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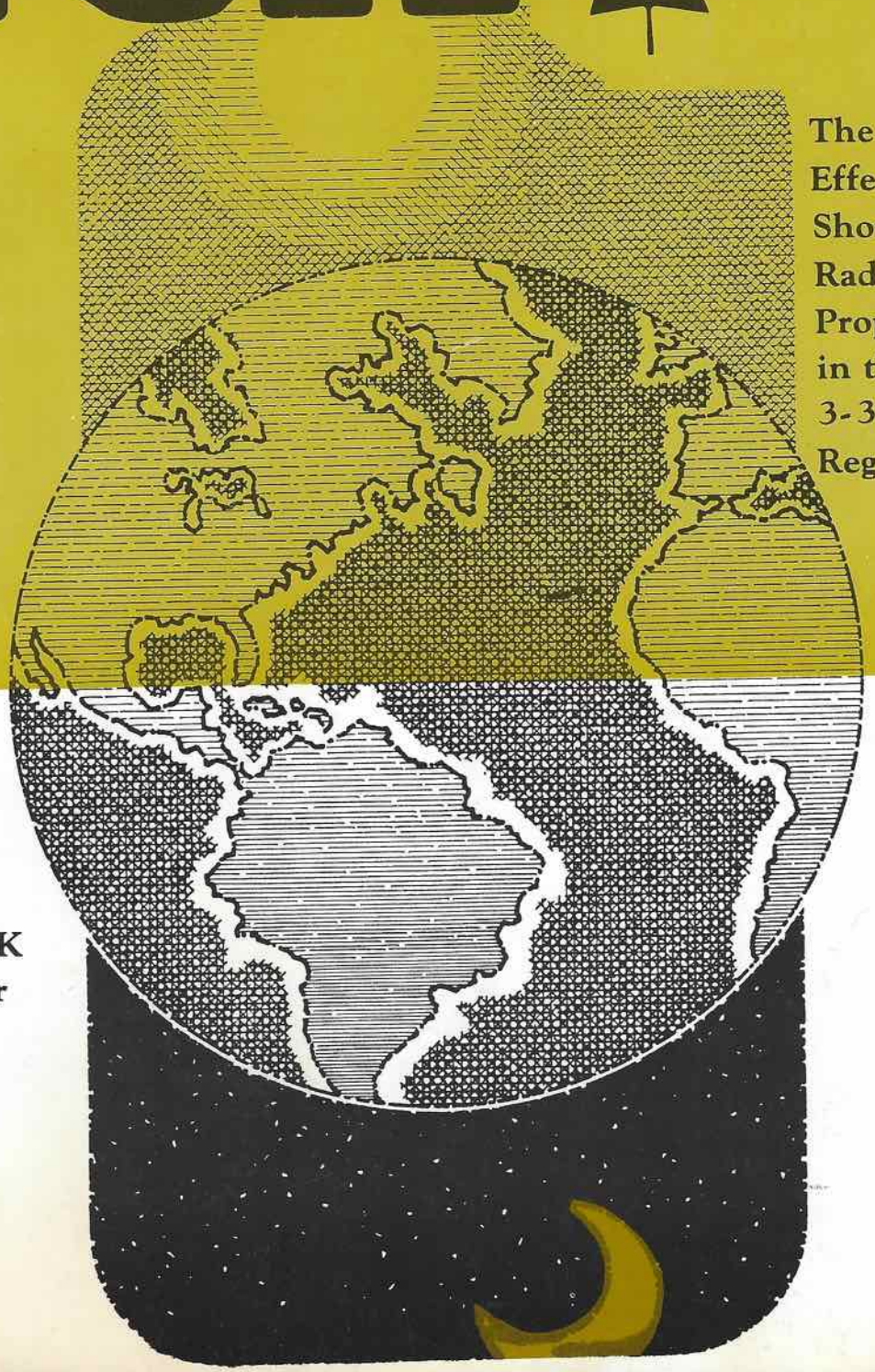
MARCH 1984

TCA

The Canadian Amateur Radio Magazine

La Revue des Radio Amateurs Canadiens



The Sun's Effect on Shortwave Radio Propagation in the 3-30 MHz Region—

Page 26

Plus

- **DX**
- **YL News**
- **The BRAK Computer**

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DESIGN AND PRODUCTION
County Magazine Printshop Ltd.
RR 1 Bloomfield, Ont.
K0K 1G0

Printed in Canada

ISSN 0228-6513

TCA

THE CANADIAN AMATEUR

CONTENTS

TCA— The Canadian Amateur is published in Canada 11 times per year to provide Radio Amateurs, those interested in radio communications and electronics and the general public with information on matters related to the science of telecommunications.

TCA— The Canadian Amateur is published by C.A.R.F. Publications Limited, 370 King St., P.O. Box 356, Kingston, Ontario, Canada K7L 4W2. It is available for $20 per year or $2.50 per copy. It is recommended by the Canadian Amateur Radio Federation Inc. and members receive it automatically.
Indexed in the Canadian Periodical Index: ISSN 0228-6513
Second Class Mail Registration Number 5073

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

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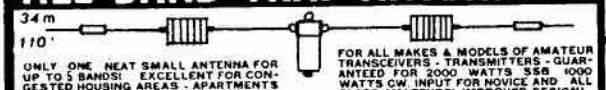

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TH5MK2S	w. BN-86, 5el. tribander, 10-15-20m,	$ 599
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TH2MK3S	2el. tribander, 10-15-20m,	$ 249
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103 BAS	3el. monobander for 10m,	$ 109
153 BAS	3el. monobander for 15m,	$ 149
105 BAS	Long John, 5el. monobander for 10m,	$ 229
12 AVQS	trap vertical, 10-15-20m,	$ 79
14 AVQ/WBS	trap vertical, 10-15-20-40m,	$ 99
18 AVT/WBS	trap vertical, 10-15-20-40-80m,	$ 159
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Model HF6V - Completely automatic bandswitching 80 through 10 plus 30 meters. Outperforms all 4- and 5-band "trap" verticals of comparable size. Thousands in use worldwide since December '81! 160 meter option available now; retrofit kits for remaining WARC bands coming soon. Height: 26 ft/7.8 meters; guying not required in most installations.

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RMK-II	roof mount + radials	$ 64
2MCV	2m co linear 3/2 wave	$ 59
2MCV-5	2m co linear 5/2 wave	$ 79

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ICOM IC-745

160-10 MTR 100W XCVR / 0.1-30MHz RCVR

The IC-745 represents a major breakthrough in the ham industry...a full featured HF base station transceiver with a combination of standard features found on no other transceiver in its price range.

Compare these exceptional standard features:

- 100KHz - 30MHz Receiver
- 16 Memories
- 100% Transmit Duty Cycle Transmitter with exceptionally low distortion
- IF Shift AND Passband Tuning
- Receiver Preamp
- 10Hz/50Hz/1KHz Tuning Rates with 1MHz band steps
- Adjustable Noise Blanker (width and level)
- Continuously Adjustable AGC with an OFF position
- Full function Metering with a built-in SWR Bridge
- Optional Internal AC Power Supply

Other Standard Features. Included as standard are many of the features most asked for by experienced ham radio operators: dual VFO's, RF speech compressor, tunable notch filter, all-mode squelch, program band scan, memory scan (frequency and modes are stored), receiver and transmitter incremental tuning and VOX.

ICOM's proven transceiver designs and technology are used in the IC-745 all ham band transceiver which includes SSB, CW, RTTY, AM receive and an optional FM **plus** a 100KHz to 30MHz general coverage receiver.

ICOM System. The IC-745 is compatible with ICOM's full line of standard HF accessories.

Accessories available include the IC-PS15 base supply, IC-PS30 system power supply (switching), IC-PS35 internal power supply, the IC-2KL linear amplifier, AT100 automatic antenna tuner, AT500 automatic antenna tuner, HP1 headphones, and HM12 hand or SM6 base microphone.

Options. The EX241 marker and EX242 FM module, plus a wide variety of filters for sharp audio reception are available.

Filter	-6dB Width	Center Freq. MHz
FL45	500 Hz	9.000
FL53A	270 Hz	9.000
FL44A	2.1 KHz	0.455
FL52A	500 Hz	0.455
FL54	250 Hz	0.455

The IC-745 is the only transceiver today that has such features standard...the number of options and accessories available...and such an affordable price.

ICOM
The World System

ICOM America, Inc., 2112-116th Ave NE, Bellevue, WA 98004 **(206)454-8155** / 3331 Towerwood Drive, Suite 307, Dallas, TX 75234 **(214)620-2760**

All stated specifications are approximate and subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions.

7451283

ICOM IC-R71A

The Best Just Got Better

IC-GC4
World Clock

ICOM introduces the IC-R71A 100KHz to 30MHz superior-grade general coverage receiver with innovative features including keyboard frequency entry and wireless remote control (optional).

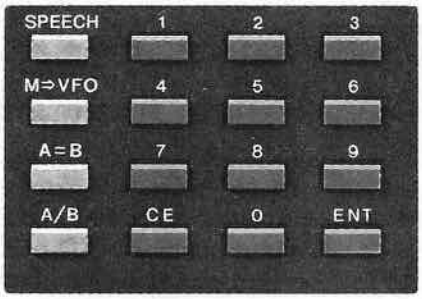
This easy-to-use and versatile receiver is ideal for anyone wanting to listen in to worldwide communciations. Demanding no previous shortwave receiver experience, the IC-R71A will accommodate an SWL (shortwave listener), Ham (amateur radio operator), maritime operator or commercial operator.

With 32 programmable memory channels, SSB/AM/RTTY/CW/FM (optional), dual VFO's, scanning, selectable AGC and noise blanker, the IC-R71A's versatility is unmatched by any other commercial grade unit in its price range.

Superior Receiver Performance. Utilizing ICOM's DFM (Direct Feed Mixer), the IC-R71A is virtually immune to interference from strong adjacent signals, and has a 100dB dynamic range.

IC-RC11
Infrared
Remote

Passband tuning, a deep IF notch filter, adjustable AGC (Automatic Gain Control) and noise blanker provide easy-to-adjust clear reception, even in the presence of strong interference or high noise levels. A preamplifier allows improved reception of weak signals.



Keyboard Entry. ICOM introduces a unique feature to shortwave receivers... direct keyboard entry for simplified operation. Precise frequencies can be selected by pushing the digit keys in sequence of frequency. The frequency will be automatically entered without changing the main tuning control. Memory channels may be called up by pressing the VFO/M (memory) switch, then keying in the memory channel number from 1 to 32.

VFO's/Memories. A quartz-locked rock solid synthesized tuning system provides superb stability. Three tuning rates are provided: 10Hz / 50Hz / 1KHz.

32 Tunable Memories. Thirty-two tunable memories, more than any other general coverage receiver on the market, offer instant recall of your favorite frequency. Each memory stores frequency, VFO and operating mode, and is backed by an internal lithium memory backup battery to maintain the memories for up to five years.

Options. FM, synthesized voice frequency readout (activated by SPEECH button), RC11 wireless remote controller, CK1 DC adapter for 12 volt operation, MB12 mobile mounting bracket, two CW filters FL32 — 500Hz, and FL63 — 250Hz, and high-grade 455KHz crystal filter FL44A.

ICOM
The World System

ICOM America, Inc., 2112-116th Ave NE, Bellevue, WA 98004 **(206)454-8155** / 3331 Towerwood Drive, Suite 307, Dallas, TX 75234 **(214)620-2780**

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IMPORTANT: For more surplus items refer to previous issues of 'TCA'. Very few items listed are stocked in depth, many one of a kind.

Oscilloscope rise time calibration kit. E H Research Labs model 6110 with tunnel diode pulser and 6 standards. Also included are cables, attenuator, adapter, calibration sheets and manuals. Provides nominal rise time of 100 to 5000 picoseconds plus fixed markers (time) at 1 nanosecond intervals. Designed for accurate calibration of high speed oscilloscopes etc. $125.00

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Model 310ABR 20Hz to 200KHz $40.00
Model 310AB 20Hz to 200KHz $40.00
Model 330M .2Hz to 20KHz $50.00
All units have calibrated adjustable high and low frequency cut off controls.

Small hand held video camera, black and white, RCA model BW001. With lens 16mm f1.6 ..... $25.00

Signal generators, Marconi TF801D, AM/CW. 10-470MHz in 5 bands. Seperate meters for modulation and carrier level. Calibrated attenuator, RF calibrator, hi and low output, Type N fittings, large 8" circular scale, size 22X14X19 deep. $150.00

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Tektronix oscilloscope plugins:
53/54D; 53/54E; 53/54G; 53/54T; 67; 2B67 ..... $50.00 each
1S1 ..... $125.00
3A1.....$ 75.00 3A1 missing some tubes/transistors $45.00

General Radio precision variable capacitors, with correction charts, 7x7x8 ins. Model 722D Max capacity 115 and 1150 pf; 722FS5 Max capacity 1400 pf ..... Either model $40.00

Experimenters: 4ft fibreglass parabolic dish. sprayed on metal coating requires replacing due to flaking off..... $10.00

Small chassis/panel unit 18x8x4 containing 9 tubes, 5 audio xmfrs, 6 pots, 6 phone jacks, switch etc plus one miniature 1½" round meter 0-8vdc. $2.00. Larger chassis/panel unit 18x8x8 containing 110v pwr supply, 16 tubes, 4 audio xmfrs, 2 audio filters, 6 pots, 4 rotary switches, 4 toggle switches, pilot light, components etc plus miniature 1½" round meter 50-0-50 ua. $3.50

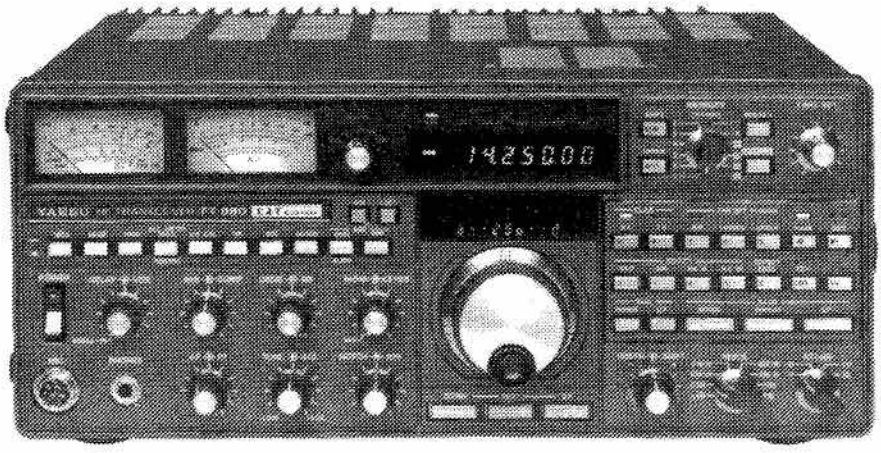
Nems Clark Model 1456A Telemetry receiver. 126-142 MHz. Variable band width 20-1200 KHz in 6 steps, crystal or manual tuning. Receives PM/ reshaped PM/ AM/ FM and 0L. With IF demodulator module plug-in model IFM 50/100; phase tracking module plug in model PTD; oscillator unit plug-in model OSK 100. Rack mounting 8½x19x15 deep. Built in speaker and power supply. Partial solid state..... $180.00

Nems Clarke panoramic spectrum display unit, Model 200-3. Rack mounting, 7x19x14 deep. 3" crt. Controls include sweep width and centre frequency. Accepts 30MHz input. $75.00

General Electric Halogen leak detectors. Portable case with carrying handle, 15x7x9 inches, 3" sq. meter, built in monitor speaker, air flow vacuum pump, leak detector probe and built in pwr supply..... $12.00

All items used surplus unless indicated otherwise. FOB Smith Falls. Ontario residents include 7% Sales Tax. Any queries phone or write (include stamp for reply). Save on calls, phone anytime before 8 a.m. or after 6 p.m.

FT-980



The FT-980 CAT* presents a new leap forward in the amateur field, incorporating an 8-bit microprocessor (80C85) for the highest level of built-in computer control ever offered in an all mode, all solid state HF transceiver.

The CAT Interface System

Now being introduced in the FT-980, Yaesu's Computer Aided Transceiver system is specially designed to provide for external microcomputer control of the FT-980 and other future Yaesu transceivers. Externally controllable functions include mode selection, IF passband control and frequency selection and storage functions. The number of compatible computer systems is increasing all the time as we develop new interfaces, and transceiver handling software is being made available through our dealers now.

Compatible computer systems now include:

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New

IC-751

HF Transceiver/General Coverage Receiver

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

$1794

$1999 (incl. p.s.)

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.

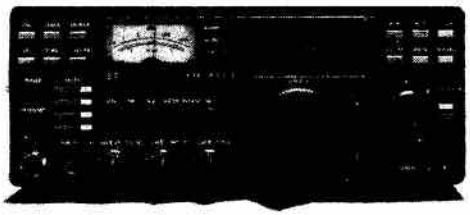
• 105dB Dynamic Range • 70.4515MHz First IF • Deep IF Notch • RIT With Separate Readout • Low Noise Preamp • Low IMD Transmitter • 100% Duty Cycle • 12VDC Operation • Quiet Relay Selection of LPFs • Monitor Circuit • Full QSK • Dual VFO With Data Transfer • 32 Tunable Memories • Internal Memory Backup • 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
CWN: FL52A, FL53A
AM: FL33

IC-271A

2 Meter/FM/CW/SSB



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- *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 flourescent 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"W x 4⅜"H x 10¾"D the IC-271A is styled to look good and engineered for ease of operation. • Computer Interface.

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IC-471A

430 — 450MHz/FM/CW/SSB

$1025

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- *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.

