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 VE3SUV 147.780 147.180
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 VE3TTL 223.160 224.760
 VE3HNR 147.075

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 Aurora
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 Bancroft
 Barrie
 Belleville
 Bracebridge
 Bracebridge
 Brampton
 Brampton
 Brampton
 Brampton
 Brantford
 Brantford
 Brighton
 Brockville
 Brownsburg
 Burlington
 Burlington
 Burlington
 Burlington
 Cambellford
 Carleton Place
 Chatham
 Chatham
 Chatham
 Chatham
 Chatham
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 VE3RGM 146.160 146.760
 VE3SDL 144.590 145.190
 VE3SOV 144.850 145.450
 VE3SOV 447.200 442.200
 VE3SUE 449.400 444.400
 VE3TTT 147.780 147.180
 VE3TTT 223.180 224.780
 VE3TTT 447.300 442.300
 VE3MCR 52.010 53.010
 VE3MCR 147.600 147.000
 VE3UGB 146.310 146.910
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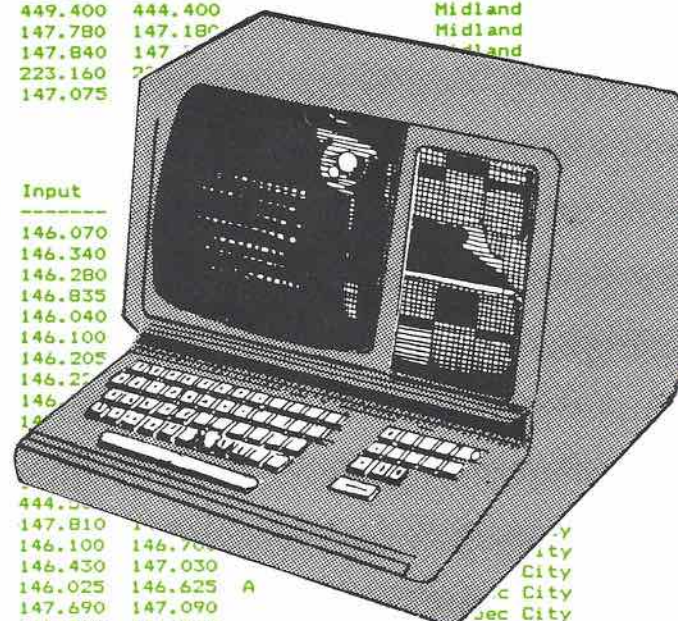
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 La Sarre
 La Tuque
 Matane
 Mont Dufor
 Mont Joli
 Mont Joli
 Mont Laurier
 Mont Logan
 Mont Tremblant
 Mont Valin
 Montmagny
 Montmagny
 Montreal
 Montreal
 Montreal
 Montreal

Call sign Input
 VE2RCA 146.070
 VE2RCR 146.340
 VE2KH 146.280
 VE2RCL 146.835
 VE2RYB 146.040
 VE2RPR 146.100
 VE2RWC 146.205
 VE2RIN 146.250
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 VE2RIU 146.070
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 VE2RTS 444.250
 VE2RAP 147.810
 VE2RCD 146.100
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 VE2RDL 146.025
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Call sign Input Output
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 VE2RY 147.900 147.300
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 VE2ELC 146.190 146.790
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 146.250 146.850
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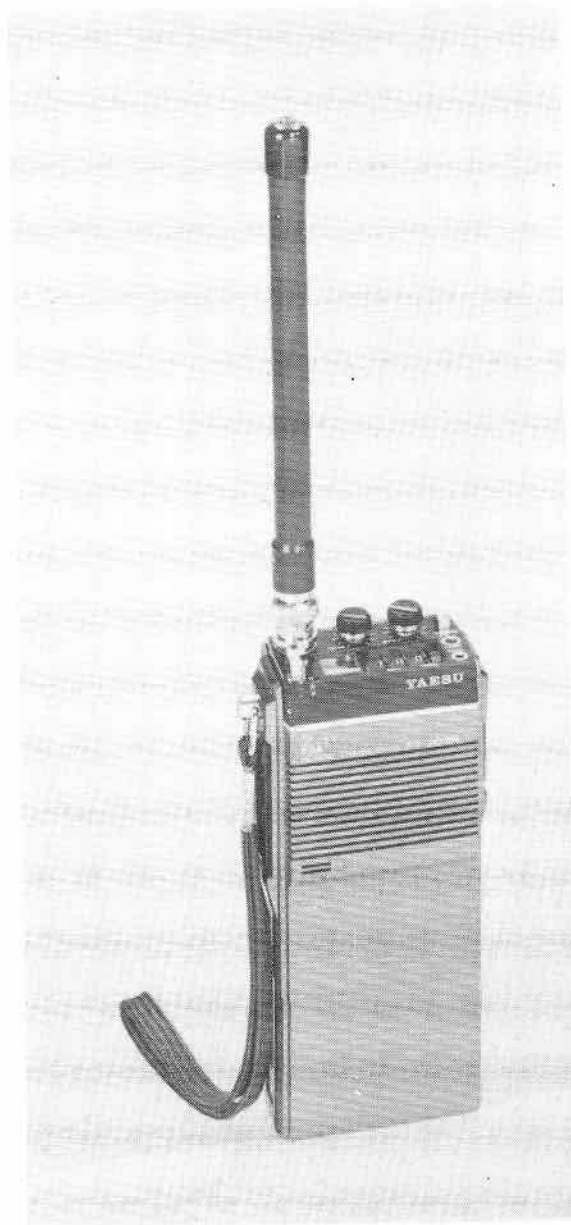
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CONTENTS

Letters to the Editor.....	19
CRAG 1984 Repeater Directory	21
MUFLOT for the Apple Computer	29
DX Column	33
Moose Jaw Award	35
Draft Amendments	35
CARF Publications Committee	36
Affiliate Clubs Program.....	36
Cable TV QRM prompts intervention at Vancouver hearing	37
Ham in Space again?	39
Social Events	39
Winnipeg Senior Citizens— VE4WSC	41
Morse Code	42
Swap Shop	45
TECHNICAL SECTION	
COCO builds an Antenna	43
Curing Cable TVI	43

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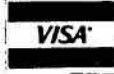
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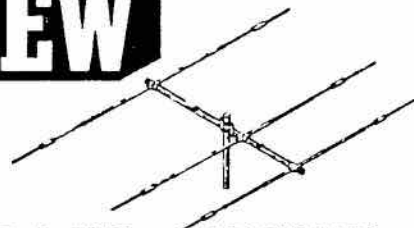
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32 Memories. Thirty-two tunable memories are provided to store mode, VFO, and frequency, and the CPU is backed by an internal lithium memory backup battery to maintain the memories for up to seven years. Scanning of frequencies, memories and bands are possible from the unit, or from the IC-HM12 scanning microphone. In the Mode S mode, only those memories with a particular mode are scanned; others are bypassed. Data may be transferred between VFO's,

from VFO to memories, or from memories to VFO.

Standard Features. All of the above features plus FM unit, high shape factor FL44A, 455KHz SSB filter, full function metering, SSB and FM squelch, convenient large controls, a large selection of plug-in filters, and a new high visibility multi-color fluorescent display that shows frequency in white or red, make the IC-751 your best choice for a superior grade HF base transceiver.

Options. External frequency controller, external IC-PS15 power supply, voice synthesizer, computer interface, internal IC-PS35 power supply, high stability reference crystal (less than ± 10 Hz after 1 hour), IC-HM12 hand mic, desk mic, filter options:

SSB: FL-70
 CWN: FL-52A, FL-53A,
 FL-32, FL-63
 AM: FL-33



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 The World System

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\$399.



TS-930S \$2129.



TS-830S
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PS-430
\$199.

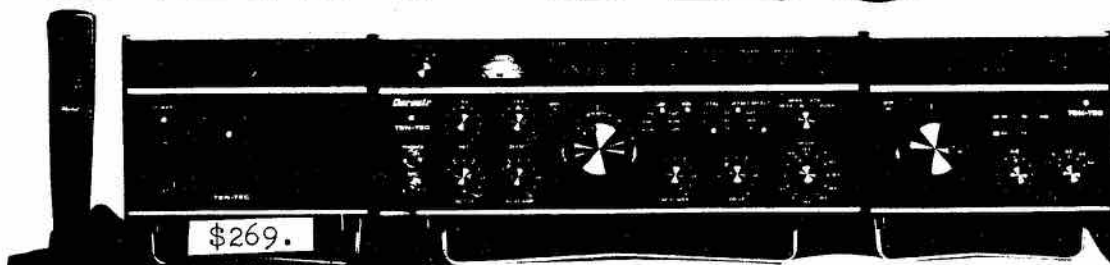


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NEW DIGITAL ARGOSY
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FT-230R COMPACT FULL FEATURE 2 Metre FM Transceiver



- Advanced Microprocessor Control
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- Repeater Shift \pm 600 kHz
- Programmable Odd Rpt. Splits
- Optional DTMF Microphone YM50
- Case Size: 6"(w) \times 2"(H) \times 7"(D)
150(w) \times 50(H) \times 174(D) mm

FT-730R — 10 WATT UHF VERSION 440 - 450 Mhz

Available from your authorized Yaesu Dealer.

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for colour brochure and
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Armaco Electronics Ltd.
P.O. Box 24625, Station "C"
Vancouver, B.C. V5T 4E2

DIFFICULT CHOICE - EASY OPERATION

TR-7950

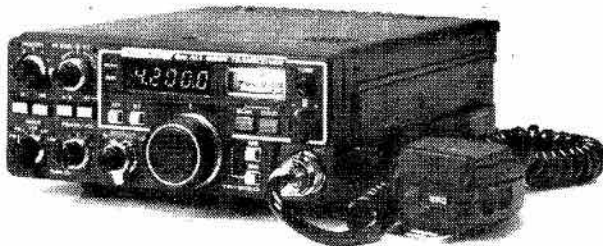
\$549



Outstanding features providing maximum ease of operation include a large, easy-to-read (direct sunlight or dark) LCD display, 21 multi-function memories, automatic offset, programmable priority channel, memory and band scans, built-in lithium battery memory back-up, built-in 16-key autopatch, and a choice of a hefty 45 watts output (TR-7950), or 25 watts output (TR-7930).

TR-7730 \$449

The TR-7730 is an incredibly compact, reasonably priced, 25-watt, 2-meter FM mobile transceiver with five memories, memory scan, automatic band scan, UP/DOWN manual scan from the microphone, and other convenient operating features.



TR-9130 \$719

The TR-9130 is a powerful, yet compact, 25 watt FM/USB/LSB/CW transceiver providing increased versatility of operation on the two meter band. It features six memories, memory scan, memory back-up capability, automatic band scan, all-mode squelch, CW semi break-in, and incorporates microprocessor technology.



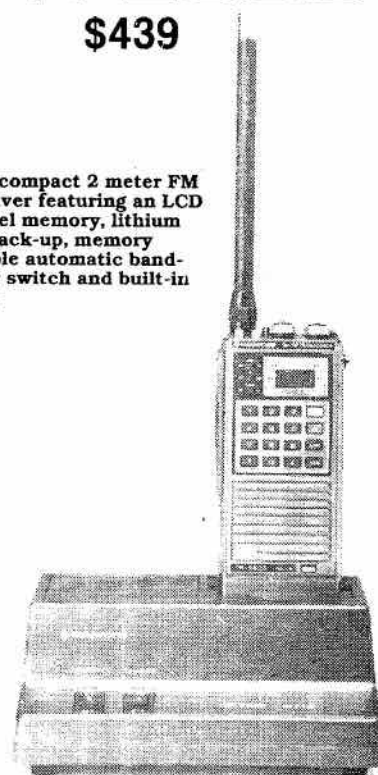
TR-8400 \$679

Synthesized operation on the 440 MHz amateur band now is available with KENWOOD's TR-8400 70 cm FM mobile transceiver. This extremely compact, full-featured rig covers 440-450 MHz, in 25 kHz steps and includes five memories, memory scan, automatic band scan, UP/DOWN manual scan, and two VFOs.

TR-2500

\$439

The TR-2500 is a compact 2 meter FM handheld transceiver featuring an LCD readout, 10 channel memory, lithium battery memory back-up, memory scan, programmable automatic band-scan, Hi/Lo power switch and built-in sub-tone encoder.



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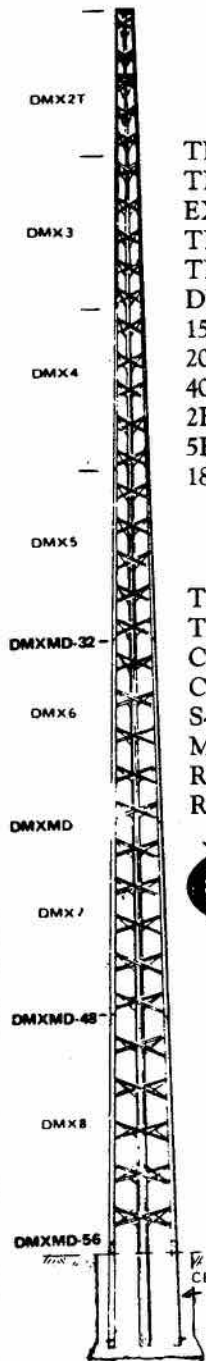
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402BA 2 el 40 mtr.....	\$469.00
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18AVT/wb 80/10vertical	\$169.00

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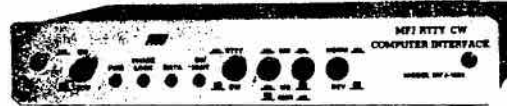
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TR-7950
2 METERS, 45 WATTS,
21 CHANNEL MEMORY



TR-2500

TS-430S transceiver	\$1199.00
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TS-530S transceiver	\$979.00
TS-830S transceiver	\$1229.00
TS-930S transceiver	\$2129.00
TS-930SAT transceiver	\$2349.00
TR-2500 2 mtr H.H.	\$395.00
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TR-7950 2 mtr mobile	\$549.00
TR-9130 2 mtr all mode	\$619.00

YAESU

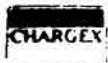
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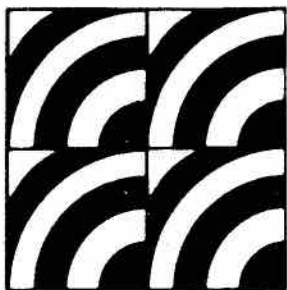
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IC-751

HF Transceiver/General Coverage Receiver



- 160-10M
- 100KHz — 30MHz Receiver
- CW/SSB/AM/RTTY/FM
- Microprocessor Controlled
- 12VDC Operation
- Fluorescent Display

ICOM is proud to announce the most advanced amateur transceiver in communications history. Based on ICOM's proven high technology and wide dynamic range HF receiver designs, the IC-751 is a competition grade ham receiver, a 100KHz to 30 MHz continuous tuning general coverage receiver, and a full featured all mode, solid state ham band transmitter, that covers all the new WARC bands. And with the optional

internal AC power supply, it becomes one compact, portable/field day package.

- 105dB Dynamic Range
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- RIT With Separate Readout
- Low Noise Preamp
- Low IMD Transmitter
- 100% Duty Cycle
- 12VDC Operation
- Quiet Relay Selection of LPFs
- Monitor Circuit
- Full QSK
- Dual VFO With Data Transfer
- 32 Tunable Memories
- Internal Memory Backup

\$ 1794

\$ 1999
(incl. p.s.)

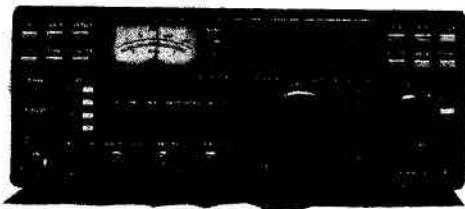
Scanning • Digital I/O For Computer Control • Mode Scan • Full Function Metering • Squelch • FM • Multicolor Fluorescent Display/Options (external)

Options: Voice Frequency Readout, External frequency controller, external PS-15 power supply, internal power supply, high stability reference crystal (less than 100Hz, -10°C to +60°C), HM12 hand mic, desk mic, filter options:

SSB: FL30
CW/N: FL52A, FL53A
AM: FL33

IC-271A

2 Meter/FM/CW/SSB



\$ 896

- 25 Watts
- Built in Subaudible Tones
- 32 Memory Channels
- 12VDC
- Internal Power Supply Option
- Fluorescent Display

ICOM presents the most advanced all mode, two meter base station available today... the IC-271A. 25 watts of power from 12VDC or from 117VAC with the optional internal power supply/32 full function memories/multimodes/subaudible tones/PLL locked to 10Hz/high visibility, multi-color fluorescent display/RIT readout/scanning/dual VFO's new size.

- 25 Watts
- 32 Full Function Memories that hold frequency, offset, offset direction, mode, and subaudible tone. Frequency, tones and offset are selected by rotating the main tuning knob. 7 year lithium memory backup.
- Subaudible Tones are selected by rotating the main tuning knob and may be stored into memory.
- PLL locked to 10Hz
- ICOM's new high visibility, multi-color display gives easy to read at-a-glance display of frequency, mode, offset, VFO in use, memory channel, and RIT offset direction and amount.
- Scan Memories, programmable sections of the band, or modes.
- Mode-S Scan is a mode scan and can be used to scan memories with a particular mode.
- Dual VFOs. ICOM's dual VFO system is now even more versatile with the ability to transfer from memory to VFO.
- New Size. Only 11¼" x 4¾" H x 10¾" D the IC-271A is styled to look good and engineered for ease of operation.
- Computer Interface.

