Canada Post Postage paid / Postes Canada Port payé
Third class / Troisième classe
PICTON
23

CARF

the canadian amateur

December 1976 Number 10

Opinion poll results

As reported in the November issue, Amateurs in Canada gave a decisive thumbs down to the proposal for a no-code, experimenter certificate. It seems to have been a foregone conclusion that it would go that way because of a general feeling that there was no credible objective shown in the proposal and that it was, to those who worked at getting a ticket requiring code, nothing but a "give-away".

As for the 'novice' licence as proposed by DOC, it narrowly sqeaked through with an affirmative. The vote was 778 for the DOC proposal opposed by 433

Continued on Page Eight

Season's Greetings

VE3RCS commended

John Plamondon at the controls of VE3RCS. For story, see page seven

CARF

the canadian amateur

ISSN 0318-0867

Publisher:
Steve Campbell
Managing Editor:
Doug Burrill VE3CDC
Art Editor:
Stan Hill VE3DQ
Technical Editor:
H.T. Edworthy
VE3CLG
Assistant Technical
Editor:
Brian Pass VE3BGP

Vol. 4 No. 10

All correspondence is welcomed and should be addressed to the Editor. The Canadian Amateur, P.O. Box 356, Kingston, Ontario. K7L 4W2.

FCC clamps down

'HR Report', a newsy weekly Amateur radio bulletin notes with satisfaction that a blitz on illegal operations by CB licence holders in Baltimore netted 19 violators and seizure of $65,000 worth of equipment, a large portion of which was Amateur HF gear - even some two metre rigs. Charges laid were use of excess power, operation on unauthorized frequencies and others. More FCC enforcement action is anticipated.

If the DOC are active in this sort of enforcement, it certainly hasn't been publicized.

From the Front Office

In the last issue there were two stories dealing with enforcement of the legislation governing radio in Canada. The stories and our November editorial generated requests for more detail on the Vancouver case, so here it is.

Mention is made in one story of the fact that there is a move by responsible elements in the General Radio Service (CB) to "clean up the act". It appears that organized CB users and political figures are demanding that the Department of Communications spend some of the hundreds of thousands of dollars collected from GRS operators on enforcement measures to rid the CB of the lunatic fringe.

The Amateur bands have the odd nut showing up, too, but seldom have Amateurs had to ask for DOC assistance in taking care of them. Such help was, however, sought in a recent Vancouver case of flagrant, illegal operation of an unlicensed station on the Amateur bands by a person who had no Certificate of Proficiency.

The positive response of the DOC field officers in nabbing the culprit was unfortunately overshadowed by a lack of enthusiasm on the part of the Minister and her senior advisors in bringing him to account. This generated emotions ranging from distress to rage among those law-abiding Amateurs who spent time and money to obtain a Certificate and a station licence and who believe that laws are meant to be obeyed.

An archaic provision of the Radio Act requires the consent of the DOC Minister before field officials can launch a prosecution for violation of certain sections of the Radio Act and thus carry out their responsibility to the public by bringing the offender before a court of justice.

In the Vancouver case, their efforts were thwarted by the reluctance of the Minister to authorize prosecution of the charges. The Amateurs who played a large part in finding the bootleg operator asked the Federation to look into the matter when, after several months, there was no further action on their request to DOC for assistance in cleaning up the matter. Some quotes from the resulting correspondence cast a revealing light on the view of justice and her responsibil-

ities under the Radio Act on the part of the Minister, Madame Jeanne Sauve.

The Federation's first letter to the Minister noted the concern of Amateurs as to the lack of action and "seeming condonation of what appears to be a flagrant violation of the law". The letter continued ..."In the past, when occasional difficulties arose, the Amateurs could always rely on the Department for (its) support by its action in fairly and firmly enforcing the Regulations. Now it appears that this close and valued relationship is in danger of deteriorating for want of decisive action when stern and resolute measures are obviously necessary."

"...We would therefore request that you provide greater strength and support to Canadian Amateurs in their endeavors to conduct a law-abiding Service by upholding your field officials in carrying out their responsibility in enforcing the legislation relating to radio..."

Although the letter asks for a reply outlining what action the Minister would take, a formal acknowledgement was all that was received.

There is another section of the Radio Act which requires certain charges to be laid within a year from the time "when the matter of complaint or information arose". With this limitation of action in mind, the Federation wrote again to the Minister: "...We are most concerned that unless immediate action is taken by you the time limit for prosecution will lapse and the case will be disposed of by default. This would be a most unsatisfactory situation and completely unacceptable to Canadian Amateurs..."

"...As the very least move in this direction, it is believed that such cases as may be brought to your attention should be permitted to proceed to the point where they may be presented to a court of law and their merits determined by due legal process. It is not believed that the present provisions of the Radio Act intended that the Minister responsible should in any instance replace the courts of this country ... We now call upon you to provide (your) support to overcome problems resulting from illegal acts outside of the sphere of influence exerted by Amateurs and their organizations."

Subsequently, the Vancouver office received permission to proceed on a charge of illegal operation of a radio transmitter, a very short time before the time limit was up. A letter was then received from the Minister which read: "Contrary to your understanding, we have not declined to proceed with legal prosecution. Rather, it is our policy in such matters initially to extend to citizens every opportunity to comply with the law and to embark upon court action only as a last resort.

"In pursuit of this policy, we have endeavored to have (the offender) take appropriate steps necessary for him to become a legitimate operator and licensee of an Amateur service radio station. Our efforts in this regard have not been successful and therefore legal proceedings have been initiated."

To carry this philosophy into another sphere, if one was caught firing an unlicensed handgun in public, there would be no prosecution by the police if one could be persuaded to ask for and obtain a permit for it within a year.

Absurd? No more, in our view, than the Minister's bizarre approach to law enforcement in the Vancouver case.

CARF AND CLARA
CELEBRATE

10th year

Both your Federation and the Canadian Ladies' Amateur Radio Association celebrate their tenth anniversary in 1977.

CLARA is holding a mini-convention in Toronto at the same time as the ARRL wingding in June. CLARA will have a booth, a get-acquainted meeting, an anniversary luncheon, prizes and presentations, and a YL forum with speakers and entertainment.

The ladies are looking for donations for prizes and freebies for the goodie bags...donations go to Cathy Hrischenko, VE3GJH, 2 Dalmeny Rd., Thornhill, Ont, L3T 1L9.

The YL DXCC Certificate sponsored by CLARA has gone to 4X4JU, M. Webman. Certificates sponsored by CLARA are "Working Canadian YLs". "YL DXCC" for working YLs in 100 countries and the "Canadian Family Certificate". Details as to requirements can be had from CLARA official Anne Rushford, VE6AYR, Box 775, Grassy Lake, Alberta, T0K 0Z0.

CRAG Canadian Repeater Advisory Group

News from the Maritimes starts off this months report. VE1RTI (22/82) in Mulgrave, N.S., has had some major maintenance carried out and repeater operation is now reported as "very satisfactory". From the members of the International Repeater Group in N.B., comes the following information: VE1IE (07/67), St. Andrew's N.B., will be moved to 146.25/146.85 in the near future: a new call (temporary) VE1BIT is on the air from Springhill on 146.07/146.67, it is in a temp. location and has a proposed call of VE1SPR; The Bathurst repeater VE1PL was stolen in August and has been replaced with another machine operating on 146.16/146.76 until the 34/94 crystals are received; VE1CFR in Summerside, P.E.I., (25/85) has been moved to a new location; The Maritimes now have 25 active repeaters and most populated areas are covered by one repeater or another.

In La Belle Province, the activity on 450 MHz is increasing. At the moment VE2UX, Quebec (22/82) and VE2NY, Riviere du Loup (46/06) are linked on 450. There is a possibliity VE2NY will be linked with VE2VP Jonquiere (22/82) or another Jonquiere repeater in the near future, and then VE2VP will be linked with VE2EFA, Dolbeau (10/70) and VE2EH, La Tuque, (34/94).

In Ontario, it is reported that Canada's first ATV repeater, VE3TVR, is under construction, and should be appearing (literally!) in Hamilton shortly. Some 45 members of the Ottawa Amateur Radio Club, operators of VE2CRA (34/94) are busy constructing synthisizers as a club project.

A new repeater in Portage La Prairie, Manitoba, is on the air - VE4PLP, (146.25/146.85) and is filling in the gap between Winnipeg and Brandon.

The proposed repeater for Arcola, Sask., VE5MMR (22/82) is now on the air from Moose Mt. VE5ESK (16/76) has been changed from Jansen to Yellowhead Sask. The proposed repeater at Last Mt. is now on the air as VE5AT (25/85). A novel unit, it is buried in the ground and wind-powered. We are trying to extract a feature story from the group responsible for this innovation. Two proposed repeaters for VE5 are from Melfort (146.28/146.88 - no call yet) and Melville (no frequencies or call yet). VE5ESK, Yellowhead (16/76) and VE5SK, Saskatoon (34/94) are now linked.

From the West Coast comes news that two more machines are on the air - Maple Ridge, VE7RMR (146.19/146.79) and one in North Vancouver for teletype, VE7COT, (146.10/146.70). Another for Vancouver is proposed for 147.90/147.30 with the temporary call of VE7OP.

(Copies of an up-to-date Canadian repeater list is available to CARF members - write to CARF, Box 356, Kingston, Ont., K7L 4W2)

Repeater 'restrictions'

A word to anyone thinking of setting up a repeater...if you wish to avoid possible complications DO NOT ASK DOC FOR A REPEATER STATION LICENSE. There is no such thing in the Radio Regulations governing Amateur stations. Any Amateur can set up a repeater on his own premises using his own call sign;

OR if a station at another location is to be used as a repeater, just ask for a land station license performing on Amateur Experimental Service. (Hopefully, owners of such stations will have their input and output co-ordinated with their area repeater council before getting too far along with their planning. CARF can supply council addresses.)