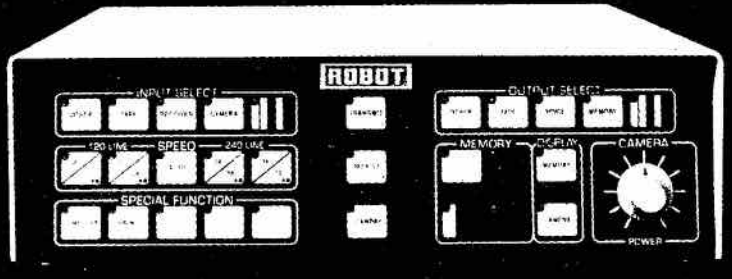
Scanning. Scanning of memories, programmable band scan, and mode scanning are available and easy to use.

New Size. Only 11¼"W x 4⅜"H x 10¾"D the IC-471A is styled to look good and engineered for ease of operation.

Dollard's Radio·West

810 S.W. Marine Drive, Vancouver, B.C. V6P 6E3
Telephone: 321-1833

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:

CQ ROBOT CO

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.

ROBOT

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.

ROBOT RESEARCH, INC.
7591 Convoy Ct., San Diego, CA 92111 (619) 279-9430

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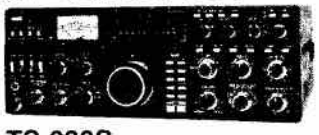
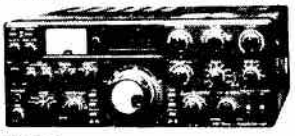


TS-930S

NEW

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

TR-2500



TS-830S

TS-930S Transceiver c/w built in tuner FREE MC-60A	2349.00
SP-930 Matching Speaker	119.00
MC-60A Desk Mike	109.00
TS-830S HF Transceiver	1229.00
TS-530S HF Transceiver	979.00
TS-130SE HF Transceiver	899.00
TS-430S HF Transceiver	1199.00
SP-230 External Speaker TS-830	89.00
VFO-230 Matching Digital VFO	419.00
VFO-240 VFO for either 830S-530S	239.00
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PS-430 pwr supply TS-430S	199.00
SM-220 Monitor Scope	529.00
TR-7930 2 mtr. mobile FM 25 watt	499.00
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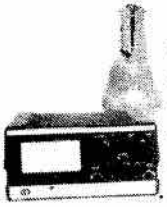
TR-9130 2 mtr. mobile all mode 25 watt	695.00
TR-2500 2 mtr. handheld	399.00
SMC-25 Speaker mike for TR-2500	45.00
TR-7730 2 mtr. mobile 25 watt	449.00
R-600 communications receiver	519.00
R-1000 S.W.L. receiver c/w/clock	639.00
R-2000 Super deluxe S.W.L. radio	795.00
HC-10 Digital world ham clock	179.00
P.C.1A & PC-1 phone patch	89.00
MC-50 50K & 500 ohm desk mike	59.00

March Super Special Clearouts



OPTO-7000 600 MHz frequency counter	Special $179.00
Transmatch 'McCoy' with rotary inductor	to clear 179.00
Hy-Gain TH7DXX 7el. tri-band beam	Special 599.00
Hy-Gain HAM IV rotor regular $349.00	Sale 279.00
Mosley CL-33 deluxe 3 el tri-band beam	Special 449.00
Kenwood VFO-240 (demo) Regular $419.00	to clear 389.00
Kenwood R-600 receiver (slightly used)	459.00
Kenwood R-1000 receiver (as new)	579.00
Yaesu FT102 HF transceiver regular 1259.00	Sale 1059.00
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MFJ 496 Super Keyboard, 256 buffer was $469.00	Sale 419.00
Bencher BY-1 Iambic key (black base)	Special 67.50
Bencher BY-2 Iambic key (chrome base)	Special 79.00

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FORMIDABLE LINE-UP FROM KENWOOD

TS-930S $2349

The TS-930S is a superlative, high performance, all-solid state, HF transceiver keyed to the exacting requirements of the DX and contest operator. It covers all Amateur bands from 160 through 10 meters, and incorporates a 150 kHz to 30 MHz general coverage receiver having an excellent dynamic range.
Among its other important features are, SSB slope tuning, CW VBT, IF notch filter, CW pitch control, dual digital VFO's, CW full break-in, automatic antenna tuner, and a higher voltage operated solid state final amplifier.

TS-830S $1249

Now most Amateurs can afford a high-performance SSB/CW transceiver with every conceivable operating feature built in for 160 through 10 meters (including the three new bands). The TS-830S combines a high dynamic range with variable bandwidth tuning (VBT), IF shift, and an IF notch filter, as well as very sharp filters in the 455-kHz second IF. Its optional VFO-230 remote digital VFO provides five memories.

TS-530S $989

The TS-530S SSB/CW transceiver is designed with Kenwood's latest, most advanced circuit technology, providing wide dynamic range, high sensitivity, very sharp selectivity with selectable filters and IF shift, built-in digital display, speech processor, and other features for optimum, yet economical, operation on 160 through 10 meters.

TS-130SE $939

An incredibly compact, full-featured, all solid-state HF SSB/CW transceiver for both mobile and fixed operation. It covers 3.5 to 29.7 MHz (including the three new Amateur bands!) and is loaded with optimum operating features such as digital display, IF shift, speech processor, narrow/wide filter selection (on both SSB and CW), and optional DFC-230 digital frequency controller. The TS-130S runs high power and the TS-130V is a low-power version for QRP applications.

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INTRODUCTION

We have been supplying crystals for nine years to commercial and private customers in Canada, many of whom have been with us the whole time. As a Canadian company, we hope to develop any crystal business which might go outside the country for want of knowledge of our service.

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.

HOW TO ORDER

Give us at least the information suggested in the sample order below. If we need more information, we will request it. In most cases, this is enough to proceed.

QTY	XTAL FREQ	T/R	CARRIER	Make and/or model Additional data
1		T	146.34	INOUE 1C22
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.

1983 PRICES

	HC-6/U	HC-25/U
AMATEUR		
Amateur bands	8.00	8.00
CUSTOM		
6 - 55Mhz	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	16.95	-
55 - 100	12.75	12.75

MODULES

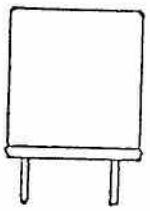
Mocom 70	31.75
Mocom 35	24.85

REWORK MODULES to new frequency

Generally	19.95
More difficult MT500,MX,Wabco	29.95

COMMON HOLDERS

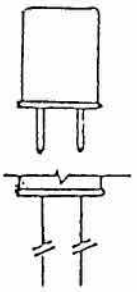
MIL Designations



3/4 x 3/4 x 5/16 approximately
HC-6/U 050 pins

HC-17/U .093 pins

HC-33/U wire leads



1/2 x 3/8 x 1/8 approximately
HC-25/U .040 pins

HC-18/U wire leads

The above holders accommodate the majority of requirements. We list requirements for most sets.

FM-2033

2m C-MOS MICROPROCESSOR CONTROLLED
DIGITAL SYNTHESIZER FM TRANSCEIVER

CANADIAN K.D.K.'s have
140-149.995MHz COVERAGE.

6 in 1

Exclusive KDK 6 in 1 control is now joined by 6 exciting new KDK features:

NEW! % Soft Orange background Liquid Crystal Display (LCD) for direct sunlight viewing plus lighting for night viewing.

NEW! % Offset (+, −, S) stored in memory along with the frequency information.

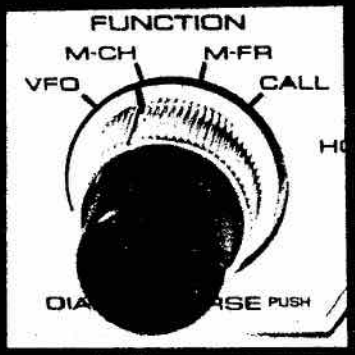
NEW! % Frequency coverage of 142.000 to 149.995 MHz for M.A.R.S. and C.A.P. usage.

NEW! % Chrome front panel with accent knobs and lighter color on case to match today's auto decor.

NEW! % Scan for signal now has 3-second delay before resume after loss of signal.

NEW! % Repositioned controls for more convenient operation.

The Exclusive KDK 6 in 1 Knob.



Suggested List $389.95

- Only memories with data are scanned; blanks are skipped.
- Complete memory back-up with power unplugged. Re-chargeable Ni-Cd with capability of several months back-up of memory.
- Single frequency sub-audible tone generator included as a standard feature.
- Tone unit switch on front panel to prevent "humming" on the wrong channel.
- Repeater input monitor capability with the push of a single momentary switch.
- Solid-state level meter for both output level and input level monitoring.
- User programmable initial characteristics for band limits, channel step size, etc.
- Odd repeater splits can be handled with the memory in the AxB mode.
- Programmable band-scan limits are stored in protected RAM.
- Modular construction with pluggable interconnecting wiring.
- Touch-Tone* microphone TM-2 is standard with each radio.
- Change channels, skip-scan or step up and down the band from TM-2 microphone.
- Audible beep for end-of-band or last memory location for better "eye's off" operation.

The KDK FM-2033 represents a significant advance in user convenience and simplicity of operation for the radio user. The KDK '33' series of transceivers provides excellent readability in any lighting condition for either the operating frequency or the memory channel number in use. The use of a warm orange background for the LCD displays improves the readability by providing an easy on the eyes contrast improvement.

Simplicity of operation has always been the mark of the KDK design team and the FM-2033 is no exception. From the single knob frequency and memory selection to the automatic recall of the desired repeater offset from memory, the FM-2033 continues to provide relaxed, comfortable mobile operation.

Once the 10 memory frequencies have been selected, a single knob is all that is required for operation on the standard simplex or repeater channels. Using the audible beep as the end of memory marker allows setting to a particular channel without even looking at the radio.

In the scan mode, scanning for a busy memory or pre-programmed band scan keeps you up to date on the happenings in the area. Very busy frequencies can be skipped by using the up key on the TM-2 microphone. If a full 10 memories are not used, the unused ones can be marked for scan skip so that no time is wasted checking them.

The FM-2033 provides a clean 25 watt output signal across 142 - 149.995 MHz to operate in balance with most repeater signals and provide quieting on the simplex operations. M.A.R.S. (NAVY too!) and C.A.P. frequencies are also accommodated.

You want convenience, reliability and easy operation for your mobile station and a tough to beat dollar value. Check out the FM-2033 at your local dealer TODAY or send a QSL for specifications.

* Touch Tone is a Registered Trade Mark of American Telephone and Telegraph.

Specifications are nominal and are subject to change. All KDK transceivers meet or exceed FCC regulations regarding spurious emissions.

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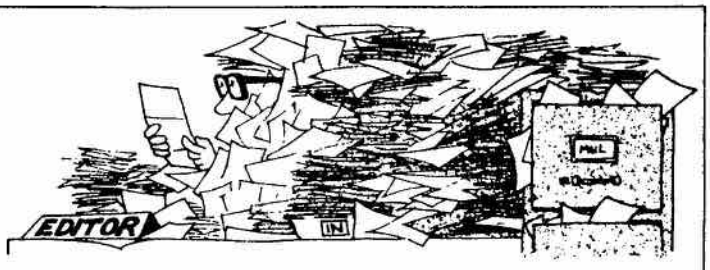
LETTERS



READY FOR 30 METRES?

Just a short note to ask you to please encourage the use of the new 30 metre band by Canadian Amateurs across the country. It is rare to hear any VE's on this band. I have been monitoring it almost daily and to date QSO'd only with Ron VE3FGG in North Bay, Ont., and Bill VE6HH in Edmonton. There is room here for more QSO's for Canadaward.

The 30 metre band is relatively quiet and inactive due no doubt to many hams not being equipped with a 30 metre segment in their rig, or lack of a suitable antenna. The band has only been open since May 1983 and is so quiet it reminds one of pre-war days on the other bands. The Americans are making fair use of the band to date and calls all across the States can be monitored. At this time, of course, north-south propagation is dominant, but trans-Pacific and trans-Atlantic QSO's are an almost daily occurrence.

Canada and other Commonwealth countries are not restricted in the 10.100 to 10.150 segment; however our American cousins are denied the 10.109 to 10.115 portion at the present time. So we are able to use that small portion free of the big gun signals if we wish to make frequent trans-Canada and Commonwealth contacts at present.

Anyway, if any VE's want a VE7 QSO for Canadaward on 30 metres I will monitor 10.112 MHz at 02:00 UCT daily except weekends when at all possible and will be glad to QSL.

J.F. (Hop) Hopwood VE7AHB
North Vancouver, B.C.

Let's hope that Hop stirs up some interest in this band but before you modify your rig or get one with the 10 MHz slice on it, remember that it's CW only.

GOOD RESPONSE TO TCA

Your plea for new members should bring results. The increase may be less than what is hoped for. Console yourself that such a diverse group of Amateurs cannot be expected to have the same priorities. Hams are interested in various subjects, from the abacus to Zulu Culture, and one cannot join every worthwhile organization.

Good Luck to TCA.

Fred Noble VE3BAJ
Ottawa, Ont.

Actually we had no idea what to expect from our November issue to all Amateurs, but the response was certainly worth the effort in new members and renewals.

RETIRED AND ON THE AIR

OK, so you sold me— both on membership and on the magazine— don't know which had most attractive influence— hi. Actually this single issue sold two memberships as my friend FVM has also joined.

Dunno who had the idea of sending out those samples but it sure hit pay dirt. I had never been aware of CARF's existence ('way out here in the west) and have to admit that my Amateur activity hasn't been very high over the past years. Was really active when I was in the Air Force but when I retired (and went to work— hi) as an electronic tech the Amateur activity didn't have quite the same appeal. However with advancing years and the near-approach of yet another retirement (this time to full leisure) the hobby has become more important.

At the same time have regained interest in the CW mode (horrible as I am) and my most recent activity is in this field— trying to work VE7FVM with QRP is my current goal— since he is 40 miles away and on 80 metres this is actually a bit of a problem— oh well, its fun!

Actually I am getting lazy and my latest approach is towards a keyboard (codetyper) and eventually to a decoder unit ideally to be home brewed, as this is the main interest to me in Amateur radio. Consequently I found that filter circuit in your sample issue real interesting and it is going to be added to my less than adequate receiver ASAP. Incidently this is a Radio Shack DX-300 and if you know anything about this beastie you will appreciate my problems. Cross modulation— makes one appreciate vacuum tubes (hi). Dunno exactly what the solution will be— has there been anything published on this? I will probably end up building a new receiver but at the moment will try a lash-up.

There are quite a few hams at work (Microtel) and we even formed a ham club but unfortunately most of the activity seems to be with two metres (ugh), commercial gear, etc. Oh well, maybe I can find some kindred spirits.

Neil Vincent VE7CIH
Burnaby, B.C.

Sorry, Neil I haven't any clues on your cross-modulation problem but among our illustrious readership there must be someone who could clue you up. What say, out there in Radioland. Drop a line to me or Neil.

MORE ON SPECIAL CALLS

Claiming he didn't have enough time to write, a caller, giving an unintelligible call sign, left an interesting comment in our tape machine concerning the letter from VE3MJ about the special calls for St. Paul's and Sable Islands, which appeared in our February issue. The letter noted that the writer was a member of the first "DX-pedition" to "activate" the two islands after they had been blessed as "separate countries" by the ARRL DX people and that they had used the calls VX9A and VY0A. The DOC originally assigned these two calls on request away back in 1975, stating (somewhat optimistically) that it did not constitute a precedent. The caller pointed out that the calls were rather screwed up because while VY and VX are assigned to Canada, the figure '9' was not in the number prefixes for the Amateur Service but was assigned to commercial and scientific stations in the Experimental Service as VE9 and that '0', although used in the Amateur Service, is assigned to Amateur maritime mobile stations as VE0.

And so on, far, far, into the night...

Incidentally, any Amateur who can get to these godforsaken spots may use his own call sign. By adding the magic words indicating where he is, he will probably be deluged by 'new country' hunters... as witnessed by a VE3 friend who vacationed at **CAPE** *Sable Islands... no relation to the Island of the same name. He gave up trying to point out that he was located at the south end of Nova Scotia and that he was not on Sable Island and proceeded to enjoy an unprecedented number of contacts on various bands.*

G.R.S. 900 MHz BAND

I have been with Amateur radio most of my adult life and a good number of Amateurs including myself are also G.R.S. operators (although some are little bit touchy when it comes to admitting it, hi hi).

Would you please publish in a future issue of TCA any and or all information you may be able to scrounge, beg, borrow or almost steal concerning proposed G.R.S. 900 MHz band.

Patrick A. Hughes
VE1BGA/XM62-2223
Moncton, N.B.

Last year DOC and the Canadian National Alliance of GRS Operators collaborated on a survey of just what CB ops would like to see in the proposed Personal Radio Service operating on UHF. The proposal would grant a total of 8 MHz divided in two blocks of four megs each located between 898 and 902 MHz. This is adjacent to the Amateur allocation of 902-908 MHz. The new PRS would use FM with 25 kHz channel spacing and type-approved equipment.

The respondents to a CGRSA survey commented on a variety of ideas. Ninety per cent of them suggested a test before DOC would issue a licence. It would concern procedure and regulations. Automatic transmitter identification received 100% approval. Other features proposed were time limiters, digital transmission, telephone interconnect, repeater installations, emergency and calling channels.

DOC has been studying the proposed new service and the ideas noted above and is at present near the stage when it will decide whether to go ahead with the allocation.

If it does go through, it could mean that modified equipment, which would not need type approval, could be used in the adjacent UHF Amateur allocation.

For really interested GRS buffs, we suggest that they join the CGRSA and keep in touch with GRS activities. The address is CGRSA, Box 894, Oshawa, Ont. L1H 7N1.

By the way, Patrick, there is a CB club in your home town: the Moncton Community CBers Club, Box 2882, Moncton, N.B. E1C 8T8.

RSO BICENTENNIAL AWARD

It is my pleasure to send to you for publication the guidelines for the Radio Society of Ontario's Bicentennial Award for 1984. The guidelines are:

Valid contacts for the period of January 1 to December 31, 1984.