IC-471A

430 — 450MHz/FM/CW/SSB



\$ 1025

- 430 — 450MHz
- Fluorescent Display
- 32 Memories
- PL Tones
- 12 VDC Operation

Full 20MHz coverage 430 — 450MHz. 32 Memories. Each memory holds frequency, mode, offset direction, offset frequency and subaudible tone for easy return to an oft used frequency or for remembering a new repeater or simplex frequency. Subaudible Tones. Subaudible tones are selected

by rotating the main tuning knob. These tones may then be stored into memory along with the frequency, offering ease of operation.

Phase Lock Loop. Extremely low noise and good signal to noise ratio PLL design allows the IC-471A to lock to 10Hz for extreme accuracy.

New Display. ICOM's new easy-to-read two color fluorescent transceiver situation display shows frequency, mode, offset direction, VFO in use, memory channel, and RIT offset direction and amount.

Scanning. Scanning of memories, programmable band scan, and mode scanning are available and easy to use.

New Size. Only 11¼" W x 4¾" H x 10¾" D the IC-471A is styled to look good and engineered for ease of operation.

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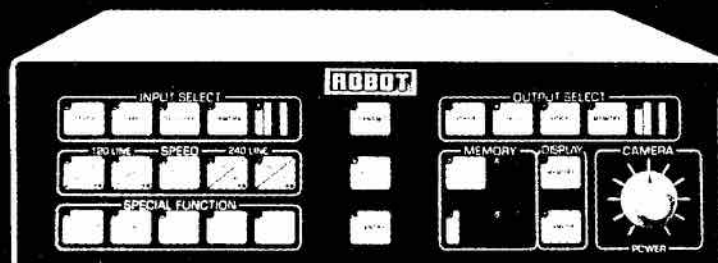


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COLOR SSTV



Introducing the Robot 450C and 1200C Single Frame Color SSTV Converters

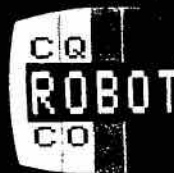
Robot's new color slow scan TV converters provide you with a whole new dimension of Amateur Radio activity. Now you can exchange color pictures of your latest DX QSL card, the best stamp in your collection, or even that terrific sunset scene you shot last summer.

Robot's microprocessor controlled color SSTV equipment provides a significant breakthrough in the transmission of single frame color images known as "Time Multiplex Color Component System" (TMCCS). This method was chosen as being faster, easier to use and more reliable than the cumbersome frame or line sequential systems now in use, as well as being black and white compatible with the thousands of slow scan stations already on the air world wide.

In addition to having fast, single frame color capability as with the Robot Model 450C, the Model 1200C also offers

sharp, high resolution color pictures that rival commercial broadcast television! With all their flexibility, interfaceability and dependability, the Models 450C and 1200C will be in the forefront of technology for years to come. Their new multi-dimensional SSTV standards will be the pace-setters in the industry.

There are even more features and capabilities too numerous to be listed here, such as computer interface, automatic fine tuning, multi speed operation and many more, so see your dealer today for literature and a demonstration, or write:



ATTENTION MODEL 400 OWNERS: Now you can have single frame color SSTV capability too by installing the Model 400C Update Kit to your unit. All necessary parts and hardware are included for an easy single evening installation.



Also introducing the new Robot Model 800C Super Terminal with color graphics capability when used with the new Robot color scan converters. Also has expanded memory with lithium battery back-up, and has both serial and parallel printer interface. A complete terminal for RTTY and Morse Code.

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Most of our work is with repeat customers, for whom our regular delivery is 2 - 3 weeks on average, for custom crystals. There is no premium for rush orders, and crystals in stock are sent out immediately.

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1		T	146.34	INQUE IC22
1		R	146.94	"
3		T	157.845	GE ROYAL EXEC
3		R	152.585	"

PRICING

If the pricing is obvious, total the amount, add \$1.00 for First Class mail, and send in your money order, or cheque, with the order. If there is any doubt about the formula and/or price, send in the order without the money. We will price the order and inform you by return mail. In the meantime, your order will be made up and shipped on receipt of your payment.

In the example, the amateur band crystals are \$8.00 each, and the custom or commercial crystals are \$9.50 each. The total is \$73.00 plus \$1.00 = \$74.00. Ontario residents add 7% sales tax.

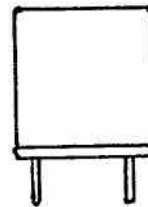
1984 PRICES

	HC-6U	HC-25U
<u>AMATEUR</u>		
Amateur bands	8.00	8.00
<u>CUSTOM</u>		
6 - 55 Mhz	9.50	9.50
5 - 5.9	10.55	12.75
4 - 4.9	11.60	16.95
3 - 3.9	12.75	16.95
Below 3 mhz	16.95	-
55-100 Mhz 5th	12.75	12.75
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Mocom 70		24.95
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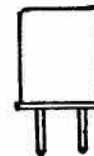
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Approximately
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HC-17/U .093 pins

HC-33/U wire leads



Approximately
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_____ Superprize
_____ Tickets @ \$ 2.00 ea. _____

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BASE (2) SYSTEMS INTRODUCES MUFPLLOT

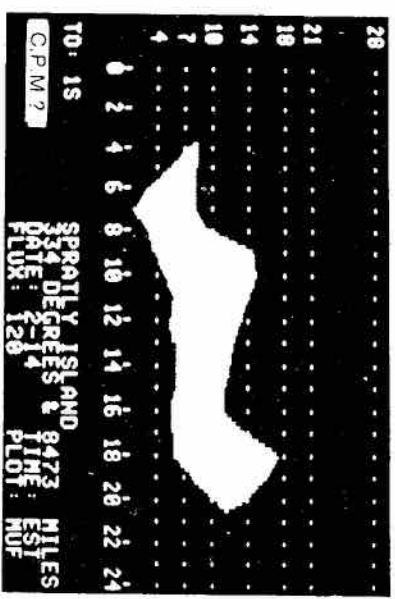
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Propagation Forecasts are good over the entire HF Spectrum.

Built in information on over 550 targets — and you can add hundreds more!

Calculates Bearing & Distance.



Shaded areas show the times and frequencies of band openings.

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Forecasts may be plotted in any US time zone—or UTC.

Upper frequency limit is selectable between HPF, MUF and FOT. Lower limit is always LUF.

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"Truly a break through in do-it-yourself Propagation Forecasting... It's been checking out beautifully!"
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We think you'll agree that you've never seen anything like it—order yours today.

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As an Introductory Offer to the readers of TCA, during the month of May, MUFPLLOT will be sold to residents of Canada without making adjustments for difference in Currency Exchange Rates. \$1 U.S. equals \$1 Canadian! Buy Now and save more than 20% of future prices!! Orders paid via Mastercharge/Visa will be adjusted as closely as possible to reflect this policy.

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POWER/REV/SWR X-NEEDLE METERS

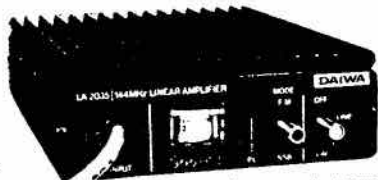
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GIVE YOUR HAND-HELD
THE BOOST IT NEEDS!**



The New Daiwa LA-2035 two meter linear amplifier.

A compact amp at a compact price
Only \$99.95 Suggested Retail.

This amplifier is designed for use with hand-held transceivers in either mobile or fixed station configurations. Because of its light weight and compact size, the LA-2035 can be mounted under the dash, under the seat, or in any other convenient location. The LA-2035 is equipped with RF activated stand by circuitry. Easy operation. Simply connect your antenna and your hand-held to the LA-2035. Connect the LA-2035 to a suitable power supply and go.



Specifications
Band: 144-148 MHz
Mode: FM/CW/SSB
Input power: 1-3 watts

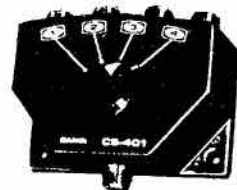
Maximum output power 30 watts plus
Power consumption: 13.8VDC at 5A. Max.
Dimensions: 100W x 35H x 125Dm/m
Weight: 500 grams
Coaxial input cable supplied with a BNC connector
Output connector: SO239

\$99.95

DK-200 not available until late fall of 1984, Sorry !!

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	CS-201	CS-401
FREQUENCY	600MHz	800MHz
VSWR	below 1.12	
POWER RATING	2.5kW PEP 1kW CW	
IMPEDANCE	50 ohm	
INSERTION LOSS	Less than 0.2dB	
ISOLATION	better than 50dB at 300MHz better than 45dB at 450MHz adjacent terminal	
CONNECTORS	SO-239	SO-239
OUTPUT PORT	2	4
	Unused terminals grounded	

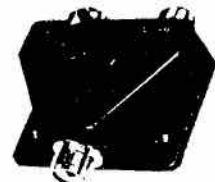


CS-401
\$119

CS-201
\$35

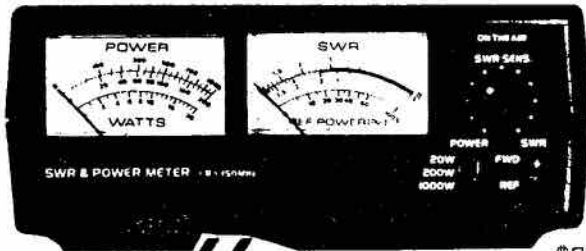


DK-200
\$99.95
DK-210
\$119.95



SPEED	DK-210 DK-200
SIDE-TONE OSCILLATOR FREQUENCY	8 WPM -- 50 WPM
KEYING OUTPUT CIRCUITRY	GRID BLOCK: -100 V 10 mA max; DIRECT: +300 V 100mA max.
POWER CONSUMPTION	13.8 V DC @ 9-15 V approx 100 mA (DK-200) 200 mA (DK-210) for 9 volt battery can be installed inside cabinet!
DIMENSIONS (W x H x D mm)	150 x 62 x 150
LED SPEED INDICATOR	DK-210 only

SWR and POWER METER



\$79.95



\$49.95

HANSEN FS-55 SWR/Power Meter has a frequency range of 18 to 150 MHz and a power range of 0-20, 200 and 1000W in three ranges. FS-55 is compact, lightweight and measures SWR and power simultaneously, only \$79.95

HANSEN FS-55 SWR/POWER METER

DIMENSIONS: 180W 75H 90D mm 800g
BOTH FS-55 & SWR-3S HAVE LIGHTED METERS.

HANSEN SWR-3S SWR/POWER/FS METER

FREQUENCY RANGE: 3.5-150MHz
POWER RANGE: 0-20, 200 Watts, 2 Ranges +10%
METER SENSITIVITY: 100uA F.S.D.
DIMENSION: 150W 65H 70D mm WEIGHT: 400g
COMES WITH 2 POSITION ANTENNA SWITCH & F.S. Ant

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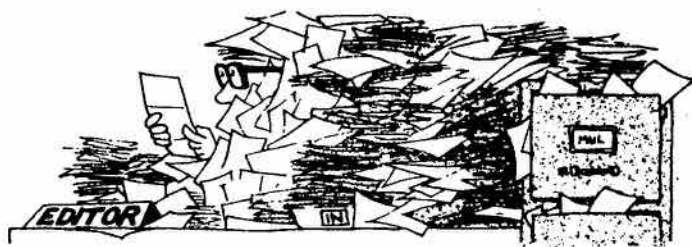
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LETTERS



WARTIME MESSAGE

During my younger years, I served in the Merchant Marine as a Ship's Radio Officer. After some years in that line of work, it was inevitable that I ended up with a tin box full of 'foreign coins'; change from many trips ashore in various ports throughout the world.

Recently when sorting through these coins prior to giving them to a young friend, I came across one of our own Canadian coins: a World War II issue of a 12-sided 'brass coloured' nickel. This is the only coin that I have ever come across that carried a message in code. This message came from the Government of the Day, presumably to inspire us all on to Victory.

Quite a number of Stamps have been issued honouring 'Telegraphy' but perhaps some of your readers know of other coins which have carried the code. If so I would like to hear their comments through the pages of TCA.

Some of the hotshot CW lads might like to try their hand at deciphering this message, however an automatic code reader will not help in this case. For those of us who go the bi-focal route now, I have enlarged the coin somewhat.

The message consists of six

words: 24 characters and each word starts with the same letter.

I really enjoy your magazine and look forward to my copy each month.

To read the message:

Turn the coin upside down and start at the letter 'N' in CENTS. Read clockwise:

"WE WIN WHEN WE WORK WILLINGLY"

Bob Baillie VE3GKN

DEREGULATION OF HF BANDS

I read with interest the resolutions and reports from the Halifax symposium in the December 83 and February 84 issues of TCA.

It is my view that CARF is acting prematurely if they are considering approaching DOC for deregulation of the HF bands based on the opinion of 67 Amateurs attending a symposium on the east coast. Perhaps there should be more symposiums in all regions or, better still, a ballot vote of all members before such a major decision of this kind is made.

Perhaps some of the RTTY and new computerized CW operators haven't considered what phone band expansion will mean to them.

I believe there is the possibility that the U.S. could expand their phone bands if we lead the way. Perhaps not total deregulation, but it is conceivable that Extra and General class operators could be given similar spectrum to ourselves. Being so close to the U.S., the ramifications of U.S. phone band expansion is much greater for us than most other countries.

I wonder if the proponents of Canadian expansion understand

where they are expanding to. Some may feel it is a vast wasteland waiting to be explored by SSB. As an active CW operator I can assure you this is not the case. Those who feel they are expanding away from QRM should listen to the Aurora net a few times on 40 metres. Having been a net control station for this net it was often very difficult to run a net through the CW stations that populate this portion of the band. Quite often the CW operator can throw in a narrow filter and work through the phone station, but the reverse is much more difficult.

As a net control station for the Sask. phone net on 3785 kHz, the QRM has more often come from VE3 stations who are heard 5/9 here but apparently they are unable to hear us.

As for 20 metres, the other major phone band, where are all of the VE phone stations who want expansion? Apart from two or three hours on weekends during the Trans-Canada net, there appears to be very little VE phone operation below 150, although the South Americans seem to make good use of this portion of the band.

I believe we already have enough phone spectrum away from the U.S. operators.

As a net manager of the Sask. CW net (SATN) and a Tenth Region liaison station, I can assure you that CW traffic handlers will not appreciate SSB stations operating on top of them. In many cases this is exactly what happens. Many times the Twelfth Region net operates on 7070 kHz. It is a CW net and I have often heard phone stations QSY from the Aurora net right on top of this net and then

complain about the QRM!

It all sounds very nice this 'self regulation', but being so close to the 49th I believe it won't work to our advantage. Not as a phone or a CW operator.

Perhaps as mentioned at the symposium, deregulation is inevitable in the U.S. and Canada. If so, I think it will be a dark day for HF in Canada so let's not encourage them. My vote is for the status quo. I hope your reports and articles on this topic in TCA, and perhaps my letter, will stimulate a lot more discussion before any decision is made on this issue.

Dave Allister VE5BAF
Saskatoon, Sask.

Next Teleconference to originate in Canada

The March 8th North American two-metre teleconference net featured U.S. experience with the tower by-law problem, which is similar to ours but there are differences in law. Many Canadian repeaters were hooked up, but our input was limited to a recorded message by Bob Benson VE2VW, the CRRL legal counsel. CARF is taking an active part in this battle of the by-laws and if you are having tower trouble with your municipal authorities, write to CARF past president Bill Wilson VE3NR, whose many years of experience as a senior DOC official has given him an unique background to this problem.

The next hook-up on June 7 will feature Jack Belrose VE2CV. Jack, who is on the research staff of the federal Communications Research Centre in Ottawa, will talk on antennas.

CARF News Service

TCA
NEWSLINE
(613)-824-3467

The New DOC Exams

As most of you know, the Amateur Radio exams have been the subject of much discussion over the past few years and the DOC, in cooperation with Associations and knowledgeable hams throughout the country, have made an honest effort to update the system of testing and return them more to the status of hobby exams.

The first of the 'New' examinations was held on Feb. 8, 1984 and your editor, in order to report changes to the code and theory class, sat for them. Whether he passed or not is irrelevant but we'll find out soon enough.

The receiving portion of the code test was greatly improved from the previous exams which were held at the Broom and Stone, the old curling rink in Scarborough. The code is now transmitted by a low power FM transmitter in the room at 90 MHz and picked up by several small portable FM receivers around the room. The candidates can, and I would advise them to, bring along their own *Battery Operated* FM receiver and headsets and use them. I have no excuse this time for missing this part of the test nor should any of the future candidates because of poor quality of the acoustics. I just lost my concentration at one point in each of the two runs we were allowed and that'll do it every time— Hi!

The sending portion, re-instated after a five or six year absence (which never should have occurred) was no problem. Each candidate was examined individually and the equipment provided was reasonable. I would recommend that if you have your own key, set to your own liking, you take it along with you, but, if you have a jack connector, take it off and have the two wires to connect to the oscillator as they are not equipped to accept jacks. Alligator clips would work FB.

As far as the Regulations were

concerned, there was no change. Regs are Regs whether you are an Amateur or advanced ham or candidate, you should know them. The questions are straight forward (pretty well) and if you know what's in TRC 25 (Oct. 83) you're off and running. There are 25 multiple choice questions worth four marks each so you can miss seven and still pass; Hi!

I can only speak for the advanced, but I felt the theory was fair (I guess). Unfortunately, I had never heard of 'Capture effect' and I know little about Grid Dip Meters in the active and passive mode or how Frequency Counters work so I have to get 70 marks out of nine questions. Somewhat doubtful, so I'll probably be back in April.

The examiners were courteous, co-operative and helpful, but they are going to have to speed up two areas. First, the checking in and so on for the written part was slow. A simple problem to fix. The second will be tougher. I think everyone gets three cracks at sending, so between nine minutes there, the settling down period is between 12 and 15 minutes each for the sending test. There were four rooms so that four people were tested each 12 minutes— that's about a rate of 20 per hour. Can you imagine in April with 200 people writing what will happen?

Editor, Nortown ARC Nortopics
Willowdale, Ont.