If the DOC office asks if the land station is to be used for a repeater, tell them, but unless you are asked for further details as to power and frequency, there is no need to volunteer it. All that is necessary under the Radio Regulations is the exact location of the land station.

Those who have asked for "repeater licenses" in Vancouver and in Quebec have run into local restrictive rulings made by the regional offices or field offices in those provinces. In B.C. the DOC gets into the frequency assignment act as well to some extent and will issue calls for land stations used as repeaters with the alphabetical suffix beginning with "R".

In Quebec, the Regional Office has notified those who asked for "repeater stations" and the Radio Amateur du Quebec Inc. of its intention to have all repeaters in Quebec use "R" in the alphabetical suffix. This matter is at present under discussion between the RAQI executive and Quebec DOC Regional office because this plan would re-name a number of memorial call repeaters and cause other disruptions...including time-consuming and expensive changes to automatic identifiers.

Letter to the Editor

"Enjoyed seeing Martha Pankratz' picture and write-up but how come you left out the fact that Martha is part of the Canadian Ladies' Amateur Radio Association? You musn't forget CLARA!...(it) is celebrating its tenth anniversary in 1977 and holding a mini-convention within the ARRL convention being held in Toronto in June 77..."

...Cathy Hrischenko, VE3GJH

(Martha was too modest in her biography...we didn't know about CLARA Connection! Details on your mini-convention will appear in a forthcoming issue. ed)

Change in CRTPB rep

Your Federation's new vice-president, John M. Henry, VE2DNM, replaces Doug Burrill, VE3CDC as CARF representative on the Canadian Radio Technical Planning Board. John's professional specialization in VHF and UHF will be an asset in making contributions to the Board's deliberations, especially to the current discussions of the temporary committee on the DOC review of allocations from 406 to 960 MHz. From all indications this review will largely be concerned with finding more channels for commercial mobile services and UHF TV.

A November 4 meeting of this committee did not venture discussion on the Amateur allocation of 420 - 450 MHz - which is allocated primarily to radiolocation.

"CB can order special car plates"

Fantasy? Nope, a fact...according to the ding-a-ling who wrote this in the official safety bulletin of the Ontario Ministry of Transportation and Communication for September-October 176.

To confuse the issue completely, the story goes to say the "Ontario radio operators"(presumably, from the headline referring to "CB" (GRS operators) can indeed get special plates for $25.00 which are in a series VE3 followed by two or three letters".

This idiotic error appears in a full page story on the advantages of CB radio on the highway and provoked such comments in letters to the Minister of that Department (one James Snow) as the following:

"Of all the Ministries, yours has the least excuse to insult Ontario's 6,000 Amateurs with a blunder like this -- you people ought to know better -- Ontario Amateurs showered your Ministry with briefs and pleas for special recognition until Ontario the only province or state in North America to deny this privilege, finally caved in last year."

Anyway, how in heck could you get all of "XM 49321" on one license plate?

Director nominations invited

By-Law # 2, Article 4.

(a) INVITATION TO SUBMIT NOMINATIONS:

Not less than four months prior to the date of each annual meeting, the Secretary shall cause a notice to be published in The Canadian Amateur inviting the FULL members of the Federation to submit nominations for election to the office of Director in their respective Regions.

(b) NOMINATIONS

In any one region, five or more FULL Members may nominate any other Full Member residing in such Region for election to the office of Director by signing and having the nominee sign a notice of such nomination and by sending such notice to the Secretary by Registered Mail not less than three months prior to the date of the next Annual Meeting.

By the above terms of the Corporate By-Law, the Secretary hereby invites nominations to be submitted for the five regions - ATLANTIC: QUEBEC: ONTARIO: MIDWEST (Man, Sask, Alta, NWT): and PACIFIC (B.C., Yukon, Pacific Maritime Mobile).

The appropriate Region for each membership shall be determined by the geographical location designated in the postal address as recorded in the books of the Federation except that a Full Member residing temporarily outside of Canada shall be included in the Region appropriate to that member's most recent call-sign of postal address in Canada.

QUALIFICATION FOR DIRECTORS: Directors elected by Full Members shall each be, at the time of election and throughout the term of office, a Full Member and a resident of Canada. A Full Member must hold a Certificate of Proficiency in Radio of at least AMATEUR class issued by the Department of Communications (Transport).

Nominations will close on 31st day of January 1977.

K.E. Rolison, VE3CRL
Secretary

A plaque was presented to the Custodian of VE3RCS "With Appreciation" from all the boys in Ismialia by Cpl. Violette, one of the serving members.

VE3RCS receives Commendation

OTTAWA - The amateur radio club of CFB Kingston, Ont., has been commended by the chief of the defence staff, General J.A. Dextraze, in recognition of the club's service to the military community at Kingston and abroad for over 20 years.

Chief of the defence staff commendations usually are awarded to individuals of the Canadian Forces who perform a deed or action beyond the call of normal duty.

A feature of the club's operation is the "phone-patch" between the servicemen and their families in CFS Alert, N.W.T. and the Middle East.

Over the years, club members have contributed many hours of free time to help bridge the miles that often separate military families. Past and present members of the club were cited for excellent service and contributions to high morale.

Club members successfully completed 1,285 patches for Alert and 1,154 patches for the Middle East in 1975. Many of these patches were of an emergency nature, concerning death, sickness, and last minute changes in travel plans. Emergency patches also were arranged between doctors in Alert and Trenton, and between construction engineers from these bases.

The Kingston club uses the VE3RCS call sign. It is derived from a combination of international communications policy and military symbolism, denoted by the VE and 3 as a Canadian amateur radio club located in Ontario, and the RCS for Royal Canadian Signals. The club facilities are open to all licensed radio amateurs at CFB Kingston.

Fortunately, members say, the vast majority of the patches have been on the lighter side, with servicemen taking the opportunity to contact families on special occasions, or just to hear a loved one's voice.

To all operators past and present of the CFB (K) Amateur Radio Club, sincere congratulations from all members of the Base!!

Postal Code

The Federation asks that the postal code, K7L 4W2, be used in all correspondence with Box 356, Kingston, Ont.

Opinion Poll

Continued from Page One

who said 'no' and 201 who would buy it only with changes.

Here is a breakdown of the results received from 1,431 Amateurs out of the approximately 3,000 ballots distributed:

A. ARE YOU IN FAVOR OF A "NO-CODE" EXPERIMENTER CLASS CERTIFICATE?

1. YES - As proposed by DOC (1000 watts all modes, all bands) -63 - 4%
2. YES - But limited to working above 50 MHz - no HF privileges - 223 - 16%
3. YES - But limited to 220 MHz and above, plus 50-54 MHz - 155 - 11%
4. YES - But limited to 144 MHz and above - 84 - 6%
5. NO - Not in favor -888 - 63%

B. ARE YOU IN FAVOR OF A NOVICE CLASS 5 WORD-PER-MINUTE CERTIFICATE?

1. YES - As proposed by DOC (90 watts CW on parts of 80-40-15-10 metres as specified in proposal) -778 - 55%
2. YES - But with 100 watts only, on any part of 80-40-15-10 metres - 50 - 4%
3. YES - But with limits written on separate sheet re certificate life, power, modes bands 86 - 6%
4. NO - Not in favor of a separate novice class but rather simplify the Amateur class requirements - 65 - 5%
5. NO - Not in favor - (No change to present requirements and two classes - Amateur and Advanced) - 433 - 31%

* (The per cent figures are rounded off)

The results shown were presented to DOC officials personally by the CARF DOC Liaison / Regulations Committee chairman. Along with the letter of transmittal, the DOC were given a detailed computer printout of the results, tabulated by DOC regions and with copies of 40 or so letters received by your Federation. A number of these contained useful and constructive ideas related to new certificates and exams.

The multiple choice questionaire was devised to meet the DOC request for some credible alternatives to a 'yes' or 'no' answer to the proposals.

Your Federation asked DOC if it intends to proceed with one or both of the new certificates, either as it is proposed or as amended, to follow its policy of consultation with radio spectrum users by meeting with Federation representatives to discuss a number of points which would have to be considered in some detail. These include the potential effects of new or changed classes of certificates; the qualifications for them including code speed, technical competency, knowledge of regulations and procedures, operating privileges and method of progression to a higher class.

Opinion Polls are one thing, but DOC HQ believes that first hand information is another and has recently sent Pat Monnelly of the Telecommunication Regulations Service across Canada to explain further to Radio Clubs the DOC rationale behind its proposal for a 'Novice' and an 'Experimenter' Certificate and to get some feedback.

The Department, according to one report, plans to assess the information gathered by Pat along with the opinion polls submitted by your Federation and others before deciding on a course of action.

Converting CBers to Amateurs

by VE3AHN - Jim Fathers

Late last spring I was approached by the local G.R.S. club to which I belong, to organize and run a course for club members and those of their families who wished to obtain their Amateur certificate. Fortunately, the club (Ottawa's XM49ers), already had a nucleus of five Amateurs, as well as a club station licence (VE3OTT) and a private commercial licence for VHF mobile stations. All proceeds of the course would be used to equip the club station.

I decided that the course would be organized partially along the lines of the class which I attended at a local community college but with some of my own ideas thrown in. It was soon apparent that a rigid 15 to 20 week course would not suit the needs of the average student, so an open-ended course was set up which will run until spring. I found that the ranks of Ottawa Amateurs were more than receptive to the idea of assisting us by talking to the class on their particular field within this hobby.

