

-24

CARF the canadian amateur

March 1978

No. 3

Proposed Act Revived

The DOC announced the introduction of Bill C-24 in the House of Commons on January 26 for first reading. This bill is the new proposed legislation for the control of telecommunications in Canada and, in part, will replace the present Radio Act. The proposed legislation was first introduced during the past session of Parliament as Bill C-43 but it 'died' with the end of the session. With the present priority items in the House and election talk in the air, Bill C-24's chances of survival may be no better.

Section 63(1)(c) is of some interest to Amateurs because it clearly sets
Continued on Page 5

AMATEUR RADIO RESCUE

Two Vancouver Amateurs, Vic Waters VE7ALR and Gerry Descantes VE7 CGD, combined with FR7ZS on Reunion Island to help a seriously ill sailor on the French freighter 'Onyx' in the Indian Ocean.

The incident began on the morning of February 14 when Vic, a radio personality and a longtime Amateur, heard a call for help on 20 metres from the ship's station FNRE manned by a former ON6, Alain.

Vic said that "he couldn't speak English very well and all I could make out was that help was needed for a very sick man on board". Vic called neighbour Gerry, who is fluent in French, and he found out that Alain, the ship's operator, had tried the normal marine frequencies but had been unable to raise anybody so, knowing from his Amateur experience that his chances of raising someone on the Amateur bands were good, he put out a call.

Vic and Gerry knew that there was no active Amateur in Port of Moroni in the Comoros Islands, the ship's destination, but managed to raise FR7ZS on Reunion Island who knew the tower frequency at that port. He radioed the authorities there and they sent a fast launch to the assistance of the stricken crewman.

A couple of days later, Vic and Gerry heard from VE7ZQ the news from Noel ON7FN that the timely assistance via Amateur radio led to the sailor's recovery. Just to make the story even more interesting, if not more complicated, Noel was one of the 'anchor men' who kept in touch with Willi de Roos VK9XR during his epic sailing venture through the Northwest Passage. (See our front page story in the January issue.)

Luck was with all involved because the next day 20 metres went dead as the proverbial doornail.

the canadian amateur

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Editor:
VE3CDC Doug Burrill

Publisher:
Steve Campbell

 from the **Front Office...**

The Canadian Amateur is the official monthly publication of the Canadian Amateur Radio Federation, Inc. It is distributed to members and is available to others for \$7.00 per year. The Federation is incorporated and operates under a federal charter, with the following objectives:

1. To act as a coordinating body for Amateur radio organizations in Canada;
2. To act as a liaison agency between its members and other Amateur organizations in Canada and other countries;
3. To act as a liaison and advisory agency between its members and the Department of Communications;
4. To promote the interests of Amateur radio operators through a program of technical and general education in Amateur matters.

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Any club wishing to become an Affiliate Member of CARF should submit the names and call signs of five or more club members who are CARF members.

Affiliation includes free, a subscription to the CARF News Service bulletins, the CARF News Release service, and use of the CARF Out-going QSL service for the club station. (A club subscription to The Canadian Amateur is available for \$7.00 per year.)

march 1978 - page two

An appraisal of the Financial Report for 1977, found elsewhere in this issue, demonstrates that it takes considerable finances to operate your national society. Expenses incurred in 1977 were heavy and necessary and note that, by careful management, your Federation ended with an excess of \$3000.00 of income over expenditures. This excess will enable CARF to go ahead with plans to further develop services and activities and thus make your membership even more valuable.

Income is derived mainly from membership dues and sale of publications and advertising; expenditures cover cost of production of The Canadian Amateur and CARF publications, meetings, conventions and travel expenses, membership services and general administration and the operation of the National QSL Bureau.

All dues received from Life and multiple year memberships are invested in Canadian companies and a reserve fund has been created to cover long term and budgetary expenses. Interest from these sources will add to CARF's income in future years. Current account funds are those used for day-to-day expenses.

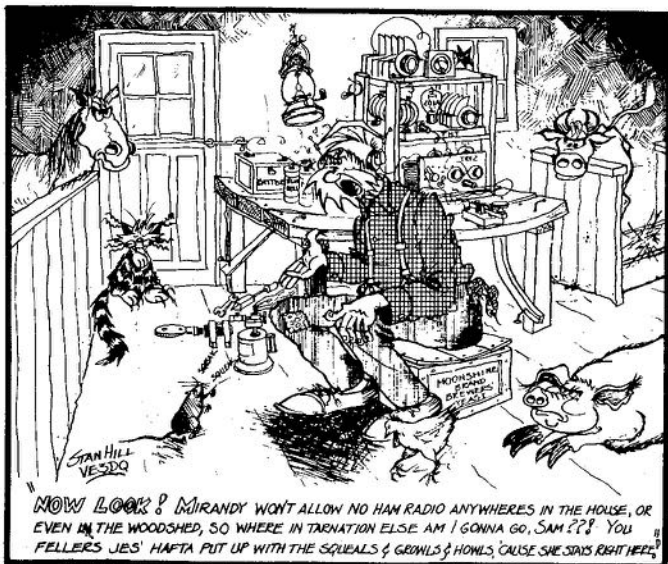
One, expense not in the 1977 budget, was CARF's involvement in the Symposium and our excellent financial picture enabled your Federation to deal with these with no problem. Expected expenses to be met for the 2nd Annual Symposium have been included in the 1978 budget.

Letters have been forwarded to the provincial Amateur organizations requesting that they consider hosting these vital annual events. The intent is to hold future Symposiums in a different location each year and to make them a two-day affair. Suggestions for Workshop topics are welcomed and should be forwarded to your provincial organization, your Regional Director, or directly to CARF for consideration.

One topic already on the books is "Canadian Amateur qualifications and examinations". Questions such as - "What should the minimum qualifications be for obtaining an Amateur Certificate?"

SHORT CIRCUITS

by
Stan Hill
VE3DQ



NOW LOOK! MIRANDY WON'T ALLOW NO HAM RADIO ANYWHERE'S IN THE HOUSE, OR EVEN IN THE WOODSHED, SO WHERE IN TARNATION ELSE AM I GONNA GO, SAM??? YOU FELLERS JES' HAFTA PUT UP WITH THE SQUALS & GROWLS & HOWLS, 'CAUSE SHE SAID RIGHT THEES!

(i.e. code requirement; technical knowledge of sufficient depth for progress, through self-study, to a higher class; operating knowledge; regulation knowledge). 'Do the current examinations determine that a candidate possesses the necessary knowledge & ability?', 'Should more emphasis be paid to the "experimental" side of Amateur Radio when assessing qualifications for the Advanced Amateur certificate?', 'Should Incentive Licensing such as in the United States be adopted in Canada?'

Full publicity of topics suggested and chosen will be contained in future issues of The Canadian Amateur and enable all Amateurs to express their opinions and comment to guide their representatives in their discussions. Decisions made by the various Workshops and by the plenary session are completely based on the arguments presented during the Symposium, particularly those containing facts and figures substantiating the argument.

The great value of Symposiums is that they serve as a forum in which your representatives can positively express their concern to officials of the DOC, to CARF, and to other Amateur organizations, about matters of concern to the Amateurs of Canada. All attending have complete freedom to express their opinions on all matters discussed so that, if any topic is rejected or approved by those attending, the blame for the rejection or credit for approval rests with the weight of argument presented.

WARC '79 Update



Second draft of Canadian WARC '79 proposals released February 20 --

It shows 160 metres as exclusive but cut 1800-1900 kHz. Shocking cut in 45 metres with 3800-4000 kHz deleted from Amateurs with compensating exclusive use of 3500-3800 kHz. 40 metres slides down to 6900-7100 kHz exclusive with 7100-7300 lost. A real gain in two new bands exclusive 10100-10300 kHz and 24000-24500. 220 band changes to Amateur primary from secondary use. 420-430 MHz chopped off. New band proposed 902-928 MHz shared. Few and minor changes in remainder of UHF and SUHF.

Details in next CARF newsletter and April issue The Canadian Amateur. Public discussion on these proposals will be held in Ottawa the first week of April.

Meanwhile, south of the border, our Washington source notes that the FCC next draft recommendations will be later than anticipated and probably will not be out until the middle of March. The FCC and DOC frequency planners are due to meet in Ottawa during the last part of February, according to a reliable informant.



Canadian
Repeater
Advisory Group

VE3DWL Hugh Lines

Saskatchewan starts off this month with a large number of updates thanks to the Saskatchewan VHF Advisory Group. A new repeater is in operation at Moosomin on 146.16/146.76 but no call sign was given. New repeaters have been proposed for Grenfell and Tompkins with 146.31/146.91 assigned to both. As well, the areas around Weyburn and Rosetown are being considered as possible repeater locations. Two new repeaters are in operation from Meacham (VE5HVR 146.22/146.82) and Rock Point (VE5RPR 146.13/146.73). The Rock Point machine is wind-powered, making it the second such installation in the province. Another proposed repeater is for Anglin Lake, and 146.16/146.76 has been assigned to this area. The Saskatchewan VHF Advisory group has agreed to follow the standard ARRL band plan for 146/147 MHz, and all future frequency assignments will follow this plan. The repeaters at Yellow-

head (VE5ESK 146.16/146.76) and Meacham (VE5HVR 146.22/146.82) are working with a full-duplex link on 220 MHz with a possibility of Rock Point (VE5RPR 146.13/146.73) being linked in the future.