All stations or SWL reports must accumulate 200 points by the following:

VE3 stations must contact 200 different VE3 or portable stations in VE3 for one point per contact.

Other VE, VO, VY stations must contact 100 different VE3 or stations portable in VE3 for two points per contact.

DX stations, including USA, must contact 20 different VE3 stations or stations portable in VE3 for 10 points per contact.

If the VE3 station contacted is a special event operation or using a special prefix during July of 1984, double the points for each contact. A special prefix may be allocated during July of 1984 but nothing official has been set as of this date.

Any mode, band, endorsed at your request. A special seal will be available for each 200 points (400, 600, 800, etc.)

The special seal

No QSL cards are necessary.

To receive this multi-coloured parchment award send $1.00 or 3 IRC's with certified log data to: VE3LSS Bicentennial Project; Listowel District Secondary School, Geography Department, Listowel, Ontario N4W 2M4 Canada.

This award is made possible by the volunteer efforts of Garry VE3GCO, Dave VE3FOI and the individual Bicentennial committees, especially the city of St. Catharines, Ontario.

If you have any questions please call me, or I can be found on Ontars net or the Trans Provincial net or the C.J. net most evenings.

VE3SAS is a special event Bicentennial station active from St. Catharines and will be active for the extra points needed.

Thank you for your time, keep up the great work in TCA; I enjoy reading it very much.
Dave Digweed VE3FOI
Editor, The Ontario Amateur and RSO Bicentennial Chairman

The above notice was received January 13, too late for our January or February issue. Anyone sending in similar notice please allow six weeks lead time to meet TCA deadlines.
Doug VE3CDC

Attention, Senior Citizens' Clubs!

The Winnipeg Senior Citizens Amateur Radio Club (VE4WSC) would like to have other senior citizens' clubs across Canada contact them. The person to contact is Albert Diamond VE4AIP, president of the Winnipeg club, either by mail, radio or phone. His address is 1 Morley Avenue, Winnipeg, Man. R3L 2P4, telephone (204) 284-5351. He would like to have their station call and address and club representative's names.

Many of these clubs have been set up through the federal government's New Horizons grants and a number of them are located in senior citizens' homes. If any of our readers living in these residences hold Amateur certificates and are interested in starting a radio club as a recreation facility, they can contact 'New Horizons, Social Service Programs Branch, Department of National Health and Welfare, Brooke Claxton Bldg., Tunney's Pasture, Ottawa, Ontario K1A 0K9.

More on Private Receiving Station Licences

By Bill Wilson VE3NR

My article on this subject in the January '84 issue of TCA prompted Gordon Collins VE3GWC to write me and enclose photocopies of 'Licence to Operate Radio Receiving Equipment' for the years 1925-26 and 1929-30. Apparently the above kind of licence was a precursor of the 'Private Receiving Station Licence.'

Back then those licenses cost $1.00 and were issued by the Radiotelegraph Branch of the Department of Marine and Fisheries. By 1929 they were being issued by the Radio Service of the Marine Branch in the same department which, by that time, was responsible for the regulation of radio in Canada. It had taken over from the Navy which, during 1908-1913, had established the first network of radio stations in Canada along the St. Lawrence River and Gulf to ensure the safety of shipping using Quebec and Montreal.

Gordon drew attention to the notes printed on the back of these licences. The first required that the licensee not divulge to any person other than a properly authorized person or make use of any message coming to his knowledge and not intended for receipt by the licensee's apparatus. This did not apply to broadcasting. The second said that irregular working and infractions of the radio regulations by transmitting stations should be reported to the Director of Radio, Department of Marine and Fisheries, Ottawa, immediately. The final note said, "When using a receiver of the regenerative type for reception of radio telephone programs, please avoid increasing the regeneration to the point at which the receiver begins to oscillate, otherwise you will cause interference with neighbouring receiving equipments."

Remember when a battery-operated regenerative receiver was the quietest, most selective and sensitive receiver available and, with a key in the B+ lead, made a pretty good CW transceiver?

Social Scene for 1984

April 14- Flea Market: Sponsored by the Durham Region ARC. 8 am to 2 pm at Pickering High School. Take Church St. N. from Exit 400 on Hwy 401. $2 at door. 8 am to 2 pm. Inside vendors only, 6 am; $4 per table. Call Phil Washburn VE3HAA (416) 683-3368, Alberry Cres. Ajax L1S 2Y3. (Renew your CARF membership at our booth.)

May 12— Flea Market sponsored by the Southern Ontario Repeater Team. Inc. (No details received.)

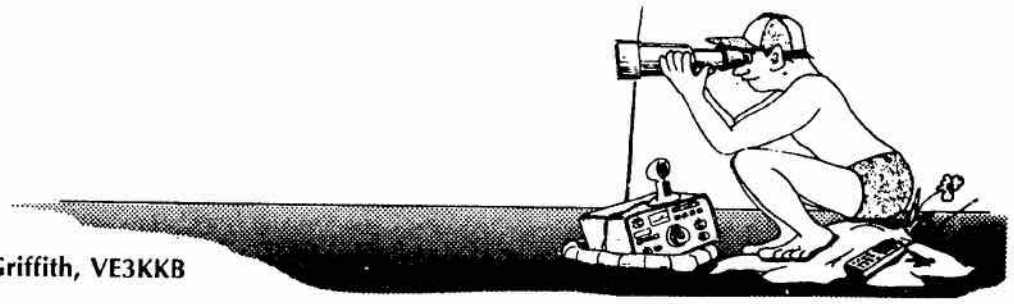
May 20— Flea Market for the Halifax area. Co-ordinator is VE1CES. (No details received).

October 5,6,7— Radio Society of Ontario Convention hosted by the Ottawa ARC. More dope later.

(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.

DX

D.W. Griffith, VE3KKB



As Hugh Cassidy WA6AUD, late of the West Coast DX Bulletin, and currently the DX Editor of CQ magazine says "DX IS". DX is what, you ask? Well, it just IS.

For the last two years, I have been gradually sinking into the depths of Amateur apathy, with increased difficulty in maintaining a high level of interest, and activity in the DX scene (the column is about the only thing that kept me going at all) in particular, and Amateur radio in general. I am only beginning to realize how monofocal my thinking has been. To me. DX meant only working new countries, regardless of band or mode, and if I had already worked a country, it didn't matter if it was on CW, and not on SSB, or vice-versa. I never stopped to consider the challenge of a lot of the other possibilities, mainly because at myQTHin town, I simply don't have the room for efficient low-band antennas (or so I thought). I was something like the burning of a piece of magnesium, or nitrated-cellulose, fast starting, hot burning, but with the flame all too quickly extinquished. I worked too many countries, too soon in my Amateur career, and after a couple of years was relegated to the less enviable role of waiting for countries to activate, or for DX-peditions to appear at some remote spot on the Amateur map.

It took two somewhat unrelated events to bring me back into line, and I currently am experiencing a revival in interest in DX such as I have not enjoyed since my first year in Amateur radio. The first of these events was a trip to Toronto in November 1983, where I attended a meeting of the Ontario DX Association, an SWL organization, where Tony Ward VE3IAT (who my wife and I were visiting at the time) was speaking. I soon discovered that there are as many dedicated souls, and 'crazies', in the SWL ranks, as there are in Amateur circles. The wonders (and incredible challenges) of medium wave DX, and tropic band DX-ing were revealed, and with a cry of sheer delight, I was back in the saddle. I must currently list myself as a near fanatic SWL DXer. The pleasant spillover was that I began to play around with antennas again, and soon should have some reasonable ones for 40, 80, & 160M at my home QTH. (Oh to be a little closer to Perth and the contest station.) This in turn has led to an increased interest in Amateur DX, particularly on the lower bands. (You also have to appreciate the special receiver requirements I have, living 1.0 km from CHU's 10 KW 7.335 MHz transmitter, and the problems I have on these low bands due to the mixing with 6 AM broadcast stations, all within 5 km of my place... Talk about a challenge.)

The second event was the melding of my other hobby with radio and the result is exploring the area of computerized RTTY. Naturally, one of the first questions that I asked myself was, "How long will it take to work RTTY DXCC?", and frankly, I intend to find out (but not to be in quite the rush that I was in before... more to treat it like a fine, mature wine, to be savoured, and not rushed.)

Apathy is a curable affliction. I discovered that there are a tremendous number of avenues to explore, and down each one "DX IS".

Bits & Pieces

D68WD— Comoros Republic: A newly licensed station, may be heard daily on 14.166 at 2130Z. QSL to William Barnett, P.B. 540, Morono, Rep. of Comoros, Via France.

VP2V— Br. Virgin Is...K9GL, K9PW, and K4UUE will be active from Feb. 27 to Mar. 12, 1984. QSL as announced during the operation.

A35FI— Tonga: Club station, listen around 14.213 at 0500Z daily. QSL to Box 278, Nuku Alofa, Republic of Tonga.

KE4UX/KH9— Wake Is: Listen 21.355 at 1500Z daily. QSL to David Kniss, Box 248, Wake Island, 96898.

BY— China: Many who worked VE7BC at BY1PK have had their QSL's returned marked 'not in log'. Also, the N4SF/BYO operation is supposed to be a 'private' and unlicensed one. *(See "More BY Operation" on Page 22. ...Ed.)*

D44BC— Cape Verde Is: Often found on 40M SSB on Sundays, from 0500Z on. Listen in the 7.050 to 7.100 of 40M. QSL direct only to his CBA.

Congratulations to VE1BNN who has worked 301 countries on 10M SSB.

TL8ER— Central African Republic: Until June, 1984. Look on 21.005 from 2030Z QSL via

F6GQK.

FO0XX— Clipperton: Latest word is the DX-pedition will take place from Mar. 5-Mar. 23, 1984. Should be lots of fun on the band.

FB8ZP— Amsterdam Is: Daily around 14.220, from 1100Z.

TR8DR— Gabon: Thurs. 2230Z on 21.300, & Wed. 2230Z on 7.005. QSL to W2PD. Also TR8JLD 21.020 after 2100Z, and 14.020-14.030 around 2300Z.

XU1SS— Kampuchea: Was worked back in Dec. nr. 14.007 between 1100Z and 1300Z.

A22ME and

A22TE— Botswana: Look on 21.335 at 2000Z, 28.470 at 2100Z and 28.535 at 1530Z. QSL to M. Elazer, American Embassy Gabarone, Dept. of State, Washington DC 20520.

VP8AOD— S. Orkney Is. Often at 14.220 around 0430Z. QSL via K0JW.

ZD9BV— Tristan da Cunha: Listen 1700Z on 21.265 on CW.

ZD7BW— St. Helena Is: 160M 0500Z on 1.827, listening 1.803 MHz for N. Americans.

SV0AA— Greece: 160M 0330-0430Z on 1.8050 MHz. QSL to Charles Jackson, Box 722R, APO, New York 09223.

ZL— New Zealand: Changes in the island prefixes— Chatham Is. ZL7; Kermadecs ZL8; Auckland and Campbell ZL9; N. Cook Is ZK3.

That's it for this month. Good luck, and Good DX.

(Thanks to Westlink Report, CQ Magazine, and Long Skip, for much of the material appearing here.)

CALLSIGN	QSL Via
A4XGY	K2RU
A71BH	G4HNP
ED9IAL	EA9JV
EL2AD	WA3HUP
EL2Z	KØLST
KØHWS/FC	I4ALU
FB8WI	F6GXB
FB8ZP	F6KNO
FC9UC	F5RV
FK8CE	K2ROR
FO8FO	F2BS
FO8JP	F1BBD
FOØJE	F3JE
FPØHOQ	NS4M
FPØIDQ	VE1CCM
HI8LC	W2KF
HL9SN	KA5EPI
I2DMK/IA5	I2MQP
IT9HLO/IH9	I2YBC
J5HTL	SM3CXS
J73AJ	W2KF
J88AQ	W2MIG
JX6BAA	LA7JO
JY9TS	WA3HUP
KC4AAA	K9TUB
KC6GM	WD6BDZ
KC6HA	K6EDV
KC6RN	JH1RNZ
KD7P/KH2	KS7L
KG4CD	KC4VD
LA2WW/9L1	NØAFW
OHØTTY	OH2AA
OJØMA	OHØNA
T77B	WA3HUP
TR8CR	F6AQO
TR8SDP	F8BC
TU2NW	AK3F
VP2MM	AB1U
VQ9JD	N6AFD
W3TB/TF	W3IVG
WA6DJO/KH8	WB6HGH
ZD9BV	W4FRU
ZL2BKM/C	ZL2HE
ZL3HI/A	ZL2QW
ZL4OY/C	VK3DWJ
9Y4VU	W3EVW
7P8CT	DL2CI
A6XJC	WB3CQN
CU6FSJ	CT1ARE
EK1O	UK1AOZ
EL7M	SL1M
PJ8I	N8II
TJ1KR	W2PD
V3DX	N6ADI
YT3T	YU1EIJ

More 'BY' Operation

At press deadline a month ago, Tom Wong VE7BC had scheduled another visit to the People's Republic of China and had plans to take along two U.S. operators and three Canadians including well-known Fred Hammond VE3HC, who was one of the donors of equipment to the 'BY' stations. Tom will also activate BY4AA in Shanghai if time permits.

The pile-ups when a BY station comes on the air on sideband sometimes lead to misunderstandings by eager beaver DX hunters, especially if calls are similar. Tom showed CARF News one such example. He worked a CE3 with the same suffix as a VE3 who thought Tom read him. The station, however, was indeed a CE3 and Tom showed the latter's QSL card to prove it. Anyway, Tom has a couple of simple rules to straighten this out. He says, "If I call you and I don't hear you acknowledge me, I won't enter you in the log. If you are not in the log, you don't get a QSL card." Tom says that 'green stamps' and complaints won't get him to change the log.

20 Canadian Two-ways with Space Shuttle

Twenty Canadian stations were officially worked by Astronaut Owen Garriott on the recent voyage of the Columbia space shuttle. The 'W5YI Report' says that the official tapes showed the following Canadian stations made two-way contacts: VE10C, CGY, UT, CAW, BB and AFU; VE3BNA, BNO, LKW, KRP; VE4OO; VE7BOQ and CYB; VO1BK, DI, FP, FR and GG. Two partially identified VE stations also made it, VE3J?? on pass 146 and another VE3 on orbit 149. More than 200 U.S. stations were logged and about 60 other countries among which German and Australian calls predominated. Those whose calls are listed above should send a SASE to ARRL "STS-9, 225 Main St., Newington, CT 06111, U.S.A.", marking the envelope as "2-way QSL".

Why not 2 Metre Sideband Repeaters?

The following article was written by Frank Merritt VE7AFJ a former CARF director for the Naniamo ARC bulletin 'Static'.)

With the bands 'dead as a bone' I glanced over the 'ole crystal ball to notice that it was not glowing. Gosh, what is this? Oh, yes, that review I was reading about the Austin Omni 2-M antenna. Ed Tilton W1HDQ reviewed this antenna in QST in the December issue just received. For the young 'whippersnappers', it should be noted that Ed Tilton was involved in VHF communications in the 1930's and has been an advocate of VHF for lo! these many years.

It's an interesting antenna for mobile applications. One thing that sets it apart is the fact that it can be used either as a vertical or horizontal polarization radiator! A non-vertical antenna seems almost heretical since mobiles on VHF are FM are vertically polarized antennas are 'the thing'. That is the sort of logic that can get one into trouble quickly.

To back up for a moment we should have a look at emission modes. The first modulation mode used on VHF commonly was AM simply because it was in common use on HF. There was some FM activity but it did not amount to much. In the heyday of AM and VHF was the Gonset Communicator which was a one-foot square box with a single plug-in crystal controlled transmitter and a tunable receiver. It was a big box to use mobile, but our cars were bigger then and it did work. The main reason that FM came in at all was the availability of surplus radios from the taxi, police and other VHF users as they up-graded equipment. It is interesting to note that the first repeater in the L.A., Calif. area was K6MYK and it was AM. But, at any rate, FM swept in and all at once the repeater really became practical.

The bottom line of communications is the basic efficiency of the mode used. As it turns out, FM is the WORST weak signal mode. This means that as the signal of an FM signal gets less than STRONG it just drops out. AM is markedly better as a weak signal mode and of course SSB is the winner. While talking about basic efficiency. it should be noted that vertical antennas are noted for being "noisy" compared to horizontal antennas.

Theory is great but it is actual practice that counts. Always being a practical chap, Ed installed an Austin antenna on his car with a 2M SSB rig and gave it a try. To say the least his results were impressive! His first CQ was answered by a station 65 miles away and he was running 10 watts output. On a trip to Florida he found that the antenna permitted operation at ranges from 150 to 230 miles from his 10-watt mobile. Remember this is VHF and not HF!

To keep the matter in perspective, it is obvious that the repeater has a definite utility in dealing with 'out-of-valley' or 'around-mountains' situations. Even so there is no reason why the repeater cannot be SSB! Indeed, projecting a bit farther, the SSB translator becomes very practical. Reduced to its simplest dimensions, a translator is a specialized repeater in which the output frequency depends on the input frequency within a restricted range. This means that a number of QSO's can take place using one translator with each QSO on a slightly different frequency.

One of the classical arguments against VHF SSB has been that it is difficult to get sufficient stability at VHF to permit SSB transmission. This argument has become null and void with modern synthesizers and all modern VHF equipment uses synthesizers. In fact, it is not difficult to recognize that there could be a 1 kHz tone transmitted for a few milliseconds during the initiation of a transmission that could be used to AFC the receiving station exactly on frequency. This would eliminate any long-term drift resulting in perfect non-'mickey-mouse' transmission. During the period of time of receiving the 1 kHz tone it would be easy to switch in a 1 kHz filter in the receiver to eliminate the tone during the time it is present.

