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# TCA

MAY 1980

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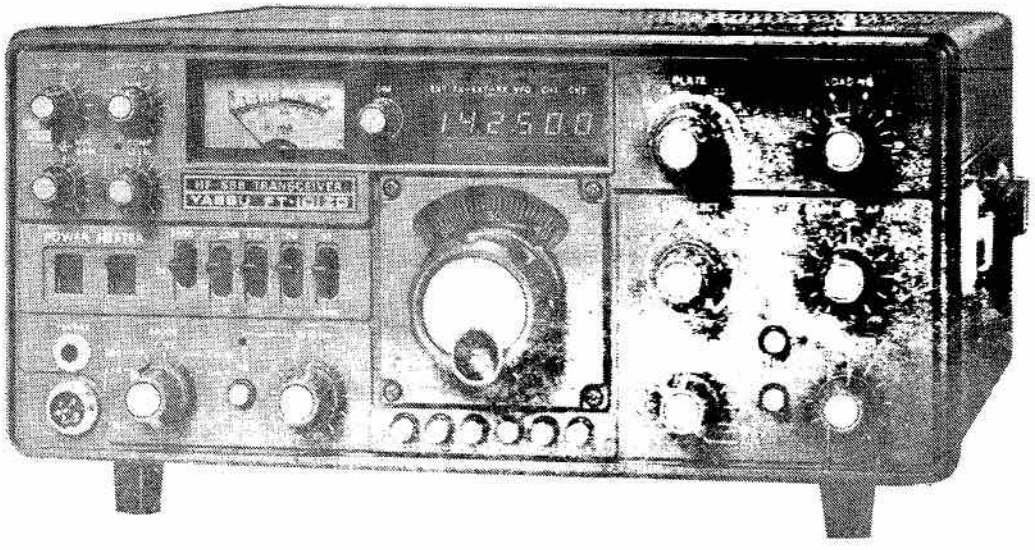
CARF

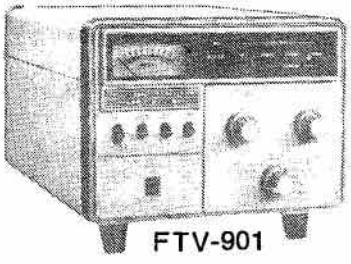
The Canadian Amateur Radio Magazine

## AROUND THE WORLD ON 70CM

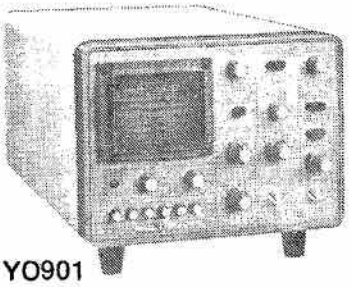
May launch planned for OSCAR 9 satellite

## New Regs!





FTV-901



YO901
MULTISCOPE

Write for Catalogue Sheets
c/o J.H. Williams VE3XY
Wayne Deactis VE3JFV

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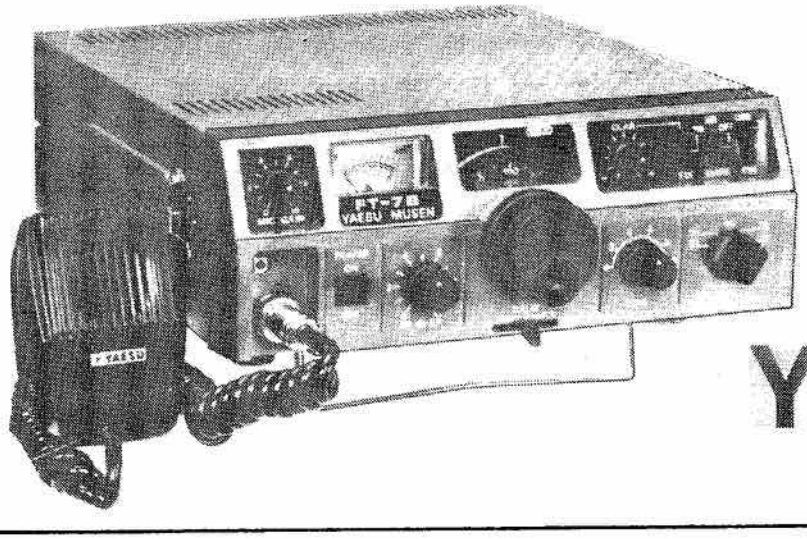
Toronto Amateur Dept.: 47A Colville Road
Toronto 15, Ont.



YAESU

**YAESU**

ISSN 0318-0867

# TCA

CARF THE CANADIAN AMATEUR

May 1980 Vol. 8 No. 5

## 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.

Unsolicited articles, reviews, features, criticism and essays are welcomed. Manuscripts should be legible and include the contributor's name and address.



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Indexed in the Canadian Periodical Index: ISSN 0318-1867.

# YAESU The radio. SOMETHING DIFFERENT

## FT-107M


**PRICE $1995.00**

**INCLUDES FP107E POWER SUPPLY AND SPEAKER.**

- **Solid State**
- **240 watts DC SSB/CW**
- **160-10 meters, WWV** (2 auxiliary band positions are available for future expansion)

THE FT107M ALL SOLID STATE HF TRANSCEIVER COVERS 160 THROUGH 10 METERS, WWV/JJY (15 MHZ) PLUS TWO OPTIONAL BANDS. FULLY SOLID STATE INCLUDING FINALS. EQUIPPED FOR 13.5 VDC OPERATION. THE FP107E ALLOWS FOR AC OPERATION 100/110/117/200/220/234 VAC.

### RECEIVER:

**Sensitivity:** 0.25 uV for 10dB S/N, CW/SSB, FSK
1.0 uV for 10dB S/N, AM
**Image Rejection:** 60dB except 10 meters (50dB)
**IF Rejection:** 70dB
**Selectivity:** SSB 2.4 kHz at −6dB, 4.0 kHz at −60dB.
CW 0.6 kHz at −6dB, 1.2 kHz at −60dB.
AM 6 kHz at −6dB, 12 kHz at −60dB
Variable IF Bandwidth
**20dB RF Attenuator**
**Peak/Notch Audio Filter**
**Audio Output:** 3 watts (4-16 ohms)

### TRANSMITTER:

**Power Input:** 240 watts DC SSB/CW
80 watts DC AM/FSK
**Opposite Sideband Suppression:** Better than 50dB
**Spurious Radiation:** −50dB.
**Transmitter Bandwidth** 350-2700 hz (−6dB)
**Transmitter:** 3rd IMD −31dB neg feedback 6dB
**Transmitter Stability:** 30 hz after 10 min. warmup
less than 100 hz after 30 min.
**Antenna Input Impedance:** 50 ohms
**Microphone Impedance:** 500 ohms
**Power Required:** 13.5V DC at 20 amps
100/110/117/200/220/234V AC at 650 VA

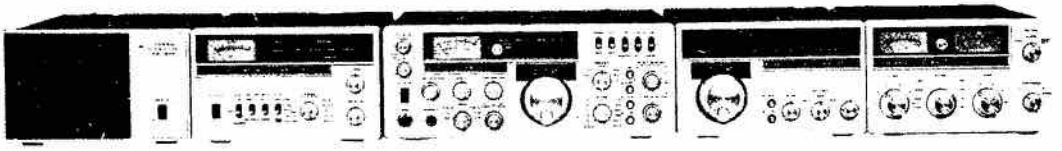
Price And Specifications Subject To Change Without Notice Or Obligation

### FEATURES

VARIABLE IF BAND WIDTH — AUDIO PEAK/NOTCH FILTER — RF SPEECH PROCESSOR — VARIABLE THRESHOLD NOISE BLANKER — FULL METERING AND SWR. ALL NEW MEMORY SYSTEM PROVIDING 12 MEMORY CHANNELS WITH FINE TUNING — SCANNING BY USING OPTIONAL SCANNING MICROPHONE — YAESU'S NEW AND EXCLUSIVE DMS (DIGITAL MEMORY SHIFT) SYSTEM. THE DMS SYSTEM PROVIDES UNLIMITED OFFSET FROM MEMORY CHANNELS, USING PHOTO-INTERRUPTOR TECHNIQUE FOR 100 SYNTHESIZER STEPS, FINE TUNING BETWEEN 100 Hz STEPS.
MODES SSB-CW-AM-FSK. TWO BANDWIDTHS FOR CW. RECEIVER SECTION UTILIZES SCHOTTKY DIODE RING MIXER FOR WIDE DYNAMIC RANGE

### ACCESSORIES

FV107 EXT VFO
FC107 ANTENNA COUPLER
FP107E AC POWER SUPPLY/SPEAKER
FTV107 TRANSVERTER (WITHOUT BOARDS)
FTV107 TRANSVERTER WITH 2 METERS
2 METER BOARD FOR FTV107
6 METER BOARD FOR FTV107
70CM BOARD FOR FTV107
SP107P PHONE PATCH/SPEAKER
SP107 SPEAKER (EXTERNAL)
YM34 SCANNING MICROPHONE
YM35 AS YM34 WITH FAST-SLOW SWITCH
AM-CW FILTERS



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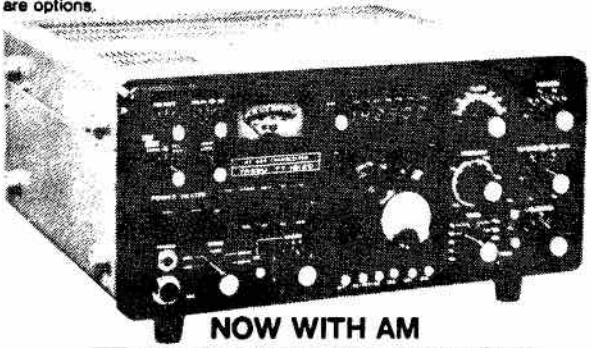
# THE BIG 4 FROM YAESU

**FT 901 DM DELUXE TRANSCEIVER**
**SUGGESTED LIST PRICE $1749.00**
This model is exactly as per specs, except to give you this special price, it does not include the DC Convertor, Keyer or FM Board which are options.



**NOW WITH AM**
**FT 101ZD WITH DIG. READOUT**
**SUGGESTED LIST PRICE $1295.00**

NEW FROM **YAESU** FT-107M

**SUGGESTED LIST PRICE $1995.00**
**INCLUDES FP107E**
**POWER SUPPLY AND SPEAKER.**

THE FT107M ALL SOLID STATE HF TRANSCEIVER COVERS 160 THROUGH 10 METERS, WWV/JJY (15 MHZ) PLUS TWO OPTIONAL BANDS. FULLY SOLID STATE INCLUDING FINALS. EQUIPPED FOR 13.5 VDC OPERATION. THE FP107E ALLOWS FOR AC OPERATION 100/110/117/200/220/234 VAC.

Price and Specifications Subject to Change Without Notice Or Obligation

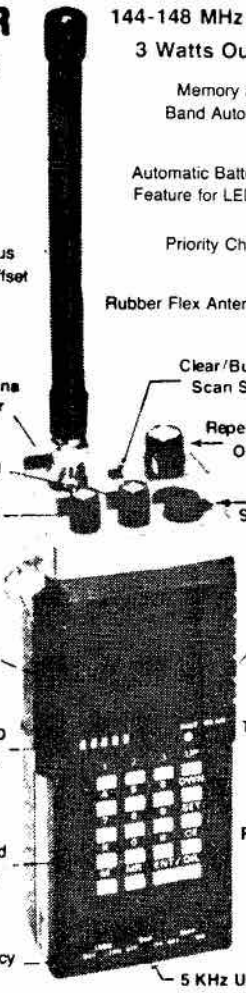
## A Breakthrough In Technology!

***MICROPROCESSOR CONTROLLED SYNTHESIZED HANDIE***

***The Yaesu FT-207R Synthesized Handie has all the features you could want in a very compact package***

**FT-207R**

144-148 MHz Range
3 Watts Output
Memory and Band Auto Scan
Automatic Battery Saver Feature for LED Display
Priority Channel
4 Memories plus Programmable Offset
Rubber Flex Antenna
Clear/Busy Auto Scan Selector
BNC Antenna Connector
Repeater/Simplex Offset Switch
Squelch Control
Remote Speaker/Mike Input
Audio Gain Control
Channel Busy Lamp
Condensor Mike
Transmit
5-Digit LED Readout
PRICE **$469.00** INCLUDES RECHARGEABLE BATTERY PACK AND CHARGER
Keyboard Encoded Frequency Entry
Keyboard Lock guards against accidental frequency change
On/Off
5 KHz Up



- 144-148 MHz Range
- 10 KHz Steps
- 3 Watts Output (Approx.)
- 4 Memories plus Programmable Offset
- Priority Channel
- Memory and Band Auto Scan
- Keyboard Encoded Frequency Entry
- 2 Tone (Touchtone ) Input from Keyboard
- Keyboard Lock guards against accidental frequency change
- Odd Splits Can Be Programmed from Keyboard
- Automatic Battery Saver Feature for LED Display
- Rubber Flex Antenna
- Optional Equipment Tone Squelch, Speaker/Mike, Leather Case.

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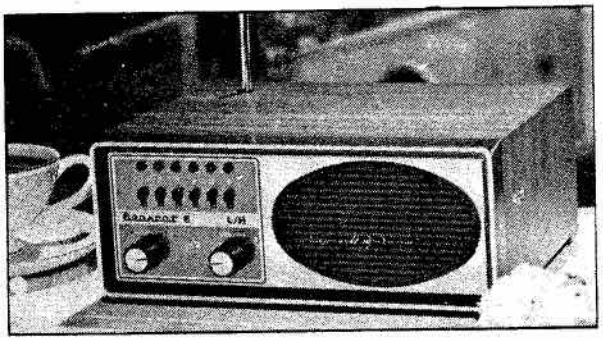
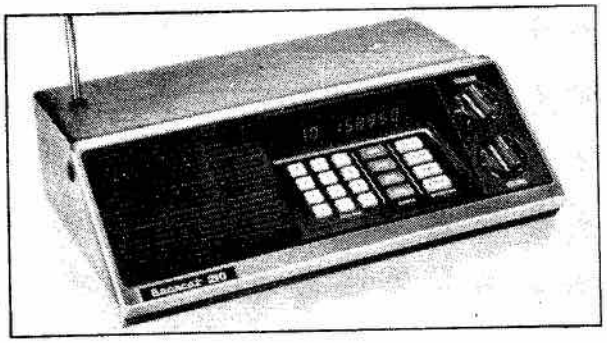
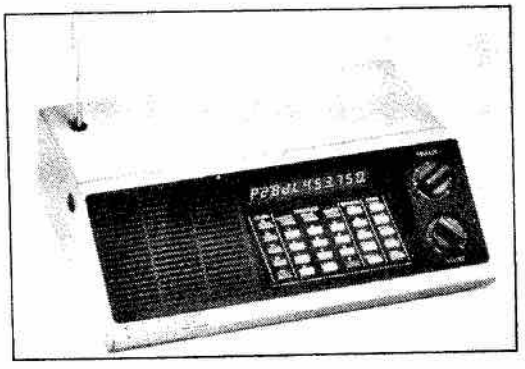




Bearcat®



# SCANNING MADE EASY.

The Bearcat scanners you see here represent just about the broadest range available. Whether you want economy or the ultimate quality in a scanner, Bearcat has it. Basic features include track tuning, single antenna, single manual scan switch, light emitting diodes, decimal display. Specific model features will help you choose the Bearcat you want.

But no matter which model you select, you've made the right choice with a Bearcat scanner.

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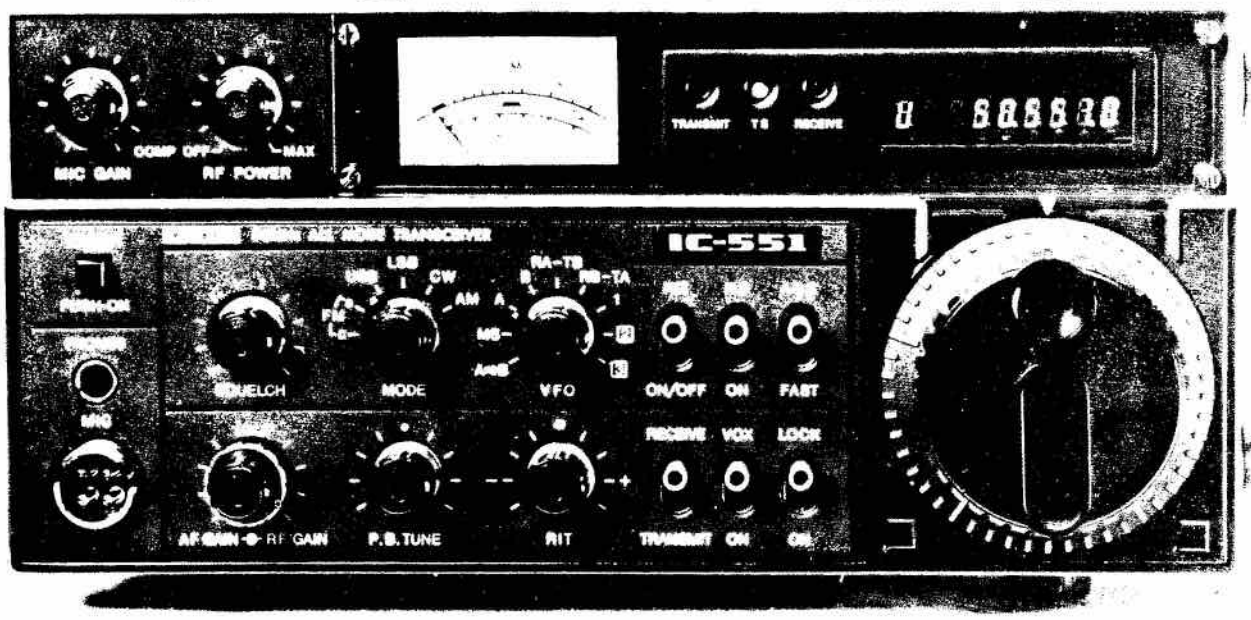
# HEAVEN ON SIX METERS!




# The New ICOM 551

## Proven Digital Technology

ICOM has used its expertise with Digital Technology, developed with the **IC-701**, in designing the all-new **IC-551**. A Microprocessor Controlled PLL is at the heart of this rig. The frequency tuning dial is ICOM's unique Optical Chopper, which provides years of problem-free service. This is also the first radio to use a pulse power supply, resulting in a lighter weight.