From the Brandon Manitoba ARC we find that the Brandon repeater (VE4BDN 146.34/146.94) is now a solid state station and is working well with new VHF Engineering gear. The Killarney repeater (VE4KIL 146.25/146.85) is a new one on the air. The club has been asked to help with communications during the Canada Winter Games and hopes to use 2 metres extensively.

From the Minden, Ont. ARC comes news of a proposed repeater for the Minden area. No frequencies have been assigned yet and the proposed call is VE3MIN. From the Aurora Ontario area, plans are well under way for a repeater to straddle the Aurora ridge on 147.60/147.00. In the Belleville area, the VE3IVL auto-patch repeater (146.43/147.03) is back on the air after being re-built.

The minutes of the St. Lawrence Valley Repeater Council provide lots of news from the South Eastern Ontario area. In Ottawa, VE2KPG (147.96/147.36) has a battery supply installed and is now located at Camp Fortune, Quebec. Another proposed repeater for Ottawa is VE3OXM (147.72/147.12). VE3TWO (147.90/147.30) is an intermittent operation pending arrival of a more extensive control system. A new Ottawa repeater is VE3TEL of the Telephone Pioneers on 146.43/147.03. In Smith's Falls, VE3RLR (147.81/147.21) is in full operation, and in Montreal VE2RM (146.40 in) now is going out on 224.060 as well as 147.00.

That's it for this month. Remember, summer is coming and if you expect to travel and operate in the US, it's time to get your forms 410 down to the FCC for approval. It normally takes 4-6 weeks and is valid for a year. Blank forms should be available from the DOC regional office, the US consulates and the Embassy in Ottawa.

WHAT'S UP, DOC?

Two CARF officials left Ottawa late in February for California, which besides oranges is noted for having a huge Amateur population and the 'biggest Canadian city outside of Canada'. It's rumoured that, in talks with California clubs, the feasibility of setting up a CARF American Division will be explored.

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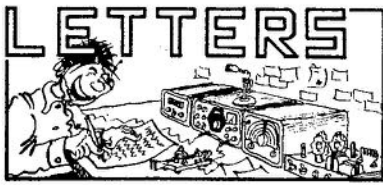
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BILL C-24

Continued from Pg.1

Apparently the report on the National Amateur Radio Symposium which I made to western clubs and Amateurs and which was published in the Amateur Radio League of Alberta's "VE6" has been misread by some people.

Out of a report of four, typewritten pages one sentence 23 words long, was lifted out of context. This sentence has been used to belittle CARF and its objectives in a memo sent to various clubs and Amateurs.

Let me state emphatically that my report was written and edited by myself alone and is my own personal opinion of the symposium. It was not discussed with the CARF executive prior to publication because neither the Federation nor its executive operates that way ... it is not a dictatorship. Please publish this letter to make it clear that the report reflected my personal view, not the view of the Federation or its executive.

Jim McKenna VE6HO
Western Director

Symposium Aftermath

More than 150 Amateurs from south-western Ontario gathered in London on February 9 to hear Bill Wilson VE3NR from DOC HQ and Fred Towner VE2DNW, CARF vice-president, talk on the recent National Amateur Radio Symposium.

Fred and Bill (who was the moderator of the Symposium) related the circumstances surrounding the symposium and the recommendations and results of the one-day conference to a highly interested audience which included W.D. (Dave) Lyon, DOC Ontario Region Director.

The meeting, which was arranged by the London club, was the result of a wish to clear up the erroneous second-hand information concerning the conduct and results of the symposium which appeared in a number of Ontario club bulletins. The lively question period did a great deal to set the record straight.

forth the Department's intention of retaining control over antenna supporting structures. This section states that 'The Minister (of Communications) may ... establish technical requirements with respect to radiocommunication facilities, ... approve each site ... including antenna systems ... and approve the erection of masts, towers and other antenna supporting structures'.

There have been some changes made in the new bill, but most are for clarification and generally concern the Broadcasting Service and the Canadian Radio-Television and Telecommunications Commission (CRTC) "... principally in response to representations from provincial ministers, industry officials and others..." and "... do not alter the nature or intent of the legislation."

(VE3ZS)

FINANCIAL REPORT

FOR FISCAL YEAR 1977

The following statement covers the fiscal year January 1 to December 31, 1977 and is subject to audit:

Accounts Receivable	\$80,429.00
Accounts Payable	\$77,347.00
Excess of Income over Expenditures	\$3,082.00
Bank Balance - Current Acct. (Operating Fund)	\$15,341.00
Savings Acct. (Reserve Fund)	\$12,290.00
Guaranteed Investments (Life & Multiple year memberships)	\$10,000.00

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Third Party Traffic

It has recently come to our attention that Amateurs in countries with which Canada does not have formal third party traffic agreements have been requesting Canadian Amateurs to handle phone-patches, claiming that their administration has no objection to such exchanges.

Department of Communications HQ officials have advised CARF that while Canada is quite prepared to enter into appropriate agreements, they would not advocate taking the foreign Amateur's assurances of the legality of the third party traffic in case they are mistaken. No action would likely be taken against the Canadian Amateur unless the foreign administration filed a complaint. In that case undesirable disciplinary action would have to be taken. It is this probably remote but undesirable complication that the DOC wishes to avoid.

Consequently, it is recommended that should you be asked to handle third party traffic by a foreign Amateur whose country has not concluded an agreement with Canada, you should inform him you are unable to comply, but let him know that should his administration wish to

enter into such an agreement with Canada it is merely a matter of asking for it. The agreement must be reciprocal, that is Canadian Amateurs must be granted similar privileges by the other country.

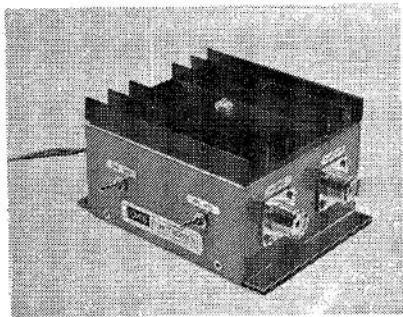
Please let CARF know of any such requests you may receive or hear about.

Conventions—

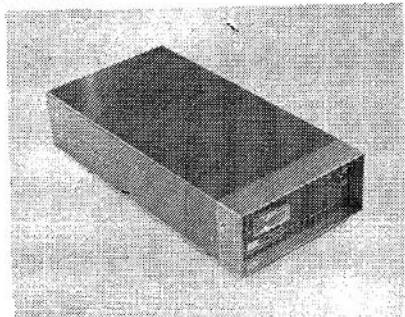
CONVENTIONS! -- If your organization wishes to publicize an upcoming convention or hamfest, let's get an early start. We will run a Convention Corner starting with the April issue. Only information so far is that the London ARC will sponsor the 1978 Radio Society of Ontario convention in October. (Ottawa ARC is taking on the 1979 show).

Vibes from the Maritimes to date are that for the first time in many, many years there will be no convention this year, as so far no club has felt able to take it on.

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SOLID STATE 2M LINEAR AMPLIFIER
All solid state 50W rms output 2m linear amplifier. Just connect in the antenna line of your 2m transceiver and leave the rest to the built in RF sensing aerial c/o relay. Accepts FM, SSB, AM and CW with switchable hang-time for SSB operation. Supplied complete with DC power cord and SO239 input and output sockets.



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Specification brochure available

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CQ Canada de VE3VCA

On March 1, VE3VCA (Voice of the Canadian Amateur), headquarters station of CARF, came on the air on a regular schedule and is now looking for

QSO's with Canadian Amateurs coast-to-coast and on the high seas. The following schedule will be adhered to as closely as possible:

Wednesdays:	0030 - 0130 Z	CW	0130 - 0230 Z	SSB
Saturdays :	1900 - 2000 "	"	2000 - 2100 "	"
Sunday * :	1500 - 1600 "	"	1600 - 1700 "	"

* Third Sunday each month only

Primary Frequencies: CW - 14060 KHz SSB - 14160 KHz
Secondary Frequencies: CW - 7060 " SSB - 3760 "

Secondary frequencies will be used when 20 meters is dead.

On major contest weekends, if QRM is heavy on 20 and 15 is open, we will shift operation to 21060 CW and/or 21160 SSB as appropriate.

These operating times have been selected to provide the maximum opportunity for Canadian Amateurs to contact the CARF HQ station. Station operators are volunteers from the Kingston (Ont.) Amateur Radio Club. During extended QSO's, the VE3VCA operator will listen frequently for other stations wishing to call in, do not hesitate to make your presence known (BK or BREAK) if you are on frequency and waiting to contact VE3VCA.

Please note that the Wednesday operation is late afternoon/early evening in Canada, but wee hours of Thursday morning GMT (Z) (UTC). Also, all frequencies are plus or minus QRM - we do not have either the power, the desire or the necessity to commandeer any particular frequency.