Gazing deeply into the crystal ball, one cannot help but observe that it certainly is not out of reason to include speech recognition and digitization circuitry that would permit the operator to 'write' a message, such as a CQ, into a digital memory and then upon command the memory could be read and, with a voice synthesizer, the voice transmission could be re-created perhaps with the 1 kHz tone that would make scanning and locking onto the signal possible. This may seem to be a bit 'far-out' but then just look at the complexity of the average modern synthesized VHF rig.

The bottom line is that in the past buying a multi-code VHF rig would seem to be an unnecessary luxury. Times are changing and the next wave of significantly improved VHF communications will include SSB operation on two metres. If this seems a bit far-out just look at the VHF rigs of 10 and 15 years ago!

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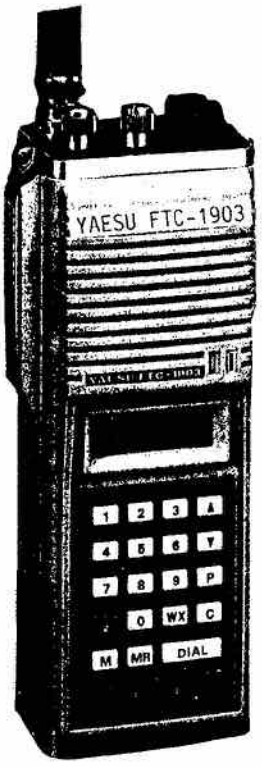

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YM-24A Speaker Microphone.....$ 37	
FNB-2 Extra Nicad Pack.....$ 39/ 37	
FNB-2LC as above without case.....$ 30	
FBA-2 Sleeve for FNB-2 in NC-8.....$ 8	
FBA-3 Sleeve for FT-208 in NC-3/1...$ 10	
MMB-10 Car Hanger for FT-208.....$ 12	
LC-208 Heavy Duty Leather Case.....$ 45/ 39	
SM-2/708 Service Manual 208 or 708..$ 19	
YH-1 Headset with Boom Mike..... $ 29	
SB-1 Switch Box for YH-1 Mom/Lock...$ 29	

FBA-2

Battery Sleeve

MMB-10

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NC-8

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PA-3

DC-DC Adapter/Trickle Charger (13.8VDC)

FNB-2

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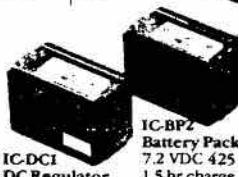
YM-24A

External Speaker/Microphone



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DC-1 DC-DC Adapter.....$ 22
BP-2* 450ma 7.2v 1 Watt Nicad Pack...$ 55
BP-3 Standard Nicad Pack 1.5 Watts..$ 44
BP-4 Alkaline Battery Case.....$ 15
BP-5* 450ma 10.8v 2.3 Watts Nicad Pak$ 65
BP-7* 425ma 13.2v 5 Watt for IC-02...$ TBA
BP-8* 800ma 8.0v Long Life Nicad Pack$ TBA
*BP-2-5-8 Require BC-30 or BC-35 Charger
*BP-7 Requires BC-35 Charger
HM-9 Speaker Microphone.....$ 49
LC-01 Leather Case.....$ 65
LC-07 Leatherette Case.....$ 15
RC-01 Plastic Rain Case for Handies..$ 35
SM-2 Service Manual for IC-2AT.....$ 25
HS-10 Headset with Boom Mike.....$ 29
HS-10SB Switch Box for HS-10 Mom/Lock$ 29
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The Sun's Effect on Shortwave Radio Propagation
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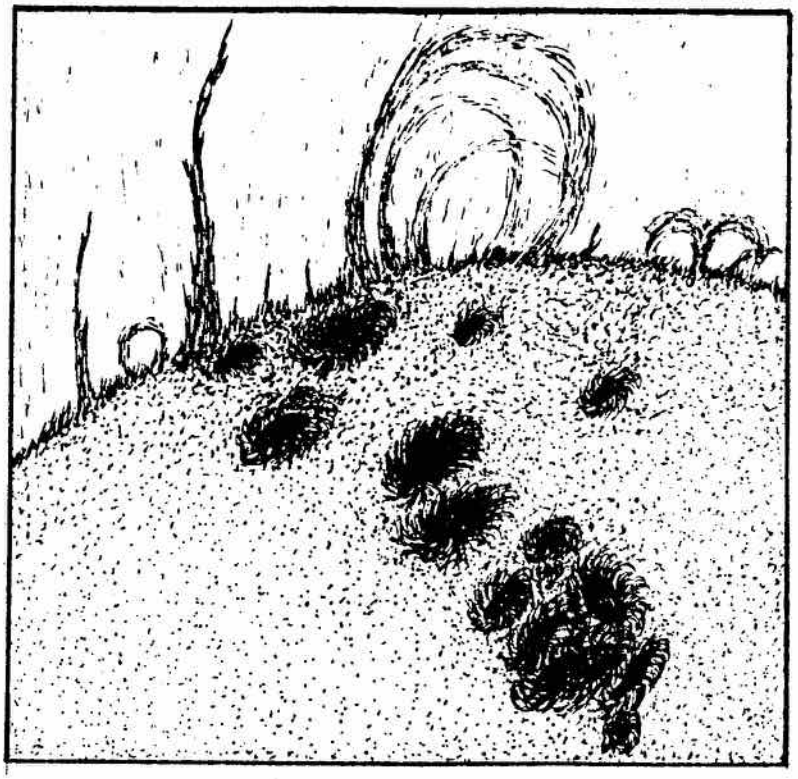
D.J. Kelly VE5TX



Amateurs for many years have been aware of the effect the sun has on radio communications in the 3 to 30 MHz range. This article is an attempt to explain as simply as possible a number of the ways in which short wave communication is enhanced, degraded or completely wiped out by unusual occurrences on the surface of the sun.

Ionosphere

A series of ionized layers have been formed around the earth's circumference by the electrification of the upper atmosphere when hit by ultraviolet and X-rays from the sun. This penetration of ultraviolet and X-rays into the upper atmosphere tears electrons from the air molecules, in effect ionizing them and rendering these molecules electrically conductive (Figure 1). These ionized layers act as reflectors and return transmitted signals back to earth. The normal ionosphere has 3 distinct layers. They are the:

E layer— Average height about 70 miles above the earth's surface.

F1 layer— Average height about 140 miles above the earth's surface.

F2 layer— Average height about 200 miles above the earth's surface.

The lower fringe of the E layer about 40 miles above the earth's surface is known as the D layer.

Radio Wave Propagation

Ground station radio waves entering the ionosphere cause the free electrons in the ionosphere to vibrate in sympathy with them and re-radiate energy at the same frequency as the incident waves. As these waves penetrate more deeply into the denser portions of the ionosphere the oscillating electrons re-radiate their energy more in the reverse direction than in the same direction as the transmitted wave. Finally the higher ionospheric density retards the transmitted wave energy to the point where it can no longer move in the forward direction. As a result of this, radio waves transmitted from earth at frequencies below 30 MHz, are turned back by the various ionospheric layers. For example:

D layer turns back frequencies below 500 KHz. E layer turns back frequencies between 500 KHz and 30 MHz.

Changes In Ionosphere

The degree of ionization or electrification of the ionosphere is continually changing. Some of the reasons for this are:

1. The rising and setting of the sun.
2. Highest ionization (electronification) occurs at noon when the sun is highest in the sky. (ie. ionization layers are the most dense.)
3. Minimum ionization occurs just before dawn (ie. ionization layers are most attenuated.)
4. Seasonal changes caused by the orientation of the earth.

5. Solar activity.
6. Ionization tends to be greatest near sunspot maximum.
7. Ionospheric storms seem to be associated with magnetic storms which destroy the normal stratified layers of the upper atmosphere.

Successful Long Distance Radio Communication

For successful long distance radio communication the frequency must be low enough so that it will not pass through the ionospheric screen but not too low so that it will be absorbed in the lower portion of the atmosphere.

Effects of Sunspot Disturbances; Sunspots

A typical sunspot possesses a cell-like structure consisting of a dark centre called the umbra surrounded by a greyish filamentary region called the penumbra. The sunspot by its very nature is very bright. Its umbral temperature is 4500 degrees kelvin. The umbra appears dark because it is viewed against an even brighter photospheric background whose temperature is 6000 degrees kelvin.

Sunspots develop rapidly (within a number of hours) as small pores in the disturbed photosphere. They grow rapidly and usually form clusters of related groups containing spots of varying size. The diameter of these spots may vary by thousands of miles; usually there is one large dominating spot in each

Figure 1
STRUCTURE OF EARTH'S ATMOSPHERE

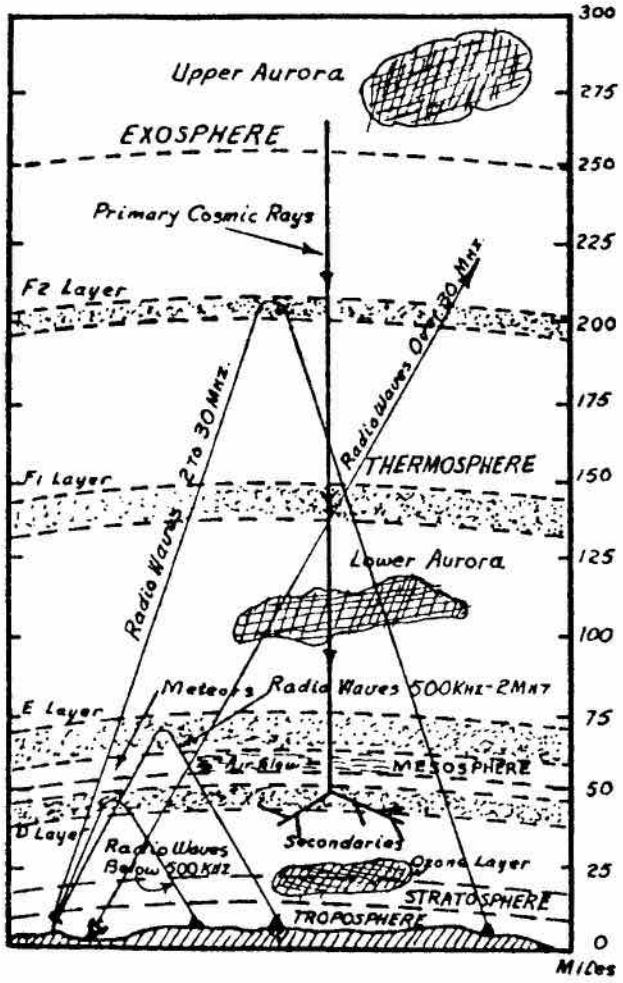


Figure 2
LARGE SUNSPOT GROUP

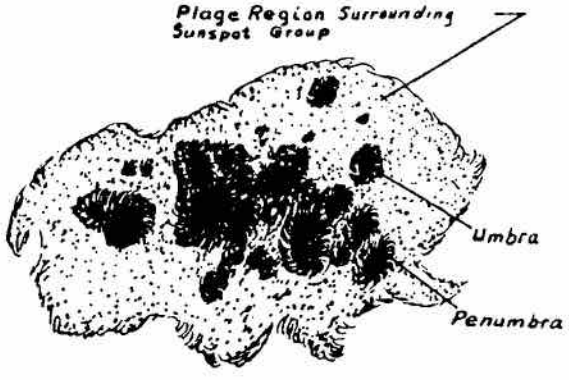
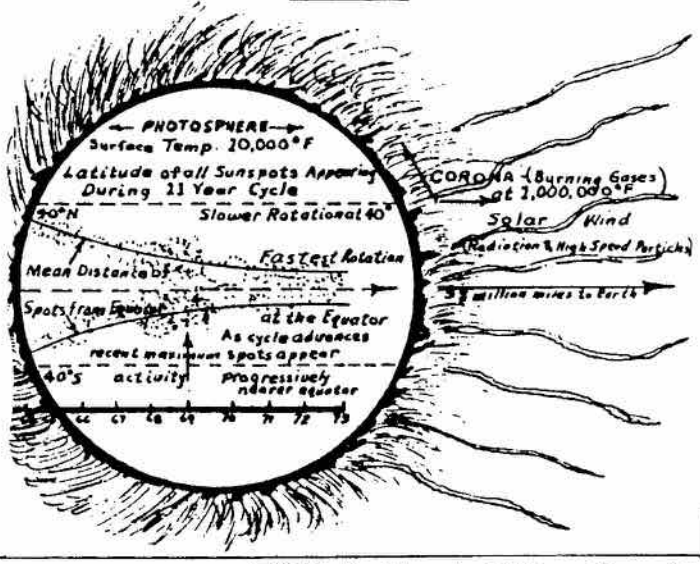


Figure 3
SUNSPOT TREND DURING A SUNSPOT CYCLE



group. A typical spot can build up to a diameter of 30,000 miles within a week and then slowly decline. The largest sunspot groups may cover an area of 200,000 miles and persist for months. (Figure 2)

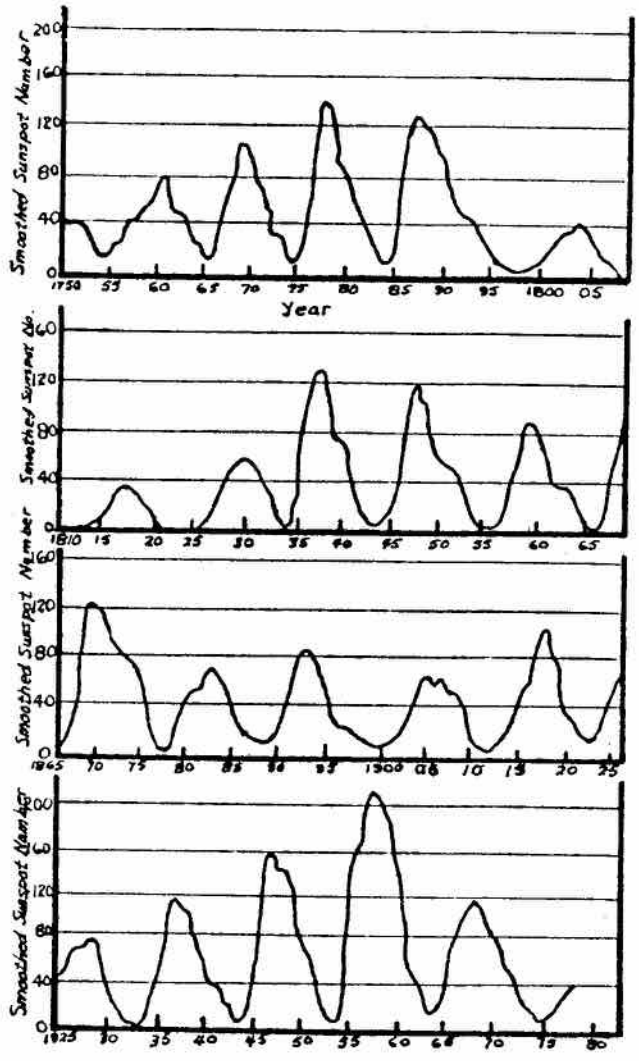
The Sunspot Cycle

The number of sunspots appearing on the sun increases and decreases over a period of time, which averages about 11 years between maximums. This 11-year cycle is by no means constant as recorded cycles have varied considerably. Intervals between maxima have varied from 7.5 to 17 years and minima from 8.5 to 14 years. Usually the rise to maximum averages 4.1 years and the decline to minimum has averaged 6.7 years.

As the 11-year cycle progresses, the spots move closer to the equator each year. (Figure 3) A new group of sunspots appearing in the higher latitudes around 35 degrees north or south indicate the beginning of a new cycle while the spots from the old cycle end their days near the solar equator.

Sunspots are disturbed areas of the sun; they are more active than the quiet sun and give off more radiation and charged particles. As the number of sunspots increase, more radiation and charged particles are given off. The radiation and charged particles enter the earth's ionosphere, increase the ionization

Figure 4



THE SUNSPOT CYCLES

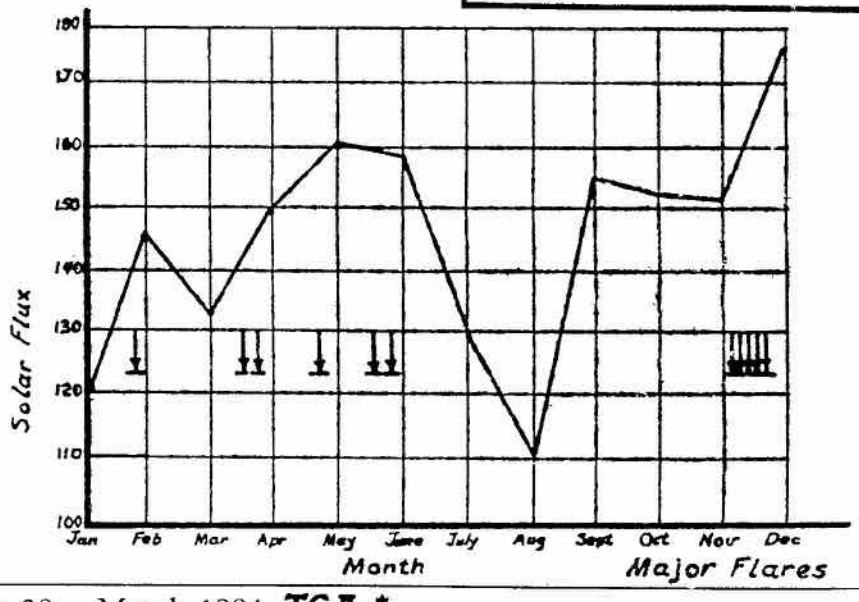


Figure 5

AVERAGE MONTHLY SOLAR FLUX 1978

(electrification) of the various layers and in effect increase the density of those layers. This increased ionospheric electron density permits improved long range communication.