## All Modes Plus Scanning

The **IC-551** has All Mode capability: USB, LSB, AM, CW, and FM. The operating mode is indicated by an LED display beside the frequency readout. The module to provide FM is optional. Scanning is a standard feature, which includes Program Scan and Memory Scan. Program Scan allows scanning between two programmed frequencies. Stop-On-Signal and Speed adjustment is also included. All scanning operations work in any mode. Reading and writing to the three memories is quick and simple. Complete **4** MHz coverage without a band select switch. Two built-in VFO's provide split frequency operation at no extra cost. The optional extras for the IC-**551** are FM, VOX, and Pass Band Tuning. The IC-**551D** includes all of the options, **except FM**, plus 80 watts RF output. An external power supply is neccessary for this model.

## Specifications

**GENERAL**

| | | |
|---|---|---|
| Frequency Coverage | : | 50 – 54MHz |
| Operationable Temperature | : | –10°C ~ +60°C (14°F ~ 140°F) |
| Power Supply Requirements | : | 13.8V DC ±15%, negative ground, or 117V/240V AC ±10% |
| Power Consumption | : | Receive at min. audio level DC 0.9A AC 35W |
| | | at max. audio level DC1.1A AC 41W |
| | | Transmit in SSB/CW modes DC 3.3A AC 98W |
| | | in AM mode DC 3.0A AC 92W |
| | | in FM mode* DC 3.3A AC 98W |
| Dimensions | : | 111mm (H) x 241mm (W) x 311mm (D) |
| Weight | : | 6.1 kg |

**TRANSMITTER**

| | | |
|---|---|---|
| RF Output Power | : | SSB 10W PEP (1 – 10W adjustable) |
| | | CW 10W (1 – 10W adjustable) |
| | | AM 4W (0 ~ 4W adjustable) |
| | | FM* 10W (1 ~ 10W adjustable) |
| Modulation System | : | SSB/AM Balanced modulation |
| | | FM* Variable reactance frequency modulation |
| Max. Frequency Deviation* | : | ±5KHz |
| Spurious Emission | : | More than 60dB below peak power output |
| SSB Carrier Suppression | : | More than 40dB below peak power output |
| SSB/AM Unwanted Sideband | : | More than 40dB down at 1000Hz AF input |
| Microphone | : | 600 ohm dynamic or electret condenser microphone |

**RECEIVER**

| | | |
|---|---|---|
| Receiving Mode | : | A1 (CW), A3J (USB, LSB), A3H (AM), F3 (FM)* |
| Receiving System | : | SSB/CW/AM Single Superheterodyne (Triple Superheterodyne when Pass Band Tuning unit is installed) |
| | | FM* Double Superheterodyne |
| Intermediate Frequency | : | SSB/CW/AM 9.0115MHz (When Pass Band Tuning Unit is installed: 2nd IF: 10.75MHz, 3rd IF: 9.0115MHz) |
| | | FM* 1st IF: 9.0115MHz, 2nd IF: 455KHz |
| Sensitivity | : | SSB/CW/AM Less than 0.5 μV for 10dB S+N/N |
| | | FM* More than 30dB S+N+D/N+D at 1 μV |
| Spurious Response Rejection Ratio | : | More than 60dB |
| Selectivity | : | SSB/CW/AM More than ±1.1KHz at –6dB |
| | | Less than ±2.2KHz at –6dB (When Pass Band Tuning Unit is installed: less than 1KHz at –6dB) |
| | | FM* More than ±7.5KHz at –6dB |
| | | Less than ±15KHz at –60dB |
| Squelch Sensitivity | : | SSB/CW/AM 1 μV |
| | | FM* 0.4 μV |
| Audio Output Power | : | More than 2 watts |

**551-$749 FM-$195 VOX-$85 PBTUNE-$169**

**551D-$1125 PS-20-$299**

ICOM Canada

Dollard Electronics Ltd.

P.O. BOX 58236, 810 S.W. MARINE DRIVE
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HFBV-1H

**SPECIAL**

**109.95**

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AFTER MAY 31 PRICE---$129

END-SULATOR 22' | KW-40 32' | W2AU 1:1 BALUN | KW-40 32' | END-SULATOR 22'

UNADILLA #14-7 STRAND COPPER WIRE

**W2AU/W2VS 5-BAND ANTENNA KIT**

Low SWR 40 & 80 meters
Resonant on 10, 15 & 20
**EVERYTHING** YOU NEED

*Sale*

**$59.95**

**KIT CONTAINS —**
- 1 pr. model KW-40 TRAPS (W2VS REYCO)
- 1 ea. W2AU 1:1 BALUN
- 1 pr. W2AU END-SULATORS (shatterproof)
- 120' quality #14-7 strand copper wire

INS. SHIPPING & HANDLING ADD $3
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Only Butternut's new HF6V-1H lets you use the entire 20-foot radiator on 80, 40, 20 and 10 meters (plus a full unbroken counterpoise length on 15) for

**BUTTERNUT**

**Larsen**

LARSEN PRICES INCREASED MAR 1, 80
your LAST chance at the OLD PRICE

ANTENNA ONLY (No Mounting Hardware) | ANTENNAS WITH PERMANENT | ANTENNAS WITH TEMPORARY MOUNTS

| LM | LM-K | LM-TMB | LM-MM | LM-GC | LM-TLM |
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| $27.99 | 34.99 | 37.99 | 39.99 | 39.99 | 40.99 |

INSURED SHIPPING AND HANDLING INCLUDED IN ABOVE

JUNE 1, 80 LIST PRICES (WITHOUT SHIPPING)

| | | | | | |
|---|---|---|---|---|---|
| $32.10 | 40.44 | 45.22 | 52.99 | 50.49 | 51.56 |

ABOVE SPECIAL PRICES APPLY TO 150-220-440 MHz
BASED ON 5/8 WAVE. ADD $3 FOR ¼ WHIP ALSO....

TILL MAY 31 only
TH3MK3------$279
TH5DX-------$329
TH6DXX------$399

**hy-gain**

**Antenna Sale!**

80M $33 | 40M $26 | 1, 5, & 4 $4 for first, $2 for additnl | 20M $24 | #415 BPR MNT $15 | 15M $22 | #276 60"Mast $30 | 10M $20

264 263 282 281 280

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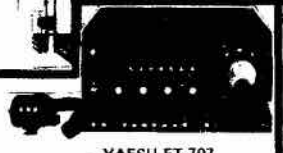
AVAILABLE SOON: CUSHCRAFT ANTENNAS

ALSO IN STOCK: 5, 8, 14 element 2M BEAMS
4 & 5 BAND VERTICALS



YAESU FT-707
FT-101ZD FT-107
FT-901DM,
FT-227RB, FT-7B
FRG 7000 FT207R

**MFJ R-X Noise Bridge**

MFJ RF NOISE BRIDGE

M.F.J. $79.00

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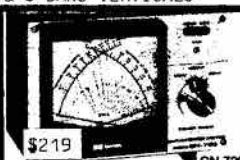
**This new MFJ-202 RF Noise Bridge** lets you quickly adjust your single or multiband dipole, inverted Vee, beam, vertical, mobile whip or random system for maximum performance.

**Tells resonant frequency** and whether to shorten or lengthen your antenna for minimum SWR over any portion of a band.

BIRD MODEL 43 Thruline Watt Meter

$189.00
ELEMENTS
HF $67 VHF $58
Leather Case $43



$219 CN-720

DAIWA

CN-620 $155

**SWR & Power Meters Models CN-720 and CN-620**

Simultaneous direct reading SWR, Forward Power and Reflected Power

Frequency Range: 1.8–150 MHz
SWR Detection Sensitivity: 5 Watts Min.
Power: 3 Ranges (FWD 20/200/1000 Watts) (REF 4/40/200 Watts)
Input/Output Impedance: 50 Ohm
Dimensions: 180 x 120 x 130 mm; 7 x 4.75 x 5 in. 165 x 75 x 97 mm

SWAN ELECTRONICS

**SWR BRIDGE** SWR IA with dual reading meters. 1000 watts RF. 3.5-150 MHz. Reads relative power output.

SPECIAL $49.99

NOW APPEARING — THE NEW MFJ SOLID STATE
**24-HR. DIGITAL CLOCK**

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- Eliminates converting to GMT
- Easy-on-eyes Blue Display • Alarm
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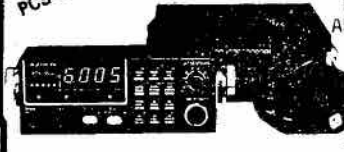
**MICROCOMPUTER CONTROLLED**
2 METER FM TRANSCEIVER
25 watts
AZDEN PCS-2000
BAND SCAN & 6 MEMORY SCAN

**$489**

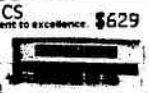


NO OTHER 2M TRANSCEIVER HAS SO MANY FEATURES AS THE AZDEN PCS 2000 CHECK FOR YOURSELF THERE AREN'T ANY 2M RIGS AVAILABLE FOR UNDER $500 THAT ARE SYNTHESIZED

25WATTS, BAND & MEMORY SCANNING, REMOTE CONTROL MIKE FOR: SQ,VOL,UP/DN,MEMORY1 ARE ALL INCLUDED PCS2800 10M $489;TTMIKE KIT $59;REMOTE CABLE $47

**Kantronics** A commitment to excellence. $629

NEW! NOW STOCKING! Field Day Reader, best prices!



FIELD DAY II NOW AVAILABLE READS CW, RTTY, ASCII AND HAS A 24 HOUR CLOCK.HRA IS THE ONLY CANADIAN DEALER..

**DAIWA CORPORATION**

Coaxial Switches $29 $88

$179 $140
RF Speech Processor Models RF-440 & RF-660

**CDE CORNELL-DUBILIER** HAM-IV T-2X

**B&W ANTENNA SWITCHES in stock!**

**SWAN ELECTRONICS**

NEW! 102BX Dual PTO's SYNTHESIZED 1.8–30 MHZ 235 Watts PEP

NEW! ASTRO 150 HF SSB Transceiver featuring "VRS"

Fully Synthesized 235 Watts PEP & CW. See the Swan ads and Call us or write for BEST PRICES ANYWHERE!

**Bearcat® 250** $475
**50 Channels • Crystalless • Searches Stores • Recalls • Self-Destruct • AC/DC Priority Channel • 5-Band • Count Feature.**
*Frequency range 32-50, 146-174, 420-512 MHz*
The Bearcat 250 performs any scanning function you could possibly want. With push button ease you can program up to 50 channels for automatic monitoring.

***Aircraft* Bearcat® 220**
***Aircraft and public service monitor.*** *Frequency range 32-50, 118-136 AM, 144-174, 420-512 MHz.*
The Bearcat 220 is one scanner which can monitor all public service bands plus the exciting AM aircraft band channels. Up to twenty frequencies may be scanned at the same time. $475 APRIL $649

**NEW! Bearcat® 300**

**HAM RADIO ATLANTIC**

HOURS: MON-FRI 6-11 ATLANTIC TIME
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INSURED SHIPPING & HANDLING 2%. MINIMUM $2.50.

MINIMUM $50

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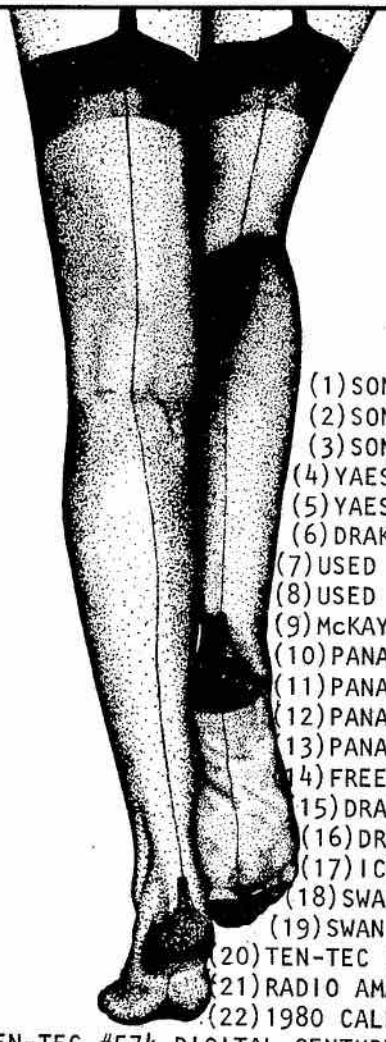

MAY 1980

# A Stocking Distributor

## Means the inventory is in great shape

(1)SONY ICF-6700W 5 BAND PORTABLE RADIO $12 S&H $499.00
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(17)ICOM IC-230 MINT..USED 2M SYNTH.RIG.10W $8 " $299.00
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(19)SWAN TB-2A 2 ELEMENT TRIBAND BEAM $10 S&H..... $189.00
(20)TEN-TEC CENTURY/21..SOLID STATE CW XCVR..$8 S&H... $469.00
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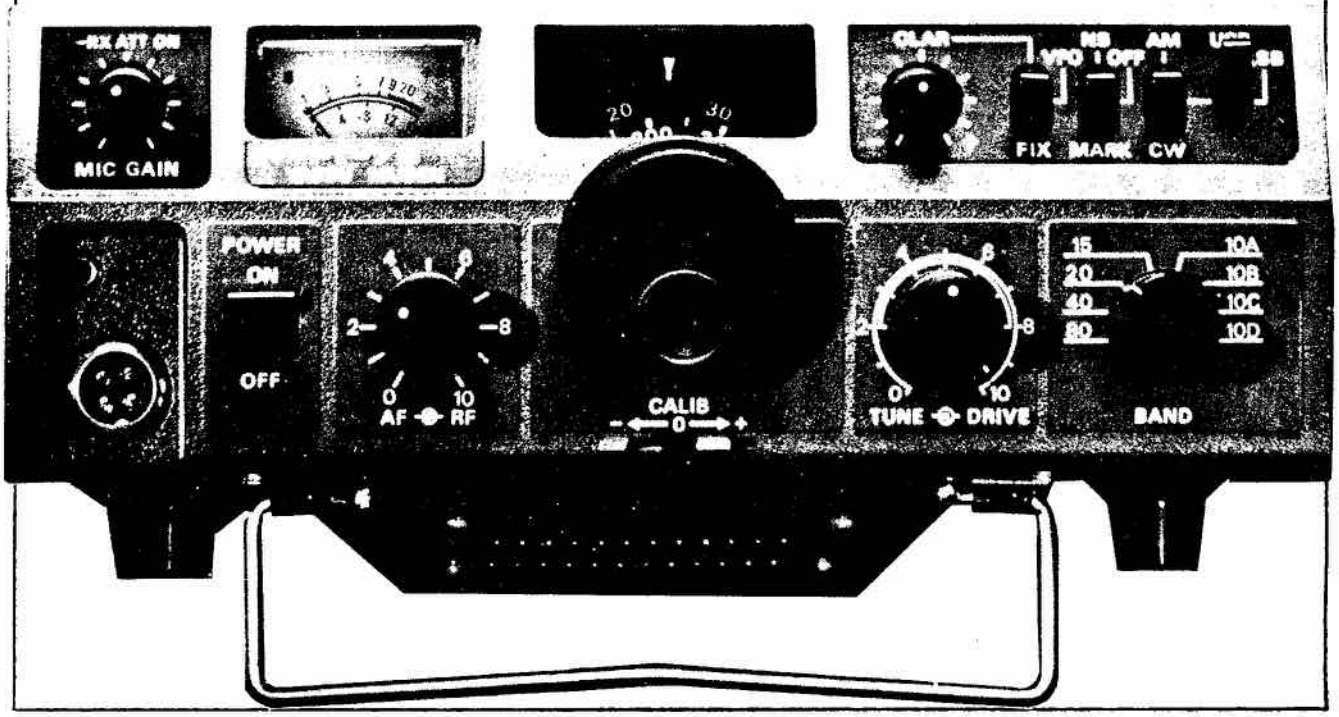
## RECEIVER

**Sensitivity:** 0.5uV for S/N 20 dB
**Image rejection:** Better than 50 dB
**IF rejection:** Better than 50 dB
**Selectivity:** -6 dB: 2.4 KHz, -60 dB; 4.0 KHz
**Cross-modulation:** Better than 60 dB immunity at 20 KHz off a 20 dB input signal typical
**Audio output:** 3 watts @ 10% THD

## TRANSMITTER

**Emission:** LSB, USB (A3j), CW (A1), AM (A3)
**Input power:** A1, A3j; 100 watts DC
**Carrier suppression:** Better than 50 dB below rated output
**Unwanted sideband suppression:** Better than 50 dB @ 1000 Hz
**Spurious emission:** Better than -40 dB
**Distortion products:** Better than -31 dB



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**RX-110 RECEIVER**

- **Frequency Coverage:** 3500-4000 kHz, 7000-7500 kHz, 14,000-14,500 kHz, 21,000-21,500 kHz, 28,000-29,000 kHz.
- **All Solid State, High Performance Design.** Excellent Sensitivity, Selectivity, and Dynamic Range. Superior to Most Receivers currently on the market.
- **Receives CW and normal SSB.** Lower Sideband on 3.5 and 7 MHz bands. Upper Sideband on 14, 21, and 28 MHz bands.
- **Built-in AC supply and loud speaker.**

**A REAL BREAKTHROUGH IN VERSATILE LOW COST AMATEUR EQUIPMENT!**

**TX-110 TRANSMITTER**

- **Provides CW and SSB communications**
- **All solid state**
- **Full band coverage** on 15 through 80 meters, 28 to 29 MHz on 10 meters

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TX-110-H . . . . . $299
PS-110 . . . . . $139

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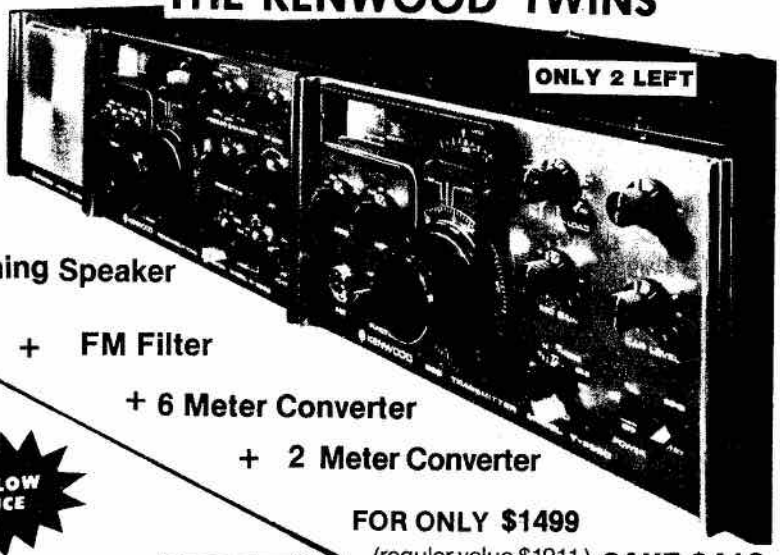