Visitors are welcome at VE3VCA, 370 King St. W. in Kingston, during operating hours. We're a bit hard to find in the maze of buildings, so would suggest you ask for directions on the local 2-metre repeater, VE3KER, or look for the beam and tower at the site and follow the coax. We will be delighted to QSL via the Bureau on request or on receipt.

PRIZES! If you are a Canadian Amateur and contact VE3VCA during March or April, a CARF message form with your call inscribed thereon will be placed in a box. (One entry per call sign). Early in May a draw will be made. The first five Amateurs whose calls are drawn will receive free their choice of a CARF

Certificate Study Guide, an Advanced Study Guide or a Radio Regulations Handbook. An additional ten calls will be drawn and these lucky winners will receive a mystery gift from CARF.

CANLON

ANNOUNCES

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We now offer a most comprehensive range of Amateur VHF and UHF receiving converters. NEW: Dual Band Converters which are designed for the operator who wishes to listen to the 432/434 and 434/436 MHz bands. Our range of converters now includes those listed below:

2M 144/28
70cm 432-434 434-436/28 Dual Band
" 432-434 434-436/144 Dual Band
" 432-434/144

FOR THE 70 Cms OPERATOR.

144/432

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Terry Finn VE6APE won praise for his cool and daring from men fighting a recent treacherous natural gas blow-out in Alberta.

Terry, a chopper pilot, landed his machine a few hundred feet away from the well to rescue men trapped by poisonous gas clouds when the wind shifted.

"It was a touchy situation," said one of the workers. "Terry knew that his exhaust could ignite the gas, but he took the chance for the sake of the men."

(Tx Kim Gunn VE6OM)

The Nova Scotia VHF Association has a new executive. President is Neil Hughes VE1YZ; vice-president, Gerry Harris VE1AAC; secretary-treasurer, Jean Hughes VE1YW. Technical chairman is Chuck Monroe VE1AJZ.

The Royal Canadian Corps of Signals, Hamilton District, is sponsoring a Signals Reunion at the Royal Connaught Hotel, Hamilton, Ont, on May 5, 6 and 7. Details from Box 3541, Sta. C, Hamilton, Ont. L8H 7M9.

Equipment Review

Before you think of firing a transmitter into an antenna, you had better line it up ... and a dummy load is the proper thing for that -- check the regulations!

To measure the power output, you need a wattmeter. As most of us run less than 120 watts output, and our activities range at least from HF to VHF, (say 80m. to 2m.) it would be nice if the same device(s) could be used for all frequency bands, and for all powers ranging from handie-talkies to HF exciter-type powers. The Kuranishi Keisokuki model RW-120D is worth taking a look at. The frequency range is 3 to 500 MHz, full scale power ranges of 5, 20, and 120 watts (on the 5 watt scale, one watt falls near mid-scale), VSWR is less than 1.15, readout accuracy is claimed to be 10%, the load is 50 ohm impedance, and it is fitted with a type M (MR-50) connector, which is compa-

NEWS BRIEFS

Ottawa Amateur Radio Club members got a real pleasant surprise at their February meeting. When the president asked any new Amateurs in the audience to stand up, there was a roar of approval when about FIFTY new licensees rose as one! Graduates of an intensive night course conducted by VE3GK at one of the local community colleges, the new Amateurs will swell the ranks of one of the larger clubs in Canada which now numbers more than 300.

Thunder Bay Amateurs provided 2 metre communication for parade coordination for the January Lakehead University Winter Carnival using the university station VE3LUE. Operators were VE3EUI, VE3AXL, VE3AYZ, VE3HJS, VE3HHS, VE3JAA and VE3JAR.

Microwave Modules Ltd. 500 MHz counter, and Kuranishi Keisokuki 3 to 500 MHz/0.5 to 120 watt Dummy Load and Wattmeter.

by Dave Robinson
VE3BTY

tible with the PL-259 "UHF" Connector.

The dimensions are (h x w x d) 100 x 190 x 100mm and two-thirds of the front panel is a large, easy-to-read meter of which the manufacturer says "High precision is obtained by adopting the band meter (1.5 class)" -- I am often bemused by Japanese to English transliterations.

No frequency corrections or charts are required, and power selection is made by using push-buttons. Depending on the value of the Yen etc. the price is around \$140 Canadian.

The device was rigged a capacitive probe-type pickup which "sniffs" out enough RF to operate the frequency counter which we also looked at. It is the Microwave Modules Ltd. MMD050/500 500 MHz Digital Frequency Meter". It's a small one, in a cast aluminum case, 111 x 60 x 27 mm, requiring 11 to 15 volts DC at 300 ma, positive with respect to the case. The power connector is a 5 pin 270 locking DIN socket, and the input



- 100% solid state SSB/CW Transceiver
- Full coverage of 10 – 160 meter bands
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THE ATLAS 350-XL

Atlas 350-XL

Model DD6-XL Digital Dial Readout

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connector is a 50 ohm BNC.

Since both the counter and the instructions appear to have originated in Liverpool England, I feel I can lift the general description directly from the brochure without too many snickers: "...The counter has two ranges which are selected by supplying 12 volts to one of two pins on the DIN socket. Internal diode switching brings the input in the 0.45 to 50 MHz range to a wideband amplifier which drives a high speed TTL divider in the main counter logic. On the 50-500 MHz range the diodes switch in a high speed ECL pre-scaler and the decimal point is changed accordingly ... The counter has reverse polarity protection. A suitable 5 pin DIN plug is supplied."

There is a six-digit red LED display 10 mm high by 45 mm wide. The sensitivity is stated as better than 50 mv for the 50 MHz range and 200 mv for the 500 MHz range, and although the supplier VE3ZS, Art Stark wasn't too happy to hear about it, it seemed to operate quite happily when I connected the output of my one-watt handie-talkie directly into it. (After all, Art, it survived when you dropped it onto your basement floor!)

The latest price quoted for the counter was \$225. So there you are for this month, a real international deal -- a piece of equipment from the other side of the Pacific and Atlantic Oceans respectively.

A Matter of Pride?

From the Metro ARC Bulletin (Toronto)

When I read the many Ham-oriented magazines which arrive at my house each month, a slow burn develops when I see Amateur Radio, Hams, and Amateurs printed as amateur radio, hams, and amateurs while, at the same time, any reference to CB, CB-ers, GRS, or Citizen Banders invariably gets the upper case treatment.

One exception to this that I should mention is the C.A.R.F. publication, "The Canadian Amateur". Credit for their policy belongs to Art Blick, VE3 AHU, who, I believe, wrote an article some years ago, recommending the use of capitals for Amateur Radio, Ham, etc. the same as accorded to similar fraternities. We speak of our great Amateur Radio Fraternity and most of the Ham magazines print it in lower case. They would not think of 'lower-casing' other fraternities such as the Kiwanis or the Rotarians.

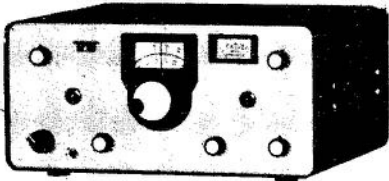
VE3AB (Editor Metro ARC)



The Ottawa Valley Mobile Radio Club recently celebrated its 20th anniversary. Holding the crest is Doreen Morgan VE3

CGO and husband Ed VE3GX who were chosen as 'Amateurs of the Year' by the Radio Society of Ontario.

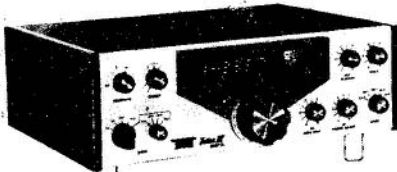
TEN-TEC



570 Century 21 70w CW Xcvr.....
574 Century 21/Digital.....



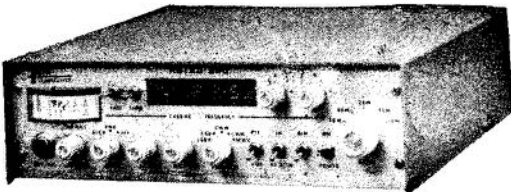
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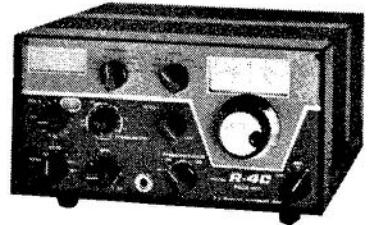
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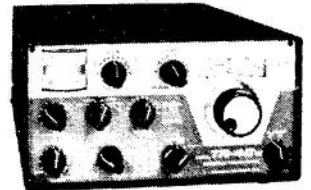
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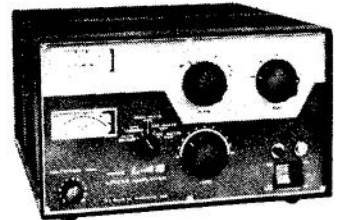


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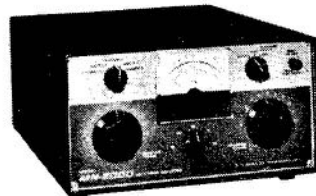


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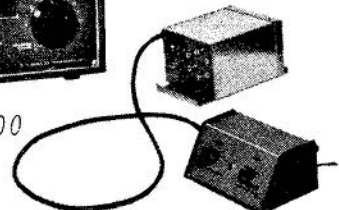
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Updating

THE CARF CANADIAN AMATEUR RADIO REGULATIONS HANDBOOK

Since the compilation of the Second Edition of the CARF Canadian Amateur Radio Regulations Handbook in 1974, there have been a number of revisions to the General Radio Regulations, Parts I and II. Most of the revisions are merely re-wordings in an attempt to clarify regulations, up-date terminology (cycles per second to hertz and multiples thereof), to accommodate changes caused by amendments to the Citizenship Act, re-organizations of portions of the Regulations (i.e. Control of Radio Interference previously covered by sections 17 thru 21 of the GRR, Part I, have become a part of the Radio Interference Regulations), a re-statement of Amateur frequency bands to show those shared with other services and other minor editorial changes and corrections.

