5-meter treasure hunt, please get in touch with Les. Weir, VE3AIB, Lombard 3986.

Lots of prizes. Prices: Adults 15c, two for 25c; children 5 cents.

DX

Worked by VE3ALL, Fraserdale — U1AD, SP1GZ, HK4AG, K5AN — Low end of 14 mc — 10 p.m. to 2 a.m. E.S.T.

VE3AOJ sends in a report of some interesting 56 mc mobile work on May 24. AOJ, AGB, AIB, KV, TY, AFO, and UT were in mobile parties, and they had mobile-fixed and mobile-mobile contacts over most of the northwest section of Toronto. PL, AHV and AJA were other stations worked, and KV heard OJ, XZ and KM at Hamilton, ADO portable, and W8's were coming in through weakly.

VE3ADO received an S8 report from Omaha, Nebra., on his 56 mc signals at 9.15 p.m., on June 27th. Which VE holds the 56 mc DX record.

Advertising copy to appear under this heading must be received, with remittance, before the 20th of the month preceding publication date.

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