NEW 80 BEACON

Look for a new 80 metre beacon on 3559 kHz. The 25 watt CW signal will be from VE3MPG in Ottawa from 0400 to 0730 hours and between 1900 and midnight.

CARF News Service

SUPPORT TCA ADVERTISERS!

Let Amateur Radio equipment dealers know that you saw their ad in TCA— The Canadian Amateur Radio Magazine!

1984 Repeater Directory

CANADIAN REPEATER ADVISORY GROUP

PRINCE EDWARD ISLAND

Location	Call sign	Input	Output	Notes	RAD
Charlottetown	VE1AHC	146.070	146.670	L11	
Charlottetown	VE1AHC	448.300	443.300	LF	
Charlottetown	VE1CRA	146.070	146.670	A E L	
Charlottetown	VE1HI	146.340	146.940	A E L	
Charlottetown	VE1UHF	449.400	444.400	A E L	
O'Leary	VE1ATN	147.720	147.120	E	
Summerside	VE1CFR	146.250	146.850	A E	

NEWFOUNDLAND & LABRADOR

Location	Call sign	Input	Output	Notes	RAD
Corner Brook	VO1MO	146.340	146.940	A	
Gander	VO1AV	146.460	147.060	Q	
Grand Falls	VO1CNR	146.340	146.940		
Grand Falls	VO1JY	146.160	146.760	A	
Labrador City	VO2AD	146.340	146.940	A	
St Johns	VO1EN	146.460	147.060	A	
St Johns	VO1GT	146.340	146.940		
St Johns	VO1PG	146.190	146.790	A	

CANADIAN REPEATER ADVISORY GROUP REPEATER DIRECTORY NOTES

NOTES:

- A - Autopatch
- B - Battery Powered
- C - Temporary Call
- D - Packet Radio/Data
- E - Emergency Power
- L - Linked
- L31 - Linked in Call Area 3, System 1
- L31H - Linked in Call Area 3, System 1 Hub Site or Frequency
- ASC - Audio Subcarrier for ATV (not necessarily specified)

RAD:

Coverage Radius in Kilometers

- LOC - Local Coverage
- SR - Short Range Up to 25 Km
- MR - Medium Range Up to 70 Km
- LR - Long Range More than 70 Km
- DR - Directed range (Beamed to a specific area)

NOVA SCOTIA

Location	Call sign	Input	Output	Notes	RAD
Big Harbour	VE1BVH	147.720	147.120	A	
Bridgetown	VE1BO	146.460	147.060	E	
Bridgewater	VE1LCA	147.840	147.240		
Dalhousie	VE1SMR	146.040	146.640		
Dartmouth	VE1DAR	147.750	147.150		
Dartmouth	VE1MAR	147.870	147.270	A Q	
Digby	VE1AAR	146.190	146.790	A	
Gore	VE1LHR	146.040	146.640		
Greenwood	VE1WN	147.870	147.270		
Halifax	VE1CBC	146.340	146.940		
Halifax	VE1MAR	147.870	147.270	A	
Liverpool	VE1VO	147.900	147.300	A	
Mt Blomidon	VE1AEH	147.780	147.180		
Mulgrave	VE1RTI	146.220	146.820	L	
New Glasgow	VE1HR	146.160	146.760	E	50
North Sydney	VE1AU	147.840	147.240	A L	
Rear Boisdale	VE1HAM	146.280	146.880	L	
Shelburne	VE1SCR	146.010	146.610		
Springhill	VE1SPR	146.400	147.000	A L11	
Springhill	VE1SPR	443.300	448.300	A LF	
Sydney	VE1CBI	146.010	146.610	R	
Sydney	VE1SYD	146.340	146.940	A	
Truro	VE1TRO	147.810	147.210	E	
Truro	VE1XK	146.190	146.790	E	
Truro	VE1ZG	146.310	146.910	E	
Yarmouth	VE1YAR	146.130	146.730		

NEW BRUNSWICK

Location	Call sign	Input	Output	Notes	RAD
Bathurst	VE1PL	146.340	146.940		
Caraquet/Chatham	VE1BRF	146.160	146.760		
Edmonston	VE1EDM	146.280	146.880		
Fredricton	VE1BM	147.720	147.120	A	
Fredricton	VE1GT	146.340	146.940		
Fredricton	VE1PD	146.160	146.760		
Moncton	VE1HUB	147.870	147.270		
Moncton	VE1MTN	147.690	147.190		
Moncton	VE1RPT	146.280	146.880	A	
Newcastle/Chatham	VE1NCR	147.750	147.150		
Perth	VE1BK	146.220	146.820	O	60
Perth	VE1KMT	146.460	147.060		
Plaster Rock	VE1PRR	147.870	147.270	E	
Saint John	VE1KI	146.220	146.820		
Saint John	VE1SJR	147.870	147.270		
Saint John	VE1TW	146.100	146.700		
St Andrews	VE1IE	146.250	146.850		
Sussex	VE1SMT	146.010	146.610		
Woodstock	VE1EMT	146.370	146.970	A	

QUEBEC

QUEBEC

Location	Call sign	Input	Output	Notes	RAD	Location	Call sign	Input	Output	Notes	RAD
Alma	VE2RCA	146.070	146.670	A		Montreal	VE2RMC	146.205	146.805		
Alma	VE2RCR	146.340	146.940	E L		Montreal	VE2RY	147.900	147.300		
Anqui	VE2KH	146.280	146.880			Parc Des Laurentides	VE2RAH	53.135	53.635		
Athabaska	VE2RCL	146.835	146.235			Parc Des Laurentides	VE2RJZ	147.810	147.210		L21 E
Bagotville	VE2RYB	146.040	146.640	A		Parc Des Laurentides	VE2RMG	147.690	147.090		L21
Baie Comeau	VE2RPR	146.100	146.700			Plessisville	VE2ELC	146.190	146.790		
Brownsburg	VE2RWC	146.205	146.805			Port Alfred (Lac St Jean)	VE2CRP	146.130	146.730		
Carleton	VE2RIN	146.220	146.820	L21		Quebec City	VE2T6	146.430	147.030		L21
Chicoutimi	VE2ES	146.280	146.880	O		Quebec City	VE2ASU	146.100	146.700		
Chicoutimi	VE2RCC	147.720	147.120	A		Quebec City	VE2ZDB	146.280	146.880		
Chicoutimi	VE2RIU	146.160	146.760	A		Quebec City	VE2ZM	146.340	146.940		L
Chicoutimi	VE2RPJ	147.870	147.270	AR		Quebec City	VE2RAA	147.960	147.360		
Covey Hill	VE2RBV	147.810	147.210	R		Quebec City	VE2RAD	146.010	146.610		A
Covey Hill	VE2RTS	444.500	449.500			Quebec City	VE2RAS	144.710	146.310		R
Deschambault	VE2RAP	147.810	147.210	A		Quebec City	VE2RAQ	146.250	146.850		A E
Dolbeau	VE2RCD	146.100	146.700	A		Quebec City	VE2RAR	147.015	147.615		
Donacona	VE2RAP	146.430	147.030	A		Quebec City	VE2RAX	147.655	147.855		
Drummondville	VE2RDL	146.025	146.625			Quebec City	VE2RCQ	147.900	147.300		
Drummondville	VE2RDV	147.690	147.090			Quebec City	VE2RCQ	449.000	444.000		R
Gagnon	VE2RGA	146.340	146.940			Quebec City	VE2RDS	146.250	146.850		A
Gaspe	VE2ELE	146.280	146.880	E		Quebec City	VE2RQC	449.400	444.400		A
Granby	VE2RTA	147.780	147.180	L21		Quebec City	VE2RQT	434.000	1278.75		V
Grand Anse	VE2RLT	147.600	147.000			Quebec City	VE2RGT	438.500	1283.50		ASC
Grand Fond	VE2CTT	146.400	147.000	A		Quebec City	VE2SRC	147.720	147.120		A
Grand Mere	VE2RGM	146.310	146.910	ABL21		Quebec City	VE2SXC	146.220	146.820		L21 E
Hauterive	VE2RJG	147.900	147.300	L21		Quebec City	VE2ZUX	146.160	146.760		E
Hereford	VE2RDM	147.960	147.360	E		Rigaud	VE2ZVD	223.050	223.050		D
Joliette	VE2RMA	146.430	147.030	L21		Rimouski	VE2PAK	146.340	146.940		A E
Jonquiere	VE2ZVP	146.220	146.820			Rimouski	VE2CSL	146.010	146.610		L21
L'Assomption	VE2RBB	147.810	147.210			Ripon	VE2RBA	147.945	147.345		
La Sarre	VE2RRL	146.100	146.700	L21		Riviere Du Loup	VE2NY	147.660	147.060		L21 E
La Tuque	VE2RTL	146.190	146.790	A E		Riviere Du Loup	VE2RAY	147.750	147.150		A
Matane	VE2RAS	147.720	147.120			Rouyn/Noranda	VE2R00	146.190	146.790		
Mont Dufor	VE2ES	146.280	146.880	L21 E		Sept Isles	VE2RSI	146.340	146.940		L21 A
Mont Joli	VE2RAC	146.130	146.730	A		Sherbrooke	VE2RSU	146.190	146.790		L21
Mont Joli	VE2RMJ	147.780	147.180	L21 E		Sherbrooke	VE2FX	147.930	147.330		L21
Mont Laurier	VE2RMC	146.370	146.970			Sherbrooke	VE2RSH	146.370	146.970		
Mont Logan	VE2DE	146.160	146.760	L21 E		Sherbrooke	VE2SS	146.250	146.850		L21 E
Mont Tremblant	VE2RMT	146.130	146.730	P		Sherbrooke	VE2TA	146.190	146.790		
Mont Valin	VE2RMV	147.840	147.240	A		Sorel Tracy	VE2RBS	146.010	146.610		A
Montmagny	VE2RAB	146.370	146.970	DF		St Felicien	VE2RSF	146.010	146.610		A
Montmagny	VE2RGM	147.870	147.270			St Georges	VE2RSB	147.225	147.625		E
Montreal	VE2 ?	223.500	223.500	A E		St Hyacinthe	VE2RBE	147.225	147.625		L21
Montreal	VE2BG	146.460	147.060	B		St Jean	VE2RVR	147.840	147.240		
Montreal	VE2HH	222.900	224.500	A E		St Joseph du Lac	VE2REL	147.315	147.915		
Montreal	VE2MRC	147.720	147.120			St Martine	VE2CAR	147.345	147.945		A
Montreal	VE2RAU	146.310	146.910	A E		Trois Rivieres	VE2CTR	146.460	147.060		A
Montreal	VE2RBD	444.600	449.600			Trois Rivieres	VE2ZM	147.900	147.300		A
Montreal	VE2RBD	147.870	147.270			Trois Rivieres	VE2RTR	147.900	147.300		A
Montreal	VE2REP	146.280	146.880	A		Val D'Or	VE2RYE	146.070	146.670		A
Montreal	VE2RKO	146.040	146.640			Victoriaville	VE2RBF	146.160	146.760		
Montreal	VE2RM	146.400	147.000					147.750	147.150		
Montreal	VE2RM	146.400	224.060								
Montreal	VE2RM	444.000	449.000	E							
Montreal	VE2RMB	146.100	146.700								
Montreal	VE2RMP	146.160	146.760								
Montreal	VE2RTV	438.000	448.000	V							
Montreal	VE2RVS	146.250	146.850	R							

NATIONAL CAPITAL REGION

Location	Call sign	Input	Output	Notes	RAD	Location	Call sign	Input	Output	Notes	RAD
Ottawa/Hull	VE2CRA	146.340	146.940		100	Dwight	VE3MUS	146.220	146.820		L31
Ottawa/Hull	VE2CRA	448.300	443.300	0		Elliot Lake	VE3MRR	147.600	147.000	Q	60
Ottawa/Hull	VE2CSD	146.100	146.700	LP21		Elliot Lake	VE3MRR	146.160	146.760	Q	
Ottawa/Hull	VE2KPG	147.960	147.360	A		Elmira	VE3EUC	449.700	444.700	Q	
Ottawa/Hull	VE3CPC	147.750	147.150	A L		Finch	VE3SDG	147.840	147.240	P	
Ottawa/Hull	VE3OCR	146.250	146.850	A L	40	Finch	VE3SDG	223.260	224.860	P	
Ottawa/Hull	VE3OEA	223.340	224.940		45	Finch	VE3SDG	449.200	444.200		
Ottawa/Hull	VE3ORA	146.070	146.670	A		Georgetown	VE3ITU	52.130	53.130		
Ottawa/Hull	VE3ORA	146.280	146.880			Georgetown	VE3OD	147.135	147.735	L	
Ottawa/Hull	VE3PAK	223.050	223.050	D	30	Georgian Bay	VE3MGB	147.780	147.180		
Ottawa/Hull	VE3RST	146.010	146.610	A		Goderich	VE3GDD	147.630	147.030		
Ottawa/Hull	VE3TEL	146.430	147.030			Goderich	VE3WZL	145.610	145.010	A	LOC
Ottawa/Hull	VE3TEL	222.340	222.340	D		Grand Bend	VE3RBB	146.160	146.760		
Ottawa/Hull	VE3TWO	147.900	147.300	P		Guelph	VE3ZMG	147.960	147.360		
Ottawa/Hull	VE3TWO	449.200	444.200			Haliburton	VE3GTS	147.720	147.120		

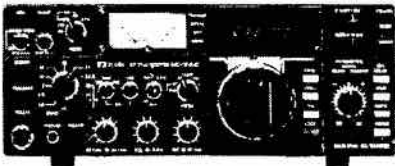
ONTARIO

Location	Call sign	Input	Output	Notes	RAD	Location	Call sign	Input	Output	Notes	RAD
Ajax	VE3 ?	144.510	145.110			Hamilton	VE3DRW	144.890	145.490		
Aurora	VE3ULR	447.025	442.025			Hamilton	VE3DRW	223.360	224.960		
Aurora	VE3YRC	147.825	147.225			Hamilton	VE3GIV	449.025	444.025		
Bancroft/Essonville	VE3TBF	147.840	147.240	L31		Hamilton	VE3MRR	147.103	147.705		L
Bancroft/Essonville	VE3TBF	223.240	224.840	L31H		Hamilton	VE3MRR	448.250	443.250		
Barrie	VE3RAG	146.070	146.670			Hamilton	VE3NCF	146.160	146.760		
Belleville	VE3OAR	146.430	147.030	A T	25	Hamilton	VE3NCF	449.075	444.075		
Bracebridge	VE3MLR	147.690	147.090			Huntsville	VE3NHR	146.520	146.520		
Bracebridge	VE3MRT	146.280	146.880	A		Ingersoll	VE3HOR	147.870	147.270		
Brampton	VE3MHZ	146.280	146.880	B		Kenora	VE3LWR	146.430	147.030		
Brampton	VE3MPC	146.280	146.880	E		Kingston	VE3KER	146.340	146.940	E	
Brampton	VE3MTC	449.450	444.450			Kingston	VE3KNR	146.190	146.790	A	
Brampton	VE3SSS	147.880	147.280			Kirkland Lake	VE3KLR	146.280	146.880	O	
Brantford	VE3TCR	147.750	147.150			Kitchener	VE3IC	146.865	146.265	B E	
Brantford	VE3XPR	147.990	147.390			Kitchener	VE3KSR	146.370	146.970		
Brighton	VE3LGX	147.765	147.165			Kitchener	VE3TRS	449.550	444.550		
Brockville	VE3BAT	146.220	146.820	A	80	Kitchener	VE3XRX	146.190	146.790		
Brownsburg	VE3BOW	146.025	146.625			Leamington	VE3TOM	147.900	147.300		
Burlington	VE3RAE	146.895	148.295			London	VE3LAC	147.660	147.060		
Burlington	VE3RAE	449.300	444.300			London	VE3MGI	52.470	53.470		
Burlington	VE3RSB	147.810	147.210			London	VE3MGI	144.790	145.390		
Burlington	VE3RSB	449.825	444.825			London	VE3MGI	448.200	443.200		
Cambellford	VE3KFR	147.990	147.390		40	London	VE3NRN	147.990	147.390		
Carleton Place	VE3FXE	147.870	147.270	P		London	VE3RGM	146.160	146.760		L33
Chatham	VE3KCR	147.720	147.120	A E		London	VE3SOL	144.590	145.190		
Chatham	VE3KCR	449.900	444.900	E L		London	VE3SOV	144.850	145.450		
Chatham	VE3SOC	144.810	145.410	E L		London	VE3SOV	447.200	442.200		
Chatham	VE3SOR	144.590	145.190	L33		London	VE3SOL	449.400	444.400		A E
Chelmsford	VE3JIG	146.160	146.760			London	VE3TTT	147.780	147.180	P	
Clairmont	VE3TNT	144.850	145.450			London	VE3TTT	223.180	224.780		
Cobalt	VE3TAR	146.370	146.970			London	VE3TTT	447.300	442.300		
Collingwood	VE3MTR	146.190	146.790	L32		Lucan	VE3MCR	52.010	53.010		
Collingwood	VE3MTR	223.280	224.880	L32		Lucan	VE3MCR	147.600	147.000		
Copper Cliff	VE3ZZZ	449.400	444.400			Midland	VE3UGB	146.310	146.910		
Cornwall	VE3SVC	147.780	147.180			Midland	VE3UGB	223.160	224.760	P	
Dorchester	VE3NDT	147.840	147.240			Midland	VE3UGB	449.650	444.650	P	
Dundas	VE3TTL	223.160	224.760			Mississauga	VE3ACN	448.250	443.250	C	
Dunville	VE3HNR	147.075	147.675			Mississauga	VE3RWB	144.830	145.430	C	