In order to bring your copy of the Handbook up to date, the changes shown below should be made:

Table of Contents - delete '2.7.2.2 Commonwealth Citizens'.

Pg. 4, col 1, Sec. 4.(3) - last line - change 'six dollars' to 'eight dollars'.

Sec. 5.(1)(a) - line 1 - change 'Commonwealth' to 'Canadian'.

Sec. 5.(1)(g) - replace with 'an individual who is a landed immigrant'.

Sec. 5.(1)(g)(ii) - delete this subparagraph.

Col. 2, Sec. 8 - change to read 'Except as otherwise provided by these Regulations, no person shall operate a radio station in Canada, or on an aircraft registered under the Aeronautics Act or on a ship registered or licensed under the Canada Shipping Act unless he is a Canadian citizen or a landed immigrant.'

Sec. 10 - delete the heading and this complete section.

Sec. 13.2 - insert new sub-section-'A United States citizen who holds a licence in respect of an amateur station in the United States and is duly authorized to operate the same may operate that amateur radio station or an amateur

radio station licensed by the Minister while he is temporarily in Canada if he has been authorized in writing by the Minister to do so.'

Page 5, Sec. 17, 18, 19, 20, 21 - These sections are now included in the Radio Interference Regulations.

Page 6, col. 2, Sec 21(1) - delete.

Page 7, col. 1, Sec 21(2) & (3) - delete.

Page 8, col. 1, Sec. 45.(1) - replace with 'Subject to section 46, the frequency bands and types of emission set out in Schedule II are allocated for use in the operation of stations performing an Amateur Experimental Service.'

Sec 45.(2) - amend to read 'In Schedules II, III, IV and V'.

Col. 2, Sec. 45.(5) - insert the following sub-section:

(5) A person who operates an amateur radio station in a frequency band set out in Schedule II, III or IV that is marked with an asterisk shall not

(a) cause harmful interference to any station providing a Radiolocation Service in that band; or

(b) claim protection from interference caused by any station providing a Radiolocation Service in that band.

Page 9, col. 1, Sec. 46A - line 6 - amend to read 'a frequency band set out in column I of an item of Schedule II using a type of emission other than the type set out in column II of that item.'

Page 10, col 1, Sec. 59(3)(a), line 3 - change 'specified in section 45' to read 'set out in Schedule II'.

Page 11, col 1, Sec 66(d)(i), line 3 - change 'section 45' to read 'Schedule II'.

Sec 66(e), last line - change 'section 45' to read 'Schedule II'.

Col 2, Sec 82 - delete.

Sec 99(1) - change to read '99. No person is eligible for an examination for certificates of proficiency unless he is a Canadian citizen or a landed immigrant.'

Sec 99(2), (3) & (5) - delete.

Page 12, col 1, Sec 99(7), (10) & (11) - delete.

Page 13 - replace Schedule II, III & IV with new schedules.

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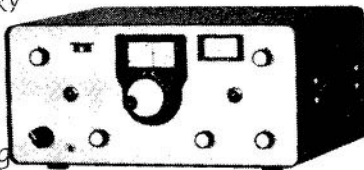
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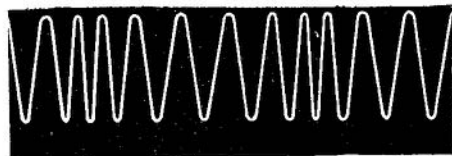
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SCHEDULE II

Item	Column I		Column II
	Frequency Bands		Types of Emission
1	1.800 -	2.000 MHz	A1, A3, F3,
2	3.500 -	3.725 MHz	A1, F1,
3	3.725 -	4.000 MHz	A1, A3, F3,
4	7.000 -	7.150 MHz	A1, F1,
5	7.150 -	7.300 MHz	A1, A3, F3,
6	14.000 -	14.100 MHz	A1, F1,
7	14.100 -	14.350 MHz	A1, A3, F3,
8	21.000 -	21.100 MHz	A1, F1,
9	21.100 -	21.450 MHz	A1, A3, F3,
10	28.000 -	28.100 MHz	A1, F1,
11	28.100 -	29.700 MHz	A1, A3, F3,
12	50.000 -	50.050 MHz	A1,
13	50.050 -	51.000 MHz	A1, A2, A3, F1, F2, F3,
14	51.000 -	54.000 MHz	A6, A1, A2, A3, A4, F1, F2, F3, F4,
15	144.000 -	144.100 MHz	A1,
16	144.100 -	148.000 MHz	A6, A1, A2, A3, A4, F1, F2, F3, F4,
17	220.000 -	225.000 MHz	A6, A1, A2, A3, A4, F1, F2, F3, F4,
18	*420.000 -	450.000 MHz	A6, A1, A2, A3, A4, A5, F1, F2, F3, F4,
19	*1 215.000 -	1 300.000 MHz	A6, A1, A2, A3, A4, A5, F1, F2, F3, F4,
20	*2 300.000 -	2 450.000 MHz	A6, A1, A2, A3, A4, A5, F1, F2, F3, F4,
21	*3 300.000 -	3 500.000 MHz	A6, A1, A2, A3, A4, A5, F1, F2, F3, F4,
22	*5 650.000 -	5 925.000 MHz	A6, A1, A2, A3, A4, A5, F1, F2, F3, F4,
23	*10 000.000 -	10 500.000 MHz	A6, A1, A2, A3, A4, A5, F1, F2, F3, F4,
24	24 000.000 -	24 050.000 MHz	A6, A1, A2, A3, A4, A5, F1, F2, F3, F4,
25	*24 050.000 -	24 250.000 MHz	A6, A1, A2, A3, A4, A5, F1, F2, F3, F4,

SCHEDULE V

Frequency Bands	Types of Emission
28.100 - 29.700 Mc/s	A3,F3

SCHEDULE III

Item	Column I	Column II
	Frequency Bands	Types of Emission
1	*420.000 - 450.000 MHz	A5
2	*1 215.000 - 1 300.000 MHz	A5
3	*2 300.000 - 2 450.000 MHz	A5
4	*3 300.000 - 3 500.000 MHz	A5
5	*5 650.000 - 5 925.000 MHz	A5
6	*10 000.000 - 10 500.000 MHz	A5
7	24 000.000 - 24 050.000 MHz	A5
8	*24 050.000 - 24 250.000 MHz	A5

SCHEDULE IV

Item	Column I		Column II
	Frequency Bands		Types of Emission
1	1.800	2.000 MHz	A1
2	3.500	4.000	A1
3	7.000	7.300	A1
4	14.000	14.350	A1
5	21.000	21.450	A1
6	28.000	29.700	A1
7	50.000	50.050	A1
8	50.050	51.000	A1,A2,A3,F1,F2,F3
9	51.000	54.000	A0,A1,A2,A3,A4,F1,F2,F3,F4
10	144.000	144.100	A1
11	144.100	148.000	A0,A1,A2,A3,A4,F1,F2,F3,F4
12	220.000	225.000	" " " "
13	420.000	450.000	" " " "
14	*1 215.000	1 300.000	" " " "
15	*2 300.000	2 450.000	" " " "
16	*3 300.000	3 500.000	" " " "
17	*5 650.000	5 925.000	" " " "
18	*10 000.000	10 500.000	" " " "
19	24 000.000	24 050.000	" " " "
20	*24 050.000	24 250.000	" " " "

Page 16, col 2, Sec 2.1, line 1 - change 'commonwealth' to 'Canadian'.

Page 17, col 1, Sec 2.2, line 4 - change 'Field' to 'District'.

Col 2, Sec 2.4, lines 12 and 13 - change '\$10.00' to '\$13.00'.

Page 18, col 2, Sec 2.7 4), line 3 - change 'GRII 14' to 'GRII 13.2'

Page 19, col 1, Sec 2.7.2.2 & 2.7.2.2.1 - delete.

Col 2, Sec 2.8, line 12 - delete the sentence beginning 'Since a landed immigrant.....' to end of paragraph.

Page 20, col 1, Sec 3.1.3, line 1 - after 'operation' insert 'on 10 metres'.

Page 28, col 1, Sec 5.1.12.2, line 8 - insert 'Canadian Amateurs may send and

receive QSL cards via the CARF National QSL Bureau, P.O. Box 66, Islington, Ontario M9A 4X1. Addresses of other QSL bureaux are listed in...'