THE TWINS
+ Matching Speaker
+ FM Filter
+ 6 Meter Converter
+ 2 Meter Converter

**R-599 RECEIVER**
**+ MATCHING SPKR**
**$679**
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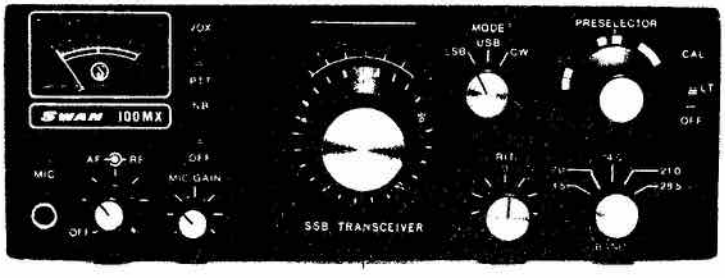


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INTERNAL SPEAKER

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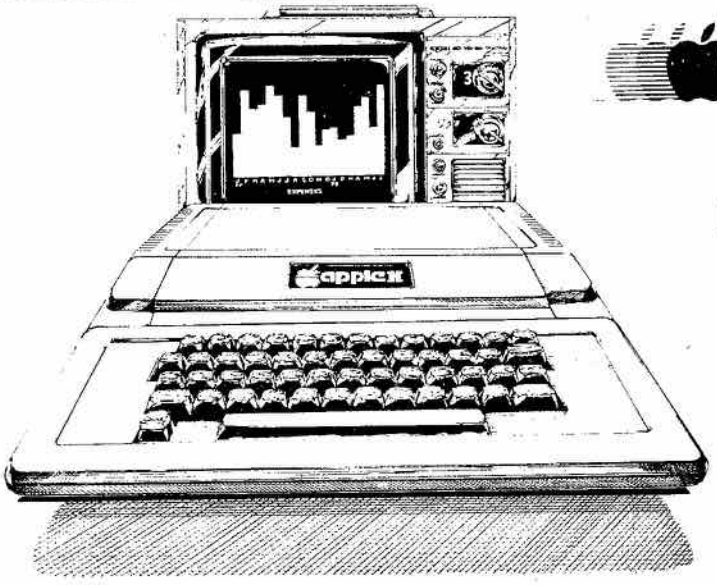

apple

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- speed electronic circuit design
- control repeaters
- teach code and theory
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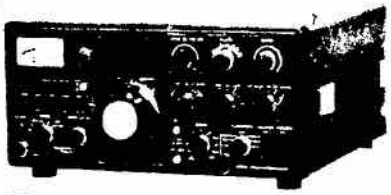
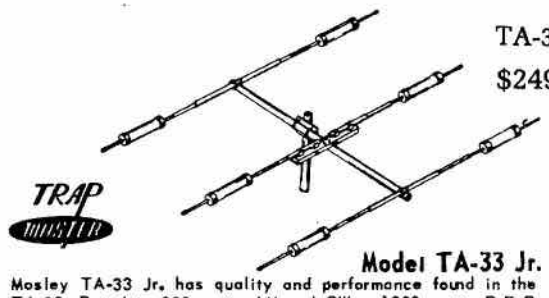


KENWOOD Transceiver
TS-820S 160 thru 10M




TA-33Jr.
$249.00

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

**MOSLEY ANTENNAS**

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| TA33 | $319. |
| CL-33 | $369. |
| CL-36 | $429. |
| MPK-3 pwr kit for TA33Jr | $85. |
| RV8C & RV4C 10-80M vertical | Special $149. |
| MY-144-9el 2m Yagi | $39. |
| MM-144 trunk mount | $47.50 |
| Mobile 80-10m antenna | $129. |

**CDE ROTORS**

| | | | |
|---|---|---|---|
| CD-45 | $185. | RG-8U coax | 38 cents/ft. |
| Big Talk | $129. | RG-213 coax | 47 cents/ft |
| Ham III | $189. | RG-58U coax | 16 cents/ft. |
| Ham IV | $239. | Rotor cable | 27 cents/ft. |
| Tail Twister | $325. | | |

**CUSHCRAFT**

| | |
|---|---|
| ATB-34 | $369. |
| A-14-3 3el 14MHz Yagi | $199. |
| A-28-4 4el 10MHz Yagi | 112.50 |
| A-147-2m 4el Yagi | $34.95 |
| A-147-11 2m 11el Yagi | $52.95 |
| ARX-2 Ringo Ranger | $53.95 |
| A-147-22 PowerPak 2m | $129. |
| ATV-5 80-10m vertical | $149.95 |
| Unadilla KW-40 all band trap antenna with wire etc. | $42.50 |
| #12 copperweld (40%) 700 B.S. | 8 cents/ft. |

**KENWOOD SPECIALS**

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| TR-2400 800 ch, H.H. | $499. |
| TR-7500 100 ch mobile | $369. |
| TR-7625 800 ch mobile | $609. |
| TS-120S 80-10 mtr HF | $1039. |
| TS-180S 80-10 mtr HF | $1659. |
| TS-520SE 80-10 mtr HF | $929. |
| YAESU FT-207R 800 ch H.H. | $469. |

**HY GAIN**

| | |
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| TH3 JR | $225. |
| TH3 Mk3 | $319. |
| TH5DXX | $369. |
| 204BA 20M | $329. |
| 203BA 20M | $198. |
| 18 HT 6-80M (tower) | $429. |
| 18AVT/WB 10-80M vert | $149. |

**SPRING SPECIALS**

Hy-Gain TH6DXX Reg. $449. Special $395.
Mosley S-402 2 el 40 mtr beam Reg. $569. Special $369.
Hy-Gain TH3Jr. 10-20M tri-band beam, CDE 'Big Talk' rotor, 75 ft. rotor cable, 75 ft. coax, Delhi DME-44 tower Reg. $639. **Special $529.**

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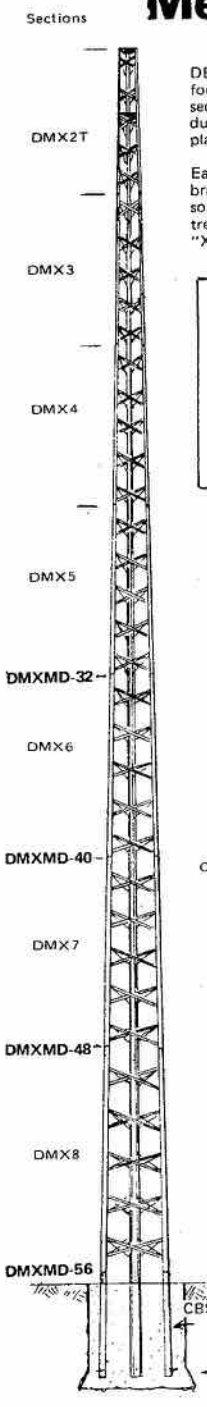
DELHI **SELF-SUPPORTING DMXHD, DMXMD CONCRETE-BASE TOWERS**

# Medium Duty and Heavy Duty Ham Towers




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

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

**ANTENNA LOAD LIMITS**

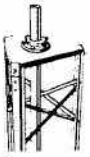
**DMXMD Medium Duty Towers** are designed to support an antenna load up to 6 square feet wind area. This is equivalent to two large TV/FM antennas or one large CB beam or one small amateur beam or one large VHF collinear.

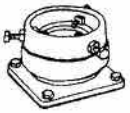
**DMXHD Heavy Duty Towers** are designed to support an antenna load up to 9 square feet wind area. This is equivalent to a very large CB beam or CB stacked array or a large amateur beam.

Guy wires must be used if larger loads are required or cross mounted antennas, or if greater height using straight sections is needed.


Unqiue beaded channel leg resists bending

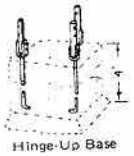

**244A**
Cast Alum. Mast Clamp



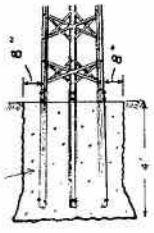

**BBMB**
Ball Bearing
Mast Bearing

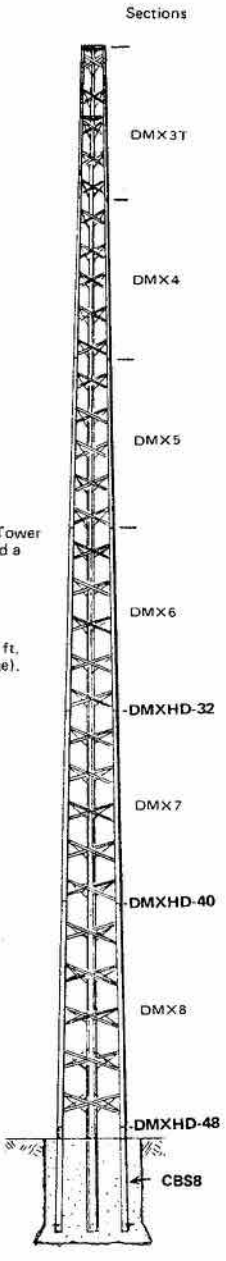

Top section of a Ham Tower with a rotator, mast and a Model BBMB installed.


Compact Tower Package


Hinge-Up Base

HUB3-6
HUB7-8






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

Specifications:

| Model No. | Height without mast | Tower Sections Supplied | Weight in lbs. |
|---|---|---|---|
| | | **DMXMD Medium Duty Towers** | |
| DMXMD-32 | 32 ft. | DMX2T, DMX3, DMX4, DMX5 | 152 |
| DMXMD-40 | 40 ft. | DMX2T, DMX3, DMX4, DMX5, DMX6 | 200 |
| DMXMD-48 | 48 ft. | DMX2T, DMX3, DMX4, DMX5, DMX6, DMX7 | 272 |
| DMXMD-56 | 56 ft. | DMX2T, DMX3, DMX4, DMX5, DMX6, DMX7, DMX8 | 351 |
| | | **DMXHD Heavy Duty Towers** | |
| DMXHD-32 | 32 ft. | DMX3T, DMX4, DMX5, DMX6 | 170 |
| DMXHD-40 | 40 ft. | DMX3T, DMX4, DMX5, DMX6, DMX7 | 241 |
| DMXHD-48 | 48 ft. | DMX3T, DMX4, DMX5, DMX6, DMX7, DMX8 | 314 |

| | |
|---|---|
| DMXMD-32 | $185.00 |
| DMXMD-40 | $239.00 |
| DMXMD-48 | $309.00 |
| DMXMD-56 | $379.00 |
| DMXHD-32 | $209.00 |
| DMXHD-40 | $285.00 |
| DMXHD-48 | $345.00 |

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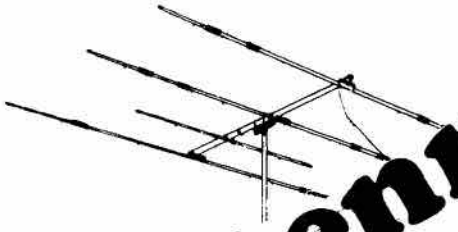

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### HY-GAIN

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| **TH6DXX** | Super Thunderbird | **$399.** |
| **TH5DX** | 5el. 10-15-20M beam | **349.** |
| **TH3MK3** | 3el. 10-15-20M beam | **299.** |
| **TH3JR** | 3el. 10-15-20M beam | **209.** |
| **204BA** | 4el. 20M beam | **399.** |
| **103BA** | 3el. 10M beam | **99.** |
| **402BA** | 2el. 40M beam | **299.** |
| **18AVT/WB** | 80-10M Trap Vertical | **129.** |
| **208** | 8el. 2M beam | **39.** |
| **214** | 14el. 2M beam | **45.** |
| **BN-86** | Balun for beam antennas | **23.** |

### CUSHCRAFT

| | | |
|---|---|---|
| **ATB-34** | 4el. 10-15-20M beam | **$359.** |
| **ARX-2** | 2MTR. Ringo Ranger | **49.** |

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**with Installation $1399.**

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**Udo Franz, VE3FFA**

# THE CANADIAN *Contest Scene*

Dave Goodwin VE2DZE
4 Victoria Place
Aylmer, Quebec J9H 2J3

**CONTEST CALENDAR**
May 24-25 CQ WW WPX CW

Well, as one can plainly see by the length of the calendar, May is pretty skimpy in terms of any major contests, it hasn't much to offer as far as I can see. So, I'll take this opportunity to get rid of some contest results that I have laying about my desk. Also, I can make the announcement for the second running of CARF's first contest, the Canada Day Contest in plenty of time for the event. This year, we hope to have a good deal more participation in the CDC, or at least more logs. I know there were a good number of stations active in CDC '79 who did not bother to send in logs.

The Xmas Contest is another case in point. Although I was too bound up to get in this contest, I do know from comments heard over the air that more than three stations were active. You never know, your entry might be the one to win a certificate, and more importantly, your entry might give the organizers of a new and struggling contest reason to carry on the next year. No matter how paltry you think your score may be, your entry is greatly appreciated by the committee.

Of more general interest, the Federation will be sponsoring a Phone version of the popular Commonwealth Contest, probably sometime next spring. Also, CARF will be sponsoring plaques for ASCII scores in the upcoming CARTG RTTY Contest. Any other suggestions you may have for the Contests Committee would be welcomed at the above address.

**CW WW WPX CW**

Period: 0000z May 24 to 2400z May 25, 1980. A maximum of 30 hours is permitted to single op stations. Classes of Entry: Single op, all or single band; multi op, single or multi transmitter; a separate single op QRP section for stations running 5 watts or less. Bands: 1.8 through 28 MHz.

Exchange: RST plus serial number (ex. 599002), multi-transmitter station use separate numbers on each band.

Scoring: QSOs with stations on different continents score 6 points on the 1.8/3.5/7 MHz bands, and 3 pts. on the others. QSOs between stations within North America count 4 and 2 pts., respective to band, as above. Final score is the total of QSO pts from all bands times the number of prefixes worked on all bands together, not on each band separately. A prefix is the initial number-letter combination at the beginning of a callsign (ex. VP2, KH6, VY1, etc.).

Entries: Separate logs must be used for each band, and must include date, time, call exchanges and points claimed. Prefix checklists and cross-checking sheets are recommended. Entries must be received by July 10 at: CQ Magazine, WPX Contest, 76 N. Broadway, Hicksville, NY 11801, U.S.A.

**CANADA DAY CONTEST**

Period: 0001-2359z, July 1, 1980. Classes of Entry: Single op, single or all band; and multi op, single transmitter.

Bands: Suggested frequencies are: CW – 1810, 3525, 7025, 14025, 21025, 28025, 50100, 144100 kHz; SSB – 1810, 3770, 3900, 7090, 7230, 14150, 14300, 21200, 21400, 28500, 50100, 146520 kHz.

Exchange: RST and serial number, VE1s should include their province.

Scoring: 10 pts per QSO with a Canadian station, 1 pt for others. 10 bonus points for each QSO with an official CARF station using the TCA or VCA suffix. Multipliers are the total number of Provinces and Territories on each mode and band.

Entries: should be postmarked not later than July 31, 1980, and sent to: CARF, c/o Peter Driessen VE7BBQ, 1946 York Ave., Apt. 203, Vancouver, B.C. V6J 1E3. Certificates will be awarded for the top score in each class in each province/territory, USA call area, and DX Country.

**CARTG RESULTS**

With apologies to CARTG, here are the results of the CARTG RTTY DX Canada 79 Sweepstakes, from Canada:

| | | |
|---|---|---|
| 12. | VE5RG | 1,808,750 |
| 16. | VE2JR | 1,284,880 |
| 17. | VE2AXO | 1,211,440 |
| 20. | VE7DTA | 1,007,070 |
| 37. | VE7DLX | 464,900 |
| 41. | VE7BDQ | 369,532 |
| 42. | VE7CIM | 361,600 |
| 47. | VE4NZ | 276,525 |
| 54. | VE6GL | 182,920 |
| 56. | VE3JKZ | 129,183 |
| 66. | VE8CM | 43,700 |
| 72. | VE6AGW | 25,180 |

# LETTERS:

**CODE PRACTICE SESSIONS**

I would like to take the opportunity to congratulate the Radio Society of Ontario for the terrific job they have been doing with code practice sessions every evening since last October. My wife started to copy on the first day and every day until she felt confident to try the morse code exam at 10 wpm. I am happy to say that she was successful...

We are both now studying for the theory and regulations and hope to have our tickets by the June exam.

Our thanks to ... Lloyd Ferns, whose dedication to code practice for 'would-be' Amateurs should be recognized with some kind of award...

Bob Smith
Orangeville, Ont.

**Herewith a public salute to Lloyd and all the others who devote their time to helping the cause of Amateur Radio.]**

**10-METRE CONTEST**

I am here at the new desk I just finished (Feb. 23) and just turned on my rig to ten metres and found the Canadian ten metre contest on. "What the hell is this," I thought, "This fellow must be crazy, this contest is on the 28th of February." He said, "No, it's on now, there was a misprint (in TCA). Well, after looking to my first contest, I had re-arranged my shack with a new desk but all my equipment was not hooked up for the 23rd of February.

Well, I try to support Canadian magazines and now that I am an Amateur I support other Amateurs in Canada, but with BLUNDERS like this one, I have my doubts if I ever will be a subscriber of yours. You will have to improve a hell of a lot.

Sitting here steaming,
Wm. Jerome VE3BUU
Cross Point, Que.

**Actually, Bill, TCA didn't screw it up; we printed the date we got from the contest organizers.**

**VITAL STATISTICS**

Thought some of your readers may get a chuckle out of the attached letter. It was written to the Dept. of Transport in the 50's in response to a letter written by a forestry official who was trying to obtain some vital statistics so that the licence of a private commercial radio station could be tranferred to the letter writer. Even in those days there were individuals who objected to giving such information.

"Enclosed are some of the vital statistics about my mother and father and myself. I hope you find them interesting.