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 YAESU FT-290R 2M portab-\$299
 YAESU FT-208R 2M handie-\$229
 ICOM SM-5 desk mike-----\$ 39
 KENWOOD PC-1 Phone Patch\$ 75
 KANTRONICS INTERFACE I--\$149
 TEMPO S-5 2M 5Watt Handy\$199
 KDK-2030 2M FM 25W Demo \$289
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- FP-757HD Heavy Duty power supply--\$259/\$249
- FP-700 Standard power supply----\$169/\$165
- FC-757AT Automatic antenna tuner--\$365/\$349
- FC-700 Standard antenna tuner----\$149/\$145
- FAS-1-4R Remote antenna switch----\$ 85/\$ 79
- MMB-16 Mobile mount-----\$ 35/\$ 35
- FRB-757 Relay box-----\$ 15/\$ 15
- MH188 Up/Down Scan Hand mike---\$ 25/\$ 25
- MD188 Up/Down Scan Desk mike---\$ 85/\$ 82

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Late Bulletin: More FV-901DM's available

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DOWN UP

ONTARIO

ONTARIO

Location	Call sign	Input	Output	Notes	RAD	Location	Call sign	Input	Output	Notes	RAD
Morrisburg	VE3SVR	146.160	146.760			Tiverton	VE3TIV	146.010	146.610		
Napanee (Bellville)	VE3KBR	146.385	146.985		60	Toronto	VE3ABG	449.675	444.675		
Newmarket	VE3YRC	147.825	147.225			Toronto	VE3CNT	448.900	443.900	0	
North Bay	VE3NBR	147.750	147.150	A		Toronto	VE3GER	144.770	145.370	L32	
North Bay	VE3NFM	146.340	146.940	A		Toronto	VE3MLZ	449.200	444.200		
Oakville	VE3DAK	147.015	147.615			Toronto	VE3MDT	147.780	147.180		
Dakville	VE3OKV	448.150	443.150			Toronto	VE3MPU	147.870	147.270		
Orangeville	VE3RSD	146.625	146.025			Toronto	VE3NOR	448.650	443.650		
Orillia	VE3LSR	52.070	53.070			Toronto	VE3NUV	449.500	444.500		
Orillia	VE3LSR	147.990	147.390			Toronto	VE3PVT	448.500	443.500		
Orillia	VE3LSR	146.250	146.850			Toronto	VE3RPT	147.660	147.060	A L31	
Orillia	VE3LSR	449.350	444.350			Toronto	VE3RPT	447.100	442.100	L31H	
Oshawa	VE3ORR	147.810	147.210			Toronto	VE3SBH	144.550	145.150		
Oshawa	VE3OSH	147.720	147.120		60	Toronto	VE3SIS	52.230	53.230	0	
Owen Sound	VE3ORR	146.340	146.940			Toronto	VE3SIX	52.030	53.030	0	
Pembroke	VE3NRR	146.160	146.760			Toronto	VE3SKY	146.385	146.985		
Penetang/Midland	VE3PEN	147.750	147.150	E		Toronto	VE3SKY	448.100	443.100		
Penetang/Midland	VE3SGB	146.780	146.180	L		Toronto	VE3SSB	144.870	145.470		
Penetanguishene	VE3MGB	147.780	147.180			Toronto	VE3TDD	146.430	147.030		
Penetanguishene	VE3 ?	147.960	147.360	P		Toronto	VE3TDX	147.930	147.330		
Peterborough	VE3KRA	223.320	224.920			Toronto	VE3TFM	29.520	29.620		
Peterborough	VE3PBO	146.340	146.940	A		Toronto	VE3TNC	147.870	147.270		
Petrolia	VE3MKG	144.770	143.370			Toronto	VE3TOR	146.340	146.940		
Pickering	VE3PIC	146.070	146.670			Toronto	VE3TRO	144.530	145.130	A	
Pickering	VE3SPA	147.975	147.375			Toronto	VE3TRD	447.700	442.700		
Pickering	VE3SPA	449.600	444.600			Toronto	VE3TTR	223.380	224.980	L32	
Port Colborne (Fonthill)	VE3WCR	147.900	147.300			Toronto	VE3TTY	146.100	146.700	A	
Port Elgin	VE3PER	146.220	146.820			Toronto	VE3TWR	449.400	444.400		
Ramore	VE3TIR	146.460	147.060			Toronto	VE3WAS	147.315	147.915	L31	
Renfrew	VE3STP	147.165	147.765			Toronto	VE3WHD	144.750	145.350	L32H	
Ridgeway	VE3LJJ	147.765	147.165			Toronto	VE3YYZ	448.050	443.050		
Ridgeway	VE3NKH	147.765	147.165			Toronto	VE3UHR	449.250	444.250		
Rosseau	VE3YGA	223.340	224.940			Toronto	VE3UHR	147.015	147.615		
Sarnia	VE3SAR	146.340	146.940			Trenton	VE3WAL	146.985	146.385	L33	
Sault Ste Marie	VE3SAP	146.460	147.060	0		Wallaceburg	VE3SOK	144.730	145.330		
Sault Ste Marie	VE3SSM	146.220	146.820	A		Waterloo	VE3WFM	147.690	147.090		
Sault Ste Marie	VE3YAK	147.750	147.150			Waterloo	VE3WNV	146.835	146.235		
Sebringville	VE3WHY	144.570	145.170			Wawa	VE3WAW	146.340	146.940	0	
Sheburne	VE3ZAP	449.925	444.925	L31-2		Welland	VE3UHF	449.500	444.500	L31	
Sheburne	VE3ZAP	147.810	147.210	0		Whitney	VE3WPR	146.400	147.000		
Smiths Falls	VE3RLR	147.840	147.240			Windsor	VE3ERX	146.130	146.730		
St Catharines	VE3RAF	147.990	147.390			Windsor	VE3IIE	144.690	145.290		
St Catharines	VE3 ?	146.340	146.940	E P		Windsor	VE3III	147.660	147.060	AELT	
St Ignace Island	VE3SJI	146.280	146.880	B		Windsor	VE3III	449.000	444.000	AELT	
St Joseph Island	VE3STR	147.930	147.330			Windsor	VE3000	223.260	224.860		
St Thomas	VE3VSC	449.650	444.650			Windsor	VE3RRR	449.300	444.300		
Stoney Creek	VE3NRB	146.460	147.060			Windsor	VE3SOT	144.870	145.470		
Sudbury	VE3SSI	146.100	146.700	0		Windsor	VE3ULU	449.400	444.400		
Sudbury	VE3TEM	146.310	146.910	P		Windsor	VE3VVV	146.835	146.235		
Temagami	VE3NSF	448.550	443.550			Windsor	VE3WAA	144.510	145.110	A	
Thornhill	VE3POT	144.630	145.230			Windsor	VE3WAA	147.795	147.195		
Thornhill	VE3HCH	147.885	147.285	C 0		Windsor	VE3WIN	147.600	147.000		
Thunder Bay	VE3TBR	146.220	146.820	A B		Windsor	VE300H	147.870	147.270		
Thunder Bay	VE3YQT	146.460	147.060			Woodstock					
Thunder Bay	VE3YQT	Not	Known								
Tillsonburg	VE3TIL	146.655	146.055								
Timmins	VE3TIS	146.340	146.940								

MANITOBA

Location	Call sign	Input	Output	Notes	RAD
Brandon	VE4AL	146.130	146.730	A T	
Brandon	VE4BDN	146.340	146.940		
Flin Flon	VE4FFR	146.340	146.940		
Gimli	VE4GIM	146.250	146.850		
Killarney	VE4KIL	146.220	146.820		
Miami	VE4HS	146.340	146.940		
Pinawa	VE4PIN	146.340	146.940		
Thompson	VE4TPN	146.340	146.940		40
Winnipeg	VE4AGA	52.760	147.120		
Winnipeg	VE4CNR	146.160	146.760		
Winnipeg	VE4MAN	146.010	146.610		
Winnipeg	VE4RAG	147.840	147.240		
Winnipeg	VE4TR	223.340	224.940		
Winnipeg	VE4UMR	146.870	146.270	A E	40
Winnipeg	VE4WDX	147.780	147.180		
Winnipeg	VE4WPG	146.460	147.060	A	

SASKATCHEWAN

Location	Call sign	Input	Output	Notes	RAD
Anglin Lake	VESBBI	146.160	146.760		
Estevan	VESEST	147.780	147.180		
Grenfell	VESGRP	146.070	146.670		
Ituna	VESABO	146.310	146.910		
Last Mountain	VESAT	146.250	146.850	B	
Lloydminster	VESRI	146.340	146.940		
Meacham	VESHV	146.220	146.820	L	
Melfort	VESRPT	146.280	146.880		
Moose Jaw	VESCI	146.340	146.940		
Moose Mountain	VESMMR	146.220	146.820		65
Moosomin	VESMRC	146.160	146.760		
North Battleford	VESBRC	146.280	146.880		
Prince Albert	VESEEE	146.460	147.060	A	
Regina	VESATV	439.250	1253.00	V	
Regina	VESKE	146.460	147.060		
Regina	VESRAG	146.010	146.610		
Regina	VESRRG	147.720	147.120	A	
Regina	VESSS	146.280	146.880	A	
Regina	VESUHF	449.000	444.000		
Rock Point	VESXW	146.130	146.730		
Rosetown	VES ?	Not	Known		
Saskatoon	VESUSR	146.340	146.940		
Swift Current	VESSCR	146.280	146.880		
Weyburn	VESWEY	146.100	146.700		
Yellowhead	VESSEK	146.160	146.760		
Yorktown	VESRF	146.280	146.880	C L G	

ALBERTA

Location	Call sign	Input	Output	Notes	RAD
Andrew	VE6JET	146.040	146.640	A	
Banff	VE6BNF	146.070	146.670		MR
Beaverlodge	VE6XN	146.250	146.850		
Calgary	VE6AID	147.640	147.240		LR
Calgary	VE6AUY	146.460	147.060	A	
Calgary	VE6HE	145.440	145.440	A	
Calgary	VE6NOV	223.340	224.940		
Calgary	VE6NOV	449.400	444.400		
Calgary	VE6OIL	146.010	146.610		LR
Calgary	VE6RPT	146.340	146.940	A L	MR
Calgary	VE6RYC	146.250	146.850		
Calgary	VE6TWD	147.990	147.390		
Cardston	VE6 ?	146.200	146.800		LR
Claresholm	VE6ROT	146.130	146.730		
Cold Lake	VE6DC	146.460	147.060	A	MR
Edmonton	VE6EAR	146.340	146.940	A	MR
Edmonton	VE6HM	146.460	147.060	A	
Edmonton	VE6MC	146.250	146.850	P	
Edmonton	VE6PKT	449.000	444.000		
Edmonton	VE6PMR	146.070	146.670	A	
Edmonton	VE6SC	147.360	147.960		
Elk Point	VE6SB	146.070	146.670		
Fort McMurray	VE6TRC	147.600	147.000		
Ft McMurray	VE6MAR	146.460	147.060		
Grand Prairie	VE6GBS	146.340	146.940	A	
Grand Prairie	VE6DL	146.160	146.760		LR
Hardisty/Camrose	VE6HW	146.160	146.760		SR
High River	VE6CGM	147.600	147.000		MR
Hinton	VE6YAR	146.160	146.760		LR
Innisfail	VE6SPR	146.370	146.970	L62	
Lacombe	VE6AHW	147.750	147.150	A	
Lethbridge	VE6CAM	146.280	146.880		MR
Medicine Hat	VE6HAT	146.460	147.060		MR
Milk River	VE6BRC	146.160	146.760		
Namoo	VE6CU	147.900	147.300		MR
Oyen	VE6CNK	146.340	146.940		LR
Pigeon Lake	VE6SS	146.280	146.880		MR
Red Deer	VE6DE	146.400	147.000		
Red Deer	VE6RCO	147.780	147.180	A	
Rocky Mtn House	VE6VHF	146.310	146.910	L	LR
Swan Hills	VE6 ?	146.220	146.820	P	
Three Hills	VE6FUN	146.220	146.820	L62	
Warner	VE6BBR	146.070	146.670		MR
Whitcourt	VE6PP	146.220	146.820		
Willingdon	VE6RJUK	146.190	146.790		

BRITISH COLUMBIA

Location	Call sign	Input	Output	Notes	RAD	Location	Call sign	Input	Output	Notes	RAD
100 Mile House	VE7RKM	146.220	146.820	P		Trail	VE7CAQ	146.240	146.840		
Blackcombe Mt	VE7RDP	144.570	145.170	L		Trail	VE7RBV	147.930	147.330		
Burnaby	VE7FVR	147.780	147.180	A		Vancouver	VE7 ?	224.300	222.700	P	
Burnaby	VE7RBY	144.750	145.350			Vancouver	VE7ESR	144.890	145.190	L	
Chilliwack	VE7ELK	146.400	147.000			Vancouver	VE7RAG	147.620	147.020	L	
Chilliwack	VE7RCK	147.700	147.100			Vancouver	VE7RAP	449.975	444.975	D	
Courtenay	VE7RCV	146.310	146.910			Vancouver	VE7RBC	146.160	146.720		
Dawson Creek	VE7RDC	146.340	146.940			Vancouver	VE7RHS	144.670	145.270	A	
Dawson Creek	VE7RSP	146.280	146.880			Vancouver	VE7RPT	146.340	146.940		
Delta	VE7RTY	146.100	146.700			Vancouver	VE7RPT	222.700	224.300		
East Kootenay	VE7CAP	146.340	146.940		80	Vancouver	VE7RPT	448.525	443.525		
Fort Fraser	VE7RFF	147.630	147.030			Vancouver	VE7UHF	448.800	443.800		
Fort Nelson	VE7RFN	146.340	146.940			Vancouver	VE7URG	449.000	444.000		
Fort St John	VE7RSJ	146.220	146.820	A		Vancouver	VE7VAN	147.720	147.120	D	
Fort St John	VE7RSJ	445.100	438.100	L		Vancouver	VE7MRS	147.870	147.270		
Fort St John	VE7RTR	438.100	445.100	L		Vernon	VE7RSS	146.280	146.880		
Fruitvale	VE7 ?	146.340	146.940			Vernon	VE7RVN	146.460	147.060	A	
Houston	VE7 ?	146.460	147.060	P		Victoria	VE7BEU	223.300	224.900		
Kamloops	VE7KAR	146.340	146.940			Victoria	VE7RCU	144.570	145.170	L	
Kamloops	VE7RKA	146.250	146.850	L		Victoria	VE7RMT	144.850	145.450	L	
Kelowna	VE7 ?	147.720	147.120	A		Victoria	VE7RSR	144.810	145.410		
Kelowna	VE7 ?	146.400	147.000	A		Victoria	VE7VIC	146.240	146.840	A	
Kelowna	VE7ROK	146.220	146.820	A		Victoria	VE7VIC	448.950	443.950		
Kelowna	VE7RNC	146.080	146.680	A		Victoria	VE7DSD	146.340	146.940	L	
Kelsey Bay	VE7 ?	146.040	146.640	L71		Williams Lake	VE7RDL	147.720	147.120		
Mackenzie	VE7RMR	146.200	146.800	P		Williams Lake					
Maple Ridge	VE7MR	448.625	443.625								
Maple Ridge	VE7DRZ	146.340	146.940								
Massett	VE7RTN	147.990	147.390								
Mt Thyme	VE7RSC	146.040	146.640	A L71							
Nanaimo	VE7RNA	144.830	145.430								
Nanaimo	VE7 ?	146.040	146.640								
Nelson	VE7BTU	146.460	147.060								
Nelson	VE7RCW	146.340	146.940	A		Frobisher Bay	VEB ?	146.340	146.940		
Nelson	VE7RDX	147.900	147.300			Whitehorse	VYIRBW	146.280	146.880	A B E	60
North Vancouver	VE7RTM	449.925	443.925	D		Whitehorse	VYIRPT	146.340	146.940	A B E	120
North Vancouver	VE7OKN	146.340	146.940			Yellowknife	VEBYK	146.340	146.940	A P	80
Penticton	VE7RAC	147.840	147.240	B L71							
Port Alberni	VE7RPA	147.750	147.150								
Port Alberni	VE7RPE	146.400	147.000								
Port Edward	VE7RNI	146.340	146.940	L71							
Port McNeill	VE7AFG	146.340	146.940								
Prince George	VE7RPG	146.280	146.880								
Prince George	VE7RTI	52.525	52.525	LP							
Prince George	VE7RTI	146.750	147.350	LP							
Prince George	VE7RTI	446.000	446.000	LP							
Prince Rupert	VE7RPR	146.280	146.880								
Prince Rupert	VE7RPR	222.980	224.580								
Prince Rupert	VE7RQL	146.460	147.060								
Salmon Arm	VE7RNH	146.160	146.760								
Salt Spring Island	VE7RSI	147.930	147.330								
Sandspit	VE7RQC	146.340	146.940								
Shuswap	VE7 ?	146.160	146.760	P							
Smithers	VE7RBH	146.280	146.880								
Smithers	VE7RHD	146.460	147.060								
Surrey	VE7RPM	449.200	444.200								
Terrace	VE7RDD	146.340	146.940	E							
Terrace	VE7RTK	146.250	146.850								

YUKON & NORTHWEST TERRITORIES

Location	Call sign	Input	Output	Notes	RAD
Frobisher Bay	VEB ?	146.340	146.940		
Whitehorse	VYIRBW	146.280	146.880	A B E	60
Whitehorse	VYIRPT	146.340	146.940	A B E	120
Yellowknife	VEBYK	146.340	146.940	A P	80



CARF wishes you a
 Good Summer
 & Drive Safely

MUFPLOT for the Apple Computer

A Review

by Douglas W. Griffith VE3KKB

An Amateur cannot reliably operate on the high frequency bands without some knowledge of propagation. Indeed, in order to earn our Amateur certificates of proficiency, we are required to learn basic propagation theory.