Page 39, col 2, Sec 8.1, line 4 - change '3.750' to '3.890'.

Page 62, col 1, Third Party Traffic Agreements - add Colombia HK; add prefix N after U.S.A.

Col 2, Reciprocal Operating/Licensing Agreements - add Colombia.

To conform with current terminology the use of 'hertz' is now used in place of 'cycles per second'. Hence kc/s becomes kHz; Mc/s becomes MHz; Gc/s becomes GHz. Changes should be made throughout the Handbook.

Applications of the 555 Timer IC

Introduction

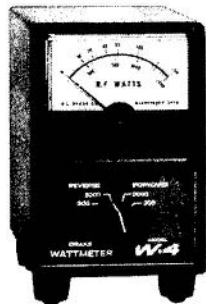
The 555 is an integrated circuit used for generating accurate time delays or very stable oscillation. In the time delay mode, the time is controlled by one external resistor and one capacitor. In the astable or oscillator mode, the fre-

By Keith Sharman, VE6BFS

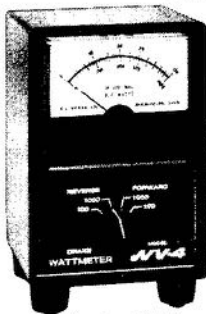
quency and duty cycle are controlled with two external resistors and one capacitor. The frequency stability is better than .005% per degree C. The output circuit can source or sink up to 200 mA, which makes it suitable for driving TTL loads.

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The pin assignment for the 8 pin dual-in-line package is shown in Figure 1.

Some readers may be familiar with the use of a 555 in a code practice oscillator. I will describe three other applications which may be of interest to Amateurs and experimenters.

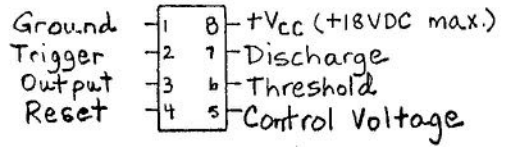


Figure 1 Pin Assignment for the 555 Timer IC

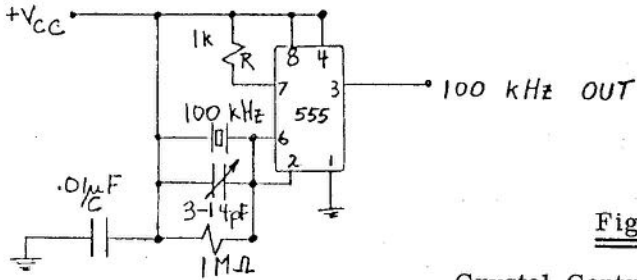


Figure 2
Crystal Controlled Oscillator

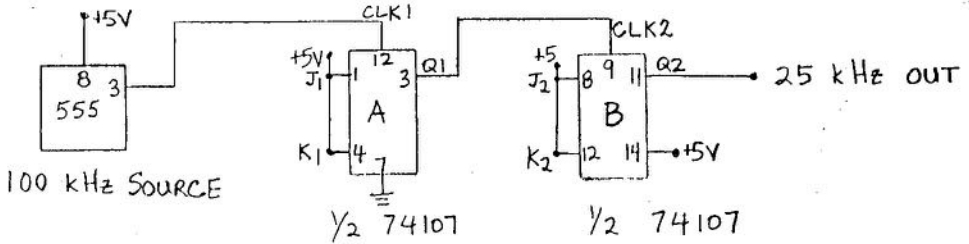


Figure 3 Frequency Division

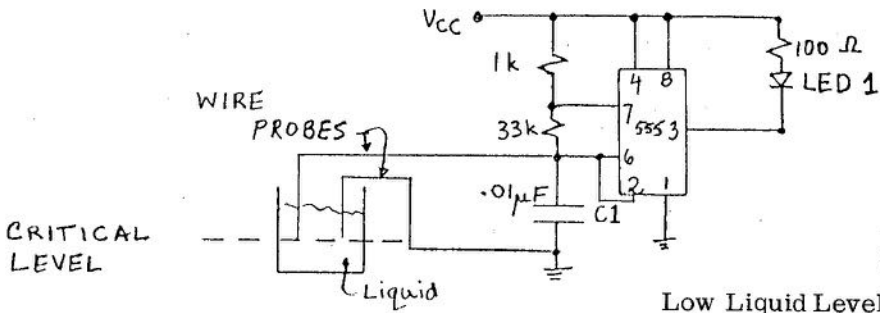


Figure 4
Low Liquid Level Indicator

A Crystal Controlled Frequency Source using the 555

The 555 can be used in conjunction with a crystal to form a very accurate frequency source, suitable for a calibrator in an Amateur receiver. The values of R and C should be chosen according to the following formula:

$$f_0 = \frac{1.443}{RC}$$

using f_0 equal to the crystal frequency. The circuit is shown in Figure 2.

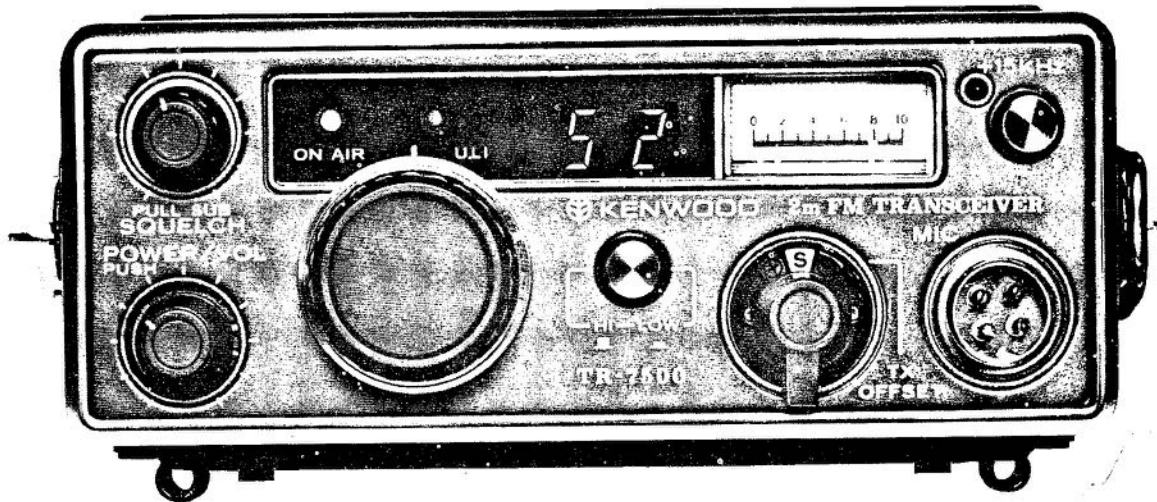
The output of this circuit can be divided by 4 using two JK flip-flops as shown in Figure 3. This configuration provides a calibration point every 25 kHz, which may be desirable for more accurate dial calibration.

Low Liquid Level Indicator

The circuit shown in Figure 4 can be used to indicate when the liquid level in
march 1978 - page 17

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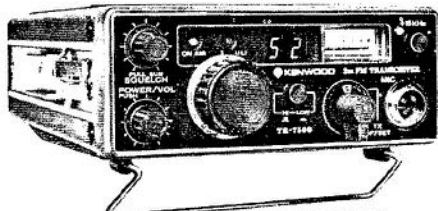


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Does it have 100 channels (88 pre-programmed)?	<input type="checkbox"/>	<input type="checkbox"/>
Does it have 12 extra diode programmable channels?	<input type="checkbox"/>	<input type="checkbox"/>
Does it have single knob channel selection?	<input type="checkbox"/>	<input type="checkbox"/>
Does it have a LED digital frequency display?	<input type="checkbox"/>	<input type="checkbox"/>
Does it have a powered tone pad connection?	<input type="checkbox"/>	<input type="checkbox"/>
Does the receiver have helical resonators?	<input type="checkbox"/>	<input type="checkbox"/>

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Diodes	35
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Mode:	FM
No. of Channels:	100
Operating Temperature:	-20 to +50 degrees C
Power Voltage:	11.5 to 16.0V DC (13.8V DC nominal)

Grounding Polarity: Negative ground
 Antenna Impedance: 50 Ohms
 Current drain: Less than 0.5A in receive with no input signal
 Less than 3A in transmit (HI)
 Less than 1.5A in transmit (LOW) (at 13.8V DC)

Dimensions: 172 mm (6-3/4") wide
 250 mm (9-7/8") deep
 75 mm (2-15/16") high
 Weight: Approximately 2.2 kg (4.8 lbs.)