I am a little confused as to whether my father was born in Bombay or Calcutta. If the D.O.T. insists upon it I will inquire at the Indian Department of Vital Statistics in both places. I was rather surprised to see that my grandfather had been left out. If by any chance this was because you forgot to send me the required forms I will be happy to supply you with the information.

I intend to keep the same father and mother for the coming year. So perhaps if you were to be kind enough as to inform the D.O.T. of my decision in this regard they may find it unnecessary to send me the same questionnare next year.

I know nothing about the inner workings of a radio. I hope you do because if you don't I don't know how we will be able to supply the D.O.T. with all the information that they want.

Enclosed is a cheque for $20.00, although I do believe that they should be paying me for all the time I spent on this business."

Frank VanderZande VE7AV
Prince George, B.C.

**POSTAL SERVICE**

I have been enjoying **TCA** since receiving my first issue and look forward to it every month.

Today I was reading the ads when I suddenly realized that I was reading the February issue, which arrived today, March 7th.

I know the post office has gone from bad to worse to useless, but this seems a bit much. Once an item of mail reaches Winnipeg, I should recive it within about 7 days, and I am wondering when **TCA** reaches the post office. Perhaps you could enlighten me. I don't expect it will do any good, but I'm going to complain about this one to the

**TCA welcomes Letters to the Editor. Please send correspondence to Editor TCA, 151 Fanshaw Ave., Ottawa, Ont. K1H 6C8.**

Postmaster General, and let him know I don't like his service.

Paul MacDougall VE8YQ
Winnipeg, Man.

**This problem has haunted TCA for years, and we are now in the process of obtaining second class mailing privileges, which [we are told] will be handled with the first class mail. In the meantime, with the cooperation of our advertisers, we have been steadily backing up the TCA deadline so that readers can receive their copies in a reasonable span of time. At this point, we mail TCA in the third week of the month before the cover date. When talking with the P.O., you might note that your air mail letter, posted March 13, arrived here in Ottawa on March 22.**

**HOW IMPORTANT IS SWR?**

VE7BTG ('How Important is your SWR?', **TCA** Mar. 80) discusses how an SWR of greater than 1:1 contributes to additional losses, and correctly concludes that at HF these losses are quite small unless the SWR is very high. However, the pi-network used to tune most transmitters will not provide a match and permit full rated power into reactive loads if the SWR is greater than 2:1. This problem is compounded if a bandpass (no variable tuning) solid-state transmitter is employed (e.g. the Atlas 220, Kenwood TS120). Here, the output of 100 watts decreases to 50 watts and 20 watts when the SWR increases from 1:1, 2:1 and 3:1 respectively.

Also, tuning antennas that are very reactive can be misleading since, unless you use a directional wattmeter, you may find that almost as much power comes back as goes forward, in which case almost nothing is radiated even if your line losses are low. Even antenna tuners such as the Drake MN2000 will not provide a 'match' for reactive loads much greater than about 5:1.

However, if the transmitter pi-network is followed by an L-section match, of a type where both the L and C elements can be tuned, and these elements can be interchanged like the Unique Products Co. tuner, a transmitter match can be achieved for almost any SWR.

If the antenna is very reactive, make sure that you remove the balun, if one is employed, since ferrite baluns will not work well if the SWR is high, tending to absorb (or reflect) the power rather than to pass it.

Finally, a moot point. The dB power scale was invented by Mr. Graham Bell, and the comment that a power change of 1 dB can just be 'heard' refers to sound, not radio waves. Most receivers with an efficient AGC hold the audio output constant within 3 dB for an RF input increase of 100 dB above threshold, typically 1 microvolt. Thus, as long as your local noise level is low, you won't 'hear' a difference if a signal changes from S1 to S9 (about 48 dB). However, for signal levels near to threshold, a difference of ½ S-unit may mean the difference between being able to communicate or not.

John S. Belrose VE2CV
Aylmer, P.Q.

**BAND CHANGE**

"Roger, Jose, and thanks for being my first OA4 on 40 phone..." That comment was heard recently around 7060 and epitomizes the recent band change. Canadian DXers and contesters must be rejoicing mow that they have this additional advantage over the U.S. Amateurs. A pity they never learned how to operate 'split' or use CW.

Doubtless U.S. Amateurs will push the FCC for a similar band change, and I can't help feeling we will soon hear U.S. SSB signals below 7100. Then what used to be 100 kHz of pleasant CW for DXers and for beginners increasing their speed will turn into 50 kHz of overcrowded CW and 50 kHz of SSB bedlam.

There are moves afoot in the U.S. to allow phone between 14150 and 14200. Doubtless the Canadians who persuaded DOC to allow the 40m change are now writing all kinds of letters to the FCC and ARRL protesting the proposed U.S. 20 metre phone band extension.

Brian Summers VE3JKZ
Ottawa, Ont.

**There are indeed letters being written, Brian. Here's**

**one sample: The president of the Sept-Iles club wrote to ARRL president Dannalls recently:**

"At the regular monthly meeting of our Association, held on February 4, 1980, it was unanimously decided that the proposal made by ARRL to the FCC for modification of the 20 metre band down to 14150 MHz for United States Amateurs, is totally unwarranted due to the bandwidth already occupied by them, therefore request ARRL to reconsider their position. 73

Jean Claude Bilodeau
VE2XY"

**...and he got this reply...**

"Thanks for your comments. There is not yet a proposal by ARRL to FCC for the widening of the 20 meter phone. At page 66 March QST, minute 61, the Board of Directors asked that the Plans and Programs Committee **study** the idea. Your letter now forms part of that study; I've sent copies to each member.

Has your group examined the fairness of 20,000 Canadian Amateurs having access to 250 kHz for phone in this band, while 360,000 U.S. Amateurs have 150 kHz? Is there really a need for Canadian Amateurs to have 100 kHz free of W/K/Ns? Would not 50 kHz protected space be adequate?" 73

Perry F. Williams W1UED
ARRL Washington Area
Coordinator

**which prompted Jean Claude to take pen in hand again and reply to W1UED...**

"We Canadians have had first hand experience of what an expansion can do to a band following the allocation given on 80 metres down to 3775 kHz. Nightly in this part of the country we have the 'Quebec Phone Net' meeting at 1845 on 3780 kHz; well anybody with a receiver can hear that there is traffic being passed on that frequency. Eight times out of 10 the net control station VE2AQC has to ask the interfering W/K/Ns stations if they could please QSY to a lower or higher frequency; I won't go into any details the answers that are given back, leaving it to your imagination.

Now on 20 metres there are also such nets meeting regularly, be they National or International and we are not talking of strictly 20,000 Canadian Amateurs as you put it, but more like roughly 300,000 Amateurs world-wide according to the DX Callbook, therefore as you might see this proposal will affect more people than you think.

If I may make a suggestion, ARRL could suggest to W/K/Ns to use only the power required for normal communications instead of 2 kw pep and directional beams, and the 150 kHz allocated on that band would be all that is needed.

Sincerely yours,
Jean Claude Bilodeau
VE2XY"

**All this ought to liven things up a bit!**

# Annual General Meeting

Notice is hereby given that the Annual General Meeting of the Federation will be held on May 31 1980 at 9 am in room D394 in Tower D of the Loeb Building, Carleton University, Ottawa for the purpose of receiving and considering the operating report and financial statement, establishing a committee to manage CARF symposia, revising the quarum for directors' meetings, appointing auditors and transacting such other business as may properly come before the meeting. Dated at Ottawa this 22nd day of March 1980.

Signed
J.A. Gilbert VE3CXL
Secretary

# Groups create input for national symposium

The Nova Scotia Amateur Radio Association is holding a regional symposium in Truro on Sunday, April 12, to formulate input to the CARF National Symposium to be held in Hamilton on May 17. Kingston Amateurs held a one-day conference in March and major clubs in Quebec province were also to hold discussions for the same purpose. With DOC about to propose ideas for domestic re-allocation of frequencies as a result of WARC 79, including some of interest to Amateurs, input to the National Symposium and its recommendations are of importance to the Amateur Service.

**-- Cover Story --**

# Around the world on 70cm

By Dave Nessman VE3GEA

The May 23 launching of OSCAR 9 will begin a new phase of AMSAT-OSCAR operations.

A new plateau of performance in DX UHF/VHF communications will be reached with the upcoming lauch of the latest in the series of OSCAR Amateur radio satellites, according to John Henry VE2VQ, president of AMSAT Canada and a past-president of CARF. The project is being conducted by AMSAT, an international group with headquarters in Washington, D.C., of which AMSAT Canada is a supporting member.

The AMSAT series of OSCAR (Orbiting Satellite Carrying Amateur Radio) satellites has moved through three phases in the evolution of technology and performance since the launch of Oscar 1 in December 1961. In the first phase (Oscars 1 through 4) the satellites were placed in relatively low orbits of 200-500 km. Their radio equipment consisted of simple beacons providing ground stations with telemetry information only, and their signals could be heard for about 15 minutes out of each 90 minute orbit cycle. Ordinary batteries provided the power source and as such did not last beyond a few weeks in most cases.

Improvements began with the launch of Oscar 5 in January 1970, when the established orbit increased to a medium range of 900-1400 kilometres. A lifetime expectancy of greater than one year was achieved through the introduction of ni-cad rechargeable batteries and solar cells. Oscar 5, like its predecessors provided only telemetry information to the ground. Phase two in the Oscar revolution really took off and established a new era in two-way communications ranging up to 2500 miles when the next three Oscars took to the air. Oscar 6 was launched in 1972 and lasted for almost five years; Oscar 7, launched in 1974, and Oscar 8, launched in 1978, are still functioning ... the gain in life expectancy had been dramatically demonstrated.

Real two-way communication between Amateurs was now possible. A frequency bandwidth of about 100 kHz was provided, accommodating, for example, 20 SSB and 20 CW QSOs simultaneously, with 25 usable minutes being available out of each 115 minute orbit cycle.

With the scheduled May 23 launch from Kouru, French Guiana, the third phase of Oscar development will begin. This will be the first Oscar launch not conducted by NASA, but rather by the European Space Association (ESA).

The new satellite will be known – after a successful launch – as AMSAT-OSCAR 9,. and is one of many scientific packages to be carried by the launch vehicle ARIANE.

It will use a communications transponder designed by Karl Meinzer DJ4ZC, and built in West Germany. The satellite's substructure was made, and final assembly completed, at the Goddard Space Centre in Washington, D.C. Made mostly of aluminum, its shape is roughly that of a triangular cone, 1 metre to each side, with a total weight of about 65 kilograms. The lifetime design expectancy has been increased again through two separate sets of rechargeable batteries and solar cells. The communications bandwidth has also increased to about 140 kHz with a 70 cm uplink (input) range of 435.150 to 435.280 MHz, and a two-metre downlink (output) range of 145.835 to 145.965 MHz. The output

power of the satellite should be up to 50 watts ERP, depending on the number of users. Recommended modes of operation are SSB and CW.

The new satellite will initially be placed in a high elliptical orbit of 200 by 34000 km, with a 17½ degree inclination to the equator. Once the orbit has been stabilized, perhaps two or three weeks after launch, the orbit will be changed to a range of 1500 by 34000 km, with a 57 degree inclination to the equator, placing the satellite in a high polar orbit near the North Pole. This will be accomplished through the use of another new feature for this satellite – a kick-motor (or thruster), fired on command from a ground station.

So what does all this mean to the average radio Amateur? Well, it means that a tremendous UHF communications range will become available to virtually all Amateurs, even the apartment dwellers, without sophisticated equipment. The high elliptical orbit will enable the satellite to provide communications coverage over most of the Northern Hemisphere for eight hours or more of its 11-hour orbit cycle, with occasional 'windows' opening between North America and the Southern Hemisphere (e.g. Australia and Africa) as the satellite continues its orbit cycle. Tracking antennas will not be necessary, and relatively little power will be required – 500 watts ERP (that's only 50 watts to a 10 dB gain antenna). It will be, without a doubt, a giant step in Amateur radio satellite performance standards ... but hang on; we still need a successful launching!

For up-to-date information on this milestone event, tune in on one of the AMSAT nets operating every Tuesday evening at 2000 hrs. EST, CST and PST. The net meets on 3850 kHz. If you're travelling and would like a look at the nuts and bolts of satellite building, stop by the AMSAT lab at the Goddard Space Centre in Washington. It is open to the public and operated by AMSAT on behalf of NASA.

(If you use the Oscar birds, you may like to show your appreciation of the work done by the dedicated group which builds the hardware by joining AMSAT Canada, Box 7306, Vanier, Ont. K1L 8E4. The fee is $12, which also brings you the AMSAT publication...Editor)

# No easy road

The statement by DOC's regs head, Dr. John deMercado VE3LBA, at the 1977 CARF Symposium that the Digital ticket would not be an easy back door to an Amateur ticket seems borne out by the results of the January exams. Only three of the 11 non-Amateurs made it, however, six out of eight Amateur ops made the grade and 12 out of 13 Advanced licensees passed.

A reason why failure rates may not reflect the actual level of the exams is that many instructors, taking advantage of the quarterly exam sittings, send their classes to write even though the course is not finished. This gives the students a first-hand glimpse of the way the papers are set up and the environment in which they can expect to write their exams after finishing their course. Surprisingly enough, the odd case has occurred where students have been able to make it with regs or the code part, but these are few and far between.

# Packet fans....

More than 100 packet radio fans have received a 20-page report on the activities of experimenters in Montreal, Ottawa and Vancouver. CARF has undertaken the printing and distributing of these reports on a continuing basis. Technical coordinator of this new venture is Hugh Pett VE3PLL. This first issue and the next four may be obtained by sending $5.00 to CARF, marked 'Packet Radio Mailings', in care of CARF Inc., Box 356, Kingston, Ontario K7L 4W2. VE3PLL may be contacted for information or input through the same address.

**SAGUENAY SIX METRE**

Fernande VE2FIZ advises of a new six-metre certificate available to stations obtaining six-metre contact (cross-band accepted) with three stations in the Saguenay Valley. Cost is $2.00 U.S. Apply to Certificate Manager, Fernande C. Audet VE2FIZ, 227 Labrecque St., Arvida, P.Q. G7S 1J9.

# DX

By Garth Hamilton VE3EUP
P.O. Box 1156
Fonthill, Ont. L0S 1E0

BY – This should be old news now but ZL1AMO and company had to cancel because one of their group had an American passport.

CR9 – VS6AG & VS6DO were planning separate trips to Macao in late April and early May.

FR7/G – DK9KX and friends started mid April with QSL's to DK9KD.

HK0AA – Malpelo in July.

HK0AB – Bajo Nuevo same time in July as Malpelo.

J5AG – SM0AGD was using this call in March for several days QSL's SM3CXS.

KH2AD – If you worked this one in April, it was Western Carolines; QSL's W6TPC.

VK0RM – QSL's VK3AQQ if you were one of the blessed.

XZ – George VE3FXT still keeping us in suspense. This morning when I heard him talking with a W station, his reply to "How is Burma coming" was "I guess I'll have to find myself an island nearby". What that means will have to be left to your imagination.

9N1MM – Plans were for Father Moran to have a visitor in May, JA8BMK, who hoped to do some DXpedition style operating from Nepal.

As I write this, the end of the Heard Island Expedition is happening. I must say, for a new operator, Conn showed some unusual dedication to the Amateur population. The TS-120 was subjected to a fair bit of abuse and started out with the receiver not working when they first went ashore, so the rig went back to the boat to be fixed. When it was delivered back ashore, it became obvious that the PA final transistors were giving up and so only a few QSOs were possible.

For almost a week Conn kept his skeds with Jim P29JS, but was frustrated when he could hear Jim and the other stations but couldn't make himself heard even to those close by in VK-land.

Finally, three days before the ship returned to Heard, they had a storm which produced winds in excess of 100 mph. The winds destroyed the vertical antenna and Conn could no longer hear anyone. Even more frustrating, the one morning that I could hear Conn I wasn't on the list and so was not able to work him, while most of the others who tried couldn't copy their reports. VO1CU was the only Canadian who got a chance, and got a 5/2 report but, unfortunately, he couldn't copy it. Hopefully there will be other trips in the near future. The last trip was ten years ago.

**FORTY METRES**

With the new band expansion for SSB operation for VE's, DX has been fairly easy to work on SSB on this band as of late. My own operating procedures seemed to have stirred up a hornets' nest in the process. I have been refusing to work fellow VE's below 7.100 MHz and have been QSYing to frequencies above 7.150 MHz for

| | | | | |
|---|---|---|---|---|
| Family Hour | W7PHO | 21.345 | 0001Z | daily |
| | | 14.225 | 0130Z | daily |
| Arabian Nights | JY3ZH | 14.250 | 0430Z | Fri. morning |
| P29Js | P29Js | 14.220 | 0630Z | daily |
| Pacific DX | VK3PA | 14.265 | 0600Z | Fri. morning |
| | VK2CX | 14.265 | 0600Z | Tues. morning |
| Caribbean Pacific | VP2/8P6 | 14.170 | 1030Z | daily |
| Ten metre | DK2OC | 28.750 | 1200Z | daily |
| Canadians Overseas | VS6CZ | 14.160 | 1400Z | daily |
| Family Hour | W7PHO | 14.225 | 1430Z | daily |
| DX to DX | WB8ZJW | 21.280 | 1700Z | Mon-Wed-Fri |
| French DX | | 21.170 | 1730Z | daily |
| | | 14.120 | 1830Z | daily |
| Africana | W6BJS | 21.355 | 1800Z | daily |
| For Information Only | | | | |
| CANAD-X | VE3EUP VE3FRA | 14.173 | 1600Z | Sun. except major SSB contests |

local QSOs. My reason for this is that when the band is open for long range communications, those stations outside the Americas are limited to just that 50 kHz of 40 metres. I feel it isn't right for us to use this limited space to talk to others who can use the other frequencies above 7.150 MHz. I feel that it is unfair for me to use space in the 7.050 to 7.100 MHz portion except when working stations which can't use the other segments of 40 metres. Many may not agree with this but, having lived in other parts of the world for long periods of time, I know how little space it is for well over a third of the world's Amateur population to use.

**Possible U.S. Expansion on 20 and 40 Metres**

Here again, calling on my African experience, I hope such an expansion doesn't occur. Currently the non-U.S. stations represent about 48% of the world's Amateur population and have exclusive use of 40% of the 250 kHz available on 20 metres. With the power and density of signals in the portion of the band above 14.200 MHz, it is virtually impossible to work other than W's in that portion of the band. The only times when S9 or better signals were not audible on 20M were from 1000 local to 1500 local time when the band was dead and from 1800 to 2000 local time with the shift from long-path to short-path propagation and signals fell to S5 on average. On the portion of 20M below 14.200, the average signal was at least two S units below the level of signals above 14.200. So this is where we were able to communicate with other stations in our area. The band is full but still usable, but if reduced it probably will force a lot of DX off 20M because of the hassle to find space in which to operate.