By way of a quick review, and without belabouring the subject, there are three basic wave forms commonly associated with the propagation of radio signals: Ionospheric, Tropospheric and Ground Wave. The Ionosphere, lying between 35 and 200 miles above the surface of the earth, is usually divided into three distinct layers: D, E and F, which can absorb and bend (refract) RF signals at different rates. While the D and E layers do play a significant role in HF propagation, it is the F layer which is usually the most important for long distance communication. In addition to this layer-type structure, UV and particle (photon) emissions from the sun (and their effect on the degree of ionization of the ionosphere), time of the day, season, latitude, direction of path (that is, north-south or east-west, trans-equatorial, polar path, etc.), 11-year sunspot cycle, 27½ day solar cycle, all have an influence on ionospheric propagation in the high frequency spectrum.

Several terms have evolved to label radio frequencies associated with propagation. Names like: highest possible frequency (HPF); maximum useable frequency (MUF); frequency of optimum traffic (FOT); and lowest useable frequency (LUF). The upper frequency limit depends on the critical frequency, which is defined as that

frequency above which an RF signal will no longer be refracted back to earth, and this in turn depends primarily on the condition of the F-layer. The lower frequency limit (LUF) is primarily determined by the D and E layers. During the hours of daylight when these layers are more highly ionized, they absorb a greater percentage of the signals passing through them on their way to the F-layer. As the frequency decreases, the level of absorption increases, and eventually is so great that little or no signal is passed through to the F-layer to be refracted back to earth.

Enough of the 'heavy' theory, and on to the fun part. What does all this mean to the average Amateur? Well, how often have you wondered if propagation exists between your QTH and some other point on the globe, on a particular Amateur band? This type of information is particularly useful when setting up a sked with a friend, or when trying to work a DX'pedition, or a DXCC country on a specific band. How often have you forgotten (if you ever knew) the beam heading to a particular country, state, or for that matter, another part of Canada? How often have you thought about how nice it would be to be able to model propagation, and examine possible paths between various parts of the world? (A great insight into why someone from a different part of the globe can get higher contact rates into various countries on a particular band in a contest.) For those who have considered these questions, then *Base (2) Systems* in Saginaw, Michigan, can help provide the answers in

the form of a program called MUFPLOT.

The original algorithms for MUFPLOT were developed by the U.S. Navy, and the routines have been modified by *Base (2) Systems* in order to make them more suitable for use by Amateurs and short-wave listeners.

The first MUFPLOT was written for the Commodore Vic-20, and was closely followed by one for the Commodore 64 computer. This latest version is for the Apple II. Basically, the C-64 and Apple versions are similar in terms of their features, and both are more complex than the Vic-20 program. Although I have had copies of both Commodore programs for almost a year, it wasn't until the Apple program was ready late in 1983 that I had an opportunity to test MUFPLOT.

MUFPLOT has four basic functions:

1. It calculates a great circle bearing to a target (destination) of your choice.
2. It determines the distance between your QTH and the selected target in statute miles.
3. It estimates your choice of an upper frequency limit (HPF, MUF or FOT) for a 24-hour time period.
4. It estimates the LUF for the same 24-hour period.

MUFPLOT II (MUFPLOT for the Apple) is written in Applesoft Basic, and has been compiled using Microsoft's TASC (The Applesoft Compiler) compiler. It comes on a copy protected disk, which *Base (2) Systems* will replace free of charge for a 30-day period from the receipt of the disk, if it should prove defec-

tive. For a nominal fee of \$5, Base (2) Systems will replace any disk which becomes defective after the initial 30 days. Documentation is in the form of a 14-page manual, written on a dot-matrix printer, and is both comprehensive and easy to follow. The manual walks you through the various features of the program. It is almost redundant, because the program itself is so straight-forward and completely menu driven that it almost runs itself.

MUFPLLOT does not support 80 column cards, so one must be sure to be in the standard 40 column display prior to booting the disk. The first time that the disk is booted, you are asked whether you are using a colour or monochrome monitor (yes, for those who have a



Fig. 1

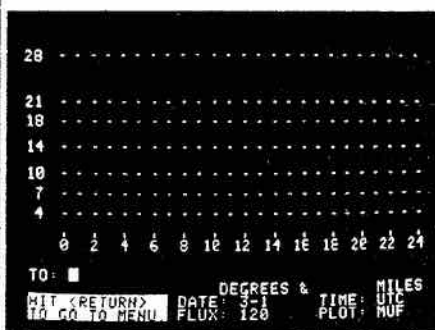


Fig. 2

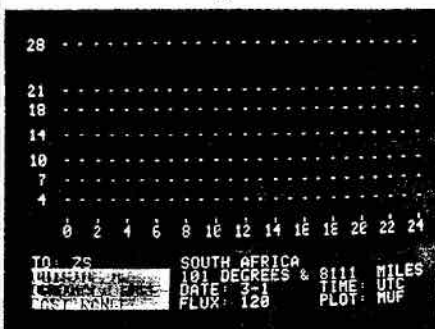


Fig. 3

colour monitor, or are using a colour TV, the display is available in full colour), and you are asked to input the latitude and longitude of your QTH. These data may be modified again at a later date by selecting the appropriate option from the main menu. The lat. and long. are input as decimal degrees, positive for locations north of the equator, and west of the Greenwich Meridian, and negative for those south latitude and east longitude.

At this point, the main menu appears on the display screen (Fig. 1) and invites one to select one of the options available at this stage of the program. Selection of option one—Plot a propagation forecast—is the 'guts' of the software, and when chosen, the display shown in Fig. 2 is put on the screen. The numbers in the vertical column represent the frequency in MHz, and those along the bottom row represent the time of day. Several prompts are then presented, and answers have to be input next to each one.

1. **TO:** This is the target area for which you would like a forecast. You may input a full callsign, either DX or domestic (MUFPLLOT knows all the U.S. and DX prefixes, and the prefix is automatically derived from the callsign), or a prefix, or the postal abbreviation of a State, or simply, a lat. or long. You may also input a special prefix which you have added to the target data base (more later).

2. **DATE:** Input the date in the format MM-DD, or MM/DD.

3. **TIME:** Input the time. You may select UTC, GMT, EST, EDT, CST, CDT, MST, MDT, PST or PDT. This will be what the time in the bottom row will be in.

4. **PLOT:** MUFPLLOT will automatically display a graph with MUF as the upper frequency limit, but you may change this, and enter either FOT or HPE as the upper limit by simply typing in your choice next to this prompt.

5. **STOP:** You may quit MUFPLLOT and return to the system

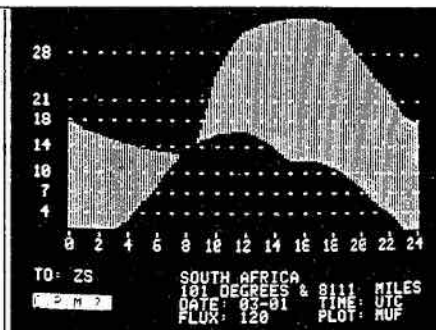


Fig. 4

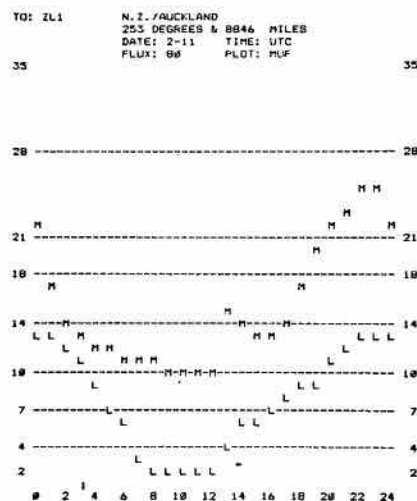


Fig. 5

level (basic) at this point if you select this option.

If a mistake has been made at any point, editing may be facilitated by using the backspace (left arrow) key, if (CR) has not been pressed, and if (RETURN) has already been pressed, and you have progressed to the next prompt, then pressing the 'C' key followed by (RETURN) will return you to the previous prompt for editing.

Fig. 3 shows that I have input ZS (South Africa) as the designated target area. Because MUF and LUF are affected by distance, the most reliable propagation forecasts will be those where the target is between 250 and 6000 statute miles away. Forecasts outside this range should not be considered worthless, but should be taken as indicators rather than an absolute prediction. Fig. 3 also shows that a flashing, inverse video message comes up on the screen below the target information, advising when the target is out-

side the nominal range. Once the warning message goes off, the target information (in this case South Africa), and the bearing and range data are displayed. Additionally, Fig. 4 shows that a date of 01-3, time in UTC, and a solar flux of 120, and an upper frequency limit for MUF were asked for. Fig. 4 also shows what the plot looks like.

Solar flux is an indication of the degree of ionization of the earth's atmosphere. It has a minimum value of 65 and information on solar flux is available by listening to WIAW propagation broadcasts, and WWV at 18 minutes past the hour. The use of five-day running averages produce the best plots for immediate propagation conditions, while 15-day and 90-day averages are best for projecting future conditions. The beauty of this program is that one could look at the effect on MUF of various values of flux over the same path.

Again referring to Fig. 4, the upper boundary of the shaded area is the MUF, and the lower boundary is the LUF. The black area between 0800-1000 UTC represents the time for which no propagation is theoretically possible between the two points.

When the plot is complete, an inverse video C,P,M? prompt appears in the lower left corner of the screen, below the target information. If (C)ontinue is chosen, then the program returns to the screen display as depicted in Fig. 2, and the system is ready to accept another target. If (P)rint is chosen, and if a printer is hooked up to the computer, a hard copy of the plot will be produced. The print routine was designed for its universality, as it will probably work with any printer. I used an Epson MX-100, and a typical printer plot is shown in Fig. 5. When the hard copy is finished, we are returned to the C,P,M prompt. If (M)enu is selected, then the program returns to the main menu.

Once back to the main menu, if option two— Get Distance/Bear-



Fig. 6

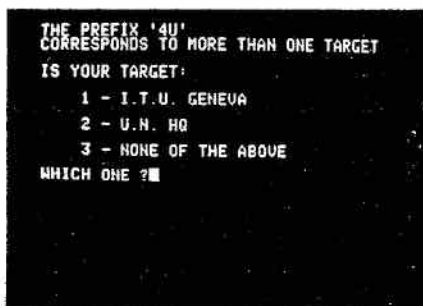


Fig. 7

ing/Name— is selected then what appears on the screen is shown in Fig. 6. In order to demonstrate another of MUFPLOTS many features, I purposely chose the prefix '4U' (knowing that there are 4U1UN, 4U1ITU and 4U1VIC, each in a different part of the world). Fig. 7 shows what is displayed in response to inputting '4U'. (Note that 4U1VIC is not one of the options— this will be examined further under option 4— Edit the Target Data Base—). In response to "which one?", I selected 1. 4U1ITU Geneva, and Fig. 8 represents what is displayed on the screen. By hitting any key other than (RETURN), the system will accept another prefix, and by pressing (CR), we are returned to the main menu.

From the main menu, selection of option 3— Edit Home Latitude and Longitude— results in a screen display like that in Fig. 9. If you answer "Y", then MUFPLOT's point of origin for the graphs will be changed to what new lat. and long. are input. Once the new coordinates are entered, MUFPLOT automatically returns to the main menu. If 'N' is entered, then the program returns to the main menu.

This feature is powerful in that it allows us to look at propagation as though we were in a different part of the world, and forms an important part of the educational and modelling aspects of this program.

Option 4— Edit the Target Data Base— from the main menu, when selected results in the target editor menu being displayed (Fig. 10). This allows us to access and modify (or update) the prefix data base. It is this part of MUFPLOT that keeps the program from ever becoming outdated. As DXCC status of various 'countries' change, the appropriate change can be made to MUFPLOT. If option 1 from the target editor menu is chosen (Fig. 10), then I can add whatever I want to the data file. For example, since 4U1VIC in Vienna was not in the file originally, I added it by inputting 4U (prefix) Vienna (location), and typing the appropriate lat. and long. for Vienna. Selection of '4U' now would result in all three choices appearing on the display depicted in Fig. 7. Additionally, this part of the program would be useful for those of you who are continually trying to figure out all the new prefixes floating around the bands these days. You could add all the unusual prefixes, with their correct country identifier and lat./long. information, and then you wouldn't have to worry about where they were, or where to point your beam. Once in the data base, selection of option 2 from the main menu would instantly give you that information.

MUFPLOT by Base (2) Systems, is an excellent product overall, but as is often the case, even with the best of products, there are some limitations. The printer output routine was designed for compatibility with a number of printers of different types, not for the aesthetic qualities, and I don't really care for it. Because of the popularity of the Epson, and Epson-like printers (eg. Star Gemini), I would have preferred to have had the option of a hi-res screen dump, such that the


```
TARGET: 4U (I.T.U. GENEVA)
BEARING: 57 DEGREES
DISTANCE: 3751 MILES
LAT/LONG: 46.2 / -6.2 DEGREES
```

```
HIT <RETURN> TO RETURN TO MAIN MENU
HIT ANY OTHER KEY TO DO ANOTHER ...
```

Fig. 8

```
THE CURRENT LATITUDE AND LONGITUDE
ARE AS FOLLOWS:
```

```
LATITUDE = 45.2
LONGITUDE = 75.4
```

```
WOULD YOU LIKE TO CHANGE IT ?
```

Fig. 9

```
- TARGET EDITOR MENU -
```

- 1 - ADD A TARGET TO THE DATA FILE
- 2 - EDIT AN EXISTING TARGET
- 3 - RETURN TO MAIN MENU

```
ENTER NUMBER OF OPTION ?
```

Fig. 10

hard copy would be similar to the screen display. To this end, Jim Dolson, the author of MUF PLOT, is adding such a routine to later editions of the program.

Another feature which would have been useful, would have been the inclusion of long path and reciprocal beam headings. Although not necessary for the calculation of MUF, these additional data would have made the Target/Bearing-/Distance portion of the program more complete.

MUF PLOT for the Apple comes on a copy protected disk, and while I acknowledge the right of a software publisher to survive in a market crawling with 'pirates', I don't believe that disk copy protection is the way to go. In their C-64 documentation, Base (2) Systems suggest that the first thing a new

owner should do is make a backup, stressing that you can never have enough copies, only too few. Of course, this option is not available to owners of the Apple version, and in spite of the guarantee of replacing defective disks, I like the program well enough that I would rather not be inconvenienced by having to do without it while a replacement copy was being sent.

Anyone using MUF PLOT, or ANY propagation predicting program, must be careful not to fall into the trap of accepting the forecast as an absolute value of conditions. These programs cannot, and do not, take into account anomalous openings (e.g. Sporadic E, Chordal Hop, Fibre Optics Mode, etc.) and, while MUF PLOT has proved to be very accurate, particularly when used with higher running averages for values of solar flux, Amateurs or SWL's who rely solely on this type of program may miss some of their best loggings. Also, when working outside the 250-6000 mile nominal range to a target, one must remember that the propagation forecast is somewhat less reliable, and Amateurs often do find themselves outside this range.

Another small gripe has to do with a slight difference between the printed copy and the screen display. The frequency on the hard copy goes all the way to 35 MHz, and the plot extends that far, but it is cut off at 28 MHz on the screen display.

Putting aside the theoretical restraints, which affect ALL programs of this type, my overall impressions of MUF PLOT were very favourable. I have used the program extensively, both for DXing and in the preparation for contests, and I have found it to be a powerful operating aid. The documentation is well-written, with an extensive bibliography, for those who wish to pursue the theory of propagation further, and the manual is easy to follow. The prefix data base is a tremendous asset, and adds immense flexibility to MUF PLOT. The program is easy to use, fun to

experiment with and, from an education standpoint, very enlightening. Of the propagation predicting software that I have used, MUF PLOT is by far the most comprehensive, user friendly, and the fastest in execution of the graphics display. Jim Dolson and the rest of the crew at Base (2) Systems are to be congratulated on a fine product.

Price class of MUF PLOT is \$37.95, for the Apple version, \$27.95 for the C-64 cassette, and \$29.95 for the C-64 disk version. There is an additional charge of \$2.00 to cover shipping in North America, \$5.00 outside. Effectively, Canadians are being offered a 28% discount, as Base (2) Systems is currently accepting the above prices in Canadian funds.

Instructors of radio courses in CARF affiliated clubs may apply for a discount, when the software is to be used for instructional purposes. Those who wish to apply must include the name of the club and have three signatures from officers of the club.

For further information on MUF PLOT, contact Base (2) Systems, 2534 Nebraska, Saginaw, Michigan, 48601, U.S.A.

Acknowledgement: The author would like to thank Harry Turner for his excellent photographs, without which this article would have been impossible.

PIRATE NAILED BY DOC

Fast action by an Ottawa Amateur in reporting out-of-band operating and a quick response by the local DOC office resulted in nailing a city Amateur for operating illegally on the 21 MHz band favored by members of the pirate HF International gang. In response to a request from a European DX operator, he gave his address and a visit from the monitoring DOC inspectors rapidly followed. DOC is now considering what enforcement action to take.

CARF News Service

DX

D.W. Griffith, VE3KKB



Bits & Pieces

As I write this, I am awaiting the arrival of two major DXpeditions; the XL8, Kermedec Is., and the FOOX, Clipperton Is. I had forgotten the keen excitement generated by the imminent activation of rare DX spot, and one can actually feel the tension on the bands. There are far more stations around than normal, and if an even casually rare country appears, the station is soon besieged by DX giants, flexing their muscles for the 'big' one. I must say that am revelling in the feeling, as it has been so long since I felt any real emotion 'vis-a-vis' Amateur radio in general, and DX in particular. I had also lost sight of the fact that waiting for a 'major' is one of the best times to check out propagation 'real-time', as one tends to be listening on all bands, and it is an interesting, and sometimes exciting, way to find a very representative cross section of the DX that is around. In the last few days for example, I have worked VU, AP, 9N, 4S7 on the long-path in the morning on 20M, and ZK1 in the evening on 15M. I also found that in terms of Pacific propagation, 10M remains quite a viable band many days of the month. Cycle 21 may be dying, but it is far from being dead.