TRANSMIT SECTION
 RF Output Power: High: 10 Watts
 Low: 1 Watt (approximately)
 Modulation: Variable reactance frequency shift
 Frequency Deviation: ± 5 KHz
 Spurious Radiation: Better than -60dB

Tone Pad Input Impedance: 600 Ohms
 Microphone: Dynamic microphone with PTT switch, 500 Ohms

RECEIVE SECTION
 Receive System: Double conversion superheterodyne
 Intermediate Frequency: 1st IF: 10.7 MHz
 2nd IF: 455 kHz
 Sensitivity: Better than 0.4 uV for 20dB queuing
 Better than 1 uV for 30dB S/N
 Squelch Sensitivity: Better than 0.25 uV
 Selectivity: 12kHz at -6dB down
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a reservoir is getting low. Two insulated wire probes, with about 1 cm of insulation stripped off each end, are connected across timing capacitor C_1 . When the liquid is in contact with each probe, C_1 is shorted out and the circuit does not oscillate. When the liquid drops below the critical level, C_1 is no longer shorted out and the circuit oscillates, which turns LED1 on. An audible indication can be realized by connecting a large capacitor

and a speaker to pin 3 of the 555, as shown in Figure 5. This circuit could be used to warn a driver when the windshield washer fluid is getting low.

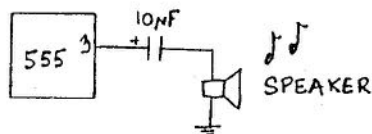


Figure 5 Audible Liquid Level Alarm

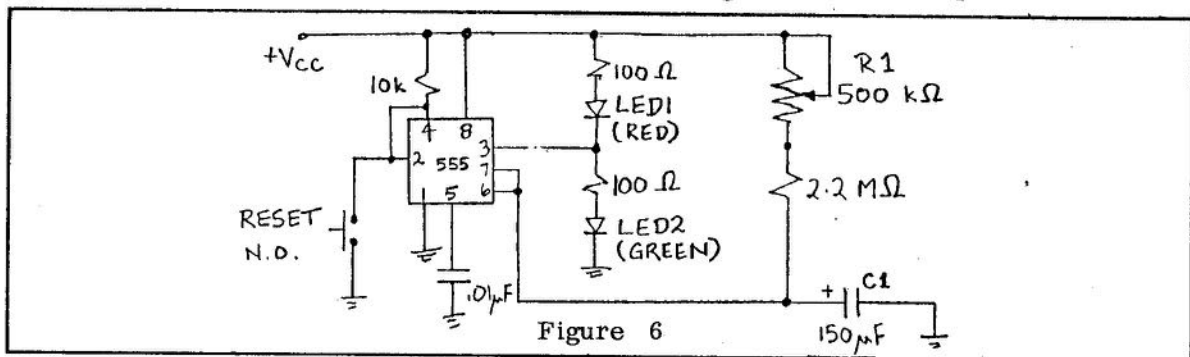


Figure 6

Station Identification Timer

The above circuit can be used to warn the Amateur operator that it is time to identify. Operation is as follows: at the beginning of the conversation, the reset button is pushed and the output of the timer is high, causing the green LED to come on. After a certain time period, the green LED will go out and the red LED will come on, telling the operator it is time to identify. * The time period is set by R_1 and C_1 . Once the station has identified, the reset button is pushed and the cycle repeats. This circuit is espec-

ially handy during lengthy conversations, ragchews, etc.

*(Canadian rules only require ident every half-hour or at the end of a series of transmission or a test...Ed.)

References

Berlin, Howard M., "The 555 Timer Applications Sourcebook, with Experiments", E & L Instruments, Inc., Conn., 1976, pp. 3-10, 7-1, 9-9.

National Semiconductor Corporation, "Linear Data Book", p. 9-23.

On becoming an Amateur

Part 2 I face the 'Code'

(In his first article Don Ward described how he became interested in taking an Amateur radio course. The second in this series follows.)

I didn't have to wait very long to find out about the night class in 'Morse Code' and 'Theory'. My wife handed me the paper one day and pointed out the application form for a local course. The night courses held at that centre included one in 'macrame' in which my wife was interested. An open house was to be held soon. We attended to find out more about the facilities. I met the Instructor for the

radio course but the class my wife was interested in was filled.

We were looking forward to going to our classes together. Fortunately there was a cancellation during the week. We were all set to begin our first night which wasn't far away. Twenty sessions were needed. Two parts, at \$15.00 for each of the ten-week courses. Prior to all these things happening was a discovery

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that Heath had a good course available in International Morse Code. I had sent for the tape. The A.R.R.L. tape and information had not, as yet arrived and I was anxious to start on something before going to class. There was no idea in my mind what this would lead to. You got lots of advice, some theories but no clear picture of what to expect.

The information had come from CARF. I had the Study Guide and Regulations Handbook. Counting the number of nights before classes were to begin, I divided the book into ten parts, read it through, then tackled each section. As I read this material, I realized a world that I knew very little about. A little High School reference didn't help that much. Ohm's Law was about all I could relate to; algebra was not my best subject during school days. Certainly, I found things strange to my background in many ways and yet felt drawn to it in some way that is not too hard to explain.

It began all wrong! One doesn't read and then re-read. This helps but does not get you there. To pick up a pencil, analyse and take the subject apart, then put it together again my way; that's the way I had to go. Concentration was very important. Many things took place and robbed me of that necessary habit. You had to spend time with each item and work it out ... "STUDY" was the word!

Tapes had arrived from A.R.R.L. and Heathkit. Beginning with the A.R.R.L. tape did not get me a start. I was taken back a bit that day. I didn't think it would be easy. Others used the A.R.R.L. tape and got along quite well. Why can't I?

Add to this; - "Women do well with code" ... 14-year old gets Amateur ticket ... 78-year-old enjoys sending messages to her friends with CW ... paralyzed Amateur sends Morse with his toe. I began to have mixed feelings about my abilities to absorb material for study.

My next move was to the Epsilon tape and it did the trick! The start was made. I was learning code! I found out later on, that this breakthrough was very important to me. I really had to go back and forth to let it sink in. I had no fabulous memory or any of those qualities that others seemed to possess, to make things easy for them. Trying to remember the advice given on the tape and listening to the sounds was not easy. I had to have great purpose and burned it

into my mind. (As I write the account of those days, I am re-living those beginnings. I really had to do things that way. Did anyone else go through a similar experience?)

While learning code someone said, "Don't think too much" - Well, here comes the best part of all. The tape explained that sound was what I had to remember for each letter. What I couldn't figure out was - "Did you memorize the sound?" Was it just a matter of getting used to hearing that sound over and over or did you need a bridge? In other words, "Did that sound connect to a mental image that meant a particular letter?" I realized, at this point, I would be accused of asking why and, therefore, would become complicated, take a long time and add much difficulty to code learning. Perhaps this was true but I was dealing with reactions to a real problem in an area about which I knew little. (On my own in a strange world!) We live with cause and effect every day and deal with it...action and re-action. This was no different for me than any other problem. I had to have an answer.

It was now necessary to move along in some way. I decided that I had to have some kind of bridge. The method I used actually helped me get off the ground. As you might note later, it grew into something else. I could not have anticipated this before, due to lack of experience. One formed a mental image of the sound to help remember it, the shape or form of it, moved as the sound was heard. For example; ... 'dit dah' was in two parts - 'dit' being the small sound at the top and 'dah' being wider at the bottom. The top as an apex and the bottom as a base meant "A" to my mind, just as a sound form ... 'dah dit dah dit' was a musical curved sound, meaning "C" ... 'dit dit dit dit' formed a square and there was my "H". My "bridge" worked perfectly. No particular effort was involved because it related to me as a person. I wondered if the fact that I was involved with letters and lettering in my work made any difference? Perhaps later I can comment on this. Many changes took place during the time I was learning the 'Code'.

Things were not quite as simple as they seemed to be to those more familiar with the Morse code. There were memory losses, times when you were not as keen as you need be. All played a role in the

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final mastering of the code. It didn't always work out like they said it was going to be. One other curious thing that happened was the fact that even though I was told to write the letter down, it got in my way. I had to recognize the sound first, mentally. I began to sit quietly with no pencil, listening as the sounds were introduced over and over again, until I could recognize them.

No writing was done until I got to the practice exercises. I felt very comfortable with this method and was doing quite well with the exercises. I did manage to learn code and continued in this manner. Nothing goes perfect! I should have known something would hold up progress.

I had started the theory and was doing well with the 'Code'. Everything came to a grinding halt. My commercial work load had increased that week and I was very tired. Trying for a later return to efficiency didn't work either, because time ran out. I had to be content to go to class with this small beginning. I was to learn soon how small it was! There were many more problems awaiting me. I was glad to have made some progress but was sorry that I had not gone further with things before starting classes. There was to be a surprise waiting for me. I remembered the saying I once heard ... "Oh Boy, Good," and "Oh Boy, Bad!" ... I had BOTH!!!!

Canadian Net — Another Idea

VE7BBQ Peter Driessen

Recently, two suggestions have been made to CARF re establishing national calling and monitoring frequencies for Amateurs across Canada. They would be used to supplement the TransCanada net. If you wanted to pass a message to a specific city or area in Canada, you would call on this calling frequency, which is monitored continuously. Thus your chances of getting an answer from that specific city or area would be greatly increased over blind calling on some random frequency. This idea has already been adopted on a provincial basis in the form of ONTARS (and ALTARS in Alberta...Ed.).