CARF

# News Briefs

**LICENCES DELAYED**

The issuing of the five-year licence forms for those which expired on March 31 was delayed for some time after that date, due to the fact that the forms had to be reprinted with the name of the new Minister of Communications, Francis Fox. With many other Departments facing a similar problem, the printers were overloaded. CARF was assured by DOC that operation of stations awaiting their actual licence forms during the delay period will not be considered illegal.

**DOC HOLDS PUBLIC HEARING**

The DOC has prepared a paper outlining its ideas for reallocating domestic frequencies. The proposals will be up for discussion with spectrum user groups at a public meeting on May 15 in Ottawa. CARF will be there to represent Amateur views on the proposals. Subsequent to the meeting, DOC will accept written comments until some time in September.

**CW ONLY ON 10 MHZ?**

The IARU Region 1 executive committee has agreed that the new 10 MHz band, when it becomes available, should be a CW band only, due to its narrow width of only 50 kHz. Action by Region 1 Amateurs will not be likely until April next year when the European and African organizations meet.

**OLD NET REVIVED**

The Aurora Phone Net is back on the air after an absence of 10 or 12 years. It spans Canada nightly on 7060 kHz at 0230 hours Zulu time. Initial control station was Ward Warren VE4WR in Winnipeg.

N4XX Propagation Forecast

April

| S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | | | |

May

| S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |

| Sun | Mon | Tues | Wed | Thurs | Fri | Sat |
|---|---|---|---|---|---|---|
| 20-L | 21-H/L | 22-L/B | 23-H | 24-H | 25-H | 26-H/L |
| 27-L/H | 28-H/A | 29-A | 30-H | 1-H | 2-H/L | 3-L/B |
| 4-L/B* | 5-L | 6-H | 7-H | 8-H | 9-H | 10-H |
| 11-H | 12-H/L | 13-H | 14-L | 15-L | 16-H | 17-L |
| 18-H/L | 19-L/B | 20-H | 21-H | 22-H | 23-H/L | 24-L/H |
| 25-H/A | 26-A | 27-H | 28-H | 29-H/L | 30-L/B | 31-L/B |

*start of 54-Day Prediction

# Social Season

**June 7** Central Ontario Flea Market, sponsored by the Guelph ARC at the Centennial Arena. 8 am to 4 pm. Admission $1. Vendors $2 and bring own table. Followed by the famous Sidebanders Dinner. For info on that contact Jack Kirby VE3AFN. For dope on the flea market, contact Rocco Furfaro VE3HGC (519) 824-1157.

**June 13-15** Lake Simcoe Hamfest, $5 at the gate; Molson's Park, Barrie, Ont. For reservations and $4 for pre-registration, write to Box 2283, Orillia, Ont. L3V 6S1. Auspices of Lake Simcoe Repeater Assoc. Inc. Flea market, displays, beer garden, barbeque.

**July 5** Sixth Annual Ontario Hamfest, sponsored by Burlington Amateur Radio Club at the Milton Fairgrounds. $3 at gate. Camping, food, prizes, flea market. Gate open 1200 hrs July 4.

**July 5-6** Hamfest 80, hosted by the Maple Ridge ARC at the Maple Ridge Fairgrounds, 30 miles west of Vancouver. Registration $4.00 for program. Banquet $10. preregistered. Camper space. For info: Bob Haughton VE7BZH, 114th Ave., Maple Ridge, B.C. V2X 1S7.

**August 2-4** Saskatchewan Hamfest sponsored by the Battleford Arc, celebrating Saskatchewan's 75th Birthday as a province.

**August 22-24** RAQI Annual Convention, Tadoussac, Que. Details later.

**August 29 - Sept. 1** Maritime Hamfest, or 'Ham Ceilidh '80', the Maritime Hamfest reappears after a two-year absence, with a Gaelic title meaning 'gathering'. Hosted by Sydney ARC. Info and reservations, Box 1051, Sydney, N.S. B1P 6J7. Bring your own bagpipe and kilt. Haggis will **not** be featured at the banquet in deference to Sassenach stomachs.

**October 2-4** RSO Convention at the Prince Hotel, Toronto. For information and registration write RSO Convention Committee, Box 997, Station B, Willowdale, Ont. M2K 2T6.

**DOC TO B.A.**

In mid-March Canadian delegates attended one of the first of the post-WARC conferences in Buenos Aires. This meeting got down to the technical details of Region 2 broadcast service changes agreed to last fall in Geneva. Future meetings will deal with allocation changes to other services, including those concerning the Amateur Service.

# Unsung Hero

A note from VE2LN reminds us that, along with a number of Amateurs whom we have already mentioned in these columns, he too was on the WARC delegation. To clinch the matter, here is Real Therrien at the mike at 4U1ITU, the International Telecommunications Union Amateur station in Geneva last November.

Real has been seen on TV lately as he is chairman of the Pay TV hearings before the Canadian Radio Telecommunications Commission (CRTC).

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**MFJ-941B Versa tuner II**
This accurate unit has SWR and dual range wattmeter, antenna switch, built-in balun, 300W RF output. Matches everything from 1.8 thru 30 MHz. You can use just one antenna and increase the useable bandwidth. Has SO-239 connectors. Mobile mounting bracket.

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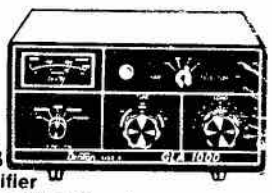
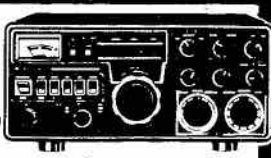


**DENTRON GLA-1000B linear amplifier**
Freq. coverage 80 to 10 meters, covers most MARS freq., RF drive: Max. 125, power consumption: 117 VAC 50/60 Hz 12.5 Amps, factory fused at 15 Amps. 234 VAC 50/60 Hz 7 Amps, DC input: 1 KW CW and 1200W PEP SSB. Final tubes 4D-50A tubes (6LQ6).



**KENWOOD TS-700SP**
**all mode 2m transceiver**
Covers the entire 2 meter band. SSB, CW, FM, AM, and semi-break in CW, side tone monitor, digital frequency readout, receiver preamp and 600 KHz repeater offset operation within all 2m repeater subbands including the new 144.5-145.5 MHz. 10 watts RF output complete with AC/DC power supply.

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**YAESU FT-207R**
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144-148 Mhz, 5 KHz steps, output: 2.5W hi/200 mW low, 4 memories plus programmable offset, prior ch., memory band & auto scan, keyboard encoder freq. entry, 2 tone input from keyboard, keyboard lock, programs odd splits, auto. battery saver for LED, rubber flex antenna & 15 hr. wall charger.

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**DRAKE TR/DR7 general coverage digital R/O transceiver**
Covers 160 thru 10 meters, reception from 1.5-30 MHz continuous, 0-30 MHz with optional Aux-7 modes: USB, LSB, CW, RTTY, AM equiv., true passband tuning, RIT, built-in RF wattmeter/VSWR bridge, SSB 250W PEP, CW 250W AM equiv. 80W. Power supply required for AC operation.

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Full break-in, 70 watts input, all solid state, built-in speaker, receives CW or SSB but transmits CW only, overload protection, offset receiver tuning, adjustable level sidetone, built-in regulated power supply. Crystals are provided to cover the 80 thru 10 meter bands.

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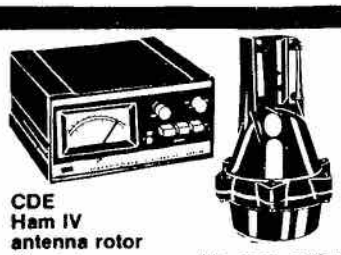

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Pinpoint accuracy with snap action switched wedge brake and rotational controls. Tower mounted only. Turns 12 sq. ft. of antenna. 8 conductor cable required.

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**HF transceiver**
No tune up! With digital display, cooling fan, IF shift, protection for the final transistor, VOX, noise blanker, 25 KHz marker, 80-10 meters, WWV, modes: SSB and CW, 200W PEP SSB, power requirements: R.O. 7A 13.8 VDC, T. 18A 13.8 VDC, Size: 3½"H x 9¼"W x 13½"L.

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**KENWOOD TS-180S**
**solid state HF transceiver**
Covers 160-10 meters, digital frequency control with 4 memories and manual scanning, 200W PEP/160W DC 160-15 meters and tunable noise blanker, dual RIT (VFO and memory/fix) SSB, CW, and FSK, 13.8 VDC operation, and built-in digital display to show VFO freq. and difference between VFO and M-1 memory freq.

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# New Regs!

CARF News Service has already distributed copies of the new regulations to affiliated clubs and through these pages now brings them to the individual Amateur. A number of the changes were the result of recommendations to DOC from the CARF National Symposiums held in the past three years.

When studying these amendments, one should remember that there are still rules in other sections of the Radio Regulations and Radio Act which apply to all radio services, including the Amateur Service. An example of this is the requirement for logging which appears in sections previous to those amended; that requirement was not changed.

The Minister of Communications, pursuant to subsection 7(1) of the Radio Act, is pleased hereby to amend the General Radio Regulations, Part II, C.R.C., c. 1372, in accordance with the schedule hereto.

Dated at Ottawa, February 26, 1980

DAVID S. H. MACDONALD
*Minister of Communications*

SCHEDULE

1. (1) Section 2 of the *General Radio Regulations, Part II*, is amended by adding thereto, immediately after the definition "Act", the following definition:

" "amateur station" means a station that performs an amateur service; (*station d'amateur*)"

(2) All that portion of the definition "terrestrial service" in section 2 of the said Regulations preceding paragraph (*a*) thereof is revoked and the following substituted therefor:

" "terrestrial service" means a radiocommunication service provided by an amateur station, a coast station, a land station or a mobile station, and consists of the following categories of service:"

(3) Paragraph (*c*) of the definition "terrestrial service" in section 2 of the said Regulations is revoked and the following substituted therefor:

"(*c*) "amateur service" being a radiocommunication service for purposes of self-training, intercommunication or technical investigation carried on by persons who are interested in radio technique solely with a personal aim and without pecuniary interest,"

(4) The definition "terrestrial service" in section 2 of the said Regulations is further amended by adding thereto, immediately after paragraph (*p*) thereof, the following paragraph:

"(*p*.1) "radiodetermination service" being a radiocommunication service using the propagation properties of radio waves to obtain information relative to the position of an object,"

2. (1) Paragraphs 4(*a*) to (*f*) of the said Regulations are renumbered as paragraphs 4(*b*) to (*g*) respectively.

(2) Section 4 of the said Regulations is further amended by adding thereto, immediately preceding the renumbered paragraph (*b*) thereof, the following paragraph:

"(*a*) amateur stations;"

3. (1) Subsection 7(1) of the said Regulations is amended by deleting the word "and" at the end of paragraph (*d*) thereof, by adding the word "and" at the end of paragraph (*e*) thereof and by adding thereto the following paragraph:

"(*f*) amateur station licences."

(2) Subparagraph 7(3)(*a*)(viii) of the said Regulations is revoked.

(3) Section 7 of the said Regulations is further amended by adding thereto the following subsection:

"(5) Amateur station licences may be issued for amateur stations."

4. The headings preceding section 42 and sections 42 to 64[1] of the said Regulations are revoked and the following substituted therefor:

"AMATEUR SERVICE

*Frequencies Allocated*

42. The radio frequencies in the bands between the lower frequency limits set out in column I of an item of Schedule II and the higher frequency limits set out in column II of that item are allocated for the use of amateur stations.

*Conditions Applying to the use of the Frequency Band 1.8 to 2.0 MHz*

43. (1) No person shall operate an amateur mobile station on any frequency in the band 1.8 to 2.0 MHz.

(2) Any person operating an amateur station using frequencies in the band 1.8 to 2.0 MHz at a permanent location in the area set out in an item of Schedule X shall comply with the frequency and transmitter power for day and night operation set out in that item.

(3) Where, in respect of an item of Schedule X, a frequency band is marked with an asterisk, a person described in subsection (2) may be authorized by the Minister to use a power level of 1000 watts during the day and 200 watts at night if

(*a*) he applies to the Minister in writing; and

(*b*) the Minister is satisfied that such use will not cause interference to stations providing a radiodetermination service.

(4) For the purposes of Schedule X, "transmitter power" means the maximum direct current power supplied to the anode or collector of the final stage of the transmitter.

[1] as amended by SOR/78-702, 1978 *Canada Gazette* Part II, p. 3618

*Interference to Radiodetermination Service*

44. Any person operating an amateur station in a frequency band shown in any of items 10, 12 to 16 and 18 of Schedule II shall ensure that harmful interference is not caused to any station providing a radiodetermination service in that band and shall not claim protection from interference caused by the operation of such a station.

*Interference to Fixed Service*

45. Any person operating an amateur station in the frequency band shown in item 11 of Schedule II shall ensure that harmful interference is not caused to any station providing a fixed service in that band and shall not claim protection from interference caused by the operation of such a station.

*Frequencies for Operation of Radio-controlled Models by Amateurs*

46. The licensee of an amateur station may operate radio controlled models

(*a*) in the frequency bands 40.66 to 40.70 MHz and 2450 to 2500 MHz designated for industrial, scientific and medical purposes, if the power output of the transmitter does not exceed five watts; and

(*b*) in all frequency bands above 53 MHz allocated for use under section 42.

*Types of Emission*

47. Where, in these Regulations, symbols are used to identify a particular type of emission, they shall have the following meanings:

(*a*) "AØ" means an emission that is unkeyed or unmodulated;

(*b*) "A1" means telegraphy by the on-off keying of an unmodulated carrier;

(*c*) "A2" means telegraphy by the on-off keying of an amplitude modulating audio frequency signal or by the on-off keying of the amplitude modulated carrier;

(*d*) "A3" means telephony by amplitude modulation;

(*e*) "A4" means facsimile by amplitude modulation of a carrier, either directly or by a frequency modulated sub-carrier;

(*f*) "A5" means television by amplitude modulation;

(*g*) "F1" means telegraphy by frequency shift keying where one of two unmodulated carriers is being emitted at any instant;

(*h*) "F2" means telegraphy by the on-off keying of a frequency modulating audio frequency or by the on-off keying of a frequency modulated emission;

(*i*) "F3" means telephony by frequency modulation;

(*j*) "F4" means facsimile by direct frequency modulation of the carrier;

(*k*) "F5" means television by frequency modulation;

(*l*) "PØ" means a pulsed emission without any modulation intended to carry information (e.g. radar);

(*m*) "P1" means telegraphy by the on-off keying of a pulsed carrier without the use of a modulating audio frequency;

(*n*) "P2" means telegraphy by the on-off keying of a modulating audio frequency or audio frequencies or by the on-off keying of a modulated pulsed carrier;

(*o*) "P3" means telephony by pulse modulation;

(*p*) "P4" means facsimile by pulse modulation;

(*q*) "P5" means television by pulse modulation; and

(*r*) "P9" means any type of pulse modulation not described in paragraphs (*l*) to (*q*).

QUALIFICATIONS OF RADIO OPERATORS FOR AMATEUR STATION OPERATION

*Classes of Certificates*

48. To qualify as an operator of an amateur station, a person shall hold

(*a*) a radio operator's

(i) Radiocommunication Operator's General Certificate,

(ii) First Class Certificate,

(iii) Second Class Certificate,

(iv) Advanced Amateur Class Certificate,

(v) Amateur Class Certificate, or

(vi) Digital Amateur Class Certificate;

(*b*) a station licence issued pursuant to subsection 5(4) of the *General Radio Regulations, Part I*;

(*c*) a station licence for an amateur station issued by the government of the United States; or

(*d*) an authorization issued by the Minister in the case of a person temporarily in Canada who is

(i) a resident and citizen of a country other than Canada or the United States, and

(ii) the holder of a valid amateur station licence issued by the government of the country of which he is a citizen,

where the Minister is satisfied that the government of the country of which that person is a citizen grants the same privilege to Canadian citizens.

*General Restrictions*

49. (1) A person qualified pursuant to section 48 to operate an amateur station shall only use frequencies, types of emissions or modes of transmission authorized in sections 50 to 56.

(2) No licensee of an amateur station shall, under the authority of his radio licence, operate more than

(*a*) one station at a permanent location;

(*b*) one station at a temporary location; and

(*c*) one mobile station.

*Foreign Amateur Operation*

50. A person qualified pursuant to paragraph 48(*c*) or (*d*) may operate his station or a station licensed by the Minister and such person shall use the call sign, radio frequencies, types of emission or modes of transmission he is authorized to use in his own country, if those frequencies, types of emission or modes of transmission are authorized by these Regulations.

*Packet Transmissions*

51. A person holding a radio operator's certificate of proficiency that qualifies him to operate an amateur station may use radio frequencies in the range between the lower frequency limit set out in column I of an item of Schedule III and the higher frequency limit set out in column II of that item for packet transmissions employing such types of emission, other than pulse modulation, as may be selected by experimentation, on condition that

(*a*) the bandwidths prescribed in column III of that item are not exceeded; and

(*b*) the final RF output power does not exceed 100 watts peak power and 10 watts average power.

*Digital Amateur Class Certificate*

52. A person holding a radio operator's Digital Amateur Class Certificate may use frequencies in the range between the lower frequency limit set out in column I of an item of Schedule IV and the higher frequency limit set out in column II of that item, with the corresponding types of emission set out in column III of that item.

*Amateur Class Certificate*

53. (1) A person holding a station licence referred to in paragraph 48(*b*) or a radio operator's Amateur Class Certificate may use frequencies in the range between the lower frequency limit set out in column I of an item of Schedule V and the higher frequency limit set out in column II of that item, with the corresponding types of emission set out in column III of that item.

(2) Where a person holding a radio operator's Amateur Class Certificate satisfies the Minister that he has actively operated his station for at least six months, he may use frequencies in the range between the lower frequency limit set out in column I of an item of Schedule VI and the higher frequency limit set out in column II of that item, with the corresponding types of emission set out in column III of that item.