Sunspot records have been kept for many years so that the various cycles of activity are readily available for study. (Figure 4)

It must also be realized that as the sun rotates sun spots will move with that rotation across the solar disc appearing and disappearing from the earth's view about every 27 days. As the speed at the sun's equator is greater than at the higher latitudes this figure will probably be somewhat higher at the beginning of a new cycle. My records which are admittedly of very short duration, have indicated an average of 28.8 days for 1978.

There are also a number of other solar terrestrial interrelations known to be tied into the 11-year sunspot cycle.

They are:

1. Maximum and minimum receipt of solar ultraviolet radiation by the earth coincides respectively with the maximum and minimum sunspot cycle.
2. Aurorae are most prominent at the time of sunspot maximum.
3. Terrestrial magnetic activity closely follows the ups and downs of the sunspot cylce.
4. The intensity of galactic cosmic rays diminishes near sunspot maximum as the result of the interrelation between the charged particles and the strengthened magnetic field which tends to deflect the particles.

Flares

When a flare erupts it occurs as an intensely bright area in the plage region of the chromosphere usually associated with a sunspot group. It emits radiation strongly through the entire electromagnetic spectrum and is most common when sunspots are high. A major flare is the most violent kind of solar disturbance. When a flare occurs it gives off intense ultraviolet and x-rays. These rays, travelling at the speed of light, hit the ionosphere and very rapidly increase the ionization, especially in the D layer. Radio waves hitting the ionosphere could be quite strongly reflected prior to the occurence of a flare and shortly after may fade and disappear completely. All frequencies from the 1.5 to 30MHz. are affected with the lower frequencies being the most severly absorbed. This radio fadeout is known as a Sudden Ionospheric Disturbance (SID) and affects only stations lying in the sunlit hemisphere of the earth. Fadeouts may last for a few minutes or several hours and several may occur in rapid succession.

Within 24 hours of the flare outburst, low energy cosmic rays (charged particles) spiral into the earth's polar regions causing polar radio blackouts. A long plasma tongue (high energy mixture of charged particles) with its own magnetic field stretches out from the sun sweeping over the earth.

These unusual developments disrupt the ionosphere, interfere with the earth's magnetosphere, and generate magnetic storms.

The effect flares have on the solar flux is clearly shown in the graph 'Average Monthly Solar Flux for 1978'. (Figure 5)

All of these features, which are the result of solar flares, can disrupt communications in the 2 to 30 MHz range for days.

The Sun As A Transmitter

The quiet undisturbed sun emits thermal radiation from the microwave region (app. 1 cm.) to the long wave region of about 20 metres. The shortest waves (Millimetres) originate in the cooler photospheric layer, the medium waves (centimetres) in the hotter chromosphere and the longest (metres) in the still hotter coronal regions.

When the sun is disturbed three additional radio emissions occur which are not of thermal origin.

1. Very intense radio burst lasting about a minute and radiating over many wave-lengths are produced by the ejection of plasma from the highly disturbed regions surrounding a sunspot group.
2. Noise storms which can last from hours to days, in the one to ten metre wavelengths. They are believed to originate from the interaction between magnetically trapped particles and moving plasma waves.
3. The centimetre wavelength slowly varying component which is partly thermal in nature and can last for weeks. This phenomena is connected with sunspot activity in the vicinity of the surrounding bright areas known as plages.

The Earth's Magnetism

According to seismic test evidence, the earth's core is largely composed of liquid with a density of 10 to 12 grams per cubic centimetre. This density would indicate an iron alloy probably made up of iron and some lighter element such as silica.

It is generally assumed that the earth's liquid core is a rotating conductor of electricity. As the earth's magnetic field operates much like a giant bar magnet aligned in a north south direction, the rotation probably sets up a dynamo effect generating an extremely strong electrical current.

This current would tend to circulate around the earth's axis of rotation producing a magnetic field in the same way that an electrified coil of wire behaves like a bar magnet. This action sets up a magnetic field around the earth with one pole at the north axis of rotation and the other at the south axis.

The Magnetosphere

The maximum ion density in the ionsphere occurs at about 300 km (180 miles) above the earth's surface. Above this height, the concentration of charged particles drops off steadily and the total number of gas particles, both charged and uncharged, decreased at a much more rapid rate. This change results in an increase in the proportion of charged to uncharged particles as the height above the earth is increased, even though the total number of charged particles

actually decreases. This is possible because the high energy ionizing radiation increases in the upper atmosphere where there are fewer gas molecules available to absorb it.

In the layer of maximum ion concentration, about one percent of the gas molecules are ionized; at this altitude atomic oxygen is the principal gas present. The maximum ionization at this level more than likely represents the removal of electrons from a small portion of these atoms. At heights above 800 metres, first helium and then hydrogen become the principal gases present in the atmosphere; in these layers the gas concentration is so low and the high energy radiation from the sun so intense that virtually all of the gas particles are ionized (Figure 6 & 7).

Another property of these high altitude gases with respect to those at the 300 km height is their extreme mobility. At the lower levels ionized gases are much more liable to strike ionized gas particles of a different polarity and become neutralized . However the ions and electrons of the much thinner helium and hydrogen layers can move great distances without bumping into other particles and losing their charge. This permits these charged particles to be strongly influenced by the earth's magnetic field and they travel great distances in order to align themselves with it.

Because of the strong influence of the earth's magnetic field on these ionized particles the outer inosphere above 500 metres (300 miles) is known as the magnetosphere. The shape of the outer boundary of the magnetosphere, or magnetopause, is determined largely by the earth's magnetic field but it is also affect by the charged particles (the solar wind) moving out from the sun. The magnetosphere shows sharp boundaries at the outer edge because the earth's magnetism tends to repel the sun's charged particles away from the earth; however, the pressure of the solar wind distorts and compresses the magnetosphere more on the sunlight side than on the dark side of the earth. (Figure 8) This causes the boundary of the magnetosphere on the dark side of the earth to be extremely elongated.

Most of the magnetosphere's charged particles have little energy and are much like those in the lower atmosphere, however in the lower magnetosphere there is a belt of highly charged particles surrounding the earth. The charged particles in this area move very rapidly because they have much greater energy than most of the charged particles in the atmosphere. The zone is known as the Van Allen radiation belt.

The distribution of charged particles in this belt, as in the rest of the magnetosphere, is controlled by the earth's magnetic field. Because of their high energy, these particles move very rapidly and tend to follow the earth's magnetic lines of force. At the poles they move vertically towards the earth where they are reflected back up by the earth's converging magnetic field which acts like a mirror. This reflective action forces the charged particles to move back and forth from pole to pole at very high speed. There are a number of theories as to the reason for these so-called radiation belts

Figure 6
PRODUCTION OF CHARGED PARTICLES IN THE ATMOSPHERE

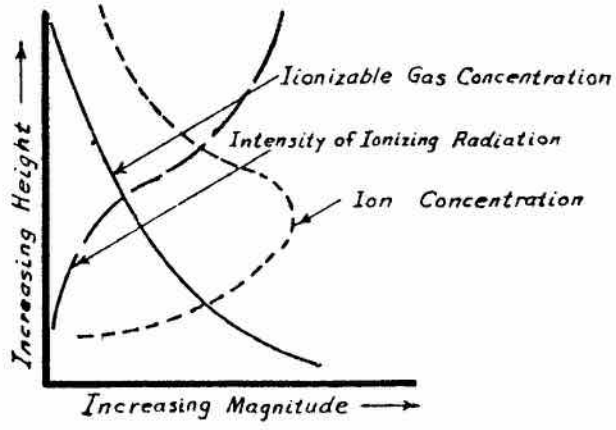
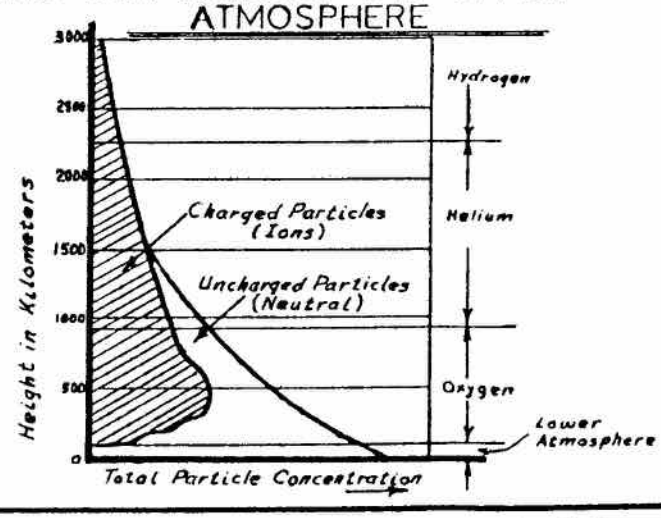


Figure 7
SCHEMATIC SHOWING PROPORTIONAL INCREASE IN CHARGED PARTICLES IN THE THIN GASES OF THE UPPER ATMOSPHERE



but no satisfactory explanation has yet been given.

Magnetic Storms

As in the lower ionosphere the magnetosphere is strongly influenced by variations in the sun's energy output during solar flares. A the time of a flare, in addition to the increased electromagnetic radiation, the number of charged particles (plasma tongue) travelling outward in the solar wind also increases. Travelling more slowly than the electromagnetic radiation waves which travel at the speed of light, the charged particles of the solar wind arrive about 24 hours after a flare occurs. This increased solar wind pressure compresses the boundaries of the magnetosphere which tends to slightly increase the earth's magnetic field. This affects compasses, radio communications, transmission of electricity and other related matters; it is known as a Magnetic Storm.

Aurora

The aurora are closely related to the magnetosphere and occur predominantly in the earth's polar regions. They are caused by temporary changes in the earth's magnetic field resulting from charged particles of a solar flare creating a magnetic storm on contact with the earth's magnetosphere. The aurora occur most frequently in circular belts called auroral zones about 2400 km (1500 miles) from the magnetic poles and varying height from about 100 km (60 miles) to 300 km (180 miles) above the surface of the earth. They are caused through the absorption of energy by the oxygen and nitrogen molecules which are the major gases occuring in the 100 to 300 km altitude range where aurora are present.

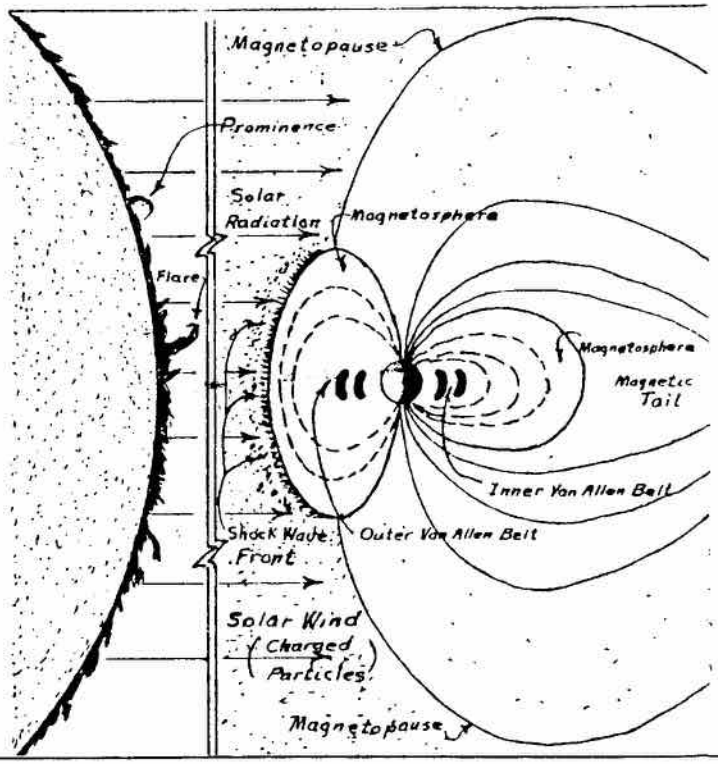
When molecules of these gases collide with electromagnetic radiation or high-energy charged particles the gas can give off visible light as it is raised to a higher energy level. This is the same principal on which the flourescent light is based. In that case an electric current is used to raise the energy level of a confined gas. When these gases are raised to a higher energy level, each gas gives off a different wavelength of light and consequently different colours. The red and green light in the aurora are due to the presence of atomic oxygen; the less common blue colours are due to the presence of molecular nitrogen. Other colours appear as combinations of these three principal wave lengths.

It was originally thought that the aurora might be caused by excess energy spilling out of the radiation belt at times of magnetic storms; it now however appears that the aurora are distant phenomena. Both the radiation belt and the aurora are related but poorly understood products of the interaction between the magnetosphere and the solar wind.

Aurora also affect radio communication causing signal flutter and permitting high frequency back scatter propagation. However as auroral absorption lasts for only a few hours the effect on radio communication is minimal.

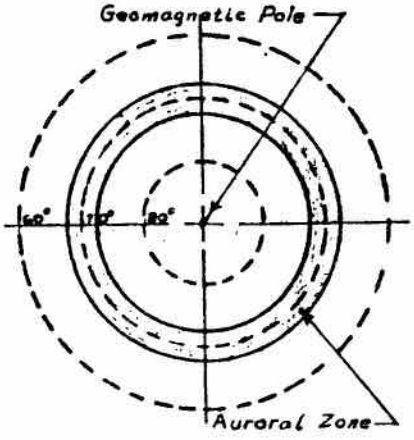
Figure 8

MAGNETOSPHERE
CROSS-SECTION



Polar Cap Absorption Events

Occasionally in addition to ionospheric storms, which follow a solar flare by 20 or 30 hours, disturbances of a different kind occur. These disturbances, which develop much more rapidly than ionospheric storms, are marked not by magnetic or auroral displays but by intense absorption of radio waves within the auroral zone.



These occurences known as Polar Cap Absorption (PCA) events, are accompanied by a con-

siderable increase in the electron content of the D layer of the ionosphere where radio waves are most easily absorbed. They occur over the entire region within the auroral zone.

PCA events appear to be caused by streams of protons which are ejected from the sun. These protons when they hit the earth's magnetic field, are guided by that field to the regions inside the auroral zone where, because of their speed, they penetrate to the D region before giving up their energy.

PCA events can last for several days and occur most during the sunspot peak. They may happen 10 or 12 times a year; in 1978, according to my records, there were 5 PCA events.

Conditions are worse in the daytime than at night and poorer at higher latitudes than at sub-aural ones. Attenuations of 15 to 30 decibels up to 30MHz are typical.

The Effect Of The Seasons

Since the earth's rotational axis is tilted with respect to its orbital axis about the sun the amount of radiation each part of the earth receives varies, with the portion of the earth's surface closest to the sun receiving the largest amount of radiation.

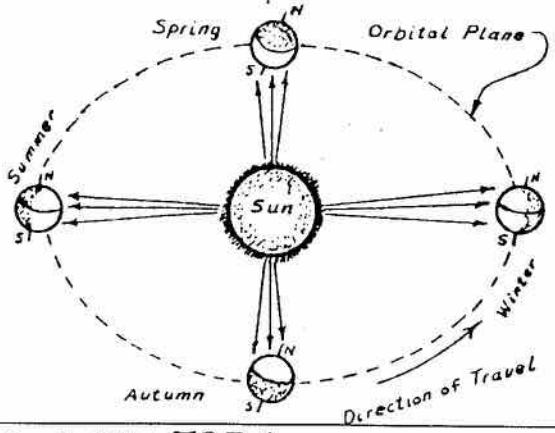
Solar radiation travels in a straight line from the sun and because of this, much of it hits the earth at an angle. The angle of radiation depends on the location on the earth where this radiation falls and the tilt the earth's axis makes with the sun.

When the northern hemisphere is experiencing winter it is tilted away from the sun so that the radiation angle is greater; consequently less radiation falls on this part of the earth than on the southern hemisphere which is tilted toward the sun. In the summer the reverse is true.

The tilt of the earth's axis also causes variations in the hours of daylight with the northern hemisphere receiving less hours of daylight in the winter than in the summer. In the summer because any one point in the northern hemisphere receives sunlight for a longer period of time and because the angle of radiation is smaller due to the earth's tilt, more radiation falls on that point than in the winter. This radiation ionizes the various layers of the earth's atmosphere more intensely in the summer permitting long range radio communication to take place on higher frequencies than is usually the case during the winter.

Additional Considerations

1. A sudden increase in the solar flux level will initiate a large increase in the D region absorption. This tends to attenuate signals below the maximum usuable frequency. (MUF)
2. D region attenuation occurs much faster than F region reflectivity builds up. However if sunspot activity is sustained for about three days, increased F region reflectivity will offset D region attenuation and conditions will be improved.
3. The effect of solar flux variations decrease with increasing latitude.
4. As solar flux decreases to low levels, magnetic storms tend to increase.
5. When the MUF is high and solar flux level increasing, magnetic storms can affect high frequency communications. The lower limit of the useable frequencies is determined by ionospheric reflection and absorption. Both usually increase as the frequency is decreased.
6. Another problem is solar particle radiation. This causes fading, flutter and increased noise.



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YL News and Views

Cathy Hrischenko VE3GJH
56 Stockdale Crescent
Richmond Hill, Ontario
L4C 3S9

C.L.A.R.A. AC-DC Contest
1983 Results

Member Winners

E17CW Clare ..... 1st Place
VE1BWP Jeannine 2nd
VE7BIP Elizabeth 3rd

Non-member Winners

VE3JPJ Steven 1st
VE4MG Malcolm 2nd
JH3DPB Yutoka 3rd
Mini-prize draw: VE3JPJ Steven

Congratulations to all those that took part. Nice to see the spread across Canada and the DX stations. A contest that's well worth the effort. Prizes include a trophy, certificates and draw.

Still looking for those YLs that became licensed in later life. Also those that became licensed in their 'teens and younger. Please send me the story behind their success or if you know of a Canadian YL that comes under these two headlines, please pass the name and call on to me and I will do a follow-up.

Early Canadian YLs

Who was the first female Amateur Radio operator? This honour has to be shared by two YLs living many miles from each other.