The question arises as to which frequencies to choose for Canadian calling frequencies on the various bands. One suggestion published in The Canadian Amateur (Jan 78) is to use frequencies 200 KHz from the bottom of all bands, i.e. 7200, 14200, 21200, 28200 KHz. Unfortunately the seeming advantages of easily recalling the frequencies and bandswitching without moving the tuning dial are offset by the undesirability of most of these frequencies. The calling frequency should be in a less active part of the phone bands away from QRM.

On 40 metres, 7200 KHz is a poor choice because it is right in the middle of the international Broadcast band. At night 7200 is generally wiped out by megawatt broadcast QRM. A much better choice on 40 would be a frequency below 7100 kHz away from the BC QRM in the

exclusive Amateur band. (7000-7100 kHz)

On 20 metres 14140 kHz is a much better choice than 14200 because the TransCanada net operates 14140 and is well known. Also 14140 is relatively quiet whereas 14200 is right in the DX part of the band and is continuously active. In fact, VE3ATW has already started up a monitoring service on this frequency.

On 15 metres any frequency between 21200-21250 kHz would be good. The calling frequency would be away from both the US Novice CW band (21100-21200) and the US phone band (21250-21450) and thus relatively QRM-free.

On 10 metres a frequency just below 28500 kHz would be better than 28200 since 28200 is right on the edge of both the US Novice CW band (28100-28200) and the IARU beacon band (28200-28250). Also, many rigs only cover 28500-29000 kHz on ten.

An 80 metres frequency would be useful for those winter nights when 40 metres goes dead and is no good for TransCanada working. Any frequency between 3750-3775 kHz would be good away from both the US Novice CW band (3700-3750) and the US Phone band (3775-4000). The ONTARS frequency 3755 is probably the best choice.

On 160 metres, propagation is not suitable for TransCanada working except with high power and good antennas, but it is very useful for intra-provincial

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contacts when the skip is long on 80.

In summary, the concept of a calling and monitoring frequency for Canadian Amateurs is an excellent one. However, the choice of frequencies must be made carefully to minimize QRM both to and from existing activity on the bands. The following frequencies are suggested, based on the discussion above: 3755, 7090, 14140, 21240, 28495 kHz

These frequencies are not as easy to remember as the 200 suggestion, but they are much more practical from a QRM point of view. Agreement on the choice of frequencies is needed before any one plan can be actively supported and successful. More comment from our readers is necessary -- let's hear from you.

RADIATION HAZARDS, PART 2

The Uncooked Ham

By VE1PZ A. Peter Ruderman, Ph.D.

Prologue

In the February issue of *The Canadian Amateur* I wrote about some of the hazards to hams from heat damage caused by non-ionizing (electromagnetic) radiation. The Editor, VE3CDC, is not only responsible for the appropriate nomenclature "cooked" and "uncooked" ham, but sent me his file on heart pacemakers which served as a basis for some of my comments on both them and automobile fuel injection later in this paper.

Once we get away from burns, cataracts, and other forms of heat damage, we enter a world of mixed fact and fancy where there are a good many unanswered questions. It is known that pulsed waves can be demodulated by tissue membranes. Fields too weak to break chemical bonds within molecules can still cause molecular changes by affecting electron spin. Some proteins, enzymes, and bacteria have been found to be affected by fields too weak to cause any appreciable heating. It is not known whether these changes hurt people any more than does our daily bombardment with solar photons or cosmic rays, leakage from microwave ovens and TV h.v. rectifiers, and the total immersion of city dwellers in the low-power-density portion of fields of commercial transmitters, radar, paging systems, 60-cycle power lines, and the like.

One of the reasons I decided to write Part II is that my beam blew down and the weather doesn't permit me to work on the roof. The other is to expiate my guilt, for I am at least partly responsible for our lack of knowledge. Some years ago I served for a while as chairman

of a body called the Public Health Research Advisory Committee of the Dominion Council of Health. Our function was to recommend to the Department of National Health and Welfare projects that deserved financial support from the Public Health Research Grant. Once we had an application to support a study of the health hazards of r.f. radiation. In those days the "in" thing was to study ionizing radiation from atomic installations and X-ray equipment in hospitals and dentists' offices. I was also afraid of being teased about my interest in ham radio, so I went along with the prevailing view that the r.f. radiation problem was unimportant, and that there was no point spending Canadian dollars when we could use the results of British and U.S. research. The project was turned down, and I have been kicking myself ever since. I see these papers as one way to restimulate interest in the subject.

Mysterious heart attacks

A few years ago, epidemiologists were puzzled by a rash of heart attacks in the Finnish district of Northern Karelia. Something like one-third of men between the ages of 45 and 59 were disabled or killed by heart trouble -- far more than the "normal" or "expected" incidence of heart attacks in people of that age. What's more, many of these men were leading supposedly healthy lives involving outdoor physical labour, good natural food, and cheerful after-hours relaxation. A team of medical specialists was set up to look into the problem, and a five-year project was set up to run

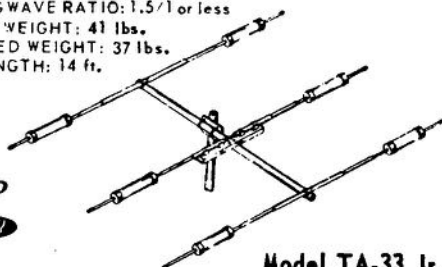
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STANDING WAVE RATIO: 1.5/1 or better.

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BOOM LENGTH: 18 ft.

SHIPPING WEIGHT: 47 lbs.

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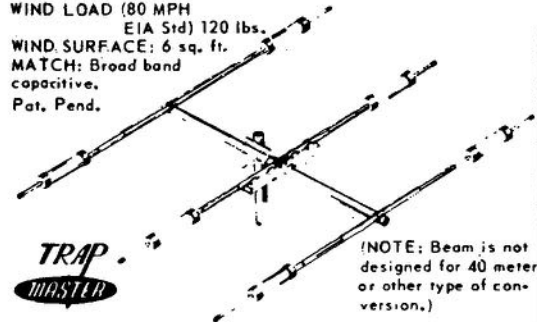
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from 1972 to 1977. It was based on the conventional wisdom that the way to minimize the risk of heart attacks was to give up cigarettes, eat low-cholesterol foods, and keep the blood pressure down. By the end of the five years, though the incidence of heart attacks was down a bit, the program did not look like an unmitigated success.

Why didn't the recipe work? The answer may not lie in the conventional wisdom of the doctors. It has been suggested that many of the heart-attack victims had been living and working in the fields and forests right across the border from the main USSR long-distance radar and wide-band communications systems, and that r.f. energy from these sources may have had an influence. This has been confirmed, in the view of some experts, by evidence of "excess deaths" from coronaries in an admittedly small group of 20 U.S. technicians working on a similar installation in Thailand on the border with Laos and Cambodia in 1967-68.

Lest anyone push the panic button at this stage, let me assure you that whether or not there is a link between r.f. radiation and heart attacks -- in these cases there were massive quantities of energy that far exceed the legal limit for Amateur or even commercial broadcast power.

So far as scientific proof is concerned, the experimental evidence has been negative. Sparks et al. (1976) took 16 rabbits and exposed them to a radiation intensity of 20 to 30 mw per cm² of skin at a frequency of 2,450 Mhz, for 4 hours per day, .5 days per week, for 8 to 10 weeks. The purpose of the experiment was to see whether radiation exposure affected cholesterol levels, and no change in the levels was found. Cholesterol in the blood, of course, is only one indicator of the risk of heart attacks, and more studies relating radiation to other risk factors are needed.

On the encouraging side, it is also recognized that stress is a contributing factor in heart attacks. If Amateur radio is a relaxed and enjoyable hobby, it might help reduce stress. Good statistical procedure would be to follow a sample of ham operators for 10 or 20 years after getting the Advanced Certificate and see what happens to them. One might take rag-chewers as the group where the hobby reduces stress and county-hunters

or DXCC-chasers as the group where it increases stress. The problem is that this kind of research costs money and so far there are no takers.

Low-power r.f. radiation can affect such widely disparate devices as heart pacers and fuel injection systems by simple and direct interference with their electronic circuitry, but the cure is equally simple -- better-adjusted Amateur equipment and better-shielded fuel injectors.

I have a VW Rabbit that gets the staggers when accelerating at high speed if the 2-metre rig is on, and similar problems have been reported with Cadillacs. Even slight imperfections in the shielding can allow this to happen.

Pacemakers are a little better shielded because they are inserted under the skin, but they too are subject to interference from both v.h.f. and h.f. One major American firm reported that its pacemaker receiver tank circuit was tuned to 460 khz, which is very close to the popular receiver 455 khz i.f. In fact, a lot of British and European radio equipment uses 460 or 462 khz i.f. Some pacemakers are capacitively coupled so that only pulsed information gets through, but activating your transmit relay is a great way to generate pulses. Shielding is the answer, apart from the circuit redesign found in more recent models.