Of course all is not attractive. By spending more time on the air, it is only natural that one must run into the seamy side of Amateur radio, and I had the dubious pleasure of witnessing the most reprehensible behaviour that I have encountered recently. On Saturday, March 10, around 0000 UTC, on 3796 kHz, on what is called the 'Black Sheep Net', there were more four letter words floating around than scum in a

VS6 Hong Kong— VS6DO can be found daily from 1100 UTC to 1215 UTC on 1904 kHz; listening on 1822-1825. Also, 7009 kHz, CW, from 1200-1500 UTC. On 80M, he has been reported around 3795 kHz, 1100-1300 UTC.

IS1CK Spratly Is— Finally, a decision has been made to accept this station for DXCC status. This was from a Philippine-held island in the Spratly group, and should pave the way for future operations from this super-rare DX spot. Any future Spratly operation was in doubt following the death of two German Amateurs, and the sinking of a boat last year by North Koreans. As a matter of fact, an operation by DU1JZ and two others, as IS1JZ, is scheduled about May 2, 1984, for one week.

FOOX Clipperton Is— Due to lack of alternate transportation, the Clipperton DXpedition had to be cancelled. The group sat in Manzanilla for almost a week, with a few members ranging as far as Mexico City trying to make new arrangements before finally tossing in the towel. They will try again next year. Too bad fellows, I know how long and hard the planning was. Good luck in your future attempt.

A35WW Tonga— Very active of late on the low bands. 7007-7010 kHz from 1200 to 1400 UTC and 3504 kHz around 1300 UTC. QSL to JA5DQH.

7X Algeria— 7X2LS can be found around 3800 kHz from 0100-0430 UTC most days. Also, he has been reported on 21280 kHz about 1700 UTC.

5X/G8GRN Uganda— Can be found on 14.157 MHz at 2300 UTC, and on 14.196 MHz at 2000 UTC. QSL to G4CTQ.

FH8CR Mayotte— Yves has been reported on 28.512 MHz at 1415 UTC. QSL to B.P. 28, Dzaoudzi, 96710, Mayotte, France.

KX6BA Marshall Is— Bob has been reported on 14.233 MHz at 1000 UTC. QSL to Box 294, APO San Francisco, CA, 96555.

P29AF Papua New Guinea— Andrew has been reported on 14.224 MHz at 1010 Z. QSL to Box 94, Mount Hagen, PNG, Pacific.

7Q7LW Malawi— Les has been reported on 7005 kHz at 0430 UTC. He hopes to be on 80 M soon. QSL to Box 24, Mtakatika, Malawi, Africa.

XU1SS Kampuchea— Has been worked on 14019 kHz at 1315 UTC. He has been appearing fairly regularly on 14335 kHz at 1030 UTC Sundays, with VS6CT, for a (yech!) list operation. He always goes QRT at 1400 UTC. QSL to JA1HQG.

TT/F6BFN Chad— It is reported that Serge has verbal permission. He has been very active on CW, often around 21.020 at 1430 UTC, and 28.025 at 1400 UTC. QSL to F6BFN.

TZ Mali— Franz, TZ6FE has been reported on 21.290 at 2200 UTC, and 14.195 at 0005 UTC. QSL to DL4BC. Also, TZ6CY on 14.192 at 2245 UTC. QSL via N8US.

XX9 Macao— This is the new prefix that replaces CR9 from March 1, 1984. Current resident Amateurs are: XX9AK, XX9AN and XX9WW.

sewer. One fellow was advised that he was intentionally QRMing the net, and when he refused to cease, the net QSY'd. Of course this individual showed up on the new frequency, and the 'fun and games' began all over. Twice more the net moved, and this 'lid' followed. I made a tape of the RF donnybrook, as an example of what Amateur radio should NOT be. How it turned out I don't know, because I was so thoroughly disgusted after a while that I QSY'd myself. It was mentioned that one of the U.S. monitoring stations had been advised, and was on frequency. I hope that they make mincemeat out of the offending idiots. That type of behaviour we can do without on the Amateur bands.

With the Dayton Hamvention just over, I suspect many individuals will have new toys to try out. A good time to do so would be at the end of May, during the CQ WPX CW Contest. A perennial favourite with prefix hunters, and DXers alike, this contest has grown in popularity over the last couple of years, in spite of the rather late date. Set aside the last weekend in May, which this year falls on Sat. May 26/Sun. May 27. Good luck.

Back to the subject of conditions again. I have found that as early as 1130 UTC on 20 M, there are openings to the Pacific, S. America, C. America and Europe simultaneously. With the increasing hours of daylight, 20 M is opening earlier, and staying open later, as we gradually move towards Summer conditions. I hate to think of 20M on those long Winter nights a couple of years down the road, at the bottom of cycle 21. I guess it's time to start planning your low band antenna farms. I will be doing a major re-work of my home (as opposed to VE3PCA, the country contest station) antennas this Summer, putting up a beam on 40 M, and concentrating on effective 80 M radiators (a real challenge from my postage stamp sized city lot). If any of you have any exper-

ience with DX antennas, particularly with space restricted designs, please drop me a line, with a description, and diagram(s), and I'll share your antenna with all the readers.

Telex/Hygain will soon be introducing two new 40 metre beams, to replace the venerable 402 BA, and at the same time, more directly compete with KLM. One of the new antennas is a 2-element beam, and the other is 3-elements. What the boom lengths are, or spacing, I don't know, but I will pass along this information when it becomes available to me. Apparently, many of the niggling problems of the 402BA (like blowing Baluns, particularly the BN-86 Hygain toroidal balun; and then blowing holes in the plastic sleeving on the driven element, resulting in a shorted DE), have been resolved in these new antennas. They are still under test on the ranges, but should be available by this Summer.

HOLIDAYS

The following DXCC Countries enjoy holidays in May:

Date	Country
2	4X,4Z
9	OK,OL
14	ZP
17	LA
20	TJ
25	LUJY
31	ZR/ZS

If you happen to need one of the above for a new one, the dates indicated may just be the best time.

A new 80 metre beacon has been set up. VE3MPG in Ottawa, has placed a beacon on 3959 kHz. It runs 25 W CW, and is in operation from 0900-1230 UTC, and 000-0500 UTC daily. Antenna is a dipole at 35 feet, but a vertical is to go up sometime in the near future.

Special Prefixes:

CJ8— Residents of Yellowknife, NWT. from Jun. 23-July 6, 1984.

X03— Residents of Ontario, in recognition of bicentennial, July 1984.

XK3— Residents of Cornwall, Ontario from July 14-July 29, 1984. CYOSPI QSL cards are in the mail even as I write this (March 19, 1984.)

The new prefix for Lord Howe Island is VK9L.

U.S.S.R. New Callsigns:

Beginning May 1, 1984, there will be a major change in the Soviet callsign structure. A complete breakdown will follow in a later issue (when all the facts are known), but basically, all club callsigns and some which are privately held will change.

All call signs will begin with the letter R or U; and the second letter of the prefix will indicate which of the Autonomous Soviet Republics the station is in; and all numerals 0-9 will be valid, regardless of the station's location. For example, previously, the Ukraine was either UB5, RB5, UT5, RT5, UY5, RY5, the R indicating a low power novice station. Now, any of UB, RB, UT, RT, UY, RY with the numerals 0-9 will be possible. Also, UA3 for example, may become simply U3, followed by the suffix.

QSL INFORMATION

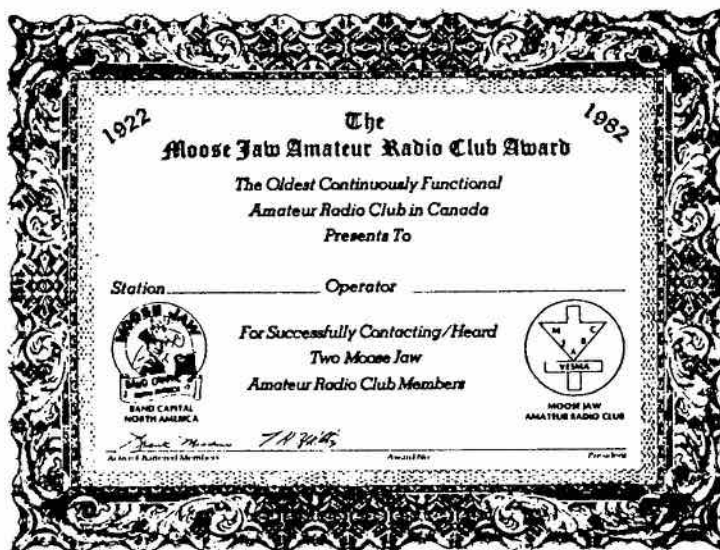
CALLSIGN	QSL Via:
1A0KM	I0MGM
1Z9A	W7PHD
3D2DX	VE5RA
3D2FR	NE4S
3D2HE	VE3FXT
3X4EX	N4CID
4D4M	YU4EGZ
5H3BH	SM0EAI
5N0/YU3KI	YU3KI
5W1DC	DF7CC
5W1ER	K2FJ
5X/68GRN	G4CTQ
5Z4JR	OH2BAH
6W1AR	WB4LFM
6W1CK	DL1HH
6W1LL	DL1HH
6Y5IC	KE3A
7F8CL	SM5DGA
8P6/NBDCJ	KZBY
9K2BE	G4GIR
9U5JB	ON5NT
9X5WP	WB6VKD
A22TE	AK1E
A35WW	JASDQH
A92NH	WBLU
AF2ZA	W6NLG
CS3AL	KA2CDE

CALLSIGN	QSL Via:
C6A/N4BP	N4BP
CN8CU	W43HUF
CT2EE	WA7GXD
CX6CK	WA1BXP
CY9SAB	VE1AJH
DU7/K2BDY	K4PT
EA9KF	EA3CTE
FB8WJ	W4FRU
F67CK	F67BT
F08JP	F1BBD
HH2WW	N4WW
HL9DX	N5DBB
HL9GT	N2AEW
HR1DAP	K8CC
J37AH	W2GHK
J39BS	WB2LCH
J73DH	W20B
J73HA	W2GBX
JD1BBG	JA7AG0
JW6VDA	LA5NM
JX5AA	LA1K
JY9CL	G3MUL
KC6HA	K6EDV
KC7UU/5N6	K6EDV
KG4AW	KA4TAY
KG4DX	WB2CPV
KH2/KD7P	K57L
KH8/K2FJ	K2FJ
KP2/K5NA	KU2Q
KX60A	K6DSI
KX60H	VK9NS
LG5LB	LA2ZN
OA4SS	KB6J
OD5LX	SMØDJZ
OY9R	K2IJL
P29KY	JR1EMT
RØK	UAØCKL
T3ØAT	G4GED
TG9NX	N4FKZ
TI5EWL	AG1K
TI9CCC	TI2CCC
TI9CF	TI2CF
TI9CRM	TI2CRM
TJ1QS	F6DZU
TL8ER	F6GQK
TR8AM	F6ESH
TU1/72/73	AK3F
UK8JBD	UJBJMM
V2A/W1CDC	AB1U
VP2KBW	VE3DUS
VP2KCA	KØ6U
VP2MGT	KC9LZ
VP2MIU	AB1U
VP2MIX	WØIJN
VP2MJI	W2BJI
VP2MKY	KY5R
VP2MM	AB1U
VP2MPB	N3CEX
VP2MSS	K3RMX
VP2MTY	WD4FHN
VP2VEG	WØDVZ
VP8KF	G3VPW
VP8LP	G3VPW
VQ9AC	KA3EDN
VR6KY	NE5C
VU2JXD	WB3TLB
VU2YOU	K4YT

CALLSIGN	QSL Via:
XE2FU	K5RC
XT2BJ	DL6FAL
YB2ARH	K2ROR
YS1LSR	VE3MFP
YVØAA	YV5AJ
Z21BN	K40AN
ZD8RC	ZDBAR
ZF2FL	N6RJ
ZF2GW	W2HPF
ZF2HL	K9QVB
ZF2HM	K9QVB
ZK1XL	ZK1CG
ZK1XR	W7XR

CALLSIGN	QSL Via:
ZLØAJW	W6REC
ZM7VU	F6DYG
ZS3E	K8EFS
ZS3GB	NØAFW
ZY8BI	PY8BI

That's it for this month. Good DX. Many thanks to QRZ DX, Long Skip, Westlink Report, VE3FRA, DX Report, CQ Magazine and QST for some of the material appearing here.



MOOSE JAW CLUB AWARD

The Moose Jaw Amateur Radio Club is pleased to announce that the 60th Anniversary Award, first announced some time ago, will continue for awhile longer. The applicant for the award is required to work any two Moose Jaw Club Members, on HF bands only, on any mode. Complete log data, along with \$1.00 for handling costs, is required. The mailing address first announced has now been changed to: The Award Manager, Moose Jaw Amateur Radio Club, P.O. Box No. 231, Moose Jaw, Saskatchewan, Canada.

Draft Amendments

CARF DOC Liaison Officer Art Stark VE3ZS has presented the Department's head office with draft amendments to the Radio Regulations and Radio Act which formalized changes recommended by the 1983 and 1984 CARF National Amateur Symposiums. Art's many years experience in DOC enable him to tackle the task of rendering the recommendation into the complicated and detailed format that is

required for amendments. If the DOC wishes to proceed with them, the CARF submission should save a lot time for the Department. In the meantime, those amendments which the DOC put up for public comment away back in January 1982 are still in the Privy Council office awaiting its blessing or other wise.

CARF News Service

CARF Publications Committee

In the past few years, the variety and volume of publications by CARF has increased drastically. The Canadian Amateur Reference File alone has nine sections available with eight more in various stages of being published. The two study guides, Amateur and Advanced, require revision after each new TRC-24 comes out, and the Regulations Handbook must be updated to agree with all the changes in the last TRC-24 and TRC-25.

Up until now, all the work for these projects has been done by the General Manager and other executive members. The task has now become too onerous for a volunteer organization and a special committee has been formed, under the chairmanship of John Iliffe VE3CES, Ontario director, and consisting of Geoff Smith VE3KCE, Ontario director, Bob Bell VE3NZQ and Steve Holland VE3LLD.

The purpose of the committee will be to examine the existing publications, updating or deleting them as necessary, to acquire new material for publication either in the Reference File or as book material, and to enhance the appearance and marketability of the existing publications.

All of this must be done, of course, without significant increases to costs as publications are expected to stand on their own feet and perhaps turn a small profit.

The committee has met and is investigating a few possible ways to carry out its mandate, but if you have seen or own a CARF publication (other than TCA of course, which has its own editorial board!), can you drop a line to the committee c/o J. Iliffe VE3CES, 387 Selby Cr., Newmarket, Ont. L3Y 6E2, and give your impressions, suggestions and comments.

We will be reporting in TCA from time to time on the materials

becoming available, on the revisions and updating to existing materials, and on the general activities of the committee.

Initial discussions have suggested that a qualified author is required to write a Study Guide for the Digital licence, and several new sections are needed for the Reference File.

If you can write for any of these, or have an idea you think would make a good publication for Canadian Amateurs, please drop a line to address above, giving the title, an outline of the expected content and a few sample pages. The committee will reply promptly indicating if we can use it and other details.

All material used by the CARF Publications committee is paid for, the amount depends on many fac-

tors, such as length, expected sales, etc. You won't get rich but you will be able to afford some typewriter ribbons and paper!

If you can't write, but you have an idea for a manual or guide that you feel would be of interest to other Canadian Amateurs, drop us a line and we will try to find an author for it. Preference is given to topics that are uniquely Canadian, (arising from the liberal regulations here for example), or which are not covered adequately in existing manuals.

In the coming months we hope to provide high quality readable manuals on interesting and unusual topics at an affordable price. A tall order, but one the committee is confident we can fulfill.

Affiliate Clubs Program

Dear Fellow Amateurs:

I have been responsible for the CARF Affiliate Clubs Program for the past three years. During that time, the number of affiliate clubs has grown from 65 to more than 130. I am pleased that one member of each club has taken the job of CARF Rep.

The idea was to use this service to help clubs and to encourage discussion of material of interest to Amateur Radio. Last September, we undertook an update of affiliates and representatives. With this done, I feel it is time for someone else to take over the program. It is best to have someone who is familiar with it. Thus I would hope one of our CARF representatives or, in fact, one of our affiliate clubs, would wish to continue running the program. As CARF grows, it is necessary that the responsibility for programs be delegated. Also, a new person has fresh ideas and can improve on what has been established.

I am retiring from office in the Federation this June. Thus, I encourage a member or group of members to volunteer to manage the program.

Sincerely,
Ron Walsh VE3IDW
Vice-President, CARF

ANTI-TOWER BYLAW

With the proliferation of satellite receiving dishes, many municipalities are concerned about the eyesore they present. Councillors, who are usually ignorant of Amateur radio and federal laws, are quick to pass by-laws restricting all antennas. The Ontario city of North York is the latest on the scene but briefs presented by CARF and CRRL officials and other Amateurs at a February public meeting succeeded in convincing the councillors to return their proposed restrictive by-law to their legal officers for advice.

CARF News Service

Cable TV QRM prompts intervention at Vancouver CRTC Hearing

Vancouver Amateurs presented briefs protesting cable television interference to the Amateur Service to the Canadian Telecommunications Commission hearing held in that city in February. The hearing, held to listen to a request for the renewal of the licence of Rogers Cable TV company, heard interventions by John Nightingale VE7AOV on behalf of the B.C. FM Communications Association, Bob Smits VE7EMD for the B.C. Provincial Emergency Program, Walley Garrett VE7CJT for the Burnaby ARC and Cliff Grandbois, VE7ATZ.