A typical evening would run like this:

7:00 - 7:30 - Review of past weeks' work and question period

7:30 - 8:00 - Code practice - under the guidance of VE3HVA

8:15 - 9:30 - Teaching or Workshop (one or more of the following)

a) Regulations - VE3CAT

b) Equipment & Schematics - VE3GST

c) Theory - myself

d) Guest speaker

e) "Design it - Build it" night. (For example, on the second night we designed constructed, erected and pruned a dipole antenna for the club station.)

9:30 - 10:00 - Code practice - VE3HVA again, with the rest of us acting as supervisors. VE3HVA also sends "On Air" code practice three nights a week.

As part of the $25.00 tuition fee each student receives a copy of CARF's Study Guide and the Regulations Handbook.

We started out with 30 members and so far have a full class ranging in age from 16 to 65. Already one of the group after some concentrated coaching, has forged on to become VE3JCS, and three more are due to write their certificate at the end of November.

Our motto here is "Amateurs have more fun" and I think working with basically a G.R.S. group puts some of the fun back into Amateur radio. Other clubs across Canada wanting to get courses rolling should actively seek out G.R.S. organizations and propose their getting involved in Amateur radio. You will be surprised to find that dedication is not a thing of the past; - it lives - in the hearts of CBers. 10-4!

Urgent!

Exam Info

Due to information just received at press time concerning examination requirements, it is believed that the story on Page One of the November issue, 'DOC uses new exams' may have been misleading.

Before making an appointment to write your Amateur or Advanced Amateur Certificate examination, ask the DOC for the Telecommunication Regulation Circular TRC-24 which outlines the examinations and ask whether the exam will be on tubes or transistor, in essay or multiple choice type or, in the case of the Amateur Certificate, whether the old or new diagrams will be required. (To our knowledge, only the CARF Certificate Study Guide shows the new diagrams -- available from CARF for $5.

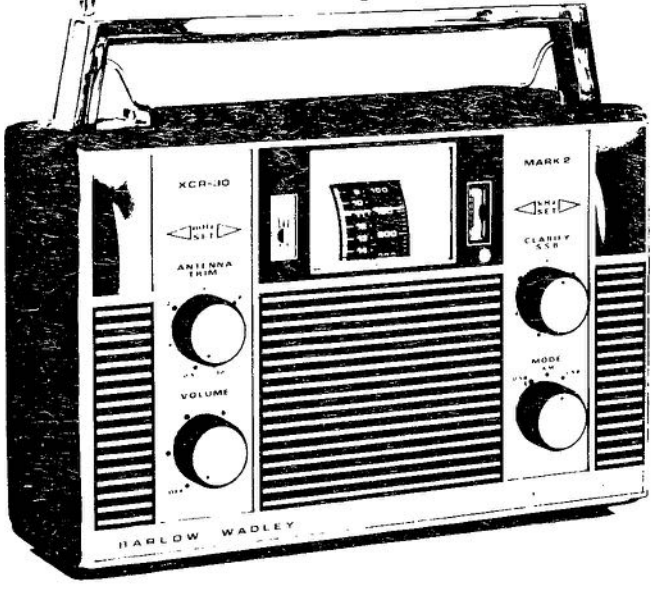
From Russia (with Love?)

The weird and powerful QRM recently experienced on the 20 metre Amateur band has been identified by American agencies as a Russian over-the-horizon radar operating in the vicinity of Minsk, east of the Polish border according to Aviation Week magazine in its Nov. 8 issue. The many protests filed with Moscow by various countries seemed to have been ignored.

BARLOW WADLEY XCR 30 MARK 2

CRYSTAL CONTROLLED PORTABLE COMMUNICATIONS RECEIVER

- 19 FEET OF CONTINUOUS BANDSPREAD TUNING (in 1 MHz segments)
- 500 KHz to 30 MHz - accurate within 5 KHz USB/LSB/AM/CW
- PSEUDO DIGITAL READOUT i.e. 3,790 MHz readout capability
- RECEIVES CANADIAN TIME SIGNALS i.e. CHU OTTAWA @ 3.330, 7.335, 14,670 MHz
- RECEIVES WWV TIME SIGNALS @ 5,000-10.000 & 15.000 MHz
- RECEIVES W1AW CODE PRACTICE SIGNALS @ 3.580, 7.080, 14.080 MHz
- TRIPLE CONVERSION WADLEY LOOP DESIGN as used in $3000.00 military rigs



- CERAMIC IF FILTERS
- SENSITIVITY EXCEEDING 2 micro-volts
- SIGNAL STRENGTH METER
- CLARIFY CONTROL FOR SSB
- EARPHONE JACK-8 ohms
- LONG WIRE ANTENNA JACK for use in ferro-concrete buildings
- EXTERNAL POWER JACK 6 to 9 Vdc
- OPERATES FROM 6 D CELLS
- DURABLE DIE CAST ALUMINUM FRONT PANEL WITH STEEL CASE
- SUPPLIED WITH LATEST ISSUE OF WORLD RADIO TV HANDBOOK A $12.00 VALUE

IMPORTED, STOCKED & WARRANTED (1 YR) BY;

WSI SALES COMPANY
18 SHELDON AVE.N.
KITCHENER, ONTARIO N2H 3M2
(519)579-0536

The Canadian DXer

Peter Driessen, VE7BBQ

This is the first in a monthly series of articles on DXing. This column will contain DX news and information as up to date as possible.

INTRODUCTION TO DXING - A HOBBY WITHIN A HOBBY.

The thrill of DXing comes mainly from working stations in far away and remote corners of the globe. This introduction outlines the underlying structure of DXing as an organized activity.

Basically the DXer strives to work as many different "countries" as possible. A DX country is not always a country in the sense of an independent political entity eligible for membership in the UN. DX countries may include unpopulated atolls on islands out in the middle of nowhere. An excellent article describing the concept of a DX country appeared in CQ magazine in early 1976.

The criteria for what constitutes a DX country were set by the ARRL just after the Second World War. The ARRL has drawn up a countries list recognized throughout the world. A DXCC (DX Century Club) award is made available to Amateurs who submit proof of contact with at least one hundred of the countries on the current "countries list". Sometimes countries are "deleted" for example when the political situation changes (AC3 Sikkim was deleted when it became part of India) New "countries" are added from time to time when they are found to meet the criteria (example Sable Island and St. Paul Island off the east coast of Canada). The all-time countries total is 361, but the current list (less deleted countries) totals 321. These figures are subject to change as new countries are added or deleted. Endorsements are available to the basic DXCC award for working more than 100 countries in the form of attractive stickers for the DXCC certificate. Most DXers pride themselves on their total number of countries worked, as shown on their DXCC certificate.

Any Amateur holding confirmations for at least 312 countries (within 10 of the current maximum of 321) is eligible for the DX Honor Roll. Achieving the DX Honor Roll carries a great deal of prestige in the DX fraternity.

In addition to the basic DXCC award, there are awards for working 100 or more countries on CW only, or phone only. A special award is available for working 100 countries on each of 5 different bands. This 5BDXCC award has created a great deal of DX activity on 40, 80 and 160 meters.

Detailed information on the DXCC awards and a current countries list are available from ARRL.

START DXCC FROM SCRATCH?

In September, the ARRL stated, "that in light of the numerous suggestions for overhauling the DXCC criteria...and the possibility of changes to our frequency allocations and/or operating privileges that may result from the forthcoming WARC, the Executive Committee requests that the DX advisory committee to explore the desirability of establishing a new beginning for DXCC, with updated country criteria, as of January 1st, 1980. A coordinated recommendation would be needed by July 1st, 1977, in order to permit action by the Board of Directors at its July 1977 Meeting."

Comments on this proposal should be directed to Hal Parsons, VE3QA, c/o CARF, Box 356, Kingston, Ont., who is the Canadian member of the ARRL DX Advisory Committee.

DXCC, 5BWAS will be available only to ARRL members in Canada and the US effective August 1, 1976. Amateurs outside the US and Canada need not be ARRL members to obtain these awards. This announcement has met with unfavorable reaction from those DXers who choose not to belong to ARRL, but who have invested time and money in a good DXCC score. They will not be able to obtain any further endorsements to raise their country total unless they join ARRL.

QSL BUREAUX

One important item in DXing is obtaining the QSL's for the countries worked. The QSL cards furnish the only proof that you really did work that country. For any rare or new country, one would normally send a card airmail either direct or to his QSL manager. For more common DX, or for answering QSL's received from DX stations, an outgoing QSL bureau service is normally used. At present, Canadian Amateurs have a choice of three outgoing QSL bureaux.

CARF provides an outgoing QSL bureau free to members. Just send your cards in alphabetical order to Box 66, Islington, Ont. M9A 4X1 and they will be mailed on to the DX stations via their national QSL bureaux. You may send cards for any DX country as well as Canada. Send as many cards as you wish as often as you like. Do not send cards for the US because the US incoming bureaux will not accept Canadian cards either direct or from CARF.

The ARRL has recently set up an outgoing QSL bureau. Only ARRL members may submit cards, and then only once a month. One dollar must be included with each submission. Cards destined only for any one or more of 80 specified countries may be sent (list available from ARRL). Note that Canadian members of ARRL may send their US cards via the ARRL outgoing bureau. This is the only VE to W/K QSL service available, aside from direct mail. (This may change... Ed)

The Cdn. DX Association CANAD-X runs the oldest outgoing QSL bureau in Canada. For a $6.00 membership fee, you receive the monthly newsletter "Long Skip" which contains DX information and various articles about DXing, as well as the use of their outgoing bureau.