Woodpeckers, brain waves, and assorted fact and fancy

Since 1976, hams all over the world have gotten to know the "woodpecker" pulses that come from broad-band transmitters in the U.S.S.R. and, while now less bothersome than when they first began, they can still interfere with h.f. communication. The sense of irritation that the operator has when the pulses interfere with his QSO is a mild form of psychological damage. The damage may not go beyond that, but it has been suggested that the "woodpecker" pulse frequency of 10 c.p.s. can interfere with the normal alpha rhythm of the human brain. Perhaps when the U.S. system goes on the air in 1978 or 1979 Amateurs in North America will get a closer experience of the phenomenon. In any event, "interfering with the normal alpha rhythm" is not as scary as it sounds. The analogy that comes to mind is a small child with a high fever who suffers a
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convulsion. The parents (particularly if it is their first child) tend to panic, but it turns out that the convulsion is one of the body's ways of signalling that it is too hot and trying to get rid of some of that excess energy. Similarly, a change in the brain's rhythm of electrical activity (in this case the alpha wave) might mean that the brain is getting hurt, or might just be evidence of the brain fighting off the potential damage.

I have a friend in Halifax who spent a number of years in Russian prisons between 1945 and 1953 -- particularly the infamous Lubyanka and the less-well-known Lefortovo in Moscow. He claims in all sincerity that he was subjected to various kinds of radiation which did not succeed in driving him crazy but certainly made him feel pretty low, and the only problem is that he has no special knowledge of physics or of applied electronics and I have not been able to get enough info for a cause-and-effect relationship, or even to determine whether his problem was with sonic or with electromagnetic waves.

Then there are the stories of U.S. embassy personnel, also in Moscow, who complained about radiation (presumably from vhf eavesdropping devices). So many symptoms in so many different people are involved; however, that it is hard to establish cause and effect and, above all, to separate the effect of fear itself from the possible effect of the radiation.

Scare stories are older than radio. In the pre-electronic age it used to be 'common knowledge' among musicians that oboe players in symphony orchestras would eventually go mad because the oboist puts his teeth against the mouthpiece and receives the sound vibrations by bone conduction instead of being dampened by the soft fleshy material of the lips and tongue. I've never known a mad oboist, but folk wisdom isn't always wrong and the expression "mad as a hatter" in the 19th century came from recognition of the symptoms of poisoning from mercury used in felt-making. Hatters did go mad.

Another possibility is that electronic radiation may not produce damage directly, but may produce genetic damage that will only show up in future generations. I have seen microphotographs of tissue from dogs subjected to massive bombardment by nuclear radiation (not march 1978 - page 28

electromagnetic radiation) that showed chromosomes literally being broken in pieces by heavy particles. The one experiment in this field that I have found related to radio frequencies was reported in Mittler (1976).

He wanted to see whether the Amateur frequencies could produce genetic damage, so he obtained some Drake equipment and some fruit flies (*Drosophila melanogaster* -- a long-time favourite for genetic studies). He put the flies in tubes and taped one tube to the gamma match of a dipole cut for 29 MHz. He then fired up a TR4C and exposed the flies for 12 hours. (The report claims that 300 watts of r.f. energy were applied, though this must have been PEP, and I wonder how many finals were burned out operating key-down for 12 hours!) The experiment was repeated with the ML-2, using 20 watts of power at 146.34 MHz (imagine the curses and groans of the users of this popular repeater input frequency). In any event, he did not find any genetic damage. Is this conclusive? That's another good question.

I was about to dismiss as fanciful another current story -- that radiation can affect the weather* -- when the mailman dumped the day's delivery on my desk. It included the John Hopkins Gazette for December 15, 1977, where there was a story about a group of their physicists, J.W. Follin, Jr., E.P. Gray, and Kwang Yu, who discovered how cosmic rays affect thunderstorms. Apparently, when a large cosmic ray shower penetrates thunderclouds, it ionizes oxygen and nitrogen molecules and detaches electrons. The electrons are accelerated in the field of the thundercloud and generate an avalanche that concentrates at the bottom of the cloud. This builds up the field to a strength where a lightning bolt breaks from the cloud. Apparently there would be no lightning without cosmic rays because the electric potential generated inside a thunderhead is not large enough by itself to produce the discharge. The remaining question for Amateurs is whether the nonionizing electromagnetic radiation from their low-power transmitters could contribute to a similar effect, or whether the higher-energy transmissions of 'wood-

*see December issue, page 5, 'Interference'.



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HEAVY DUTY HAM TOWERS

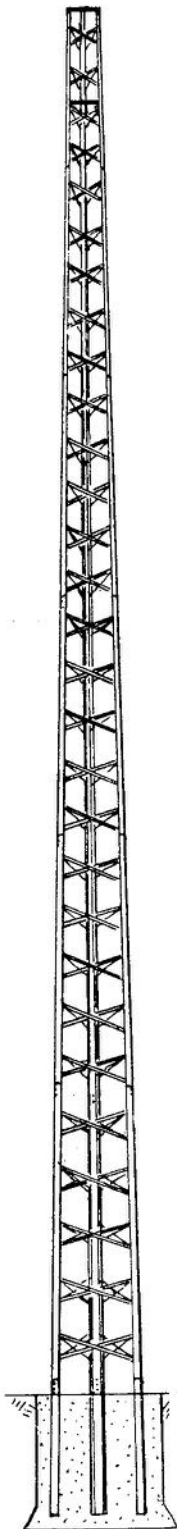
DMXHD Heavy Duty Ham Towers can support a large amateur beam of up to 9 sq. ft. wind area. Guy wires must be used if larger loads are required or cross bar mounted antennas or if greater height using straight sections is needed.

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.

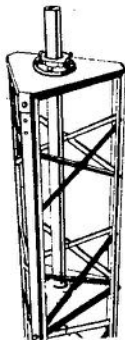
Each section is 8 ft. long and has beaded channel legs riveted together with "X" braces. Legs and braces are high tensile steel, heavily galvanized before fabrication. Rivets are solid heat treated aluminum. Sections fit accurately together and are joined by heat treated nuts and bolts. The uniform tapered 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).

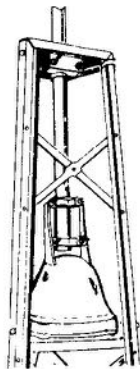
Model No.	Height of Tower	Tower Section Supplied	Wt. in lbs.
DMXHD-32	32	DMX3T, DMX4, DMX5, DMX6	170
DMXHD-40	40	DMX3T, DMX4, DMX5, DMX6, DMX7	241
DMXHD-48	48	DMX3T, DMX4, DMX5, DMX6, DMX7, DMX8	314
Items which may be ordered separately.			
CBS6		Concrete base stubs for DMXHD-32	14
CBS7		Concrete base 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



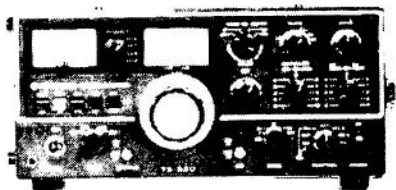
DMXHD-48



Top of tower with mast clamp plate installed.



Any make of rotator can be mounted on rotor plate.



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DMX HD 48 \$265.
DMX MD 56 \$289.

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pecker' type military installations are able to do it.

Conclusion

Once we get away from the proven and clear relationship between electromagnetic radiation and heat generation in body tissue, many fanciful ideas have been proposed but scientific proof is not all that easy to come by. Where the cause-and-effect relation is clear, as with pacemakers or automobile fuel injection, the cure is also pretty obvious. Most of the other damage that has been demonstrated involves either heavy particles (as in the case of the dog chromosomes) or ionizing radiation, which Amateur transmissions do not produce.

Note -- Although I'm the one who has written about the probabilities in getting too close to a hand-held transmitter on 2 metres, I'm not worrying about what Amateur radio is doing to my brain waves, my heart beat, or the weather. My car's fuel injection system is another matter, however, and the 2 metre rig is out of the car and on the bench right now!

Sources of Information

Mittler, S. (1976), "Failure of 2 and 10 metre waves to induce genetic damage in *Drosophila melanogaster*," Environmental Research, pp. 326-330.

Sparks, H.V. et al. (1976), "Radio and microwave irradiation and experimental atherosclerosis," Atherosclerosis, pp. 55-62.

The Karelian heart attacks have been reported in a number of sources, but the one I actually used was a summary by Dr. Oswaldo Galotti called "Epidemia de infartos" (Epidemic of Heart Attacks) in the Revista Paulista de Hospitais (1977), Journal of the Brazilian Hospital Association, p. 44. The heart attacks among American technicians were mentioned in Paul Brodeur's articles "Microwaves" in The New Yorker, Dec. 13 and 20, 1976.

The photographs of chromosome damage were provided by the U.S. Atomic Energy Commission, and I saw them at a radiation safety demonstration at the Pan American Health Organization in 1963.



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*-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.

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

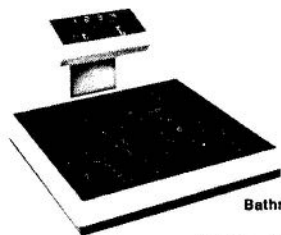
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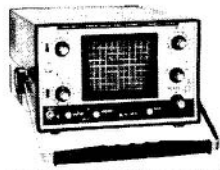


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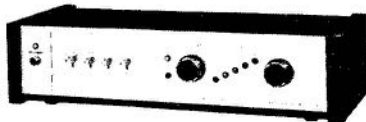
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