(3) Where a person holding a radio operator's Amateur Class Certificate satisfies the Minister that he has actively operated his station for at least one year, he may use frequencies in the range between the lower frequency limit set out in column I of an item of Schedule VIII and the higher frequency limit set out in column II of that item, with the corresponding types of emission set out in column III of that item.

*Advanced Amateur Class Certificate*

54. A person holding a radio operator's Advanced Amateur Class Certificate may use frequencies in the range between the lower frequency limit set out in column I of an item of Schedule IX and the higher frequency limit set out in column II of that item, with the corresponding types of emission set out in column III of that item.

*Professional Classes of Certificates*

55. (1) A person holding a current radio operator's

(*a*) Radiocommunication Operator's General Certificate,

(*b*) First Class Certificate, or

(*c*) Second Class Certificate,

may use frequencies in the range between the lower frequency limit set out in column I of an item of Schedule III or IX and the higher frequency limit set out in column II of that item, with the corresponding types of emission set out in column III of that item.

(2) A person holding an outdated radio operator's certificate of a class mentioned in subsection (1) may, on application to the Minister, obtain an Advanced Amateur Class Certificate without examination.

*Authorization of Special Types of Emission*

56. The Minister may, on request, authorize the licensee of an amateur station to carry on special experimentation on radio frequencies that are in a range between the lower frequency limits and the higher frequency limits set out in Schedule IV or IX, with types of emission that are other than those set out for the particular range in column III of the Schedule.

## OPERATION

*Operation by a Person Other than the Licensee*

57. Notwithstanding that the licensee of an amateur station is at all times responsible for the operation of his station, he may

(*a*) permit a person to take part in communications if he retains physical control of the apparatus of his station; or

(*b*) permit a person who holds a radio operator's certificate referred to in paragraph 48(*a*) to operate his station using only such frequencies and emissions as the licensee is qualified to use or, if the person is not as qualified as the licensee, using only such frequencies and emissions as the person is qualified to use.

*Station Identification*

58. (1) The operator of an amateur station shall transmit his assigned call sign

(*a*) at intervals not greater than thirty minutes during any period in which the station is transmitting; and

(*b*) at the termination of

(i) a single transmission, or

(ii) each exchange of communications with another station.

(2) The call sign referred to in subsection (1) shall be transmitted

(*a*) by telegraphy in the International Morse Code,

(*b*) by telephony, or

(*c*) in packet transmission, as an ASCII mapping of the call sign transmitted within the packet header,

according to the type of emission authorized for the frequency being used.

*Intercommunication and Technical Experiments*

59. (1) The operator of an amateur station shall ensure that

(*a*) communications are exchanged only with other licensed amateur stations;

(*b*) his station is not used to retransmit types A3 or F3 emissions on frequencies below 28 MHz if such emissions are received from a station that is not authorized to use such emissions on frequencies below 28 MHz;

(*c*) communications are limited to messages of a technical nature or of a personal character for which, by reason of their unimportance, recourse to the public telecommunication service is not justified; and

(*d*) no secret code or cipher is used.

(2) Notwithstanding subsection (1), the operator of an amateur station may

(*a*) provide a radiocommunication service on behalf of recognized public service agencies during peace-time civil emergencies or during tests of civil emergency facilities; and

(*b*) conduct technical experiments using the apparatus of the station to transmit signals to receiving apparatus for the measurement of emissions, temporary observation of transmission phenomena, remote control by radio or similar experimental purposes.

*Emergency Communications*

60. Where an emergency situation exists, the operator of an amateur station may use his station to communicate any type of message for himself or on behalf of third parties, but he shall not accept remuneration in any form in respect of any such communication.

*Prohibited Communications*

61. No person shall operate an amateur station to communicate with a similar station of a country that has notified the International Telecommunication Union that it objects to such communications.

*Third Party Communications*

62. No person shall operate an amateur station to communicate a message on behalf of a third party to or from a similar station of another country unless such communications are authorized by an arrangement or agreement with the country concerned.

*Operation on Aircraft*

63. (1) No person shall install or operate an amateur station on an aircraft except as authorized by the Minister pursuant to subsection (2).

(2) The Minister may authorize the installation or operation of an amateur station on an aircraft if

(*a*) a written application therefor is submitted;

(*b*) the installation is technically acceptable, as determined by a radio inspector; and

(*c*) the installation does not impair the airworthiness of the aircraft, as determined by the Minister of Transport.

*Operation on Ships*

64. (1) No person shall install or operate an amateur station on a ship except as authorized by the Minister pursuant to subsection (2).

(2) The Minister may authorize the installation or operation of an amateur station on a ship if

(*a*) a written application therefor is submitted together with the written permission of the master of the ship; and

(*b*) the applicant gives an undertaking that the operation of the station will not interfere with the ship's other radiocommunication services.

*Special Restrictions Applying to Amateur Stations Outside Canada*

64.1 (1) Subject to subsection (2), the operator of an amateur station on board an aircraft or a ship shall, while the aircraft or ship is outside Canadian territory, restrict the operation of the station to frequencies in the bands 7.0 to 7.3 MHz, 14.00 to 14.35 MHz, 21.00 to 21.45 MHz and 28.00 to 29.70 MHz.

(2) Where an aircraft or ship mentioned in subsection (1) is outside Region 2 as defined by the Radio Regulations of the International Telecommunication Union, the operator shall not operate the station on frequencies in the sub-band 7.1 to 7.3 MHz.

APPARATUS AND TECHNICAL CHARACTERISTICS

64.2 The licensee of an amateur station shall ensure that

(*a*) his radio station is equipped with a reliable means

(i) of determining the operating radio frequency,

(ii) of preventing or indicating overmodulation in the case of a radiotelephone transmitter, and

(iii) of measuring the direct-current power input to the anode or collector circuit of the final stage where such power input exceeds four hundred watts;

(*b*) the amplitude modulation of his transmitter does not exceed one hundred per cent or use a bandwidth in excess of 6 kHz;

(*c*) the frequency modulation of his transmitter does not produce, except where packet transmissions are used, a frequency deviation exceeding, plus or minus,

(i) 450 hertz where type F1 emission is used,

(ii) 3 kHz where type F2 or F3 emission is used on any frequency below 52 MHz, or

(iii) 15 kHz where type F2, F3 or F4 emission is used in the frequency bands 52 to 54 MHz, 144.1 to 148 MHz, 220 to 225 MHz and 430 to 450 MHz;

(*d*) the pulse modulation of his transmitter does not produce signals that have a bandwidth in excess of

(i) 15 kHz in the frequency band 145.5 to 145.8 MHz, and

(ii) 30 kHz in the frequency band 434 to 434.5 MHz;

(*e*) the frequency stability in the frequency bands below 220 MHz is comparable to that which is obtainable using crystal control;

(*f*) the carrier is suppressed during periods of reception when the transmitter is operating on frequencies below 51 MHz;

(*g*) an unmodulated carrier is not emitted on frequencies below 51 MHz except during brief tests and adjustments that shall be terminated by the transmission of his assigned call sign; and

(*h*) television and facsimile signals do not have a bandwidth in excess of

(i) 3 kHz in the frequency bands below 434 MHz, and

(ii) 4 MHz in the frequency bands above 434 MHz.

*Power*

64.3 Subject to subsection 43(2), the operator of an amateur station shall ensure that the station power,

(*a*) if expressed as direct-current input power, does not exceed one thousand watts to the anode or collector circuit of the transmitter stage supplying radio frequency energy to the antenna; or

(*b*) if expressed as RF output power measured across an impedance matched load, does not exceed

(i) 2250 watts peak envelope power for transmitters producing any type of single sideband emission,

(ii) 750 watts carrier power for transmitters producing other types of emission,

(iii) 100 watts peak power and 10 watts average power for transmitters that are pulse modulated and operate at frequencies below 1215 MHz, or

(iv) 2500 watts peak power and 25 watts average power for transmitters that are pulse modulated and operate at frequencies above 1215 MHz.

*Interference*

64.4 Where interference to the reception of radiocommunications is caused by the operation of an amateur station, the Minister may require that such steps be taken as are necessary for the prevention of the interference, and the operator of the station shall comply immediately with any such requirement.

*Change of Address*

64.5 The licensee of an amateur station shall notify the Department of any change in his postal address."

5. Schedules II to VI of the said Regulations are revoked and the following substituted therefor:

## SCHEDULE II (ss. 42, 44 and 45)

| | Column I | Column II |
|---|---|---|
| Item | Lower Frequency Limit | Higher Frequency Limit |
| 1 | 1.800 MHz | 2.000 MHz |
| 2 | 3.500 MHz | 4.000 MHz |
| 3 | 7.000 MHz | 7.300 MHz |
| 4 | 14.000 MHz | 14.350 MHz |
| 5 | 21.000 MHz | 21.450 MHz |
| 6 | 28.000 MHz | 29.700 MHz |
| 7 | 50.000 MHz | 54.000 MHz |
| 8 | 144.000 MHz | 148.000 MHz |
| 9 | 220.000 MHz | 225.000 MHz |
| 10 | * 430.000 MHz | 450.000 MHz |
| 11 | ** 902.000 MHz | 928.000 MHz |
| 12 | *1 215.000 MHz | 1 300.000 MHz |
| 13 | *2 300.000 MHz | 2 450.000 MHz |
| 14 | *3 300.000 MHz | 3 500.000 MHz |
| 15 | *5 650.000 MHz | 5 925.000 MHz |
| 16 | *10 000.000 MHz | 10 500.000 MHz |
| 17 | 24 000.000 MHz | 24 050.000 MHz |
| 18 | *24 050.000 MHz | 24 250.000 MHz |

* see section 44 ** see section 45

## SCHEDULE III (ss. 51 and 55)

| Item | Column I<br>Lower Frequency Limit | Column II<br>Higher Frequency Limit | Column III<br>Maximum Bandwidth |
|---|---|---|---|
| 1 | 220.100 MHz | 220.500 MHz | 10 kHz |
| 2 | 220.500 MHz | 221.000 MHz | 100 kHz |
| 3 | 221.000 MHz | 223.000 MHz | 25 kHz |
| 4 | 223.000 MHz | 223.500 MHz | 100 kHz |
| 5 | 433.000 MHz | 434.000 MHz | 100 kHz |
| 6 | 24 000.000 MHz | 24 010.000 MHz | |

## SCHEDULE IV (ss. 52 and 56)

| ITEM | Column I<br>LOWER FREQUENCY LIMIT | Column II<br>HIGHER FREQUENCY LIMIT | Column III<br>TYPES OF EMISSION |
|---|---|---|---|
| 1 | 144.000 MHz | 144.100 MHz | A1, |
| 2 | 144.100 MHz | 145.500 MHz | A0, A1, A2, A3, A4, F1, F2, F3, F4, |
| 3 | 145.500 MHz | 145.800 MHz | A0, A1, A2, A3, A4, P0, P1, F1, F2, F3, F4, |
| 4 | 145.800 MHz | 148.000 MHz | A0, A1, A2, A3, A4, F1, F2, F3, F4, |
| 5 | 220.000 MHz | 221.000 MHz | A0, A1, A2, A3, A4, F1, F2, F3, F4, |
| 6 | 223.000 MHz | 225.000 MHz | A0, A1, A2, A3, A4, F1, F2, F3, F4, |
| 7 | 430.000 MHz | 433.000 MHz | A0, A1, A2, A3, A4, F1, F2, F3, F4, |
| 8 | 434.000 MHz | 434.500 MHz | AØ, A1, A2, A3, A4, F1, F2, F3, F4, PØ, P1, P2, P3, |
| 9 | 434.500 MHz | 450.000 MHz | AØ, A1, A2, A3, A4, A5, F1, F2, F3, F4, F5, |
| 10 | 902.000 MHz | 928.000 MHz | A3, F3, |
| 11 | 1 215.000 MHz | 1 300.000 MHz | AØ, A1, A2, A3, A4, A5, F1, F2, F3, F4, F5, PØ, P1, P2, P3, P4, P5, P9, |
| 12 | 2 300.000 MHz | 2 450.000 MHz | AØ, A1, A2, A3, A4, A5, F1, F2, F3, F4, F5, PØ, P1, P2, P3, P4, P5, P9, |
| 13 | 3 300.000 MHz | 3 500.000 MHz | AØ, A1, A2, A3, A4, A5, F1, F2, F3, F4, F5, PØ, P1, P2, P3, P4, P5, P9, |
| 14 | 5 650.000 MHz | 5 925.000 MHz | AØ, A1, A2, A3, A4, A5, F1, F2, F3, F4, F5, PØ, P1, P2, P3, P4, P5, P9, |
| 15 | 10 000.000 MHz | 10 500.000 MHz | AØ, A1, A2, A3, A4, A5, F1, F2, F3, F4, F5, PØ, P1, P2, P3, P4, P5, P9, |
| 16 | 24 010.000 MHz | 24 250.000 MHz | AØ, A1, A2, A3, A4, A5, F1, F2, F3, F4, F5, PØ, P1, P2, P3, P4, P5, P9. |

## SCHEDULE V (ss. 53(1))

| ITEM | Column I<br>LOWER FREQUENCY LIMIT | Column II<br>HIGHER FREQUENCY LIMIT | Column III<br>TYPES OF EMISSION |
|---|---|---|---|
| 1 | 1.800 MHz | 2.000 MHz | A1, |
| 2 | 3.500 MHz | 4.000 MHz | A1, |
| 3 | 7.000 MHz | 7.300 MHz | A1, |
| 4 | 14.000 MHz | 14.350 MHz | A1, |
| 5 | 21.000 MHz | 21.450 MHz | A1, |
| 6 | 28.000 MHz | 29.700 MHz | A1, |
| 7 | 50.000 MHz | 50.050 MHz | A1, |
| 8 | 50.050 MHz | 51.000 MHz | A1, A2, A3, F1, F2, F3, |
| 9 | 51.000 MHz | 54.000 MHz | AØ, A1, A2, A3, A4, F1, F2, F3, F4, |
| 10 | 144.000 MHz | 144.100 MHz | A1, |
| 11 | 144.100 MHz | 148.000 MHz | AØ, A1, A2, A3, A4, F1, F2, F3, F4, |
| 12 | 220.000 MHz | 221.000 MHz | AØ, A1, A2, A3, A4, F1, F2, F3, F4, |
| 13 | 223.000 MHz | 225.000 MHz | AØ, A1, A2, A3, A4, F1, F2, F3, F4, |
| 14 | 430.000 MHz | 433.000 MHz | AØ, A1, A2, A3, A4, F1, F2, F3, F4, |
| 15 | 434.000 MHz | 450.000 MHz | AØ, A1, A2, A3, A4, F1, F2, F3, F4, |
| 16 | 902.000 MHz | 928.000 MHz | A3, F3, |
| 17 | 1 215.000 MHz | 1 300.000 MHz | AØ, A1, A2, A3, A4, F1, F2, F3, F4, |
| 18 | 2 300.000 MHz | 2 450.000 MHz | AØ, A1, A2, A3, A4, F1, F2, F3, F4, |
| 19 | 3 300.000 MHz | 3 500.000 MHz | AØ, A1, A2, A3, A4, F1, F2, F3, F4, |
| 20 | 5 650.000 MHz | 5 925.000 MHz | AØ, A1, A2, A3, A4, F1, F2, F3, F4, |
| 21 | 10 000.000 MHz | 10 500.000 MHz | AØ, A1, A2, A3, A4, F1, F2, F3, F4, |
| 22 | 24 010.000 MHz | 24 250.000 MHz | AØ, A1, A2, A3, A4, F1, F2, F3, F4. |

## SCHEDULE VI (*ss. 53(2)*)

| Item | Column I<br>Lower Frequency Limit | Column II<br>Higher Frequency Limit | Column III<br>Types of Emission |
|---|---|---|---|
| 1 | 1.800 MHz | 2.000 MHz | A3, |
| 2 | 3.500 MHz | 3.725 MHz | F1, |
| 3 | 7.000 MHz | 7.050 MHz | F1, |
| 4 | 7.100 MHz | 7.150 MHz | F1, |
| 5 | 14.000 MHz | 14.100 MHz | F1, |
| 6 | 21.000 MHz | 21.100 MHz | F1, |
| 7 | 28.000 MHz | 28.100 MHz | F1, |
| 8 | 28.100 MHz | 29.700 MHz | A3, F3." |

6. Schedule VIII to the said Regulations is revoked and the following substituted therefor:

"SCHEDULE VIII (*ss. 53(3)*)

| Item | Column I<br>Lower Frequency Limit | Column II<br>Higher Frequency Limit | Column III<br>Types of Emission |
|---|---|---|---|
| 1 | 434.000 MHz | 450.000 MHz | A5, F5, |
| 2 | 1 215.000 MHz | 1 300.000 MHz | A5, F5, |
| 3 | 2 300.000 MHz | 2 450.000 MHz | A5, F5, |
| 4 | 3 300.000 MHz | 3 500.000 MHz | A5, F5, |
| 5 | 5 650.000 MHz | 5 925.000 MHz | A5, F5, |
| 6 | 10 000.000 MHz | 10 500.000 MHz | A5, F5, |
| 7 | 24 010.000 MHz | 24 250.000 MHz | A5, F5. |