Madeleine Cross, known as 3QT, got on the air in 1922. Her father had taught her morse code. In those days you didn't run down to the local electronic store for parts, so she learned to wind coils and re-cycle things for parts— such as round Oatmeal boxes used for a box coil form. Later she became pretty good at doing her own repairs.

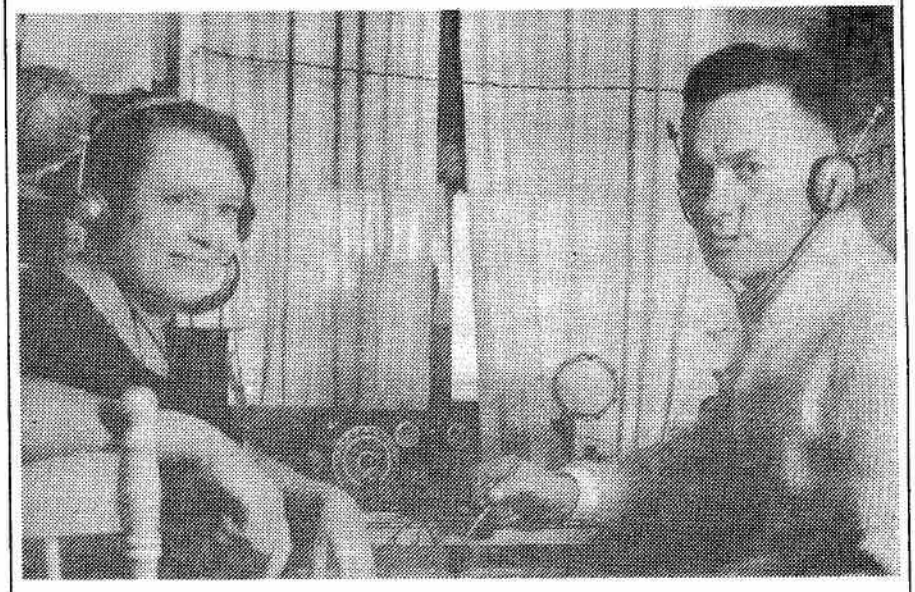
Things were less formal then, and she doesn't have papers to prove she was an operator then, but she does have a first class certificate for radio operator on Canadian ships dated April 1, 1926. I don't know if this was intended as an April fool joke, but she said, "I'd always had a great interest in travel, ships and communications."

She never did become a 'Sparks'. Most of her working years were served with communications and electronic companies in the Toronto area. Her last job before retirement was in the library of North York Board of Education.

Through all her years in radio, Madeleine never used a microphone. She does have QSL cards from around the world. Her final words about radio were, "wonder if maybe I wasn't born 30 years too soon."

The other young lady to share this honour was Lila Ober, now a silent key. Again we deal with a less formal attitude about Amateur Radio. She never passed any kind of proficiency test but she holds a real part in the early years of Amateur Radio. She was the wife of Dooley Ober, who held the calls 4DQ, C4DQ, VE4DQ & VE7RU. He got on the air around 1919. Lila started sometime in the early 1920's. Like many a female, she picked up the code by listening while the OM operated. She started operating under the same call as Dooley and was very active on CW in Vulcan, Alberta, and later in Calgary and Vancouver. Lila preferred the hand key but once, when in a hurry, she started using Dooley's bug. We have several copies of newspaper articles about Lila, thanks to her son and his wife. I will keep these details for the book I'm writing on the history of Canadian YLs. In 1925 a picture of Dooley and Lila was published in the Calgary Albertan newspaper. The first Canadian YL—OM team in Amateur Radio. She too, became proficient at building and repairing their radio gear. In 1962 Dooley became a silent key and in the Vancouver paper it stated that his wife, Lila was even more knowledgeable in the field of Amateur Radio than he. Those were the days my friend. 73/33/88 as the case may be!

Cathy VE3GJH



Lila and Dooley Ober in 1925.

A Tall Tale of a Tall Tower

or

An Ounce of Prevention is worth a Lot of Tower Height

By Bill Wilson VE3NR

Jim had quite a story; here is how he started it: "It was a good day at the plant. The weather was fine and I enjoyed walking home. I was about a block away when I surprised to see a bloody great tower sticking up above the houses. I wondered whose it was. Well, I found out when I got near my place; it was Fred's, my neighbour's. How could Fred do that to me? That nasty @#¢&, I'll show him!"

Trouble was brewing for Fred.

Jim did not waste any time. He organized a meeting of the neighbours and found that they didn't like that tower at all. They called themselves the 'CAT' group— 'Citizens Against Towers'. They wrote and phoned everyone they knew in the municipal and provincial governments and in Ottawa, saying that the tower was an eyesore, that it was not safe and that it was very likely to cause serious injury. The CAT group all trooped down to the next City Council meeting. After a very noisy meeting, the Council told the City Planner and the City Solicitor to draft a by-law that would prevent the construction of towers of any kind in their city. The Building Inspector told Council that Fred had not taken out a building permit. The reason Fred gave was that radio towers were a federal responsibility and the city could not control them. That really inflamed the Mayor, who promptly told the Inspector to get the tower taken down before it fell over, killed someone and smashed the homes around it.

Fred was about to lose his tower.

When Marcie, the young reporter from the local daily, came along to see what all the fuss was about, Jim's wife ran out to tell her the tower was really 95 feet high. The photographer she brought along to take a picture made it look as if it was 125 feet. (It was really only 75 feet high but by now no one cared about the facts.)

Jake, who retired some years ago and now lives behind Fred, assured everyone that the 'CB signals' from Fred's tower would not harm him or his wife; since the tower went up he was keeping the windows on that side of his house closed night and day. Nellie, next door to Jake, said it bothered her dog which now howled every night.

Fred had to give up going to the office by bus. His 'friends' had taken to gouging him in the ribs, stepping on his toes and knocking parcels out of his hands as they passed him on the bus.

After Fred got his tri-bander on top, a lady up the street told her friends that Fred didn't need such a high tower and huge TV antenna. "Anyone," she said, "knew that TV off the cable was plenty good. Fred probably had to do it because he didn't pay his cable TV bills on time. For that matter, he probably didn't pay any of his bills on time anyway".

Fred and his friends at the Amateur Radio Club were at their wits' end. No one would discuss the problem rationally and they had few friends in the community. The club wrote the Department of Communications who said sure, the federal government has exclusive jurisdiction over radiocommunications, but they went on to say that "a properly framed by-law dealing with local zoning and relating only indirectly to radiocommunications may coexist with federal legislation provided the by-law neither prohibits not unduly restricts the conduct of radio services or the operation of federally licensed radio stations."[1] They were worried that the solicitor, the planner and the inspector might be aware of that statement when they got together to prepare the new by-law and that Amateurs might suffer as a result.

"Nonsense!" you say? "Never heard of such a story." Well, I wish it were so, but sadly, my experience over 20 years in DOT, DOC and CARF confirms that it is typical of most problems involving towers in residential areas. CARF has been involved in four tower problems this past year alone.

One theme is common to just about all tower cases. By not paying any attention to neighbours, an Amateur can surprise, shock and often frighten— yes frighten them by putting up a high tower. These days when people still recall how fall and winter storms used to bring down numerous TV towers and when they want a "back-to-nature" style of living in suburbia, the results can be disastrous for the tower owner. He can be quickly out numbered by angry, irrational and aggressive neighbours who will say and do anything to get the tower taken down. It may be years before

[1] *From a DOC letter to CARF on towers dated April 25, 1983.*

things get cooled down. In many cases when this happens, the tower owner is eventually forced to move.

Remember that old saw about an ounce of prevention being worth a pound of cure? Well, here the prevention is preparing the neighbours to accept the tower before it goes up. It involves making friends with your neighbours, telling them about Amateur Radio, what it does for community events and emergencies, letting them see your station, and explaining about antennas and the need for a tower. Certainly, this will require some tact and diplomacy and perhaps some coffee parties as well as the occasional barbeque. You can only gain from such an effort.

Be prepared to prove to your neighbours on adjacent lots that your tower will be structurally safe. Experience has shown that this is the most worrisome problem for those close by. Invariably this requirement attracts the attention of building inspectors and they can make trouble if your mast is unsafe. DOC's regulation of radio tower safety is limited to towers used for broadcasting and to those used for private receiving antennas in areas where municipalities wanted federal authority delegated to their building inspectors for the purpose of ensuring safe receiving towers in their municipality. Thus DOC has left the safety of most radio towers unregulated, and their statement of April 25, 1983, quoted earlier, implies that the Department will allow municipalities to occupy this regulatory field. Failure by Amateurs to pay careful attention to the structural safety of their towers could result in stiff by-laws that would adversely affect Amateurs in general.

Ingenuity in dealing with your neighbours helps. Suppose your tower will withstand simultaneously 120 mph winds and ½ inch of ice and your neighbour is still worried; don't hesitate to add a guy "so it won't fall on his house". It can be a cheap visible placebo that will remove his fears. Too, you could use it as an extra antenna.

If some people are concerned about the effect of the tower on the visible environment, you may have to settle for a lower one to start with and increase its height year by year as they get used to it. Crank-up towers offer a number of possibilities for dealing with problem neighbours.

If you have not 'interference proofed' your neighbours' equipment and plan to run full power, prepare them for possible interference problems, and explain how they can let you know about interference and how you will resolve those problems. Talk about your tower plans with other Amateurs and with your local club. Those who have towers will no doubt have good suggestions about preconditioning neighbours.

By going at it the right way, you could have the neighbours helping you put up your tower as one Amateur near Ottawa had when he put up his 125, repeat *125 foot*, tower some years ago.

Licence Fees Up!

By 50¢— Today's Big Deal or the Calm before the Storm

In a long-anticipated move, the DOC has finally raised licence fees but only by 50 cents. This applies to upcoming fiscal year 1984-85. After that there will no doubt be much larger increases as a result of a study the Department is undertaking to meet the goal of cost recovery of its operation. The raise, the first in many years, brings the fee to $13.50, which is 15¢ less than the permitted 5%. Annual fee notices with the new amount should be out in a month or two.

The story on fee increases goes back to 1978 when the Auditor-General requested DOC to raise licence fees on a regular basis in order to recover the total costs of managing the radio spectrum. Forecasts for revenue for the following fiscal years, right up to 1983, were optimistic but fell far short of the actual costs, with the result that fees have been raised for the fiscal year 1984-85 and will likely continue to rise. The matter of fee increases is currently under study with the objective of determining "just and equitable methods" for producing revenue to meet costs.

Just how this criteria will be applied to a non-profit-making service such as the Amateur Service and probably the General Radio Service is not known. Indeed there are rumors that the latter may be deregulated to the extent that licences will no longer be required, following the lead of the FCC in the U.S. That would probably mean that whatever costs still existed for that service such as enforcement, plus those for the non-cost recoverable administration of government and Crown corporation spectrum users (13 million in 1982-1983) would have to be made up by fee increases on the remaining licensees.

Keep Us Informed! Call the
TCA NEWSLINE
(613)-824-3467
Anytime!

CORRECTION:

In a footnote to February's Guest Editorial, the segment of the 450 MHz band which Amateurs lost was 420 to 430, not 426 to 430. Also, the story was written by Don Bower, not Don Bowen as noted.

Code in the Head

By John F. Davidson KA0NPN
ex- VE5GL, VE7GL

Every now and then we find a real good article in one of the many club bulletins which arrive in our post box and we like to give them the wider circulation they deserve. Here's one which originated in Saskatchewan Amateur Radio League's bulletin and which we read in the Ottawa Valley Mobile ARC's 'Rambler'.

Learning the code is no problem. The problem is how you learn it! Most old-timers learned it the wrong way, and even today teaching methods might be improved.

Let me offer my credentials for teaching code. First of all, I learned it in the wrong way, of course, in the mid 30's. I picked up the alphabet and numerals plus normal ham punctuation and then hit a plateau of about eight words per minute. I was told that this was normal, and I could get over this with continued practice. Eventually, I did, and passed the 10 wpm code test in Canada and was assigned the call VE5GL. I operated for a couple of years, until September 1939, when we were closed down due to World War II.

Shortly thereafter, I was teaching physics in an RCAF school in Vancouver, when the brass discovered that I held an Amateur licence. I was immediately assigned the job of teaching code to the incoming airmen, several of whom had been told that they couldn't learn it. I inadvertently hit upon a teaching system that worked! I didn't know why at the time, but I do now after 40 years of teaching at all levels from kindergarten through Ph.D. Our record of teaching success is shown by some thousands of airmen who took the final exam, and every one of them scored 100%. We never did have a single error in copying— on the final!

In the introduction to the class on our first meeting, I asked the men to write down the letters as I dictated them. Then I simply spelled out "M—O—R—S—E—C—O—D—E—" in plain language. When I found that nobody had made errors, I promised them that they would pass the code test. All we were going to do was change the name of the letters. Instead of 'M', that letter was going to be 'Dadah,' etc. At no time did we allow, or even admit, the existence of dots or dashes. To prevent the students from breaking down the letters in their component parts, the letters were sent at about 25 wpm, but for copying practice, they were spaced— well spaced in terms of time, poorly spaced in terms of good code.

So-called 'recognition runs' were made from time-to-time, where the student was not expected to copy, but just listen for 'oddball' letters. For example, during the first half-hour session, the class was taught the 'dit' sequence from E to 5. After a half-dozen runs, with the five characters well spaced, a 25 wpm run of the letter S was presented with the occasional I or H inserted. The students' job was to pick out the 'oddballs' in the run, both letter and the number. Five half-hour sessions were used to teach the characters needed.

In subsequent lessons, the drills always contained some 'oddball' speed passages, and the students liked them very much. After the alphabet had been learned, every session ended with an exam. We used the official examination form and conducted the test just as the final would be given. They scored their own tests, and deducted 5 points for each error. Scores typically ranged from minus 125 down to minus 350 or so. They kept a graph of their progress, and we had marvelous celebrations when students got up to zero!

Speed was picked up, of course, by merely shortening the spaces between letters, and this was quite insidious. So much so, that I sneakily sped up their daily exams and other speed test. I'd tell them, "Okay, let's try six wpm." Then, I'd send the passage at seven-and-a-half or eight. We had them copying 12 and 13 words per minute while they believed it was eight! They were supposed to leave us at eight wpm but all were capable of 15, and most were up to 20 in 30 hours of instruction time. By the way, we started the program with one hour every second day, and changed to a half hour each day for five days a week. That was the program, and now after many years, I know why it was successful.

We proceeded directly from sound to letter. No intermediate interpretation was permitted. The fast letter speed forced the beginner to go from sound to letter. The code was sent too fast for a beginner to break the letter down into its components. Since it was a training program that did not require thinking or analysis, short sessions at frequent intervals were preferred over longer, less frequent sessions.

The plateau, which apparently still occurs with some students who

are learning the code, is the result of interpreting the sound as something other than the letter itself. For example, 'Dididadit' is two dots, a dash, a dot, and that is an 'F'. Counting the elements takes time, and one can do this at slow speeds, but it becomes very tough at eight to 12 wpm. This is why the plateau occurs at this level, and the plateau persists until one learns, letter by letter, to go directly from sound to letter. If you first learned that 'dididadit'is merely another name for 'F', then the phone or speaker just spells out the words for you, and your limitation is your writing speed. As I said in the beginning, learning the code is no problem!

How Call Signs are Set Up

Art Stark VE3ZS

Call signs are the combinations of letters or letters and figures by which individual radio stations are identified.

By international agreement and regulations, radio transmissions in the Amateur Service and other specified services must be identified, and to this end the International Telecommunications Union (ITU) has allocated blocks of letters or letters and figures (referred to collectively as 'characters') to each member country.

Canada, for example, has been allocated the blocks CFA-CKZ, CYA-CZZ, VAA-VGZ, VOA-VOZ, VXA-VYZ and XJA-XOZ; and the U.S.A. may use AAA-ALZ, KAA-KZZ, NAA—NZZ, WAA-WZZ. The lack of continuity in the groups of allocations has been caused over the years through the need for additional call signs and political changes throughout the world. For instance, Canada gained the VOA-VOZ group when Newfoundland joined Canada in 1947. The group had originally been allocated to Newfoundland as a British colony.

At one time country identifiers consisted only of letters, either one ('G' for Great Britain) or two ('VE' for Canada). Then with the ever-increasing number of radio stations and the number of individual states, it became necessary to employ figure/letter groups (3AA-3ZZ for Monico) and later, about 1970, letter figure groups (P2A-P3Z for Papua-New Guinea) were added.

From these ITU allocations, individual countries may develop their own series of call signs for their own individual radio stations in accordance with general rules set down by ITU. The following is a greatly simplified and abbreviated version of the ITU rules:

ship stations— 2 characters + 2 letters (GBBS, 4XAK)
aircraft stations— 2 characters + 3 letters (CFTCA)
amateur stations— 1 or 2 characters + 1 digit + not more than three letters (G3ABC, VE3TCA)

As with most rules, there are some exceptions made to these rules: e.g. 'VExRCMP' (where 'x' is the regional number designation) which is only used when the RCMP wish to communicate with Amateur stations in an emergency situation.

There are further rules or policies whereby in Canada groups of the initial two characters are reserved for specific sub-classes of stations or licensees; for example—

CI- military
VG- D.O.T. ground stations (mostly aeronautical)
CF, CG- civil aircraft (corresponding to the aircraft registration letters)
VA, VB VC— D.O.T. coast stations
CG— government ships.

Again there may be exceptions to these sub-allocations.

Other exceptions to call signs also exist. For example, broadcasting stations of the Canadian Broadcasting Corporation (CBC) such as CBO, CBOT, etc. are using the ITU countries characters from the block allocated to Chile (CAA-CEZ). This is accomplished through a bilateral agreement between Canada and Chile to enable the CBC stations to continue using the call signs originally used prior to ITU allocations.