The main thrust of the BCFMA presentation was that the question of levels of radiation escaping from leaky cable plant was not a point of argument but rather that the harmful interference caused by leak was the real issue. This QRM, which in one case interfered with the formal Amateur emergency frequency, is illegal under the laws of Canada and the level at which it exists is immaterial. At one point in the verbal presentation, the question was put to the Commission that, in view of the continued illegal interference by the company and the seeming lack of any enforcement... which would certainly be taken against any Amateur who was creating harmful interference... was there in this country in this matter, one law for the Amateur Service and another for the cable companies? The CRTC, it was claimed, should not license a cable companies, which by creating illegal interference, was in effect flouting the laws of Canada.

The Commission asked the Amateurs if the cable company ceased to use the interfering channels if this would clear the matter up with the Amateur operators.

The intervenors agreed that it would but the response by the company representatives did not encourage much hope of such a solution. The attitude of the written company was well expressed when one of its executives noted that, in the mistaken idea that cable and the Amateur Service should share the radio spectrum, he said the 'public interest' as personified by the 250,000 viewers of his system should be stacked up against the 500 Amateurs in the area.

The BCFMA brief was sent to CARF News Service and it is reprinted here for the information of other clubs who may be contemplating an intervention. CRTC hearings, by the way, are scheduled for Halifax, May 14th; Toronto, May 15th; St. John's, Newfoundland on May 17th; Ottawa/Hull again on June 5th; Victoria, June 19th; Regina, June 20th, Quebec and Windsor, both on July 4th. To find out whether or not these hearings will involve local cable TVL companies, write to the CRTTC at number 1, Promenade du Portage, Hull, Quebec, K1A 0N2.

Here is the BFMA brief:

The British Columbia Frequency Modulation Communications Association is an organization of radio operators operating stations in the VHF region and above. These operators hold Digital, Amateur or Advanced Amateur Certificates of Proficiency in Radio granted by the Department of Communications of Canada.

From the beginning of radio, Amateur operators have formed a pool of technically sophisticated talent. This pool develops at no cost to the community yet produces technicians and operators with training and orientation valuable in industry and the military and available to

the community in civil emergencies.

Amateur Operators have a long and distinguished history of technical innovation and public service. From pioneering the short, 'unusable' wavelengths below 200 metres to today's Amateur-built and operated satellites, the hams have explored their spectrum and developed hardware and techniques to use it. (At the time of writing, confirmation had just been received that a local operator had managed to work station W5LFL, the mobile station in the last space shuttle.)

The two metre band is one of the most active spectrum areas for Amateurs for technical work, public service and operating skills development. Here in Vancouver, many operators use this area for fixed station and mobile radiotelephone, FM repeater station operation, side-band long distance operation and radioteletype. This area is also used for EME experiments and meteor scatter propagation. (Last fall, long distance openings to California were exploited.)

A packet radio group was formed in Vancouver which built hardware and developed software which advanced the state of the art. No equivalent commercial equipment existed at the time. The hardware and software have become an international standard. This group now has in operation one of the first packet 'repeaters' in existence. It operates in the two metre band.

The two metre band is the band of choice for public service operations by local Amateurs. An organization has been developed in Vancouver from such operations which is ready on short notice to set up a communications network complete with a portable repeater, UHF communications links and experienced control operators for use in

civil emergencies.

The interest of the Association in the licence of Rogers Cable TV—Vancouver, is in the jamming of its members' stations, both fixed and mobile, by Rogers Cable TV—Vancouver.

Many hundreds of interference sources exist in the two metre band in Vancouver. These radiations emanate from the plant of Rogers Cable T.V.—Vancouver, which transmits a video carrier and the associated sidebands on Channel E (18).

The fact of jamming by Rogers Cable TV—Vancouver, is not denied. Interfering with a radio service is strictly prohibited in Canada (Radio Act, 9.(1). Regulations made under the Radio Act do not permit this and the regulations specific to cable operators, Broadcast Procedure 23, are quite clear on the point (3.12).

A study of the correspondence from the Applicant shows repeated attempts to represent that the interference problem is insoluble immediately because it is related to the inadequately maintained hardware of the Applicant. Factually, the interference may be ended immediately by ceasing the transmission on the plant of the interfering signals.

It is the position of the Association, therefore, that Rogers Cable TV—Vancouver must cease use of the interfering frequencies until such time as its plant is capable of carrying them without interfering with VHF radio stations.

It is an uncomplicated concept!

In reviewing correspondence from the applicant to the Association, the Commissioners will note two allusions by the Applicant to it being a radio spectrum user. The Association would greatly appreciate a statement from the Commission reminding the Applicant that Rogers Cable TV—Vancouver does not hold a licence to broadcast and has no rights to spectrum space whatsoever. Operators of Amateurs and other VHF stations share their

spectrum with no one and never have. (We do have some bands which are shared with other *radio* sources. Ed.) Indeed, Canada is the signatory of an international convention allotting the band from 144 to 148 MHz exclusively to Amateur use. (In ITU Region 2. Ed.)

In Decision 82-889, the Commission took note of the interference that Amateurs were subject to in Halifax, Nova Scotia. The data presented in that intervention were of interference only. The Association's Interference Committee undertook, on three evenings, to produce superior data.

Interference sources in Vancouver were so numerous that cataloguing them all would have been a long, long process (they number in the hundreds if not thousands). Not only are interfering radiations not permitted at any field strength, but radiations exceeding a certain field strength are forbidden absolutely. The Association therefore presents a listing of those radiation violations encountered during three evenings of driving about the city. Note, these are only the jamming sources which exceeded 10 uV/m, the maximum radiation limit; interference of any field strength is prohibited.

In presenting these data, the Association states clearly that *absolute levels* of radiation of themselves are not of concern to the Association but rather *interference*. As the Commission will recognize, sources of interference may well have levels very far below the maximum for radiations not causing interference. Neither class of radiation is, of course, permitted.

These patrols were made with apparatus set up in conformity with Broadcast Procedure 23 requirements for monitoring absolute levels of radiation. The apparatus was set up, calibrated and operated by an engineer who is employed in research and development of VHF and UHF mobile radio. The data have been certified by a Professional Engineer registered in British

Columbia. The Association may state unequivocally that Rogers Cable TV—Vancouver is in gross violation of Broadcast Procedure 23 absolute radiation limits as well as having hundreds of other interference sources, many of which may also far exceed the limits for field strength set for non-interfering radiations.

The results of these patrols were astonishing. A summary of the data appears below and in tabular form in Appendix A.

—Of the interfering areas encountered, 199 were found to exceed the intensity of 10uV/m (the level permitted to non-interfering sources.)

—The average intensity of these 199 interfering fields was 463% in violation

—The intensity of 14 of the interfering fields was ten times or more the absolute maximum permitted and for three of the fields, 20 times or more the non-interfering maximum.

As an indication of the problems faced by users of techniques other than F3, a copy of a letter from Mr. Neugebauer is appended (Appendix B). Mr. Neugebauer, an able technician, looks forward to the day when his home-built 700 Watt VHF station is on the air. Though problems internal to the operation of the Applicant's plant are not Mr. Neugebauer's concern as a radio operator, he is, as a citizen, concerned about the kind of service his neighbourhood will receive from the Applicant when he goes on the air.

Though at the moment there are few high-power two metre experimenters, their number may be expected to increase with the advent of the more sophisticated Amateur satellites; indeed, if Amateur geo-synchronous satellites should use a two-metre uplink, the number of operators using a kilowatt of power will increase very rapidly.

Higher powers are now increasingly in use by mobile stations. The Commission will understand that

each of the hundreds of sources of jamming to the Amateurs operating mobile stations is a source of interference to the Applicant's customers.

The Applicant has had ample opportunity to cease his jamming of Amateur VHF stations and has not done so.

Having regard to the above, the British Columbia Frequency Modulation Communications Association therefore *opposes* the renewal of the licence of Rogers Cable TV—Vancouver until such time as Rogers Cable TV—Vancouver undertakes to operate its plant in conformity with sound engineering practice and in conformity with the laws of Canada.

Jim Nightingale VE7AOV
for the BCFMCA

QUEER CALLS FOR QSL COLLECTORS

The DOC has come up with some of those anniversary commemorative prefixes which delight those who collect and print QSL cards. Yellowknife, N.W.T., will blossom forth with CJ8 from June 23 to July 6 and Ontario Amateurs can use XO3 for the month of July. Cornwall operators can astound and amuse their listeners by their choice of one or all of three prefixes this July—the usual VE3, the special X03 and from July 14 to July 29, XK3 for the city bicentennial. They may even have a fourth one because a special Canadian prefix may be available from July 20 to August 20.

CARF News Service

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(For TCA Subscription problems, call the Kingston office 613-544-6161 anytime. For enquiries and membership information, please quote top line of TCA label.)

Ham in Space again?

Within the next 18 months, ham radio may be invited to fly along on two shuttle missions. This information was made public after a meeting at the Johnson Space Center in Houston, Texas, on Friday, March 9th.

Attending the discussion session were NASA officials and astronauts Owen Garriott (W5LFL) and Tony Englund (W0ORE)... At the meeting, Englund indicated his intention to operate from space during Flight 51B in November of this year, if NASA will grant him permission to do so. This will be the Spacelab-3 mission, using the orbiter Challenger to carry the European Space Agency payload into space.

If this operation is approved, Englund wants to make some innovative changes to Amateur operation from earth orbit. In addition to the flight-proven two metre

FM station, he wants to add a 10-metre transceiver. Dr. Garriott feels that this would give almost world wide communications from any point in orbit.

Secondly, the two-metre station may be 'automated' so as to permit unattended operation at times when he is busy with other duties. This could be as simple as setting it as a 'beacon transmitter' for soliciting SWL reports, or possibly as a completely automated station, capable of two-way voice QSOs.

There is also the possibility that another "ham in space" operation could occur on Flight 51F, scheduled for March, 1985. This will be the Spacelab 2 mission.

(Ed. Note: The nomenclatures are correct. According to the official NASA Shuttle Flight and Crew Assignment Guide, Spacelab 3 flies before Spacelab 2.)

from 'Westlink Report'

Social Events

May 12— 3rd Ann. Ham Radio Flea Market, Halifax-Dartmouth Clubs. St. Andrew's School, Bayer's Rd., Halifax, N.S. Admiss. \$2. Info: George Snow (902) 861-2393.

May 20— Flea Market sponsored by the Southern Ont. Repeater Team Inc.

May 25, 26— Airforce Telecommunications Reunion to honour the 50th ann. of airforce comm. Cdn. Forces School of Comm. & Electronics at Kingston. Info from: Reunion Committee, CFB Kingston, Kingston, Ont. K7L 2Z2. Reservations \$10 (refundable).

May 27— Quebec Hamfest, Curling Club, Place du Centre Civique Tracy. Flea market, contests, exhibits, VE2CBS Field Day Antenna.

June 2— Cent. Ont. Fleamarket and computer fest, 8am-4pm, Regal Hall, 340 Woodlawn Rd. W., Guelph. Admiss. \$2. Displays,

refreshments, prizes. Info: Guelph ARC, Box 1305, Guelph, Ont. N1H 6N9.

June 30— Saskatchewan Hamfest. (Registration the night before.) Prizes, contests, displays, ladies program, banquet. For more details contact the Hamfest Committee at Box 6, Swift Current, Sask. S9H 3V5.

July 14— 10th Annual Ontario Hamfest at Milton Fairgrounds hosted by Burlington ARC.

(If your organization is going to have a gathering of more than just local interest, such as an area flea market, auction, hamfest, convention, picnic or whatever, let us know and we'll publicize it. Notice MUST be received at least TWO MONTHS before the event to meet our publication deadlines. Write: Editor, TCA Magazine, Box 2610, Station D, Ottawa, Ont. K1P 5W7.

Amateur Radio operators sign pact with ADS

Calgary Key Klix

Municipal and provincial disaster services officials will be able to tap into the Amateur Radio network as a back-up means of communications in the event that an emergency temporarily shuts down or overloads telephone lines.

Officials of Alberta Disaster Services (ADS) and the Alberta Amateur Radio Service (AARCS) have signed a memo of understanding in which the two organizations agree to work together to establish emergency communications in a disaster.

Ken Sheedy, the ADS communications officer, has worked with AARCS representatives in coming to the formal agreement and says real-life scenarios in the past year have shown how valuable access to the Ham network would have been when phone services were out.

In April, a snowstorm in southern Alberta knocked out telephone service for about nine hours and caused a power outage for up to two days in the Nanton area. At High River, a ham operator activated a two-metre band network and set up communications with radio operators in the Nanton, Lethbridge, Cardston, Vauxhall, Calgary and surrounding districts. Had a major emergency occurred, communications capabilities would have been in place.

On another occasion last spring, a telephone booster station located on a B.C. mountain was out of operation for a time, leaving telephone communication temporarily out of service between Edmonton and the Yukon. The federal communications department contacted Roy Ellis, emergency communications co-ordinator for AARCS. Within 30 minutes, communications were established with Whitehorse. Through the use of telephone-

patch equipment owned by ham operators in Edmonton and Whitehorse, officials in the two cities could, in fact, speak to each other over their phones.

The AARCS organization of emergency network ham operators was established more than 20 years ago during wartime preparations at the urging of Alberta Civil Defense. At that time, civil defense officials established a high frequency radio station at their headquarters, licensed with the call sign VE6ACD, and a co-operative relationship was in place between emergency officials and the Amateur Radio operators.

As other forms of communication improved over the years, officials placed less emphasis upon Amateur Radio as a means of emergency communications.

Now that the agreement between AARCS and ADS has been formalized, Alberta Disaster Services will outfit its Amateur Radio station—to be operated by an AARCS member in an emergency—with upgraded radio equipment.

ADS will also have on record the name of each AARCS volunteer member, his location and the type of equipment he operates. A province-wide directory of AARCS members will be sent to municipal directors of disaster services.

"To rely only on landline communications is utter folly," Mr. Sheedy stresses. "Alberta Disaster Services will continue to emphasize the value of Amateur Radio as a resource in coping with emergency response."

He says officials were pleased that 400 of more than 2,000 Amateur operators in the province have shown interest recently in joining the emergency network. "Alberta Disaster Services forecasts that 250

would adequately cover the needs for this back-up capability."

ADS and AARCS representatives also agreed to participate in co-operative exercise and training programs. In October, ADS provided its Mobile Emergency Operations Centre (MEOC), a 40-foot trailer which can serve as an emergency communications headquarters, and a portable power generator to Amateur Radio operators who were establishing communication links throughout the province in a simulated emergency test.

Mr. Sheedy says the new arrangement between the provincial government and Amateur Radio operators in Alberta is a positive one, second only to ham arrangements with Quebec's Bureau de la Protection Civile.

Submitted by Ken Oelke
Calgary Emergency Co-ordinator
(Courtesy Disaster Services News and Notes)

Interference Telephones

Several of the Club members pointed out at the Jan. 23 meeting another area where interference problems are surfacing: the increased numbers of non-'Bell'-type telephones in operation today. Rodger VE3BTH advises that many of these units are susceptible to RF interference and, since it is non-Bell equipment, they will not supply RF suppression units for these units. Just another area to watch out for when investigating a complaint re signals heard in a telephone handset.

In a similar vein, it was also brought to our attention by Bill VE3MWZ that the telephone amplifiers installed to aid those with hearing difficulties have a tendency to pick up RF.

from 'Hot Bananas,' Oakville ARC.

Winnipeg Senior Citizens VE4WSC Club Inc.

What is New Horizons? It is a unique program developed in 1972 by the Department of Health and Welfare to encourage retired Canadians to become more actively involved in their community. The objective is accomplished through the distribution of cash grants to groups of older people to provide them with an opportunity to share their interests, skills and talents. These projects are intended to benefit the participants and others in the community.

Here are a few of many such projects under way: In Saskatchewan an old abandoned CN Station has been renovated by retired persons and is being used as drop-in center and Tourist Information Bureau.

In Scarborough, Ontario, through the efforts of retired writers, poets, journalists, illustrators and other interested persons, a literary magazine is being published.

In Winnipeg, a group of Radio Amateurs have, thanks to a grant from New Horizons, set up a Radio Amateur Station which will include a computer and printer. It will, when complete, be equipped to work the satellite Oscar 10; and also moon bounce.

A code and theory class got under way on March 9 with ten members enrolled— nine actually attended the first class. Albert Diamond is teaching theory and Karl Nemex is teaching code. The station is manned during the day so that budding Hams can get their feet wet and learn to operate. Others can just listen to short wave if that is all they want to do.

The plan is also to help handicapped persons to get their ticket and join the ranks of Radio Amateurs. Getting into Amateur radio is not easy. You have to be able to

send and receive Morse Code at ten words a minute and pass a stiff examination in theory and regulations. To become an advanced ham you have to send and receive 15 words a minute and also pass theory and regulation tests. So a person has to be really motivated to make the grade. However, with persistence and determination it can be passed at any age.

Amateurs have a world-wide reputation for community service in setting up emergency communications in times of crisis. In the Red River Flood in 1979, the Winnipeg Amateurs, set up a 2-metre network throughout the flooded area and manned the stations night and day until the crisis was over— almost three weeks. Operators who gave of their time received a certificate of thanks from the Manitoba Government.

Radio Amateurs, as a group, are keenly motivated, and are not nonplussed by obstacles and difficulties. They are innovators, and many of the frequencies now used by commercial broadcasting stations were once regarded as being useless. Therefore, being future-oriented themselves, many of them are able to inspire and encourage others.

There is well-documented evidence that the retired person is less apt to get sick if he has something to do that is of vital interest to him. Even a person with a serious illness will recover much more quickly if there is something he still wants to accomplish. On the other hand, another person with no ambition or vital interests will succumb to his illness or become a ward of a nursing home. And that is hard on tax dollars.