## SCHEDULE IX (ss. 54 and 56)

| Item | Column I<br>Lower Frequency Limit | Column II<br>Higher Frequency Limit | Column III<br>Types of Emission |
|---|---|---|---|
| 1 | 1.800 MHz | 2.000 MHz | A1, A3, F3, |
| 2 | 3.500 MHz | 3.725 MHz | A1, F1, |
| 3 | 3.725 MHz | 4.000 MHz | A1, A3, F3, |
| 4 | 7.000 MHz | 7.050 MHz | A1, F1, |
| 5 | 7.050 MHz | 7.100 MHz | A1, A3, F3, |
| 6 | 7.100 MHz | 7.150 MHz | A1, F1, |
| 7 | 7.150 MHz | 7.300 MHz | A1, A3, F3, |
| 8 | 14.000 MHz | 14.100 MHz | A1, F1, |
| 9 | 14.100 MHz | 14.350 MHz | A1, A3, F3, |
| 10 | 21.000 MHz | 21.100 MHz | A1, F1, |
| 11 | 21.100 MHz | 21.450 MHz | A1, A3, F3, |
| 12 | 28.000 MHz | 28.100 MHz | A1, F1, |
| 13 | 28.100 MHz | 29.700 MHz | A1, A3, F3, |
| 14 | 50.000 MHz | 50.050 MHz | A1, |
| 15 | 50.050 MHz | 51.000 MHz | A1, A2, A3, F1, F2, F3, |
| 16 | 51.000 MHz | 54.000 MHz | AØ, A1, A2, A3, A4, F1, F2, F3, F4, |
| 17 | 144.000 MHz | 144.100 MHz | A1, |
| 18 | 144.100 MHz | 148.000 MHz | AØ, A1, A2, A3, A4, F1, F2, F3, F4, |
| 19 | 220.000 MHz | 221.000 MHz | AØ, A1, A2, A3, A4, F1, F2, F3, F4, |
| 20 | 223.000 MHz | 225.000 MHz | AØ, A1, A2, A3, A4, F1, F2, F3, F4, |
| 21 | 430.000 MHz | 433.000 MHz | AØ, A1, A2, A3, A4, F1, F2, F3, F4, |
| 22 | 434.000 MHz | 450.000 MHz | AØ, A1, A2, A3, A4, A5, F1, F2, F3, F4, F5, |
| 23 | 902.000 MHz | 928.000 MHz | A3, F3, |
| 24 | 1 215.000 MHz | 1 300.000 MHz | AØ, A1, A2, A3, A4, A5, F1, F2, F3, F4, F5, |
| 25 | 2 300.000 MHz | 2 450.000 MHz | AØ, A1, A2, A3, A4, A5, F1, F2, F3, F4, F5, |
| 26 | 3 300.000 MHz | 3 500.000 MHz | AØ, A1, A2, A3, A4, A5, F1, F2, F3, F4, F5, |
| 27 | 5 650.000 MHz | 5 925.000 MHz | AØ, A1, A2, A3, A4, A5, F1, F2, F3, F4, F5, |
| 28 | 10 000.000 MHz | 10 500.000 MHz | AØ, A1, A2, A3, A4, A5, F1, F2, F3, F4, F5, |
| 29 | 24 010.000 MHz | 24 250.000 MHz | AØ, A1, A2, A3, A4, A5, F1, F2, F3, F4, F5. |

## SCHEDULE X (ss. 43)

Authorized Frequency Bands (MHz) and Transmitter Power in watts for day (dj) and night (n) Operation

| Item | Area | 1.800 to 1.825 | 1.825 to 1.850 | 1.850 to 1.875 | 1.875 to 1.900 | 1.900 to 1.925 | 1.925 to 1.950 | 1.950 to 1.975 | 1.975 to 2.000 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | British Columbia | 500dj* | 500dj | 500dj | 125dj | — | — | — | — |
| | | 100n | 100n | 100n | 25n | — | — | — | — |
| 2 | Alberta | 500dj* | 500dj | 500dj | 500dj | 125dj | — | — | 125dj |
| | | 100n | 100n | 100n | 100n | 25n | — | — | 25n |
| 3 | Saskatchewan | 500dj* | 500dj | 500dj | 500dj | 500dj | 125dj | 125dj | 500dj |
| | | 100n | 100n | 100n | 100n | 100n | 25n | 25n | 100n |
| 4 | Manitoba | 500dj* | 250dj | 250dj | 250dj | 250dj | 250dj | 250dj | 500dj* |
| | | 100n | 50n | 50n | 50n | 50n | 50n | 50n | 100n |
| 5 | Ontario | 500dj | 125dj | 125dj | 125dj | 125dj | — | — | 250dj |
| | North of 50° N. Lat. | 100n | 25n | 25n | 25n | 25n | — | — | 50n |
| 6 | Ontario | 500dj* | 250dj | 125dj | — | — | — | — | 125dj |
| | South of 50° N. Lat. | 100n | 50n | 25n | — | — | — | — | 25n |
| 7 | Province of Quebec | 125dj | — | — | 125dj | 125dj | — | — | 250dj |
| | North of 52° N. Lat. | 25n | — | — | 25n | 25n | — | — | 50n |
| 8 | Province of Quebec | 500dj | 250dj | 125dj | — | — | — | — | — |
| | South of 52° N. Lat. | 100n | 50n | 25n | — | — | — | — | — |
| 9 | New Brunswick | 500dj | 250dj | 125dj | — | — | — | — | — |
| | | 100n | 50n | 25n | — | — | — | — | — |
| 10 | Nova Scotia | 500dj | 250dj | 125dj | — | — | — | — | — |
| | | 100n | 50n | 25n | — | — | — | — | — |
| 11 | Prince Edward Island | 500dj | 250dj | 125dj | — | — | — | — | — |
| | | 100n | 50n | 25n | — | — | — | — | — |
| 12 | Newfoundland (Island) | 500dj | 125dj | 125dj | — | — | — | — | — |
| | | 100n | 25n | 25n | — | — | — | — | — |
| 13 | Newfoundland (Labrador) | 250dj | — | — | — | — | — | — | — |
| | | 50n | — | — | — | — | — | — | — |
| 14 | Yukon Territory | 500dj* | 500dj | 500dj | 125dj | — | — | — | — |
| | | 100n | 100n | 100n | 25n | — | — | — | — |
| 15 | District of MacKenzie | 500dj* | 500dj | 500dj | 500dj | 125dj | — | — | 125dj |
| | | 100n | 100n | 100n | 100n | 25n | — | — | 25n |
| 16 | District of Keewatin | 500dj | 125dj | 125dj | 500dj | 250dj | — | — | 250dj |
| | | 100n | 25n | 25n | 100n | 50n | — | — | 50n |
| 17 | District of Franklin | — | — | — | — | 125dj | — | — | 125dj |
| | | — | — | — | — | 25n | — | — | 25n. " |

# Canadian QSL Bureaus

## VE8/NWT Bureau

Al Sturko VE8NS is the chief Park Warden in charge of the Resources Conservation section of Wood Buffalo National Park on the Alberta-N.W.T. border. With an area of 17,300 square miles, Wood Buffalo is the world's largest national park. Its area is actually larger than countries such as Switzerland, Belgium, or the Netherlands. The park is famous for its 13,000 bison and the fact that it is the northern nesting ground of the nearly extinct whooping crane.

Since 1972, Al has been QRV from Fort Smith, N.W.T. Previously he was active as VE6AGO from the Waterton Lakes National Park at the extreme south end of Alberta.

In addition to his bureau responsibilities Al participates in cross country skiing, hunting, fishing, camping, and vanning. He is even active on the Amateur bands where he is frequently heard on 15 metres with the dynamic duo of a Drake TR-3 transceiver to a four element monobander. With all of his present activities it is no wonder his monobanders for 10 and 20 are still on the ground.

You might well ask, "Where does VE8NS find the time to do his QSL bureau work?!"

The N.W.T. QSL Bureau receives most of its QSLs from VE1FQ of Halifax. Cards are also received from CARF National QSL Bureau in Islington and from the ARRL's Outgoing Bureau in Newington, Conn., on a monthly basis. VE8CC and VE8OV provide capable assistance to the NWT Bureau. Al wishes to remind the other VE Amateurs that the Yukon Amateurs now have their VY1 bureau established in Whitehorse. He does, however assure us that any misdirected cards will be relayed to the proper Amateurs in the Y.T. Al feels that his bureau work is his contribution to this great Amateur fraternity of ours.

Our thanks is extended to Al Sturko, VE8NS as he begins his fourth year as QSL Bureau manager for the NorthWest Territories = VE8 Call Area.

Garry Hammond VE3GCO

BUNDLES AND BUNDLES OF CARDS...VE8NS (left) North-West Territories QSL Bureau Manager and VE8CC work at handling about 1,000 cards per month from Al Sturko's Fort Smith QTH.

# Combatting TVI

By George Spencer VE4IM

In general, this article is a review of well-known principles and techniques in dealing with television interference. The most common problem is HF interference to VHF TV channels, and we will examine this case.

There are three main causes of TVI, and they are:

1. Harmonic Interference – Harmonics are internal multiples of the transmitter fundamental frequency that fall into certain television channels.

2. Fundamental Overload – The front end of the television receiver lacks adequate selectivity to discriminate against a strong transmitter fundamental frequency.

3. Rectification – The transmitter fundamental frequency induces RF currents in nearby metallic objects having dissimilar junctions. These function as a rectifier which chops the fundamental waveform to produce harmonics which are radiated to the TV receiver.

It is most important to realize that the problem must be cured at the source. That is, if the transmitter is radiating strong harmonics, there is nothing that can be done at the TV receiver to cure the problem. Conversely, if the TV receiver is deficient in selectivity, there is nothing that can be done at the transmitter to cure the problem. In the case of rectification, the source of that form of radiation must also be located and cured.

The preceding statements assume that there is a reasonable level of TV signal available at the antenna terminals of the TV set. The signal to interference signal ratio is a very important factor, and weak harmonics from the transmitter can be tolerated if the TV signal is of adequate strength.

Let's now explore the techniques to first identify which type of interference is present and then the remedy to be applied. The steps must be taken in the numerical order given:

## 1. Harmonic Interference

**You must be clean in your own home.** Some of us have seen the type of radio Amateur who has TVI complaints from neighbours and claims it is due to defects in their TV sets, yet his own family is unable to watch television when he is on the air. It may well be that his own TV set requires a high pass filter, but whatever is required must be done at home first. An Amateur who is not clean at home lacks credibility with the DOC and his neighbours, so **get clean first**. Here's how:

a) Obtain a TV set (preferably colour) and place it in the same room with the transmitter. Connect with rabbit ears or an external antenna adequate to provide a reasonable yet weaker TV signal than you would expect your neighbours to have available to them.

b) Check the available channel numbers with the table below to ascertain which Amateur bands are most likely to produce strong harmonics in locally available TV channels. The strength of harmonics will normally decrease as the order of the harmonic increases; i.e., the second harmonic can be expected to be stronger than the third, and the third

stronger than the fourth, etc. The 160, 80 and 40 metre bands have more harmonics that fall in TV channels, but they are of higher order and consequently weaker.

For the purposes of checking for harmonic interference, we therefore need consider only the 20, 15 and 10 metre HF bands. Harmonics of higher order than 10 will not be considered.

| | **Low Band Channels** 54 - 88 MHz | | | | | **High Band Channels** 174 - 216 MHz | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Channel No. | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 20M Harmonic | 4 | - | 5 | - | 6 | - | - | - | - | - | - | - |
| 15M Harmonic | - | 3 | - | - | 4 | - | - | 9 | 9 | - | - | 10 |
| 10M Harmonic | 2 | - | - | - | 3 | 6 | - | - | 7 | 7 | 7 | - |

c) Those harmonics affecting the low band channels are strongest and most likely to cause problems so should be checked first. We will consider only the VHF channels since, if an HF transmitter is clean on the VHF channels, it is unlikely to present a problem to UHF TV reception. Indeed, if an HF transmitter is clean on the VHF low band channels, it is likely also clean on the high band VHF channels. Note that TV channels 2 to 6 occupy 54 to 88 MHz (low band channels) and channels 7 to 13 occupy 174 to 216 MHz (high band channels).

d) If you have a colour TV set, load the transmitter into an antenna on a frequency of 3.58 MHz. If the colour is adversely affected, it is not a harmonic problem and will be dealt with under 1(k).

e) If you are clean in tests a to c inclusive, you are in a credible position to face the neighbours as far as harmonic interference is concerned. If not, you should proceed to step f.

f) Connect the transmitter with a short piece of coax to a shielded dummy load such as a Heathkit Cantenna. See Fig. 1. In this test, if there is no interference on the harmonically related channels, the shielding of the transmitter is adequate. Proceed to step g.

g) Make up a 'snooper loop' consisting of a length of RG58 or RG59 coax with a single turn loop about one inch in diameter soldered between the centre conductor and shield at one end. Connect the other end across the TV antenna terminals (See Fig. 2.) Run the loop over the transmitter noting where the radiation is strong, such as ventilating slots, meter or dial openings, line cord or power supply leads.

Radiation from ventilating slots and larger openings requires a modification that may be difficult. The transmitter should be removed from the case and shielding added to the chassis. It is sometimes possible to fasten perforated aluminum or copper screen over the parts immediately inside the radiating slot. Sometimes meters can be shielded by tin cans. The cage around the PA stage may

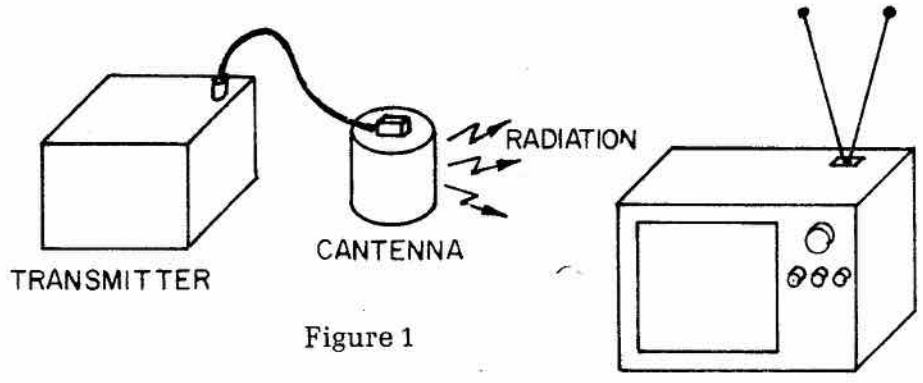



Figure 1

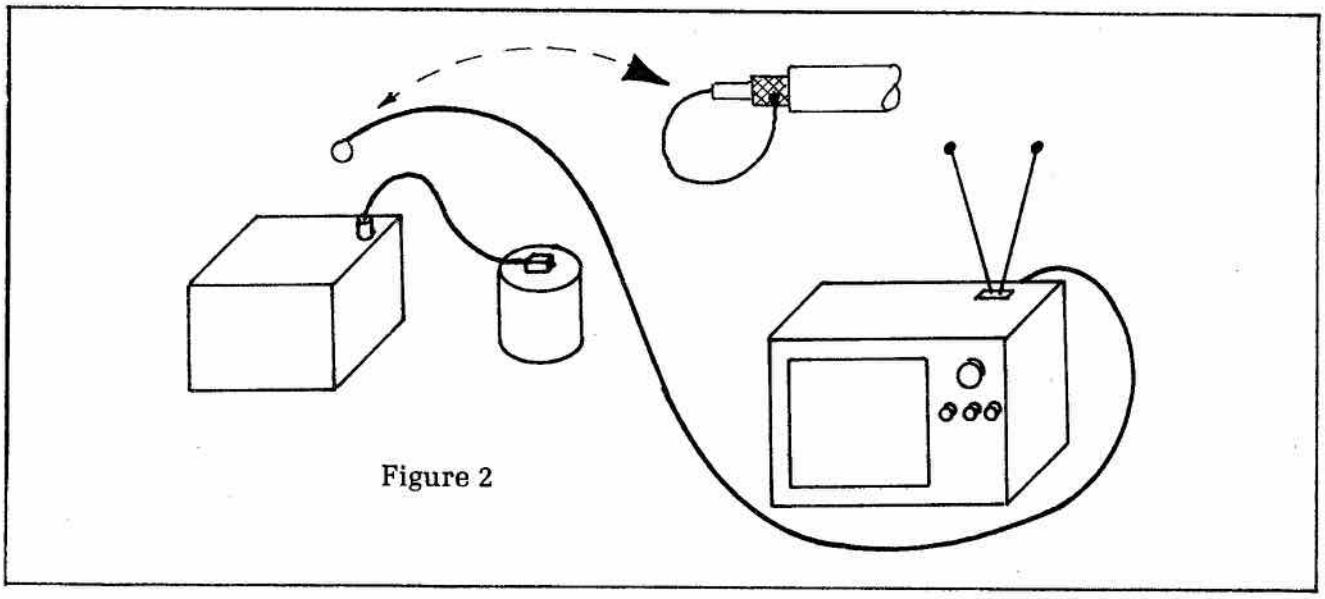


Figure 2

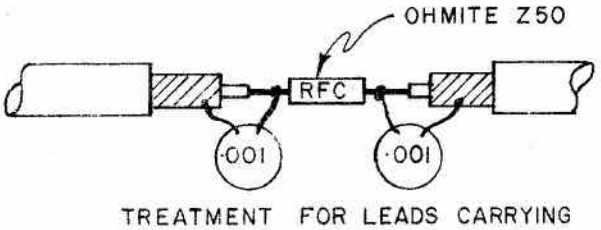
have slots which are too large. It should be replaced by one fabricated from aluminum with 3/16" holes drilled on 5/16" centres.

For some makes of transmitters, the best treatment is to sell the transmitter to someone who lives in a neighbourhood where the TV signal is very strong.

Leads such as power supply and line cord respond to the treatment outlined in the ARRL Handbook, see Fig. 3.

Multiple conductor power supply leads to the transmitter should be shielded by pulling shield braid over the complete assembly and soldering it to the ground pin of the plug and receptacle at the ends.

Sometimes a transmitter will have a particularly strong harmonic on one TV channel due to a resonant circuit at the TV frequency existing in the transmitter circuitry. This can be located with a grid dip oscillator. Re-arranging the wiring or bypassing will shift its resonance to some frequency other than a desired TV channel.




TREATMENT FOR LEADS CARRYING 1 AMP OR LESS

Figure 3

Remember that all transmitters generate harmonics. They can be attenuated by circuit design but not eliminated. The shielding must be adequate to prevent harmonics from radiating directly from the cabinet. A low pass filter will then attenuate those which leave through the centre conductor of the antenna coax.

In this connection, a low pass filter will not be effective and its capacitors may be subjected to overvoltage if the SWR on the feedline is too high. A transmatch is useful in this respect, and one with a high Q resonant circuit will provide some 30 dB of additional harmonic suppression.

When and only when the transmitter is clean while operating into the dummy load, proceed to the next step.

h) Connect the transmitter to the antenna through a low pass filter. If an SWR indicator is in the circuit, connect the low pass filter **after** it and then the antenna or antenna selector switch. Use short leads for the interconnections. When using a linear, it is a good idea to use two low pass filters, one between the exciter and the linear, and one before the antenna or antenna selector switch. If you are now clean when operating into an antenna, proceed to step i.

If you are clean on a dummy load and not clean with the antenna connected, the

low pass filter may not be doing its job, or the harmonics inside the transmitter may be too strong, even though the shielding appears to be adequate. Alternatively, the TV set may be subject to fundamental overload. To check the TV set for fundamental overload, proceed to step 2.