In summary, all three outgoing QSL bureaux will send on your cards to DX stations outside W/VE. Only the CARF bureau will also send on your VE cards and only the ARRL bureau will send on your W/K cards, in addition to the DX cards. No single bureau will send out all your cards, DX, VE and W/K.

The address for the CARF National QSL Bureau is P.O. Box 66, Islington, Ont. M9A 4X1.

Cheap Certificates & the numbers game

If the aim of the recent proposals by DOC to downgrade the requirements for Amateur certificates is to increase the total of licensed stations, it is hoped that the message in the following tables will be considered.

Despite a number of years of 'incentive' licensing, including the 'novice' licence and other low grade licence requirements, the total of Amateur stations in the US has gone up and down like the proverbial yo-yo. On the other hand, with the exception of two years -- 1969 and 1970, licensed stations in Canada have steadily climbed with only the two existing classes of certificate and shows a 25% INCREASE over a ten year period while the US, despite its multi-level system for licensing operators, showed a 5% LOSS in the same period. While totals are difficult to compare here, note that Canada gained 3,020 stations in that period, while the US lost 15,401 (1966-1975). The Canadian gain coincides with the increasing number of community colleges offering full classes and adult extension courses which lead to the Amateur certificates.

Licensed Amateur Stations

Year	Canada *		U.S. **	
1966	11,693		292,194	
1967	12,120		283,412	
1968	12,502		287,164	
1969	12,061	loss	290,298	
1970	11,906	loss	283,021	loss
1971	12,155		286,118	
1972	12,607		284,235	loss
1973	13,121		279,505	loss
1974	13,784		293,780	loss
1975	14,713		276,793	
1976	15,346		no figure	

* DOC
**"Communication News", Nov. 76

CANADIAN

CONTEST

SCENE

Peter Driessen, VE7BBQ

Preliminary results of the CQ WW Phone DX contest October 1976:

The only information has been obtained from Ron Kaye VE7LB who probably set a new all time Canadian record operating from station VE7BC. His 1976 score of 672.450 points, 1850 QSO's, 36 zones, and 114 countries on single band 20 meters broke his own previous Canadian record set in 1975. This score is well within sight of the alltime world record of just over 1 million points. Who said the bands are dead??

The ARRL Sweepstakes CW held November 6-7 saw new record scores. The Canadian high score and a new Canadian record was set by Lee Sawkins VE7CC with around a thousand QSO's. Other high Canadian scores known to this writer were made by VE7WJ, VE5DX, and VE3IXE, each over 100K points.

RSO Election

At the 9th annual convention of the Radio Society of Ontario Inc., in Toronto October 22/23/24 the Delegates elected the following Board of Directors for the year 1976/77.

Tom Atkins VE3CDM, Willowdale
Les Brownlee VE3BLZ, Whitefish
Bruce Carveth VE3BC, Toronto
Tom McKee VE3ETM, Windsor
Marvin Nash VE3FON, Willowdale
Croft Taylor VE3OR, Ottawa
Roy Tuttle VE3BNV, Peterborough

The Directors elected Tom Atkins, VE3CDM, as President of the Society and appointed the following Officers:

First Vice-President: Marvin Nash VE3FON

Second Vice-President: Dan Robertson VE3FOV

Secretary: Eric Ilott VE3XE

Treasurer: Banner Edwards VE3SU

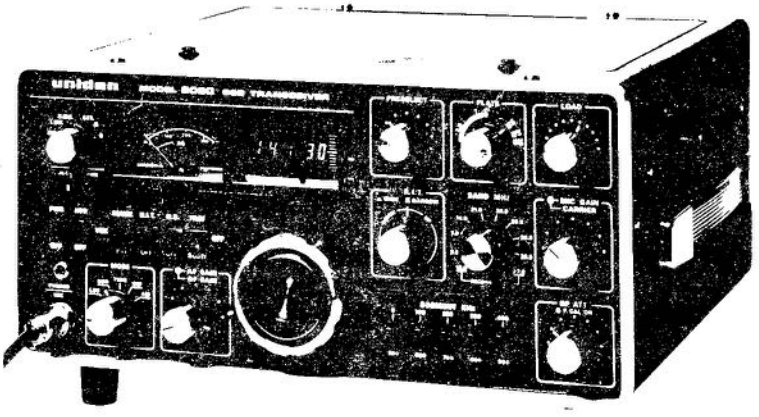
Renew now & save

Membership fees will be raised as of January 1 in order to meet rising costs and to build up better services for Canadian Amateurs. The fee of $5.00 per year will remain effective until Jan. 1, 1977, when it will increase to $7.00.

2020

A BRILLIANT NEW SSB TRANSCEIVER PROVIDING AN UNBEATABLE COMBINATION OF ADVANCED ENGINEERING AND UNIQUE OPERATING FEATURES.

YOU MAY NEVER HAVE OWNED A TRANSCEIVER THAT OFFERS SO MUCH.



*Phase lock-loop (PLL) oscillator circuit minimizes unwanted spurious responses.
*Hybrid Digital Frequency Presentation.
*Advanced Solid-state design...only 3 tubes.
*Built-in AC and 12 VDC power supplies.
*CW filter standard equipment...not an accessory.
*Rugged 6146-B final amplifier tubes.
*Cooling fan standard equipment...not an accessory.

*Microphone provided.
*Dual RIT control allows both broad and narrow tuning.
*All band 80 through 10 meter coverage.
*Multi-mode USB, LSB, CW and AM operation.
*Extraordinary receiver sensitivy (.3u S/N 10 db) and oscillator stability (100 Hz 30 min. after warm-up)
*Fixed channel crystal control on two available positions.
*RF Attenuator.
*Adjustable ALC action.

*High performance noise-blanker is standard equipment ...not an accessory.
*Built-in VOX and semi-break in CW keying.
*Crystal Calibrator and WWV receiving capability.
*Phone patch in and out jacks.
*Separate PTT jack for foot switch.
*Built-in speaker.

2020 – $899
VFO – $145
SPKR – $35

GLENWOOD TRADING COMPANY LTD.

278 East 1st St., North Vancouver, B.C. V7L 7B5

Repeater fans... aux barricades!

According to a reliable source, Canadian commercial users have recommended to the DOC that the Canadian position for the ITU 1979 World Administrative Radio Conference put forth the proposal to take 146-148 MHz away from Amateur use in ITU Region 2 (North and South America) and designate it for land mobile use.

A quick check with a U.S. source elicited the information that although interest in two megahertz between 144 and 148 MHz had been evinced by users in the aeronautical mobile service, it was believed that the FCC would not buy it; if this is the case, then the Canadian users would be in a poor position to push the idea.

It will be interesting to see if there are any proposals from U.S. commercial users concerning two metres in the wrap-up of all the U.S. WARC proposals due to appear in an FCC "Notice of Inquiry" scheduled for the end of November or early December.

New call for Forces in Cyprus

Those Amateurs who work Canadian Armed Forces overseas will be interested to read a letter from a new Amateur. VE3JCM who is now in Nicosia, Cyprus. R.E. Moll writes that he and Ron Mitchell, VE3FXM no longer will operate with a "portable" Cyprus suffix but now have been issued with a call sign by the island's government. He says "We now have a duly authorized station,...5B4DJ and hope to be able to provide a service for our fellow soldiers who are employed with us" (in the UN peacekeeping force. Ed). Correspondence should be addressed to: Capt. R.E. Moll, VE3CJM, 9 Violet St., Petawawa, Ont., K8H 2C2.

Technical Talks

FACTORS DETERMINING V.F.O. PERFORMANCE

by P.A. Macdonald VE7BRW

In a previous article, it was shown that a Fet V.F.O. could have a frequency stability of ± 1 Hz and zero drift over a period of a few hours.

The three major factors associated with this stability were listed as:

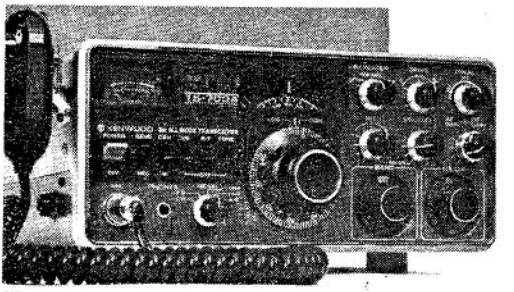
Thermal Stability of Inductor and Capacitor
Power Supply Stability
Stable Performance of the Field Effect Transistor

Present discussion centers about the performance of the Fet. There is good reason to believe that, as in the case of the tank circuit, consistent performance will be dependent upon the amount of electrical energy degraded into heat within it. The subject is approached from this perspective.

GLENWOOD TRADING COMPANY LTD.

We have the finest choice in Canada for you

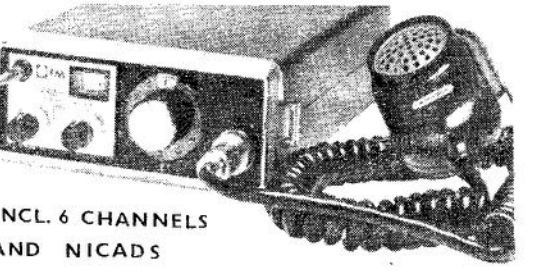
AC/DC Power Supply built in
4 MHz Band Coverage 144-148
Repeater 600 KHz split
Zero Centre Discrimination Meter
and Built-In Speaker.