ITU requires that, when developing call signs, member states take appropriate precautions to avoid assigning combinations which could be mistaken for distress or other emergency signals; thus any combination containing 'SOS' would not be acceptable.

There are to date some 279 blocks of call signs allocated to some 204 countries and 3 international organizations (International Telecommunications Union, International Civil Aviation Organization and the World Meteorological Organization). The block QAA-QZZ is not used for call signs but is reserved for service abbreviations and the Q code.

In Canada, regular Amateur station call signs are developed from the VAA-VGZ, VOA-VOZ and VYA-VYZ ITU allocations with the Canadian prefixes becoming VE, VO and VY. These country prefixes are followed by a figure, designating the DOC licensing area or region, and either two or three letters to designate the individual stations concerned.

Prefixes used in Canada to

designate the country and the DOC region are:

VE1- Nova Scotia,
New Brunswick
and Prince Edward Island
VE2- Quebec
VE3- Ontario
VE4- Manitoba
VE5- Saskatchewan
VE6- Alberta
VE7- British Columbia
VE8- North West Territories
VE0- Maritime Mobile
VO1- Island of Newfoundland
VO2- Labrador
VY1- Yukon

(It should be noted that VE9 is NOT used for Amateur stations; that prefix is reserved for commercial use in the Experimental Service.)

Canadian call signs are generally referred to as being either 'two-letter' (VE3ZS) or 'three-letter' (VE3TCA) calls. Normally 'three-letter' call signs are assigned to new Amateur stations in sequential order. At times, this may not always appear to be strictly true, since some DOC offices are allocated blocks of call signs in order to enable a faster service in the issuance of licences.

In Canada, as in many other countries, 'two-letter' call signs are highly prized by some Amateurs. Since these call signs are limited in number in some regions, the DOC has adopted guidelines for their issuance. The priority for the issuance of these calls is:

1. to an Amateur with
   a) full radiotelephone privileges, and
   b) ten or more years active operation, and
   c) who has been the previous holder of a two-letter Canadian call;
2. to an Amateur with any two of the requirements in 1;
3. to an Amateur with any one of the requirements in 1.

Canada, unlike some countries, does NOT use different groups of call sign suffixes to signify the class of Operator Certificate held by the licensee.

Full details concerning the international requirements for the identification of stations and the formation of call signs may be found in the ITU document "Final Acts of the World Administrative Radio Conference, Vol. 1, Geneva, 1979. Article N23.

Christmas Cheer via Amateur Radio

A number of clubs are utilizing their facilities to put on various activities during the Christmas season to make the season brighter for those who may be housebound or in hospital. Ottawa Amateurs used two metres to let children in the wards of the Sick Children's Hospital talk to 'Santa Claus' over two metre hand-helds and a local repeater. Both the staff and kids get a real kick out of this activity.

Some clubs handle Christmas greetings to and from residents of senior citizens' homes. Les Harris VE3AYZ describes one such activity:

"Members of the Lakehead Amateur Radio Club, the Northwestern Senior Citizen Amateur Radio Club, Amateur Radio Station VE3RCN at H.M.C.S. Griffon and other unattached Thunder Bay hams passed Christmas greeting messages for senior citizens and staff in three seniors' residences. About 97 messages were transmitted.

"Dan Person VE3KRO President of the Lakehead Amateur Radio Club set up and operated a portable 2 metre station, assisting Amateur operators at the three homes. Well done, Dan! It has been suggested that next year the Lakehead Club station, VE3FW, at the Emergency Measures Organization building, participate in this program too.

"The sending of these Christmas Messages and the replies made many senior citizens and families very happy on Christmas 1983."

How to set up a Repeater on a Mountain

The Department of Indian and Northern Affairs in the Yukon operates a number of automatic repeater stations scattered throughout the Territory.

Flat Mountain, about 50 kilometres north of Whitehorse and with an elevation 2,000 metres above sea-level, has one of these repeater installations on its peak. This site has been notorious for antenna icing problems. Because of a few failures, Northern Affairs decided to install a Comshell (communications shelter).

The Comshell is a fibreglass structure about nine metres tall and weighing about 600 kilograms. The top section accommodates the antennas, where they are completely protected from the harsh environment, eliminating the number-one problem; antenna icing. The bottom section stores the equipment and batteries.

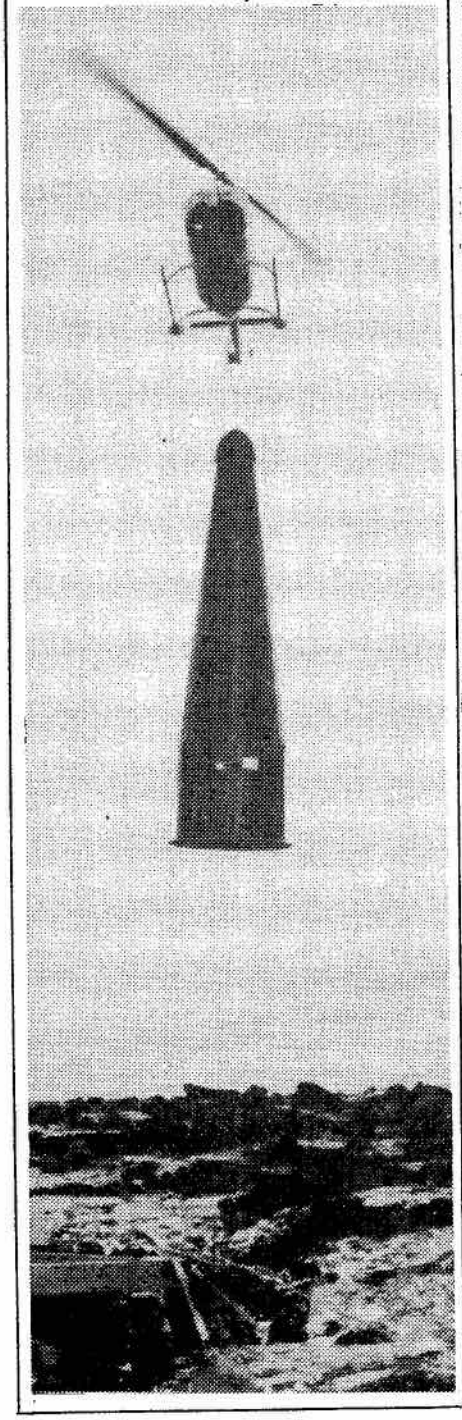
First the work crew were taken to the site, and the helicopter then went back to pick up the Comshell from a semi-trailer parked a few miles away along the Alaska Highway. In spite of a 30-knot breeze, the pilot managed, on his first attempt, to put the Comshell down on the mounting base within inches of where it was to be bolted down. It looked so easy. The pictures tell the rest of the story.

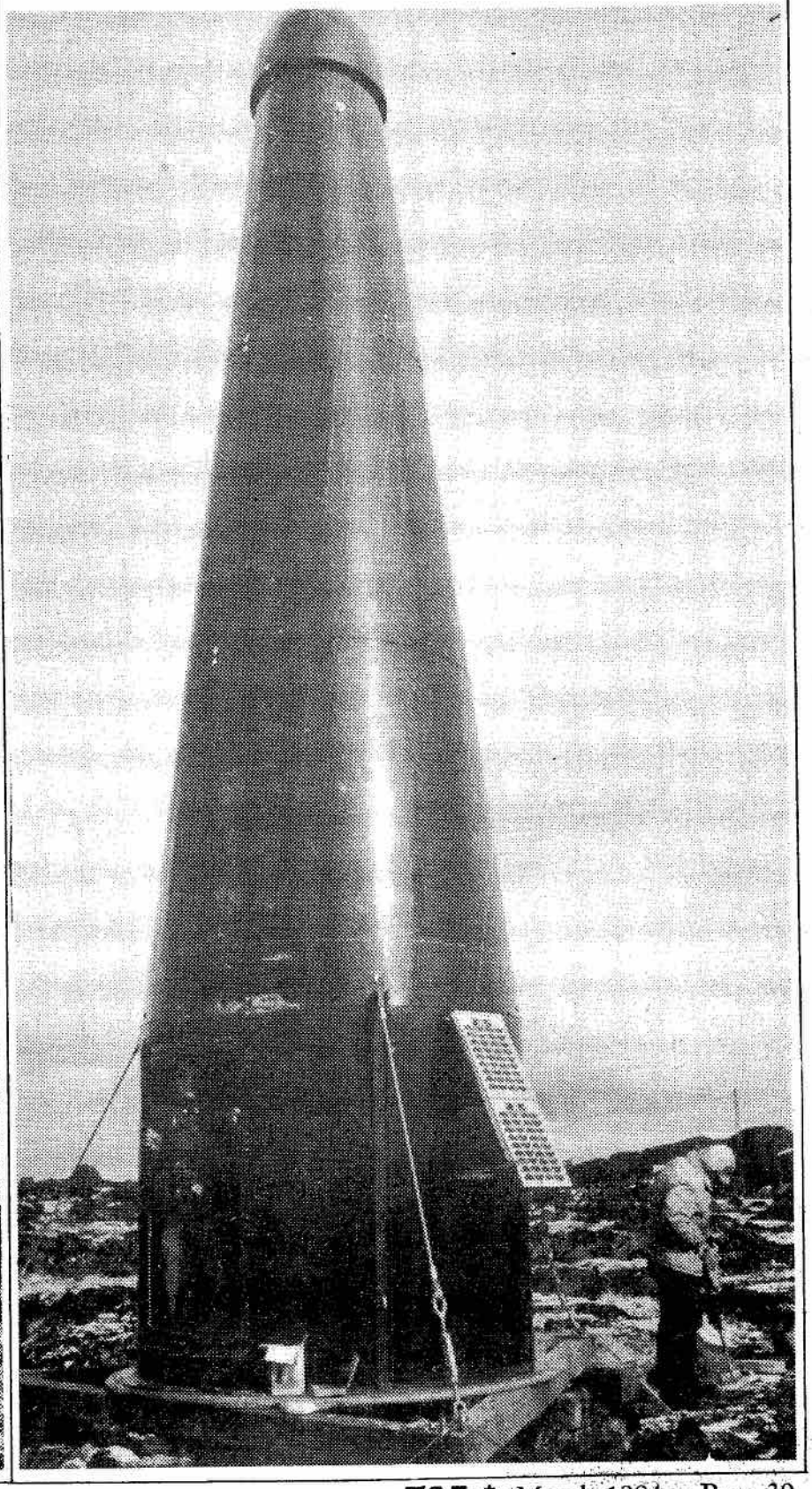
Frank VanderZande,
DOC District Manager,
Whitehorse, Yukon
Pacific Region

Below: Helicopter carrying Comshell to Flat Mountain, Yukon, 2000 metres above sea level.

Right: The Comshell is in place. The 24-volt solar panel is used for trickle charging high-capacity lead acid batteries. A technician is drilling holes for rock anchors.

Photos: Department of Communication





Technical Section

The B.R.A.K. Computer

By Tom VanDen Elshoot VE3LNY

Not only am I a member of the York Region Amateur Radio Club in Newmarket and a Life Member of CARF, but I am also a member in good standing of the Bossche Radio Amateur Klub (BRAK) in 'S Hertogenbosch, The Netherlands. I have the distinction of being the only member of this club who is unable to attend any of its meetings by virtue of the distance.

I do however receive the BRAK monthly bulletin, and in this publication I found a very interesting club project called 'The BRAK Computer'. What it does at a reasonable cost is:

1. It is an iambic keyer, with or without automatic word space.
2. It is a Morse tutor with random output, at a speed of 1 to 100 words per minute, of letters, numbers or mixed letters and numbers— all in the standard 5-character groups.
3. It is a beacon, programmed by an EPROM (erasable programmable read-only memory). The beacon transmits the call and QTH, and even a few musical notes can be programmed in. Great for autopatch, just burn in your frequently-called numbers.
4. It stores permanently up to 15 different messages using the same EPROM. This could be very useful for contests, or even regular QSOs, to transmit messages which are often repeated; e.g. "RST 599, QTH is ---, Name is ---, Rig is ---, Ant is ---.
5. It is a 90-character RAM memory which can be changed at will, and can be broken down for a series of smaller messages as long as the 90 character limit is not exceeded. It will tell you when it is full by sending in Morse "Memory Full". More RAM can be added later if needed.

All this, plus a few bells and whistles— like changing speed and tone by the paddle— is included in the basic design.

Future expansions of this design to add a voice identifier, CW receive and transmit via a standard ASCII Keyboard and printer and finally (this interests me most) by the addition of some extra memory and another EPROM the computer can be given full BASIC capabilities.!

The ICs used in this project are:
1 MC6802 8-bit microprocessor with clock and RAM (about $13)
1 MC6820 or MC6821 Peripheral Interface Adapter (about $7)
1 2716 or 2516 EPROm (about $18 or $10 respectively)
1 74LS138N 3-to-8 line decoder (about $2)
1 74LS00N quad 2-input NAND (about $0.25)
1 4.0 MHz crystal

Total cost about $40 plus the cost of the crystal, a handful of 1K and 10K resistors, a couple of 20 or 22 pF capacitors, and a stable and well-regulated power supply. You will also need 12 on/off switches and two momentary contact push-buttons. Your own or a friend's well-stocked junk box, or a flea market, will take care of most of these incidentals.

The unit can be hard-wired on Vero board, but that certainly would be doing it the hard way. A printed circuit board is available for about $6; it is double-sided but not plated through and not drilled. As a number of socket connections have to be soldered on both sides, it is advisable to use wire-wrap sockets and mount them about ¼ inch above the board so that they can be easily soldered on both sides of the board. Low profile sockets can be used if a fine wire is soldered into the hole to make the top connection to the board— tricky to say the least, but possible with a steady hand, a fine-tipped soldering iron, and a magnifier.

The schematic diagram is simplified in that each line on it may represent anywhere from one to eight wires. You can tell exactly how many by counting the branches. The printed circuit board layout is for the component side of the board; I have not included the diagram of the underside of the board because I don't have it. The drawing of the component side shows where jumpers should be added before the sockets are soldered to the board, some jumpers run underneath the sockets. Concentric circles show where a short piece of wire is used to connect the top and bottom sides of the board (one-hole jumpers?). The schematic of a simple but adequate power supply is also shown.

Although not shown, it would be a nice touch to equip the switches with LEDs to show at a glance whether the switch is set for a 0 or a 1. This will eliminate a lot of staring at the switches.

Given the precautions for soldering the IC sockets to the board, there should be no problems there. The PC board has all the extra input and output connections for future expansion. The connections for 6821 pins 2 to 13 (A to M) go through the switches and pull-up resistors to ground, as shown on the schematic for A. The LEDs suggested above can be fed in parallel, with a 1K resistor in series with each LED. Switches A, B, C and D are the CW speed switches; E to M are the program switches. All switches have the same function for both

input and output. Outputs N and O (pins 14 and 15 of the 6821) are connected through 10K pull-up resistors to +5 volts, and to the dit and dah contacts of the Keyer paddle. Output Q is the oscillator output, it is an audio signal and can be connected to any audio amplifier, e.g. for code practice. Warning— do not connect this audio signal directly into the mike input to key your rig. It is a square wave with an enormous number of harmonics, most of which will appear on your transmitter output.

The power supply was constructed entirely of junk-box parts except for a new 7805 regulator. The computer as shown draws about 300 mA, but build the supply to allow for future expansion.

If there is enough interest in this project I could see if I can get the PC boards for you, otherwise contact Frans directly. The boards cost about $6, and is available through:

Frans Maters, PA0FMY
Scheldehof 32
5463 JD Veghel
The Netherlands

All other parts are readily available in Canada. Programming the EPROM can be a major obstacle unless you know someone with the capability. Frans PA0FMY will do it for you without charge. Order the EPROM from him (about $18) and include the list of messages you want him to program into your EPROM.

After the unit is assembled and tested you can sit down and do some serious testing with the help of Table 1. In the table, 0 = ground and 1 = +5v. Switches A,B,C and D govern speed only. Setting them all at 0 (ground) will give the lowest speed; when they are all at 1 you will get the highest speed. There are 14 intermediate speeds available with other combinations of 0s and 1s. Switches M to E are the ASCII programming switches, set them as shown in the tables.

Table 2 is the ASCII table used to put your program into RAM. When switch M = 0, depressing the dit or dah paddle will send the letter or number you have chosen. If this is what you want, then switch M to 1 to put it into the memory by using either of the paddles. Do not use RESET any more, just change the switches.

When the basic design is expanded I will relate my experience to you. In the meantime, happy automatic CW!