Albert Diamond VE4AIP, the president, did much of the spade work in getting things in motion for

the development of the station. Joe Ozero VE4IO is treasurer and keeps a tight rein on how and where money is spent. Keith McConnel VE4BC is public relations and secretary; Gil Frederick started out as secretary but Gil, being editor of QUA, has many demands on his time but he comes whenever he can make it out executive meetings. Charlie Harvey VE4FG, second in command, is an excellent photographer and has kept a record of the work as it progressed. Bill Kinash VE4MZ, the man with the technical know-how, keeps the equipment in good shape. Bert Anderson VE4NP is technical advisor and is in charge of setting up an Oscar station. Bert, by the way, is in the process of building his own Oscar station.

All others in the Club have taken a keen interest in the development of the station, it has been a team effort. We hope to make our station a model of its kind so that New Horizons will not hesitate to fund other Radio Amateur groups who are interested in community work and are willing to share their skills and talents with others.

Lou Curtis VE4AEM

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Let Amateur Radio equipment dealers know that you saw their ad in TCA— The Canadian Amateur Radio Magazine!

CARF Annual General Meeting

The CARF Annual General Meeting will be held Friday, June 22 to Sunday, June 24 at the Park Lane Hotel, 111 Cooper Street, Ottawa, Ont.

Morse Code

By S.G. 'Spud' Roscoe
VE1BC

The many articles in the February 1984 issue of TCA on morse code were most interesting. Many Canadians, especially the illustrious leaders of the Canadian communication community, can neither understand nor appreciate the truth in these articles. Canada is the only nation whose marine radio operators do not meet the criteria as laid down by international agreement via the International Telecommunication Union. We few experienced Canadian Radio Officers avoid these stations if at all possible. The station at Bermuda has been a favourite of mine for years. Canada is the only nation whose government will give the ship owner permission to sail without CW and a proper Radio Officer. These ships are nothing but a nuisance and a menace to the marine community. This is the reason the FCC will not tolerate any more discussion on the idea of removing CW from the American Amateur Radio Community.

There have been far too many hair-raising experiences around this coast. This makes this move by the FCC a very wise decision. Two foreign ships stopped alongside the burning Canadian ship *Hudson Transport*, but were unable to establish contact on the distress frequency of 500 kHz, so felt that no help was required. They simply continued on their way, leaving this crew to fend for themselves. The Captain of the Canadian ship *Maurice Desagnes* had his radiotelephone stuck between the AM and SSB mode of operation, effectively disabling this unit. Fortunately for this crew, the Captain realized his error in time. They managed to alert HMCS *Huron* who happened to be in the area.

Huron still had time to lift this crew off with her helicopter. The *Maurice Desagnes* sank 20 minutes after the last man was lifted off. A bit close for anyone's comfort. There have been others, but for the sake of space I will keep them to a minimum.

The Canadian fishing vessel is the only large fishing vessel that is not equipped with CW and does not carry one of the better Radio Officers of any nation. Depending on experience, education and qualifications, these Radio Officers can and do become Electronic Officers capable of major electronic repairs within the vessel. The Japanese outfit and carry these people in all their fishing vessels of about 280 gross tons or more. All ships are measured in tons; the amount of gross tonnage is the more common figure designating a vessel's size.

I believe this was the main cause of the Canadian fishing vessel *Cape Beaver* (1,000 gross tons) running down and sinking the Canadian fishing vessel *Margaret Jane*, resulting in a loss of four lives, one a 16-year-old high school student. There have been too many accidents in the Canadian fishing fleet and the Canadian fleet as a whole.

A year ago, Misener Steamships of St. Catharines, Ont., built three new Canadian ships in Scotland when our own Canadian shipyards hardly existed for want of work. These three have no CW nor proper Radio Officer. Many Canadian ships that have CW no longer carry a Radio Officer. They make many foreign-going voyages. Tune in 2182 kHz USB and listen to these misled souls trying to maintain contact with Canada. We all know one is capable of fairly long communication on this frequency under ideal conditions, which are very rare. To

use this as the sole outside link from any ship is ridiculous.

A couple of months ago, the cargo in a ship off this coast shifted and the Korean crew had to be evacuated. This ship was properly fitted and carried proper Radio Officers where they are definitely needed. The many radiotelephone stations make it convenient for any ship to wander around this coast like a CB-equipped garbage truck, but in practice this is very dangerous both to the Canadian ship and the many well-founded foreign ships they encounter.

COMPUTER QRM?

In another look at interference problems, it would help CARF representatives on the RABC if Amateurs would write to Barc Dowden VE3TT, on interference from home computers to Amateur equipment and vice versa. Reports should detail the Amateur frequencies involved, the proximity of the computer and transmitter and the power of the latter. Names and models of both should be included. Write to Barc at 29 Pellan Crescent, Kanata, Ont. K2K 1J7.

CARF News Service RABC LOOKS AT CABLE QRM

Cable television interference to the Amateur bands and other services were on the agenda of the Interference Committee of the Radio Advisory Board of Canada (RABC) when it met in Toronto April 4. Art Stark VE3ZS attended, pinch-hitting for Barc Dowden VE3TT, who had previous commitments. Barc is chairman of the CARF Interference Committee and represents the Federation on the Board.

CARF News Service

Technical Section

COCO builds an Antenna

By John W. Ficner VE3DQM

Undoubtedly, at some time, the desire has been with you to build your own antenna— whether it be an elementary dipole, or a six-element beam. Perhaps you require a specific length of feedline, or need a coaxial balun for a two metre yagi. Well, search no more, for here is a short program that will assist you.

This program is written in Microsoft Basic for the Color Computer. It will work on a 16k extended basic system.

About the program, it was originally written in Fortran a few years ago, but will get more use here in the shack written in Basic. For that reason, the original program has been extensively modified. (In fact, it hardly resembles the original program at all.)

Several options are available. The main menu asks for a choice of coax, twin lead, tubing, or wire. Sub menus then allow you to select the type of coax or twin lead. When a request for tubing is input, you will be prompted for the diameter of the tubing, and the desired operating frequency. All of this is just so you won't have to look up the velocity factor in your misplaced handbook. Now that you have made your choice, let's put some meat on the bones.

The next prompt is for the desired operating frequency— in MHz please! Otherwise you will need a backyard on the prairies. Lo and behold, there's the lengths for a

full wavelength, a half wavelength, and a quarter wavelength, with the velocity factor included. But wait... it's in feet and inches! Well, that's

the way MY computer works best. That's it! Take a few moments to key it in, it could save you a lot of frustration later on.

```
10 :ANTENNA PROGRAM
20 * THIS PROGRAM CALCULATES ANT
ENNA AND TRANSMISSION LINE
30 *LENGTHS FOR FREQUENCIES BELOW
W 1000 MHz.
40 *SELECTABLE VELOCITY FACTORS
ARE INCLUDED.
50 * J. W. FICNER VE3DQM
60 * 88 HARROLD PLACE
70 * OTTAWA, ONTARIO K1Z 7N8
80 * 29 DEC 1983
100 F=0:VF=0:GOSUB1000
110 CLS:PRINT"VF = "VF
120 *GET INFORMATION
125 IF F <>0 GOTO 150
130 INPUT "DESIRED FREQUENCY ";F
140 *CALCULATE LENGTHS
150 L=(984.*VF)/F * FULL WAVE
LENGTH
160 WL = FIX(L) * FEET
170 WI=(L-WL)*120/10 * INCHES
180 H=(492.*VF)/F * HALF WAVE
190 HL=FIX(H)
200 HI=(H-HL)*120/10
210 Q =H/2
220 QL=FIX(Q)
230 QI=(Q-QL)*120/10
240 CLS
250 PRINT@32,"FREQUENCY = "F
260 PRINT@96,"FULL WAVE ="WL"FT.
";:PRINT USING "##.##";WI;:PRIN
T " IN.
```

```

270 PRINT@160,"HALF WAVE ="HL"FT
. ";;PRINT USING "##.##";HI;;PRI
NT" IN.
280 PRINT@224,"1/4 WAVE ="QL"FT
. ";;PRINT USING "##.##";QI;;PRI
NT" IN.
290 PRINT@322,"ANOTHER (Y/N) ";
300 INPUT Y$;IF Y$="Y" THEN 100
310 PRINT@424,"HAPPY BUILDING"
320 END
1000 CLS
1010 PRINT@34,"1 - COAX
1020 PRINT@98,"2 - TWIN LEAD
1030 PRINT@162,"3 - TUBING
1040 PRINT@226,"4 - WIRE ANTENNA
1045 PRINT@322,"ENTER SELECTION
";
1050 INPUT TY
1055 IF TY <1 OR TY >4 GOTO 1040
1060 ON TY GOTO 1100,1200,1300,1
400
1100 CLS
1110 PRINT@34,"1 - RG58 RG59 R6B
RG11
1120 PRINT@98,"2 - RG58 RG59 FOA
M
1130 PRINT@322,"ENTER SELECTION
";
1140 INPUT TY;IF TY <1 OR TY > 2
GOTO 1130
1150 IF TY = 1 THEN VF = .66
1160 IF TY = 2 THEN VF = .79
1170 RETURN
1200 CLS
1210 PRINT@34,"1 - 300 OHM TWIN
LEAD
1220 PRINT@98,"2 - 300 OHM TUBUL
AR
1230 PRINT@162,"3 - 300 OHM OPEN
WIRE
1240 PRINT@322,"ENTER SELECTION
";
1250 INPUT TY;IF TY <1 OR TY >3
GOTO 1240
1260 IF TY = 1 THEN VF = .82
1270 IF TY = 2 THEN VF = .80
1280 IF TY = 3 THEN VF = .95
1290 RETURN
1300 CLS
1310 PRINT@32,"TUBE DIAMETER (IN
CHES) = ";;INPUT D
1320 PRINT@96,"FREQUENCY (MH
Z) = ";;INPUT F
1330 R = (492/F)/D
1340 IF R>9 AND R<20 THEN VF = (
(R-10)/10*.02)+.924
1350 IF R>19 AND R<100 THEN VF =
((R-20)/80*.02)+.944
1360 IF R>99 AND R<10000 THEN VF
=((R-100/9900*.014)+.964
1361 IF R<10 THEN VF=.92
1362 IF R>10000 THEN VF=.98
1370 RETURN
1400 VF = .95 :RETURN
2000 GOTO 2000

```

Curing Cable TVI

At my present location, my Amateur radio station includes a linear amplifier and a Heath model SB-200. When the linear is in use, a trace of TVI appears on the home television receiver. The television here is by cable T.V. The main cable line is hardline, and the drop wires are good quality— 75 ohm coaxial cable.

The solution to this TVI problem is quite simple, but ingenious, so I offer it to you:

A large ferrite core was obtained, and the 75 ohm coax line

was wrapped through the ferrite head. I put eight turns of coax on my core. A friend put 15 turns of coax on his ferrite head before his TVI completely disappeared. Simply detach the coax from the television receiver, make the number of turns on the core, and re-connect the coax to the receiver, with the core hanging right at the receiver.

To obtain the ferrite core to use in this manner, remove the inside core from a focussing yoke on a

scrapped television receiver. The usual safety precautions must be observed when sliding the yoke off the neck of the television tube. For a number of years now, the inner core of the yoke has been ferrite material, in two pieces. When the core is in hand, use masking tape to maintain it in its circular shape so that it resembles a large ferrite 'bead'.

John Lestin VE3MB
Cloyne, Ont.

from an idea by
Jim Balmer K4ISG

Swap Shop

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WANTED: Old tube model domestic or communications receivers. Buy, sell, trade. Morris Sorenson, 111 Town Line, Milton, Ont. L9T 2X1. (416) 878-5130.

FOR SALE: Drake equipment T-4XC, R4C, MS-4 with power supply, FS-4 synthesizer and E-TEK frequency readout counter. All with manuals and cartons. What offers— Whole or in part. Lincoln Wismer VE3LZT, 282 Rosemount Dr., Kitchener, Ont. N2B 1R8. 519-578-3582.

FOR SALE: HW-8 4 Watt Transceiver with power supply -3A and speaker and audio amplifier 1/2 Watt. \$250. postpaid. Only one year old. ERN, Box 252, St. George, N.B. E0G 2Y0.

FOR SALE: Dentron Amp. 160-10L- 4-572B's excellent condx, B.O. over 400.00; FT-101E 160-10M Transceiver, Cooling Fan, 12V cables, mike, Mint, B.O. over \$525.00; FT DX401- SSB-CW input 560 Watts PEP, manual, built-in solid state power supply, VW filter, blanker, cooling fan, desk mike, spkr., B.O. over \$300.00; **WANTED:** Linear for HF bands, 50 Watts out, one Watt in (i.e. Tentec 405 or equiv.) Also Autek QF1A. Roly Burley VE3GRL, P.O. Box 194, Bridgenorth Ont. K0L 1H0. 705-292-7352.

WANTED: Control Box for Big Talk (CDE 5 wire) Rotator. Dwight Morrow VE7BCU, Box 928, Chase, B.C. V0E 1M0 604-679-3551.

WANTED: Pre-1930 Battery Radios, crystal sets, magazines, tubes, by collector. A. Nolf, 620 Auburn Cr., Burlington, Ont. L7L 5B2. 416-634-3267.

WANTED: Illustration Book, 5 MGHZ Oscilloscope Heathkit 10-

4560, Buy/Borrow. C.P. Tremblay VE2DNO, 188 Durocher, Hull, Que. J8Y 2S8.

FOR SALE: I am still sending out my list of ham and computer items after shack cleanout. Send me a SASE for your copy. Monty Hart VE3TA, Box 359, Stroud, Ont. L0L 2M0.

FOR SALE: Heathkit HW101 with CW filter, HP23C power supply, HS1661 Speaker, HDP242 Microphone, asking \$475; Kenwood TS830S with YK88C & YG455C CW filters, SP230 speaker, AT230 Antenna tuner, MC50 microphone, cost new \$1900, asking \$1450; Kenwood TR7730 2M FM, Mobile mounting bracket, up/down microphone, cost new \$450, asking \$350; Hygain 18AVT/WBS 5 band vertical antenna, cost new \$160, asking \$110. Contact: Al Haines VE3NYV, 358 Fairview Dr., Brantford, Ont. N3R 2X8. 519-756-2576.

FOR SALE: Programs for Commodore 64 and Vic 20 Computers. Membership List, Ham Index, Contest Log, Sort, Mailing Label Programs. Programs for your specifications. VE3GIN Gord Mitchell, Bancroft, Ont. 613-332-2473.

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FOR SALE: Kenwood R1000 Communications receiver. Mint condition, only a few hours use. With manual, DC power cord, in original carton. \$500.00. Tom Atkins VE3CDM, 55 Havenbrook Blvd., Willowdale, Ont. M2J 1A7. 416-494-8721, after 6 p.m.

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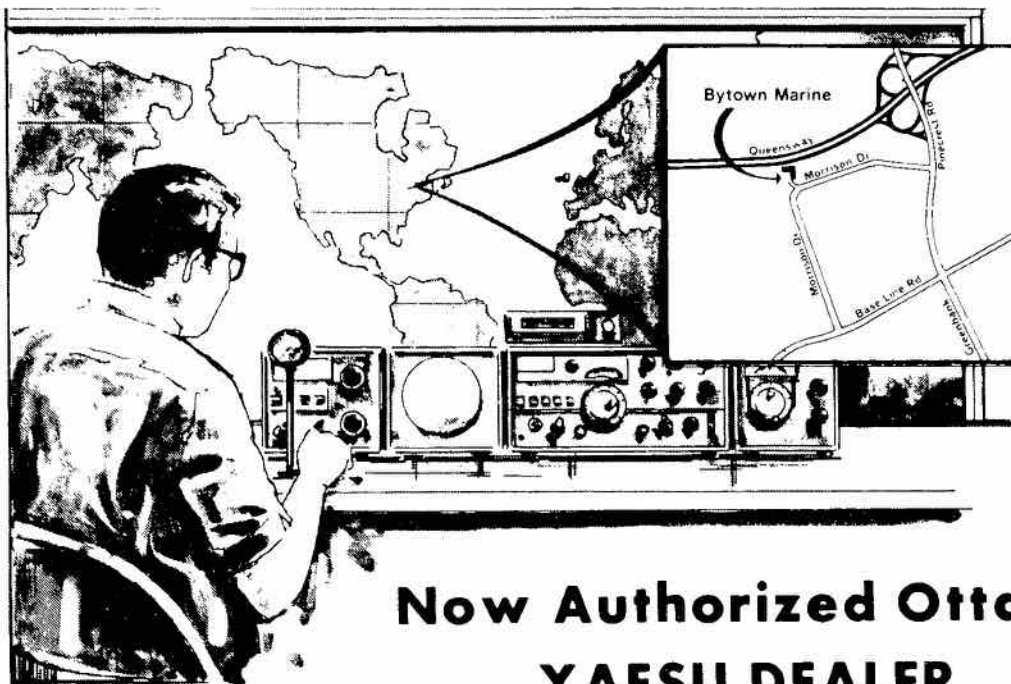
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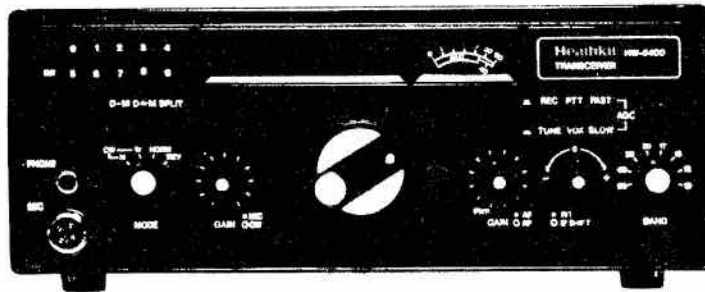
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