TS - 700A
$775
SSB . FM . AM . CW .
SOLID STATE

TR7200G 22 CH. MOBILE 52/52 INST. **$229** WHILE QUANTITIES LAST

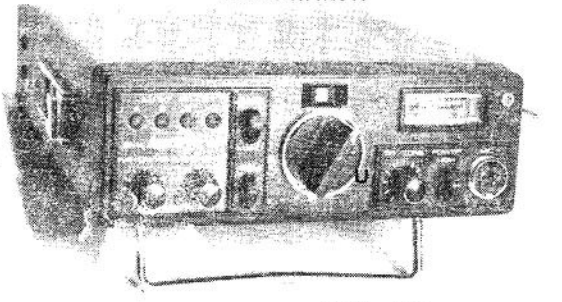
TR2200A 12 CH. PORTABLE **$279**



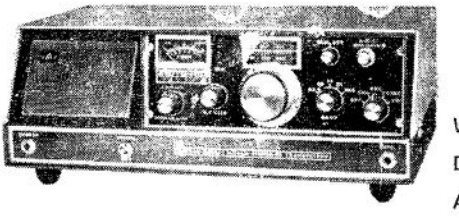
INCL. 6 CHANNELS
AND NICADS

MULTI 7 24 CH. MOBILE 7 CHANN. INST. **$279**

MULTI 11 23 CH. PLUS 4 CH. SCANNER 5 CHANN. INST. **$349**



SUPERIOR SELECTIVITY
NO TRANSMITTER TUNING
COMPACT
(7 lbs., 3½"x9½"x9½")
200 Watts P.E.P. Input
SSB & C.W.



ATLAS

210X – 10 thru 80M.	$849
215X – 15 thru 160M.	$849
With Noise Blanker	$899
DeLuxe plug-inMobile Mount	$ 53
A.C. Console	$175

KDK - 144 Mk 11 **$525**

SIX DIGIT L.E.D. READOUT.
IMPROVED Tx, Rx, and
CROSS MODULATION

PLL DIGITAL SYNTHESIZED
Rx - 144.000 - 148.995
Tx - 146.000 - 147.995
in 5 K•Hz steps

FOR THESE AND OTHER ITEMS IN OUR LATEST CATALOGUE, WRITE TO:–

GLENWOOD TRADING COMPANY LTD. 278 East 1st St. North Vancouver, B.C. V7L 7B5

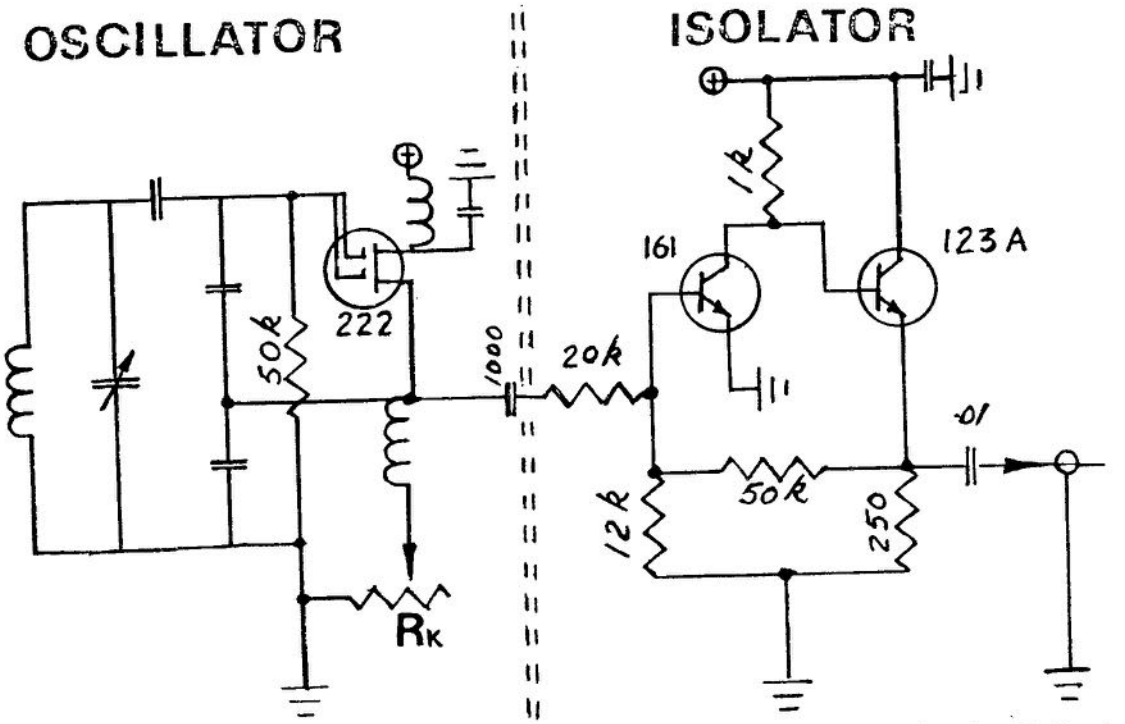


Figure 1 - Diagram of oscillator and isolating amplifier. There is one value of the transistor current at which the oscillating frequency is independent of this current. The requisite value is obtained by adjusting Rk which provides a negative feedback to the control gate.

The Fet Circuit

The complete circuit consists of an oscillator proper and an associated isolating amplifier. The detail is given by Figure 1, the oscillator being on the left; the isolating amplifier on the right. The basic system is taken from the R.C.A. Transistor Manual, though the biasing system is an important modification. It has been emphasized that the oscillator is to be considered as a source of R.F. signal - not R.F. power. To a lesser degree this thinking should be carried over to the isolating amplifier. It is to be seen as an isolator, not an amplifier, and its energy kept to a minimum since there is inevitably some interplay between it and the oscillator.

Operating Parameters

The power required to drive the oscillating tank circuit is one of the determinants of the transistor load, hence the operating parameters of the tank and their role in the transistor's operations need to be evaluated.

There are three circuit constants; the inductance L; the capacitor C; and an imaginary resistor r having an energy consumption equal to the total energy loss from the circuit.

Electrical theory establishes that:

The energy in the circuit is proportional to the capacity and hence to the ratio C/L, since L is determined by C at resonance.

The Q of the circuit increases with the ration C/L.

Increase in Q increases the voltage across the circuit, increasing the drive to the transistor, increasing the feedback to the tank circuit. Thus the transistor load increases with C/L.

Harmonics generated in the output of the transistor circuit and their combinations are fed back to the tank circuit. The selectivity of this circuit favoring its natural frequency increases with Q. Hence high C/L tends to minimize the effects of the extraneous signals.

Increasing power in the tank circuit increases temperature effects. Hence thermal stability tends to decrease with C/L.

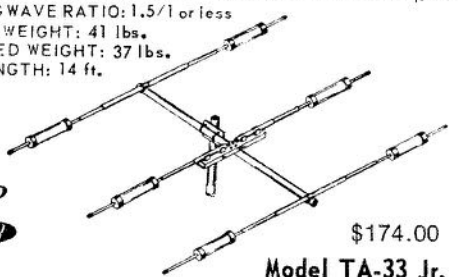
Obviously the ratio C/L is a major operating parameter of the resonant circuit and the determinant of the tank-transistor interaction. It is convenient to designate the ratio by β when C is expressed in pf and L in μH.

MOSLEY ANTENNAS

Model TA-33 for 10, 15, and 20 meters $238

The Mosley TA-33 three element beam provides outstanding 10, 15, and 20 meter performance. Exceptionally broadband – gives excellent results over full Ham bandwidth. Exclusive Mosley trap design offers resonant frequency stability under all weather conditions. Element center sections are of double thickness aluminum to reduce sag. Boom requires no bracing. Heavy duty universal mounting plate fits masts up to 1½ inch O.D. Antenna handles full KW AM/CW or 2 KW P.E.P. SSB input. Feed with one coax line, RG-8/U recommended. The TA-33 may also be used on 40 meters with TA-40 KR conversion. Complete with Hdw.

FORWARD GAIN: Up to 8 db. TURNING RADIUS: 15.5 ft.
FRONT-TO-BACK: 20 db. or better WIND LOAD: 114 pounds.
MAX. ELEMENT LENGTH: 28 ft. WIND SURFACE : 5.7 sq. ft.
STANDING WAVE RATIO: 1.5/1 or less
SHIPPING WEIGHT: 41 lbs.
ASSEMBLED WEIGHT: 37 lbs.
BOOM LENGTH: 14 ft.



TRAP MASTER

$174.00

Model TA-33 Jr.

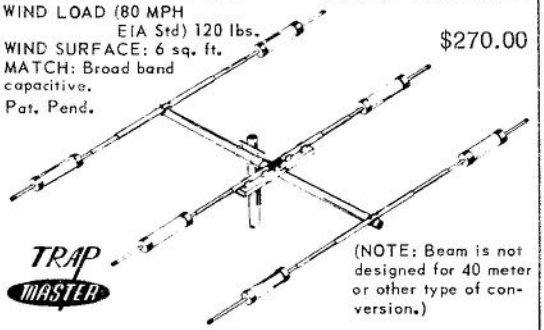
Mosley TA-33 Jr. has quality and performance found in the TA-33. Rated to 300 watts AM and CW, - 1000 watts P.E.P. on SSB. Complete with Hdw. The Junior may be converted to MP-33 with higher power rating with MPK-3 Kit. Shipping weight 28 lbs. Assembled weight 20 lbs.

The Classic 33 10, 15, and 20 meters

Beam designed to provide the extra gain for working hard-to-reach DX. Incorporates exclusive Mosley 'Weather-Proved' traps with resonant frequency stability. Features new boom to element clamping and balanced radiation. Hardware is stainless steel. Feed with 52 ohm RG-8/U coax. Fits up to two inch mast. Use with most heavy-duty rotors. 1 KW AM/CW or 2 KW P.E.P. SSB input.