Tom VanDen Elshoot VE3LNY
12 Johnson Road
Aurora, Ont. L4G 2A2

TABLE 1

FUNCTION	SWITCHES M L K J H G F E	REMARKS
IAMBIC KEYER	0 0 0 0 0 0 0 0	USE RESET AND NMI
SAME, WITH SPACE	0 0 0 1 0 0 0 0	DO NOT USE RESET !
TO CHANGE TONE AND SPEED: USE DIT PADDLE TO DECREASE. COMPUTER WILL SEND "V" WHEN RESET IS USED. "X" INDICATES THE ACTIVE SWITCH TO MAKE THE CHANGE.		
TONE	X 1 1 0 0 0 0 0	PUSH NMI TO CANCEL
SPEED	0 1 1 0 0 0 0 0	PRE-PROGRAMMED SPEED
	1 1 1 0 0 0 0 0	AND TONE
MORSE TUTOR:		
LETTERS	0 0 0 1 0 0 0 0	USE RESET
NUMBERS	0 0 1 0 0 0 0 0	NO RESET USED
MIXED MODE	0 0 1 1 0 0 0 0	NO RESET USED
PROGRAM MEMORY OUT	0 0 1 1 X X X X	REPEATS MESSAGE
	0 0 1 0 X X X X	SENDS ONCE ONLY
"XXXX" DETERMINES THE MEMORY LOCATION IN ASCII AFTER RESET IS PUSHED, EG:		
MESSAGE 0	0 0 1 1 0 0 0 0	RESET TO START ONLY,
MESSAGE 1	0 0 1 1 0 0 0 1	DO NOT USE RESET TO
MESSAGE 2	0 0 1 1 0 0 1 0	ACCESS OTHER MEMORY
MESSAGE 3	0 0 1 1 0 0 1 1	LOCATIONS
ETC.		
THIS ROUTINE IS THE SAME FOR EPROM BUT NOT FOR THE RAM MEMORY		
RAM MEMORY OUT	0 1 0 0 X X X X	
AGAIN, XXXX IS THE MEMORY LOCATION		
RAM MEMORY CLEAR	1 1 0 1 0 0 0 0	AFTER RESET, COMPUTER SENDS "MEMORY CLEAR "
RAM PROGRAM IN	0 1 0 1 X X X X	USE RESET ONLY ONCE HERE
BEACON	0 0 1 0 0 0 0 0	USE RESET TO START IT

TABLE 2

INPUT	SWITCHES M L K J H G F E	INPUT	SWITCHES M L K J H G F E
A	X 1 1 0 0 0 0 1	U	X 1 1 1 0 1 0 1
B	X 1 1 0 0 0 1 0	V	X 1 1 1 0 1 1 0
C	X 1 1 0 0 0 1 1	W	X 1 1 1 0 1 1 1
D	X 1 1 0 0 1 0 0	X	X 1 1 1 1 0 0 0
E	X 1 1 0 0 1 0 1	Y	X 1 1 1 1 0 0 1
F	X 1 1 0 0 1 1 0	Z	X 1 1 1 1 0 1 0
G	X 1 1 0 0 1 1 1	0	X 1 0 1 0 0 0 0
H	X 1 1 0 1 0 0 0	1	X 1 0 1 0 0 0 1
I	X 1 1 0 1 0 0 1	2	X 1 0 1 0 0 1 0
J	X 1 1 0 1 0 1 0	3	X 1 0 1 0 0 1 1
K	X 1 1 0 1 0 1 1	4	X 1 0 1 0 1 0 0
L	X 1 1 0 1 1 0 0	5	X 1 0 1 0 1 0 1
M	X 1 1 0 1 1 0 1	6	X 1 0 1 0 1 1 0
N	X 1 1 0 1 1 1 0	7	X 1 0 1 0 1 1 1
O	X 1 1 0 1 1 1 1	8	X 1 0 1 1 0 0 0
P	X 1 1 1 0 0 0 0	9	X 1 0 1 1 0 0 1
Q	X 1 1 1 0 0 0 1	/	X 1 0 1 1 0 1 1
R	X 1 1 1 0 0 1 0	,	X 1 0 0 1 1 0 0
S	X 1 1 1 0 0 1 1	-	X 1 0 0 1 1 0 1
T	X 1 1 1 0 1 0 0	.	X 1 0 0 1 1 1 0

I have yet to discover where the question mark is. On some settings you will hear nothing from the monitor - you have just sent a space. The memory will accept that, so you can program spaces into your messages.

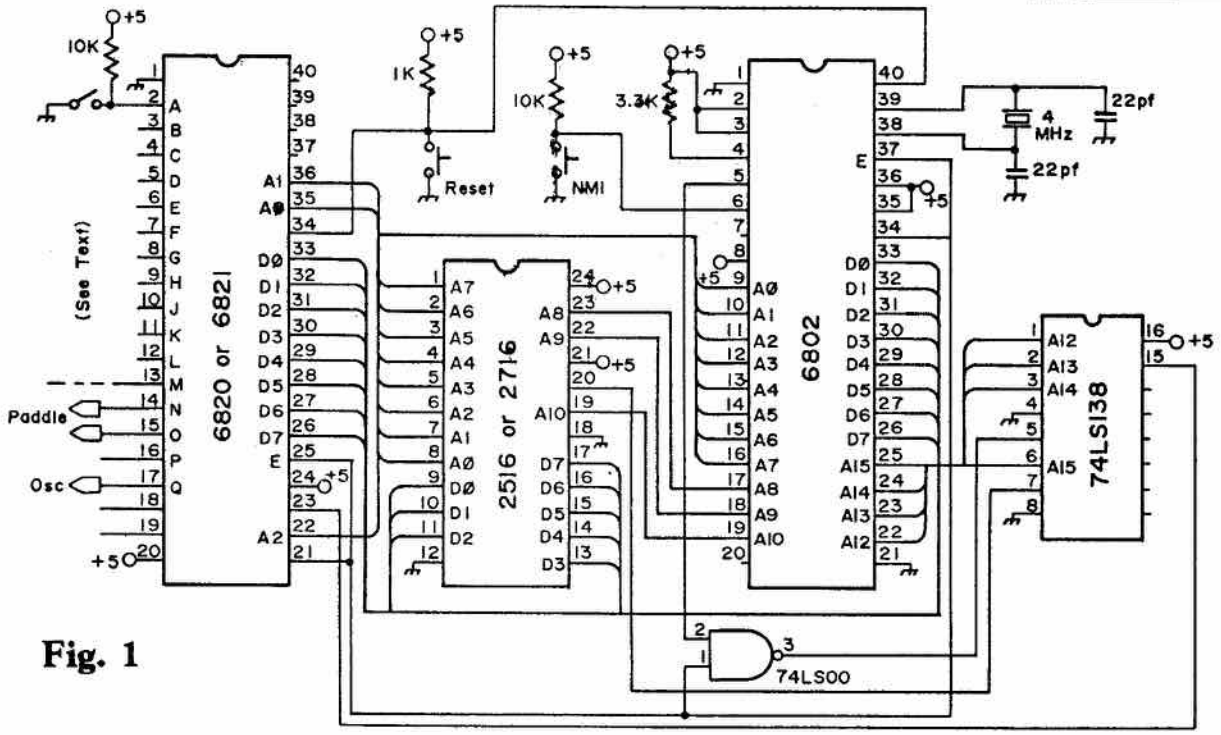


Fig. 1

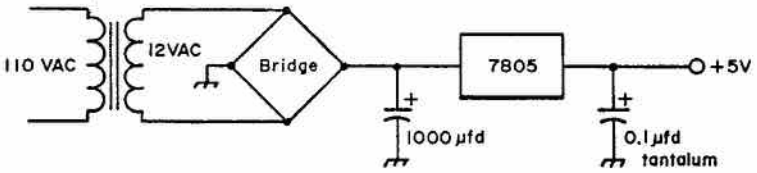


Fig. 2

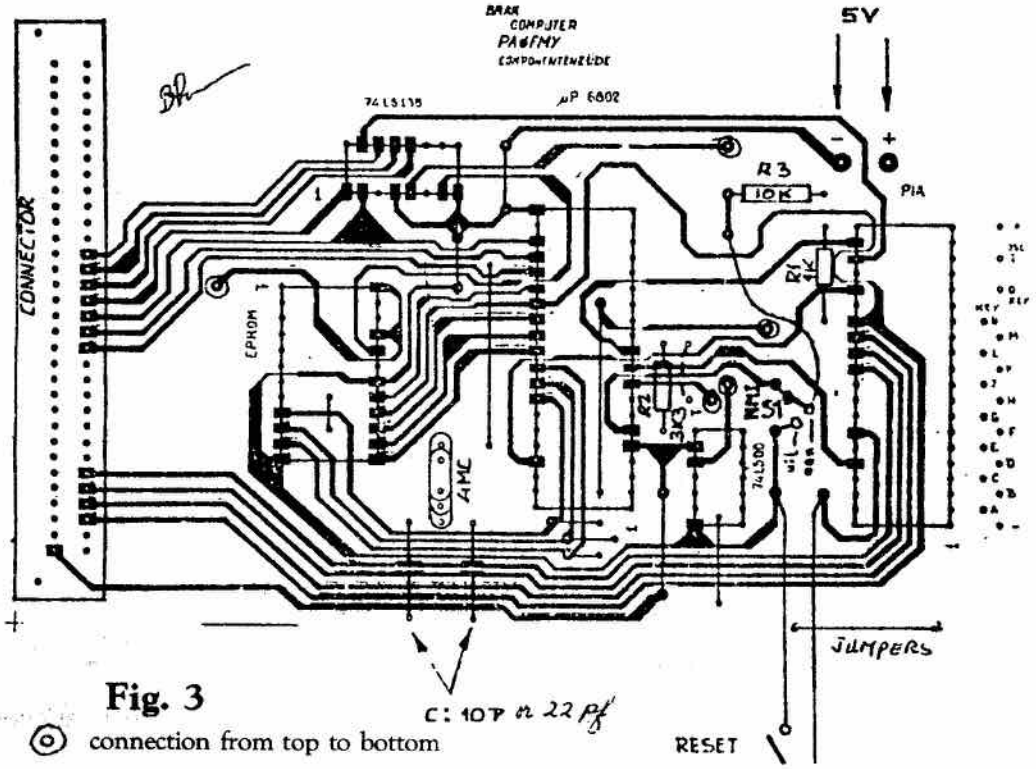


Fig. 3

connection from top to bottom

A Modified Feed for the OSCAR Turnstile Antenna

With the upcoming flight of STS-9, and a desire to at least make an attempt to work Dr. Garriot, I decided to build the recommended turnstile antenna which I could later use for OSCAR work. After studying the frequencies in question, I concluded that a more broadbanded feed than the simple dipoles might be in order. This brought to mind the folded dipole with its inherent broadband characteristics.

After a bit of head scratching and some work on the trusty old TI-30, I came up with what you see in Fig. 1. Both of the dipoles and the two quarter-wave harnesses are made from standard 300 ohm T.V. twinlead. It pays to shop around when purchasing the twinlead as there is quite a variation in the size of the conductors. Try to get the heaviest conductors that you can find. I used 'Channel Chief' model 8580 which has a velocity factor of .66, which must be taken into account when cutting the phasing harnesses. If you use a different twinlead, be sure to check the velocity factor and correct accordingly.

Make up the dipoles and harness as shown in the diagram, and connect it to the 4 to 1 balun which is made from a 26 inch length of RG-58/U coax. A short length of the same coax serves as the feed which can be terminated in any convenient connector for connection to the lead-in cable.

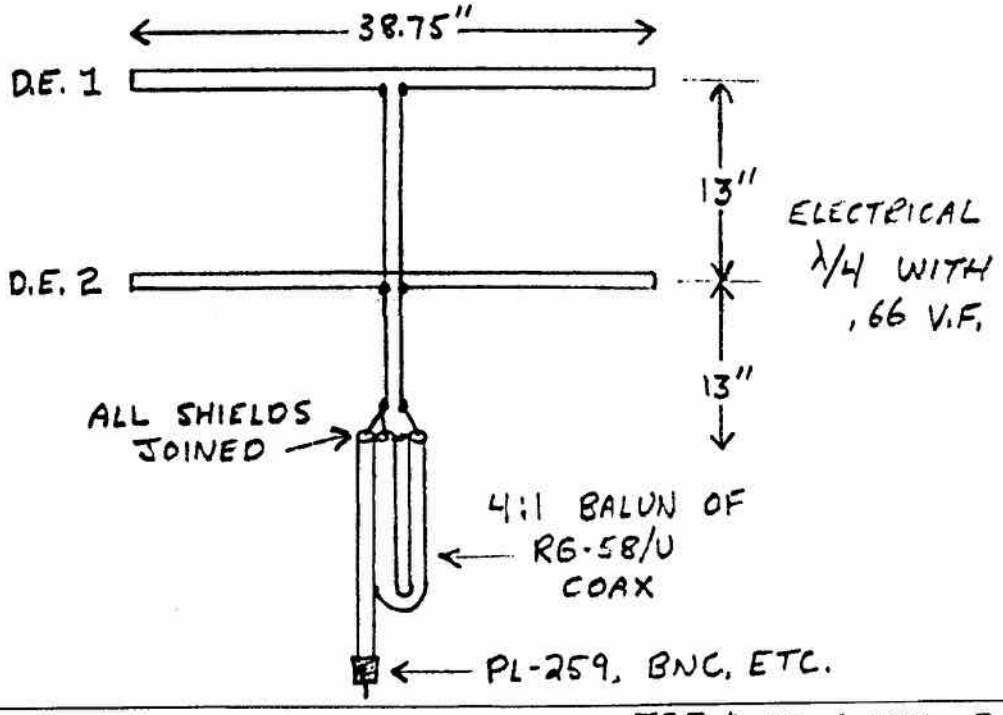
In order to mount the new feed system to the turnstile, a modification must be made to the original version as shown in Q.S.T., the A.R.R.L. Antenna Book, and other publications.

A pair of hardwood dowels are substituted for the dipole elements in the original version. The new folded dipoles are fastened to the dowels with tape, cable ties, or heat shrink tubing, whatever you have on hand. This completes the job.

I have found that this feed yields an S.W.R. of 1.2:1 or less across the entire two metre band when measured with my Bird model 43 wattmeter. This is a much better match than can be obtained with the original feed system, thus proving that the time and effort to build the new feed was not wasted.

I hope that you have similar luck with yours.

Bruce McCreath VE3EAR
Goderich, Ont.



Swap Shop

Single insertion is $1.00 (minimum charge) - 10 words and $1.00 for each additional 10 words. To renew, send copy and payment again. Deadline is first of month preceding publication (e.g. Jan 1 for Feb. issue). Put your membership number and call (not counted) at the end of your ad. Print or type your ad and include your address with postal code. If using a phone number, include the area code. TCA accepts no responsibility for content or matters arising from ads. This feature is for use of members wishing to trade, buy or sell personal radio gear. It is not open to commercial advertising. Send to: TCA Swap Shop, Box 356, Kingston, Ont. K7L 2W2.

WANTED: Yaesu VFO FV301, LL-301 phone patch, FC-301 ant coupler, Gord Curling VE3KKL, Box 855, Manotick, Ont. K0A 2N0.

FOR SALE: Cleaning Shack of various Ham and Computer Items. SASE for list. Monty Hart VE3TA, Box 359, Stroud, Ont. L0L 2M0

FOR SALE: Galaxy GT-550, 80-10 m transceiver CW, SSB, VOX, Mike, Headphones. Galaxy SC-550 Speaker, Power Supply $200. Heathkit HW-2021 Two Meter HT with xtals $50. Udo Schilcher VE2HBB, 1550 Panama, Apt. 612, Brossard, Quebec J4W 2W3. (514) 465-7848.

FOR SALE: FT101E Transceiver, Spare Mic, Spare finals, mobile power cord, YO-100 Monitor Scope, with SP-901 Speaker/patch. Manuals included. $650.00. Mike VE3MBJ (416) 298-2743. 1137 Huntingwood Dr., Agincourt, Ont. M1S 1K6.

FOR SALE: Swan 350 Compl. with PS and Manual. HyGain 14AVQ/WB ground plane. Atlas 2 10X. Requires adj. of final stage. Kenwood SSB Filter YK- 88SN. (New) Complete $800. VE3MTJ 416-877-9739.

WANTED: Any information on modifying Heath Gear to 10 MHz band. SB100 and HW16 in particular. Earl Andrews VE3NVO, 2-29 Rockway Cres., Nepean K2G 0M3.

FOR SALE: Kenwood TR-7400 2 metre transceiver hi and lo power (1-25 watts) complete with 144-148 MHz scanner, mic, mobile mount, tech manuals on 7400 and scanner. $200. Ian MacIntyre VE3CZ, 1847 Walkley Rd. Ottawa K1H 6X9. (613) 731-7617.

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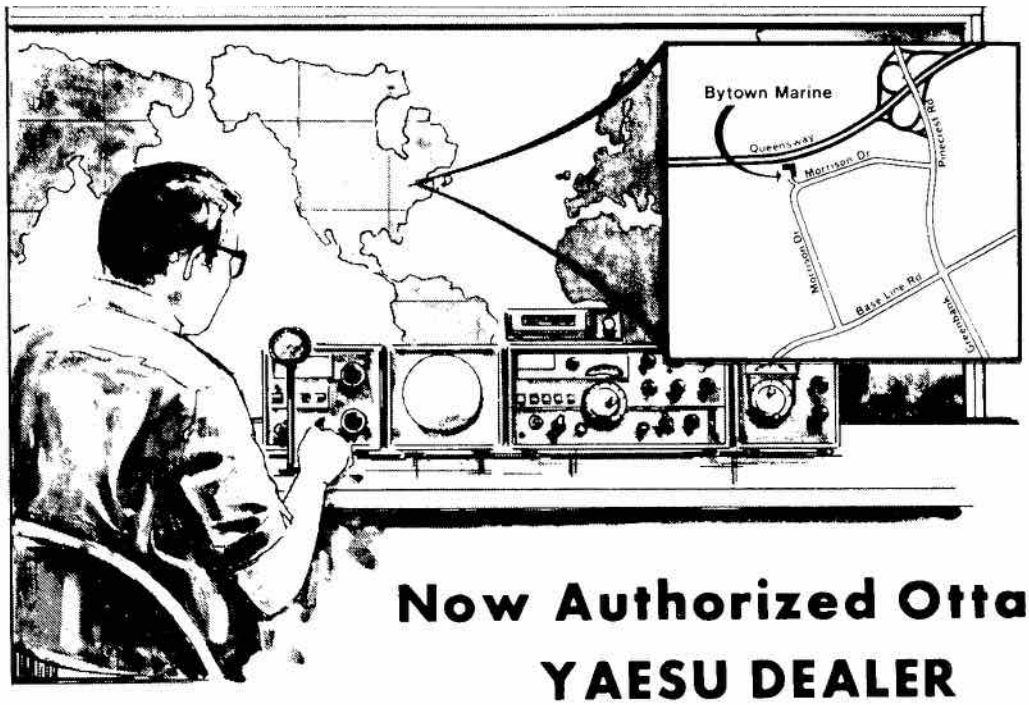

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