FORWARD GAIN: Full 8 db. compared to reference dipole or 10. 1 db. over isotropic source.
FRONT-TO-BACK: 20 db. or better on 15 and 20; 15 db. on 10 meters.
STANDING WAVE RATIO: 1.5/1 or better.
MAXIMUM ELEMENT LENGTH: 27 ft.
ASSEMBLED WEIGHT: 42 lbs. BOOM LENGTH: 18 ft.
SHIPPING WEIGHT: 47 lbs. TURNING RADIUS: 16 ft.
WIND LOAD (80 MPH EIA Std) 120 lbs.
WIND SURFACE: 6 sq. ft.
MATCH: Broad band capacitive.
Pat. Pend.

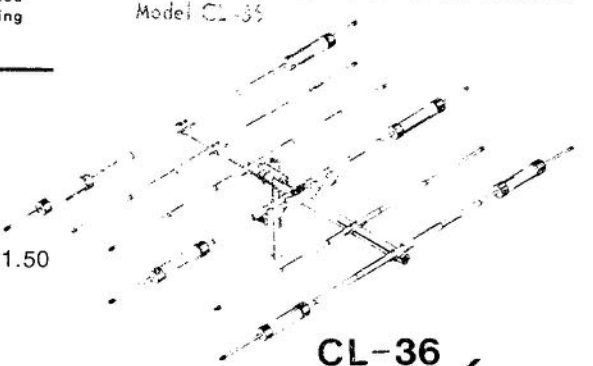
$270.00



TRAP MASTER

(NOTE: Beam is not designed for 40 meter or other type of conversion.)

CLASSIC-36...10, 15 & 20 Meters
Model CL-36



CL-36 / $360

Mosley 2 Metre Antennas

D12 Diplomat 5/8 ground plane $35.50
BASE ANTENNA
MY-144-9 E1. 14dB 2KW Yagi $49.50
MY-144-5 E1 10dB 2KW Yagi $39.50
MM-144 5/8 mobile C/W spring and base $31.50
HF Vertical Antennas
RV-4C 40 - 10 mtr, 2 KW $77.25
RV-8C 80 mtr conversion $45.25
80 - 10 Mobile antenna available
Hy-Gain 18ABT/WB 10-80 MTR $138.95

PL-259 connectors for coax 2 for $1.75
Doz. $9.00
Coax Lightning Arrestors $ 5.50
R.S.O. Low Pass Filters $31.50

6 digit LED clock kit 12/24 hr.
Kit includes .4 in. readouts
I-MM5314 clock chip, 13 transistors
diodes, resistors, molex pins,
power supply, etc. and case

$31.50 postpaid

KENWOOD TRANSCEIVERS
TS520 80-10 meter SSB CW
110/220 AC or 12 VDC
power required **799.**

TR-7200G 22CH Mobile 2 meter
with 52/52 installed **230.**

All orders over $350.00 shipped prepaid in Canada except VE8 land and Labrador

Prices subject to change

MacFarlane Electronics Reg'd

RR No. 2 Battersea, Ont
Phone (613) 353-2800
VE3BPM

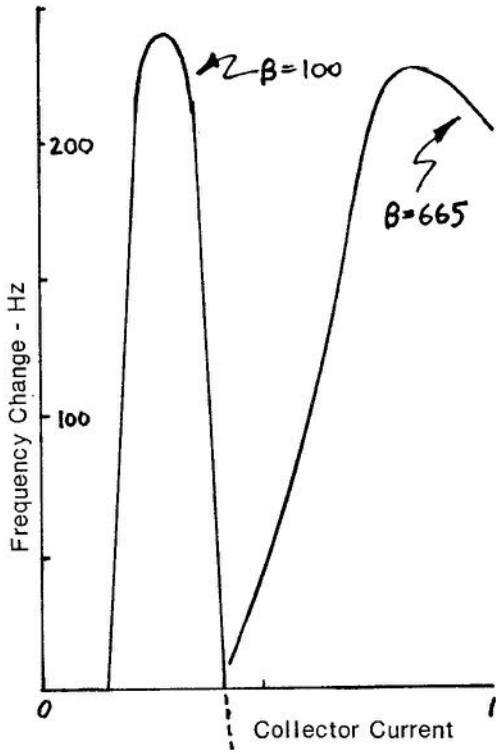


Figure 2 - Curves showing the dependence of oscillating frequency on transistor current. The form of dependence is a function of the C/L ratio of the tank circuit. β is the measure of C/L when C is given in pf and L in μH.

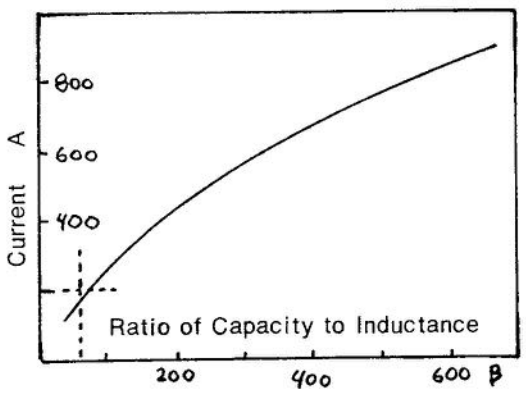


Figure 3 - Curve relating the value of the current at frequency independence to the C/L ratio of the tank circuit. The circuit tends to frequency instability for values lying in the rectangle in the left hand corner.

β may be related to the operating parameters of the transistor by the data of Figures 2 and 3.

Figure 2 shows two measured curves relating change in oscillating frequency to change in transistor current. The frequency (3 mHz) and the applied potential (5 volts) are the same for both curves; the values of β differ. The curve peaks show the existence of a range of frequency independence from the transistor current (or power.)

Figure 3 gives a plot of the numerical relation between current and frequency independence, determined for a sequence of β values at the same frequency and voltage.

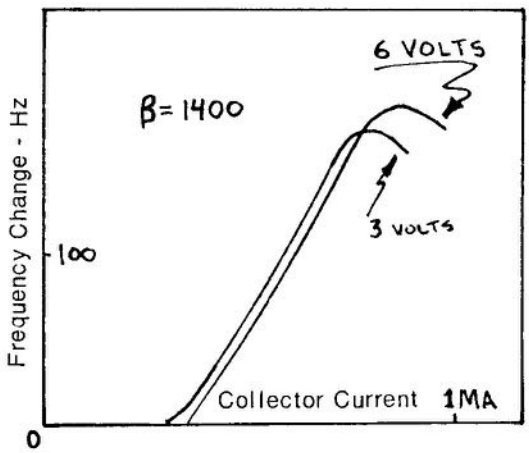


Figure 4 - Data showing that the form of the peaks of the curves in Figure 2 are controllable to some extent by the applied voltage.

Figure 4 shows the effect of voltage on the range of frequency independence.

From these curves it follows that:

The frequency of an oscillating circuit is independent of the transistor current or power over a limited range, the value and range being determined by the C/L ratio.

The stability foundation can be further strengthened by controlling the transistor current with a resistor connected as R_k in Figure 1. R_k is adjusted to yield the requisite current value. The voltage drop across R_k provides a high negative d.c. feedback to the transistor gate. This feedback voltage serves as a self-adjusting force acting to pull variations from

HEAVY DUTY HAM TOWERS

DMXHD Heavy Duty Ham Towers can support a large amateur beam of up to 9 sq. ft. wind area. Guy wires must be used if larger loads are required or cross bar mounted antennas or if greater height using straight sections is needed.

DELHI DMXMD and DMXHD towers use the larger and stronger sections of our standard eight section, 68 foot TV tower, Model DMX-68. DMXMD towers have a DMX2T top section, DMXHD towers have a DMX3T top section. Both top sections have a No. 244A cast aluminum mast clamp installed on the top plate.

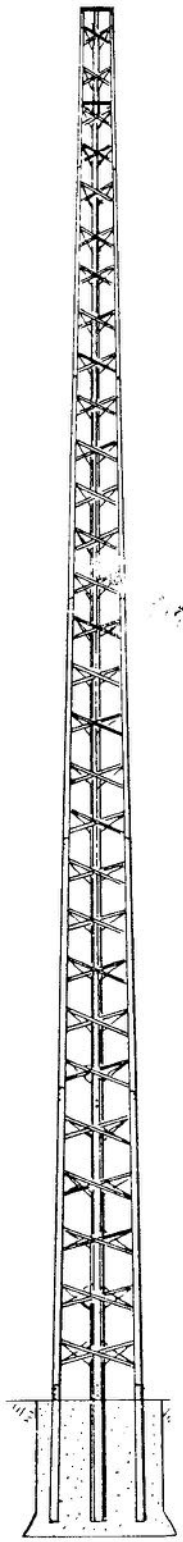
Each section is 8 ft. long and has beaded channel legs riveted together with "X" braces. Legs and braces are high tensile steel, heavily galvanized before fabrication. Rivets are solid heat treated aluminum. Sections fit accurately together and are joined by heat treated nuts and bolts. The uniform tapered leg design together with evenly spaced "X" braces give the tower greater strength and reliability.

NOTE: All DMXHD Series Ham towers are shipped complete with the following:
8 ft. tower sections, top plate with cast aluminum mast clamp, rotor plate, three 4 ft. concrete base stubs, special nuts, bolts and washers. (No mast is included in package).

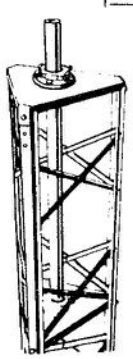
Model No.	Height of Tower	Tower Section Supplied	Wt. in lbs.
DMXHD-32	32	DMX3T, DMX4, DMX5, DMX6	170
DMXHD-40	40	DMX3T, DMX4, DMX5, DMX6, DMX7	241
DMXHD-48	48	DMX3T, DMX4, DMX5, DMX6, DMX7, DMX8	314

Items which may be ordered separately.

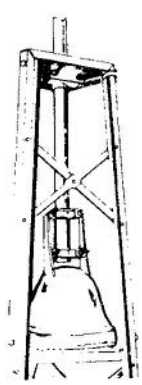
CBS6	Concrete base stubs for DMXHD-32	14
CBS7	Concrete base stubs for DMXHD-40	20
CBS8	Concrete base stubs for DMXHD-48	21
HUB 3-6	Hinge-up base for DMXHD-32	20
HUB 7-8	Hinge-up base for DMXHD-40 or DMXHD-48	24
HD Mast	2" O.D. x 12 Ga. x 8' Galv. mast	18
MD Mast	1-1/2" O.D. x 14 Ga. x 8' Galv. mast	10
BBMB	Cast alum. ball bearing mast bearing: 2" O.D. capacity	2
TA-6	Thrust bearing with tapered rollers. 1-1/2" O.D. capacity	2



DMXHD-48



Top of tower with mast clamp plate installed.



Any make of rotator can be mounted on rotor plate.

CDE ROTORS

AR-30 $59.50 AR-40 $79.50
CD-44 $149.00 HAM II $199.00
Wire for AR-30 and AR-40 12¢ ft.
Wire for CD-44 and HAM II 20¢ ft.
RG-58U coax 10¢ ft.
RG-8U 25¢ ft.
RG-213 33¢ ft.
RG-11U 23¢ ft.
RG-8U foam coax 28¢ ft.

Prices subject to change

All orders over $350.00 shipped prepaid in Canada except VE8 land and Labrador

MacFarlane Electronics Reg'd

RR No. 2 Battersea, Ont
Phone (613) 353-2800
VE3BPM

the normal back to a state of continuity of performance.

Operating Parameters

Obviously there is much to be said for operating with the highest attainable β. The major objection is the associated increase in power and this is indeed a major objection; so much so that a compromise has to be made between β and power; a compromise based upon experience.

In running the curves to obtain the data basic to Figure 3 attention was paid to the stability of the readings. The lowest operating value of β was 42 and here there was only a very small region of stable operation. It lay between current values of 80 and 120 μA: from 120 to 800 μA instability increased from $\pm$ 100 Hz to magnitudes too great to measure, finally becoming stable again at 800 μA.

With β = 54 stable operation started at 95 μA and continued to 150 μA. Above this value instability started with a magnitude of $\pm$ 12 Hz, rose to a peak of $\pm$ 125 Hz at 300 μA and gradually subsided to become stable at 450 μA.

A study of all collected data suggests that the working range for β should be set somewhere between the limits of 65 and 1500. Curves for the first paper were obtained with low β ; in the present case interest has been switched to values as high as 1500. There does not seem to be much to pick or choose between them when working in the stability range of $\pm$ 1 Hz. The story may be different for higher degrees of stability.

Oscillator Stability as Determined by the Fet.

In running stability performance curves for the present discussion it was assumed - improperly as it turned out - that minor room temperature changes would not affect transistor performance; only heat generated within it during oscillation. For this reason the tank circuit was thermally insulated and the transistor mounted outside the container. It was electrically shielded and provision made for some air circulation at room temperature, so that any Fet temperature rise due to oscillation would tend to stabilize.

Figure 5 gives the frequency performance of a circuit with a β value of

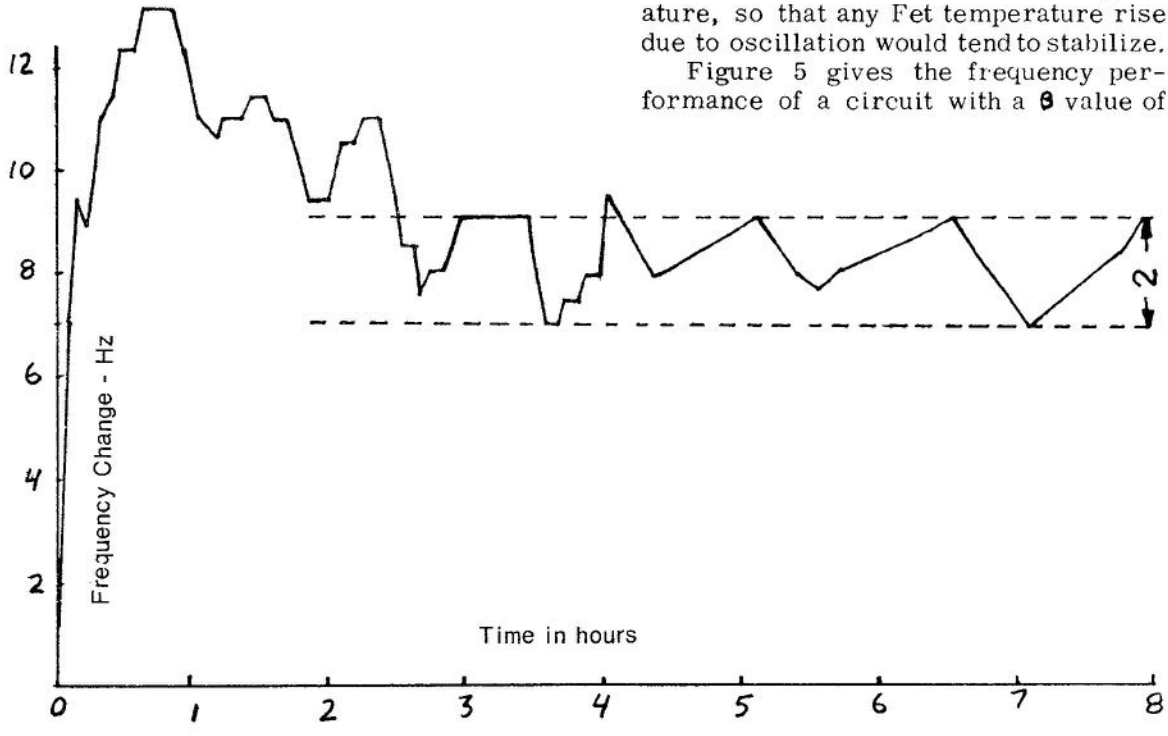


Figure 5 - Stability performance of the V.F.O. The initial rise in frequency is not due to the oscillator but to the isolator and/or power supply warm up. These take about two hours to stabilize. The stability of the oscillator then becomes apparent with a value of $\pm$ one Hz. This instability is not due to the Fet, per se, but to external temperature changes which vary periodically between $\pm$ 1° F. as determined by the house thermostat.

650. Bearing in mind the greatly expanded vertical scale, the circuit performance is much better than first impressions would suggest. The maximum frequency rise from switch-on is only 13.5 Hz; the maximum rate of frequency drop is 3 Hz/hr; the circuit eventually stabilizes to ± 1 Hz.

The extended vertical scale is as informative as it is extreme. It shows that a cause-effect relation exists and hence a potentiality for control.

For example consider the final five hour performance. The amplitudes of the frequency variations are not only precisely controlled between the upper and lower limits of one Hz, their periodicity is also systematic.

The cause of both these facts has to be related to changes in ambient temperature. This was controlled to ± 1° F by the house furnace thermostat.

The periodicity of the frequency changes closely follows the cycling pattern of the furnace. Measurements on the curve were started at 8 A.M. and continued until 4 P.M. As the day wore on the outside temperature rose with a resulting decrease in the frequency of the furnace cycling.

It can only be concluded that the observed frequency instability of ± 1 Hz is actually a trace of the room temperature changes. The transistor does O.K. as a fast acting thermometer. Hence the conclusion that:

Transistor stability is dependent upon the temperature of the environment.

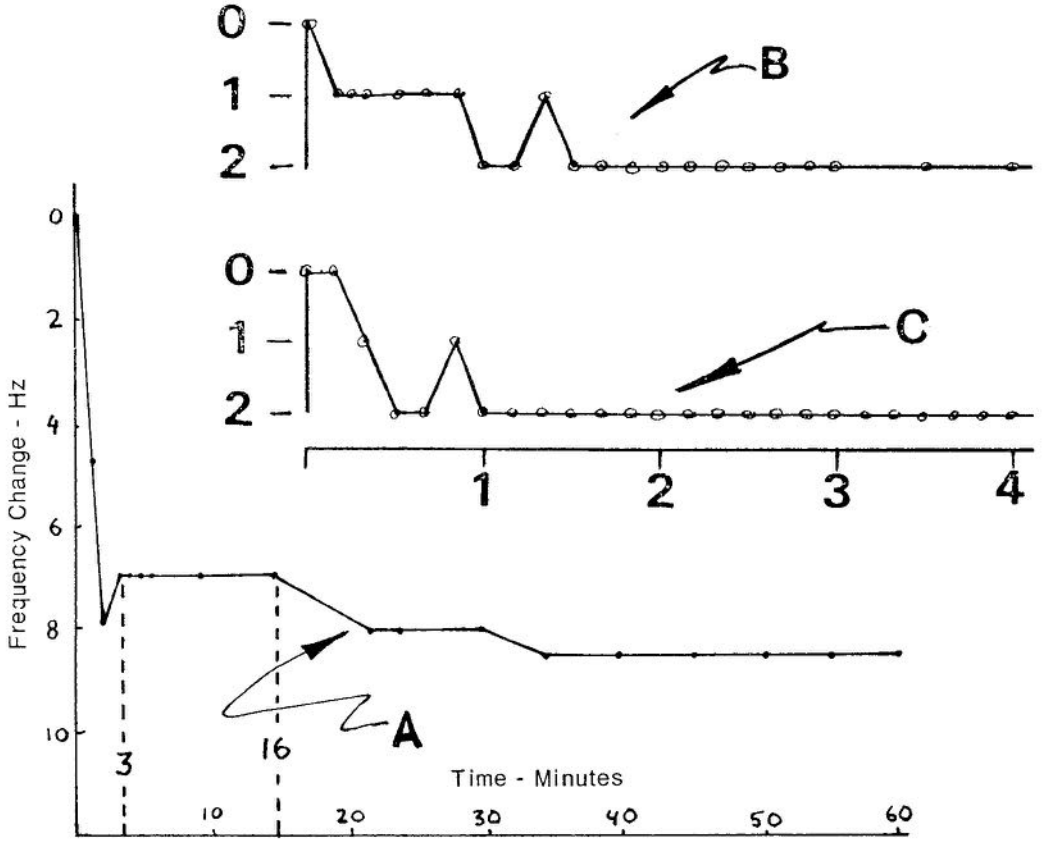


Figure 6 - Stability performance of V.F.O. In this case curve A was obtained by allowing the isolator and power supply to warm up for two hours before switching on the oscillator. The initial frequency change is now negative, characterizing the performance of the Fet, which has stabilized in less than three minutes. The decrease in frequency following the first sixteen minutes is attributed to rising room temperature of about 0.5° F. Curves B and C show the initial frequency changes due to the Fet stabilization. In both cases the Fet power was 25% of that used for curve A. The degree of initial instability is in proportion to the power.

A direct measurement of the Frequency-Temperature relation for the Fet and its immediately related circuit yielded a value of -2.7 Hz/°F.

This finding requires a reassessment of the cause of the shape of the first part of the frequency response curve of Figure 5. The initial rise is obviously associated with temperature stabilization, yet it cannot be due to the transistor, since the frequency change is positive and the transistor, coefficient is negative. The cause must lie beyond the oscillator; hence in the power supply or/and the isolating amplifier.

That this is so is shown by curve A, Figure 6. This was obtained by running the power supply and isolating amplifier for two hours prior to switching on the oscillator. The initial frequency change is now negative, as anticipated. What is particularly satisfying is that equilibrium is established in three minutes.

The internal thermal effect is thus sharply defined in time as contrasted with the external as exemplified by curve A beyond the 16 minute mark. Frequency changes beyond this point are attributed to room temperature change. The total frequency drop of 1.5 Hz after 16 minutes represents a temperature rise of 0.5° F.

Curves B and C, Figure 6 show in fine detail the consequences of the internal thermal effect. Both curves were obtained under identical conditions. The applied potential was 5 volts; the operating current 725 μA, hence the powers was 3.6 milliwatts.

It will be seen that the maximum frequency change following switch-on was 2 Hz and complete stability was attained in less than two minutes.

For curve A the applied potential was 20 volts; the operating current 660 μA; the power 13.2 milliwatts; the frequency change 8 Hz. Thus the frequency changes per watt are the same for curves A, B and C within the limits of measurement and yield a value

$$= -0.5 \text{ Hz / milliwatt at 3.8 mHz} \quad (1)$$

Change in frequency resulting from change in ambient temperature is given by

$$= -2.7 \text{ Hz/°F} \quad (2)$$

The thermal characteristics of the tank circuit of the present oscillator were

$$= -15 \text{ Hz / °F} \quad (3)$$

Conclusions

The Field Effect Transistor is unstable with respect to temperature.

The effects of temperature changes arising from energy released within the transistor are numerically predictable. Suitably selected operating values yield a small temperature effect which rapidly attains equilibrium, which is readily adjustable and completely consistent. The effect is proportional to the power, hence to change in power. Assuming a 1% change in power consumption during oscillator operation - a value far in excess of any that actually would occur - the effect on the frequency would be 0.02 Hz at 3.8 mHz, or better than 1 part in 10^8. In short the internal thermal problem need be no problem.

Ambient temperature changes do constitute a very real problem and are common to both the transistor and tank circuit, the coefficient of the latter being about 5 times the former. If the tank circuit is adjusted for self temperature compensation the two can be rated equally yielding a figure of about 2-3 Hz /° F.

Thus the limiting factor in the frequency stability of a Fet oscillator is the degree of ambient temperature control that can be exercised over the transistor and tank circuits.

This not very enticing but important problem will be discussed subsequently.

BANNED COUNTRIES LIST

Iraq, Khmer Republic**, Libya, Pakistan, Somalia, Turkey, Viet-Nam*, Peoples Democratic Republic of Yemen.

*-Stations XV5AA, XV5AB and XV5AC were authorized to exchange communications with Amateurs of other countries by the former Saigon regime.

**-Station XU1AA has been authorized to exchange communications with Amateurs of other countries.

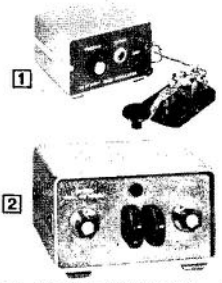
THIRD PARTY TRAFFIC AGREEMENTS

Bolivia, Chile, Costa Rica, Dominican Republic, Guyana, Honduras, El Salvador, Israel, Nicaragua, Peru, Trinidad, Tobago, U.S.A. (Territories and Possessions) and Venezuela, Guatemala and Uruguay.

RECIPROCAL LICENCING AGREEMENTS

Belgium, Brazil, Dominica, Dominican Republic, France, Ecuador, Federal Republic of Germany, Guatemala, Israel, Peru, Luxemburg, Netherlands, Norway, Nicaragua, Poland, Portugal, Republic of Panama, Senegal, Sweden, Switzerland, U.S.A., Uruguay, Venezuela, Denmark, Iceland and Finland.

Note: All Commonwealth countries are eligible for reciprocal operating privileges to Canadian Amateurs.

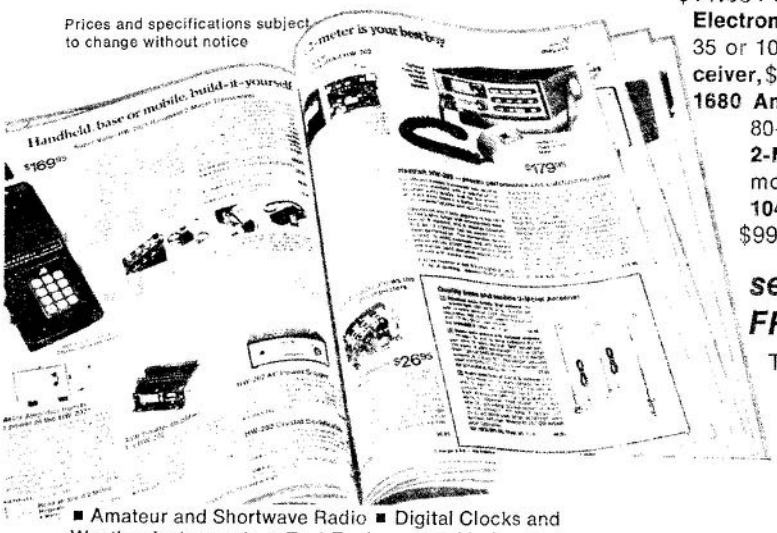


from QRP to SSB...

"There's more for the Ham at HEATH"

Heathkit Ham equipment has been the start, and standby, of thousands of Amateur Radio hobbies the world over. It offers you superior performance, day-in day-out reliability, and more VALUE for your money. And because Heathkit Ham gear comes to you in easy-to-assemble kit form, you learn more about your hobby as you put the kits together, you SAVE money over comparable assembled units, and you can service the equipment and keep it in top operating condition. You get more out of it because we design more into it! So whether you intend to work the world on a couple of watts CW or "go the limit" with state-of-the-art SSB, you'll find Heath is the place to get and keep yourself "in gear."

Prices and specifications subject to change without notice



■ Amateur and Shortwave Radio ■ Digital Clocks and Weather Instruments ■ Test Equipment ■ Marine, Automotive and Aircraft Accessories ■ Color TV ■ Hi-Fi Components...over 400 kits you can build and service yourself.

[1] **HD-1416 Code Practice Oscillator,** $14.95 Perfect for beginners. [2] **HD-1410 Electronic Code Keyer,** $70.95 Sends 10-35 or 10-60 wpm. [3] **HW-8 QRP Transceiver,** $177.50 A super-value. [4] **HR-1680 Amateur Receiver,** $299.95. Full 80-10 meter coverage. [5] **HW-202, 2-Meter Transceiver,** $276.50 A mobile 2-meter standard. [6] **SB-104 Digital CW/SSB Transceiver,** $999.95. Probably the world's finest!

send for your FREE catalog today!

TO HEATH COMPANY
1480 DUNDAS ST. E.
MISSISSAUGA, ONT.
L4X 2R7

OR PICK ONE UP AT ONE OF THE HEATHKIT ELECTRONIC CENTERS LISTED BELOW

MISSISSAUGA, ONTARIO L4X 2R7
1478 Dundas St. E. 416-277-3191

WINNIPEG, MANITOBA R3G 0V3
1315 Portage Ave. 204-783-3334

EDMONTON, ALBERTA T5E 4C2
12863-97th Street. Phone 403-475-9331

VANCOUVER, B.C. V5R 5J7
3058 Kingsway. Phone 604-437-7626

MONTREAL, QUÉBEC H2M 1H1
795 Legendre St. E. Phone 514-384-9160

OTTAWA, ONTARIO K1Z 5Z6
866 Merivale Rd. Phone 613-728-3731