If the low pass filter is not doing its job, it could be because harmonic currents are flowing on the outside shield of the coax and over the outside of the low pass filter. It is claimed by some Amateurs that a balun at the antenna will prevent such currents from flowing, but there is no real evidence that this is so. There is no substitute for good harmonic suppression inside the transmitter and very good shielding. In this connection, it is noted that the shielding of the transmitters was much better in the days of Class C amplifiers which generated stronger harmonics. The development of SSB with its lower level of harmonic output has caused manufacturers and some home-brew Amateurs to become less concerned with good shielding. Certainly, when buying a transmitter, the level of harmonic suppression should receive maximum attention, especially by Amateurs in fringe TV areas.

i) Grounding of a transmitter or the outer shield of a cable TV coax may or may not help in eliminating TVI. The problem is that a length of ground wire to the point where the water pipe or ground rod enters the ground is a good fraction of a wavelength at Amateur HF frequencies. For example, if the ground wire is about 8 feet long from the transmitter to the ground entry, it is ¼ wavelength on 10 metres and the transmitter would be effectively insulated from ground for RF. That is why it is possible to have a hot microphone on some bands even though the transmitter is grounded. On the other hand, 16 feet is ½ wavelength on 10 metres and for that band would represent a good ground but would be an insulator on 20 metres. Grounding is sometimes worth a try, but don't be surprised if it makes no difference.

j) Once you clean your own TV set, you are in a better position to handle public relations with the neighbours. A neighbour may be very obviously upset and untactful in his first approach to you. You must assume a very cooperative attitude and invite him to view your TV set while you are on the air. Get him to phone home and verify that you are in fact affecting his TV while your own is unaffected.

When and only when you are clean on your own TV set, you can ask your neighbour if he has complained to the manufacturers of his set. He will likely say, "There's nothing wrong with my TV set, it works fine when you're not on the air." Then you say, "Look, this problem is like having a hole in your roof. You don't notice it when it isn't raining." Assure him that most manufacturers will help solve the problem and, if they won't, you will do what you can to help.

k) Sometimes a colour TV set has its colour wiped off by a transmitter operated on 80 metres; and yet the set is clean when the transmitter is operated on other bands. This is due to poor shielding of the colour circuits in the TV set. There is an oscillator operating at 3.58 MHz and a wide band colour amplifier designed to operate in the frequency range of about 3 to 4 MHz; so, there isn't any 80 metre frequency that will miss it. The gain control of the colour amplifier is the colour intensity control and a phase shift control on the incoming colour burst signal is the colour "hue" control. If the shielding of the circuit boards or shielding of the wiring to these controls is poor, the set will be sensitive to this type of interference. Sometimes your 80 metre signal is coming in on the TV antenna lead and can be stopped with a high pass filter. Mostly this is a manufacturer's problem and the time to get at it is when the set is new and under warranty. Have the owner get in touch with the service manager at the manufacturer's central distribution centre. Tell him to get the man's name, and if he is uncooperative a visit from the TVI committee is in order. Sometimes the problem is new to a service manager and he will not know how to handle it. Most of the manufacturers now have instructions available for such cases. If there is no response from the service manager, go over his head to the company's home office but tell him what you are going to do first. You can also suggest that the owner return the set and buy another make.

## 2. Fundamental Overload

The best initial approach is to take a portable TV set to the complainant's house. If that TV set is clean at your place it should also be clean sitting next to his. Have another Amateur operate your station and prove it out. A couple of hand-held 2 metre rigs is useful in this exercise.

It is a good idea to have on hand a good quality high pass filter. You can then demonstrate to a cooperative neighbour that hanging such a device at the antenna terminals of the TV set will partially or completely solve the problem. If it doesn't completely solve it, very likely the filter needs to be soldered to the input terminals of the TV tuner. Suggest that he get the manufacturer to do this for him or have a TV serviceman do it. Don't get involved with modifying anybody's equipment and don't leave your high pass filter hanging on the back of someone else's TV set.

## 3. Rectification

If your portable TV set is clean at home and suffers from interference at your neighbour's house, suspect rectification. This problem occurs very seldom, but when it does it is difficult to locate. Once again, a snooper loop is useful on a long piece of coax. The transmitter has to be operated. Turn down the carrier level to the point where the interference almost disappears; use the portable set's rabbit ears to find the direction of strongest radiation, and then zero in with the snooper loop. Look for corroded metallic points, especially at the junctions of dissimilar metals. Copper to aluminum connections at the TV antenna should be checked. If the set works well on a different antenna, this may be the reason. Curtain rods, eavestroughing, downspouts, BX wiring, copper plumbing and galvanized ductwork are all under suspicion. Once located, the point of contact should be bonded together solidly or insulating tape used to isolate the two metallic points.

Good luck; and if you have trouble, get in touch with your TVI committee, but don't get your public relations to the point of no return before doing so!

By George Spencer VE4IM
Winnipeg, Manitoba

in 'The Manitoba Amateur'

# *Fibre Optics*

Mirrors and heliographs were the first use of light for communication – however, the vagaries of transmission through the atmosphere limited this application to short distances and specific situations. Transmission of light through hollow pipes, or waveguides, has also been successfully achieved, but is impractical because of stringent rigidity, uniformity and freedom from vibration requirements.

Serious research on transmission through glass started back in the 1950s but, due to the high attenuation exhibited by the types of glass available, and problems with very inefficient devices for inserting and retrieving light signals at either end, applications were few and very specialized. Fortunately, researchers remained undaunted and recent years have witnessed an increasing rate of success at overcoming obstacles and developing effective solutions.

Glass fibres used for communications are hair-thin, solid, flexible filaments which can carry light beams from

end to end, around bends and corners, without interruption. Ordinary glass absorbs light to a relatively high degree, limiting its use to a matter of feet.

The first major breakthrough in the development of highly transparent glass occurred in the early 1970s. The entire process of eliminating impurities and drawing the glass must yield a fibre which is not only uniform, unbroken and very transparent, but with a refraction index which is different at the centre than it is at the periphery so that the bulk of the light transmitted will travel along the centre core of the fibre while the outer regions, or cladding, being of a lower refraction index, will nudge any would-be strays back into the core.

While the production of low-loss, high-quality fibre can be considered a crucial milestone, problems remain: protecting the fibre from the elements and the rigors of real operating conditions. Though made of glass, these fibres are highly susceptible to moisture and, though strong in tension, they resist torsion poorly. Techniques for combatting these problems continue to evolve.

The simplest optical fibre communications system consists of a source of electrical signals – telephony, TV, data, etc. – which must be adapted to the transmission medium. In the case of fibre optics, these electrical signals are converted into corresponding beams of light by low-power lasers or LEDs. Having travelled down the fibre, the light is received by a photosensitive detector which converts its impulses back into electrical signals, which are then processed and delivered in the usual way.

If the transmission distance is very long, the light beams have to be intercepted at intervals along the path and reinforced through the use of repeaters, which is standard practice in the telephone and cable-TV industry. The lower attenuation of optical fibres usually means that far fewer repeaters are required compared to the cable system.

**"THE POTENTIAL TRANSMISSION CAPACITY EQUALS AND POSSIBLY SURPASSES THAT OF COAXIAL CABLE SYSTEMS..."**

The potential cost savings of this technique has sparked interest in nearly every developed country in the last two years. Optical fibre links appear to be a very cost-effective alternative to microwave, coaxial cable and paired cable in many applications.

Advantages include:

a) Cost: It is estimated that, as demand and production rates increase, fibre optics will undercut coaxial cable systems of equal capacity, and may become as low in cost as copper pairs used for telephony. Also, the basic material is silica, an essentially unlimited and widespread resource.

b) Transmission capacity: The potential transmission capacity equals and possibly surpasses that of coaxial cable systems; new devices and techniques are being developed which will translate this potential into actual practice. Also, due to their small size, capacity can be increased simply by adding more fibres.

c) Size and Weight: Because of their relatively small size, fibres can be used where space is at a premium. Already, some telephone companies are installing them in overcrowded ducts, avoiding the cost of installing additional cable ducts under city streets. It also has potential use in aircraft.

d) Security: By their nature, fibres are fairly immune to both jamming and eavesdropping.

e) Immunity to Interference: Due to its non-electrical character, fibre optic systems are relatively immune to interference from lightning, power lines and other communications systems. Some systems are already being used by the military and hydro companies for control purposes.

f) Safety: For the same reason, they do not exhibit shock hazard and are highly suitable for use in explosive atmospheres.

The DOC's Communications Research Centre is now working on the practical problems that must be tackled before optical systems are realized. Work is being directed toward assessing the technology and relating it to the potential requirements of communications systems □

# Versatile Continuity Tester

By Glenn McMichael VE3CGU

Care to invest ten bucks in a useful piece of test gear that will save you much time and effort? What about if it doubles as a code practice oscillator, level detector and capacitor checker? The following circuit is simplicity itself, but its value is great.

The basic purpose of this device is to find breaks in the copper foils on circuit boards and for checking continuity of audio cables. If you have ever tried to hold two probes on a cable and wiggle the connections while keeping an eye on the ohmmeter needle, you will appreciate having an audible indication of continuity.

Connect the ubiquitous NE555 'clock' or timer IC and a handful of standard parts as shown in Fig. 1. Previously published articles recommend a high impedance step-down audio transformer from pin 3 in series with a small resistor to ground. The price of a transformer approaches that of all the other electronic components; it is not required. On advice from VE3EAR, the capacitor coupled regular 8 ohm speaker was found to give excellent performance with room-filling volume.

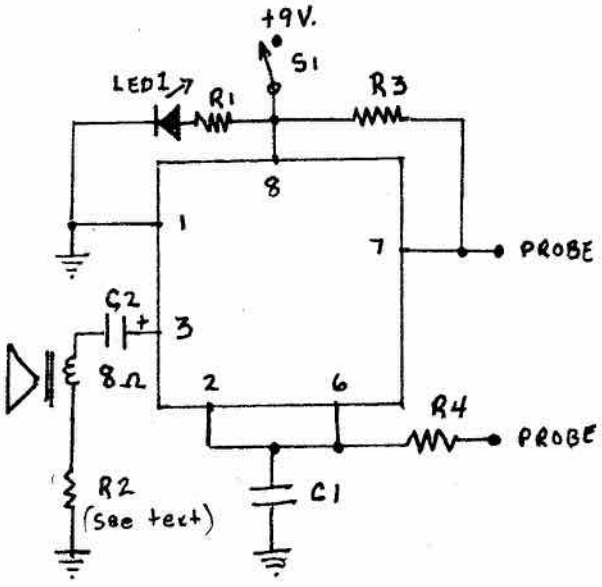
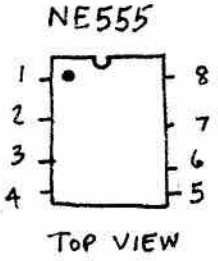



Figure 1




Looking at the circuit in Fig. 1, we see the 8 pin DIP connected to a 9-volt transistor battery. Since the typical current requirements are 8 mA idle and 12 mA keyed, it is safe to leave the device on for an hour or so without fear of killing your battery, but if you forget and leave it on for three weeks, you will be looking for a new battery. This is the reason for the red LED and dropping resistor from pin 8 to ground. If you can always remember to turn the switch off between test sessions, you may omit LED1 and R1 which will lower the current drain a bit.

Finding the correct value for C2 requires some experimentation. Depending on the size and efficiency of your speaker, C2 can vary from .22 to 10.0 µfd. If you cannot attenuate the volume because you lack the correct value for C2, do as I did and insert series resistor R2 until it sounds right. Don't forget that installing the tester in its cabinet will lower the volume a certain amount.

As with most of my favorite circuits, layout and parts values are not critical. If you haven't got a 22k resistor, don't be afraid to stick in a 27k or two 10k in series or something similar. I used perfboard and point to point wiring and put the IC in a socket.

Now that you (hopefully) have your circuit working, we come to the matter of an enclosure. If you intend it solely for use on a bench or table, you can put it in any sized box you have handy, but if you find

yourself carrying it around you may want to use my choice of a Hammond #1590B minibox 4.3"x2.3"x1.2". This handsome new style aluminum box has no sharp corners and features a flush fitting lid with countersunk fasteners.

With components placed as per Fig. 2, you can tuck the tester in your shirt pocket and use it anywhere. Having LED1 mounted on top makes it easy to tell if the device is on or off.

Despite its simplicity, this tester can indicate several things. First is its use in 'buzzing out' wires and foils in all types of electronic gear. (As with an ohmmeter, this is not for use on live circuits. Always disconnect power or damage may result.)

Secondly, it gives you a rough indication of resistance. At zero ohms, the speaker produces a high pitched tone. As the resistance increases, the tone lowers in frequency to a growl. At very high resistance levels, it clicks rapidly. A few practice sessions will accustom you to the sound of typical resistance levels.

The third use is as a code practice oscillator for would-be Amateurs, or those who wish to limber up their wrists after too long on phone. If the tone from shorting the probe leads is too high-pitched, tack a small resistor in series with the key. A potentiometer will give continuous tuning if desired.

Fourth on the list of applications is a capacitor checker. While it in no way compares with a regular commercial checker, it is at least equal to an ohmmeter check for leakage. When the probes are connected across a small capacitor, the speaker should emit a high tone which after a few seconds falls back to a low frequency tone until it clicks rapidly to signify that the capacitor under test has been charged. If there is no leakage at all, the tester should become silent. If the capacitor does have leakage, the tone will remain on indefinitely. This is your clue to haul out the expensive type checker and diagnose the fault.

Fifth and last, it can be used for monitoring levels of water-based liquids. With probes several inches apart, any water path between them keys the speaker tone. Use it as a rain detector or a basement flooding alarm to save your junkbox during the next flood. This would require a small a.c. supply for full time use.

An interesting feature of this tester is that it has very low potential voltage across the probes. It is not enough to bias a diode or transistor junction like some VOM's will. This helps to isolate stages in circuit board troubleshooting work.

There may be other applications for this tester that I haven't mentioned, but those above should convince you of its versatility. Numerous Amateurs in my area have built one and find them quite useful. For white-caners, this appears to be a natural for use around the shack in finding individual wires in cables and for pouring boiling water into cups, etc. Two bent wires for probes can be hung on edge of cup to indicate when proper level is reached. I'm sure that if you take two hours to build a tester you will be pleased with the result.

**PARTS LIST**

IC1 – NE555
LED1 – red or green light emitting diode
R1 – 1K ¼W
R2 – optional, see text; try 220 ohms
R3 – 22K ¼W
R4 – 10K ¼W
S1 – SPST slide switch
C1 – .1 µf disc ceramic
C2 – electrolytic, try 4.7 and reduce to 1 µf. If too loud, substitute .22 µf disc ceramic.
SPKR – 8 ohm 2" or smaller
Batt – 9 volt rectangular type
Misc – Case, probe leads, 9v battery connector, 4x40 hardware.

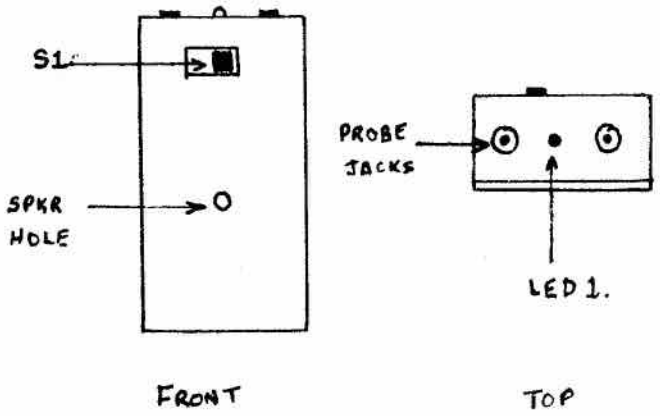



Figure 2

# How to use the CARF QSL Service

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4. Address your package as shown in the diagram at right.
5. **Do not register the cards.** This only delays them, costs more and is not really necessary.
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7. If a package should be damaged on arrival (very rare), CARF will send you a list of cards received so that you can check if any were lost.

(For an explanation of QSL Bureaus in general see the CARF Regulations Handbook chapter on QSLing.)

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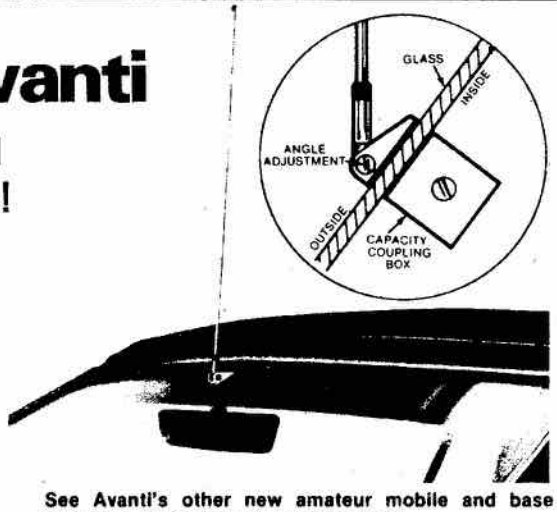


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Work shops will include:

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6. Use of Amateur Bands in disaster cases.

Pre-registration forms will be sent to most Ontario clubs and CARF Directors. Input from individuals, clubs and special interest groups is requested. Hotel reservations may be made through your local Holiday Inn.

For more information, please contact: Symposium, CARF, P.O. Box 356, Kingston, Ont. K7L 4W2 or Symposium Committee, Hamilton ARC, P.O. Box 253, Hamilton, Ont. L8N 3C8.

Fred Robinson VE3GCP
Hamilton ARC
Symposium Chairman

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

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** Station XU1AA has been authorized to exchange communications with Amateurs of other countries.
Note: The calls 7OA to 7OZ are assigned to the Peoples Republic of Yemen.

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Note: As a general rule, DOC will consider licensed Amateurs of Commonwealth countries for reciprocal privileges in Canada if the other country does the same.

# Important Notice

## to Students & Instructors

DOC has informed CARF that the June 18 exam questions on regulations, like those on the April exams, will be based on the regulations in effect **before** the amendments made on February 28 (see page 26). The October 15 exams will be the first ones with questions based on the amended regulations.

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On Sundays (Zulu Time); SSB on 14.140 MHz at 1745Z; CW on 14.078 MHz at 1900Z; Teletype 5-level, followed by 8-level, after CARFNET on 14.078 MHz at 2030Z and SSB on 3755 kHz at 2200Z. On Tuesdays (Zulu Time); CW on 3630 kHz at 0000Z and teletype 5-level followed by 8-level on 3630 kHz at 0030Z.

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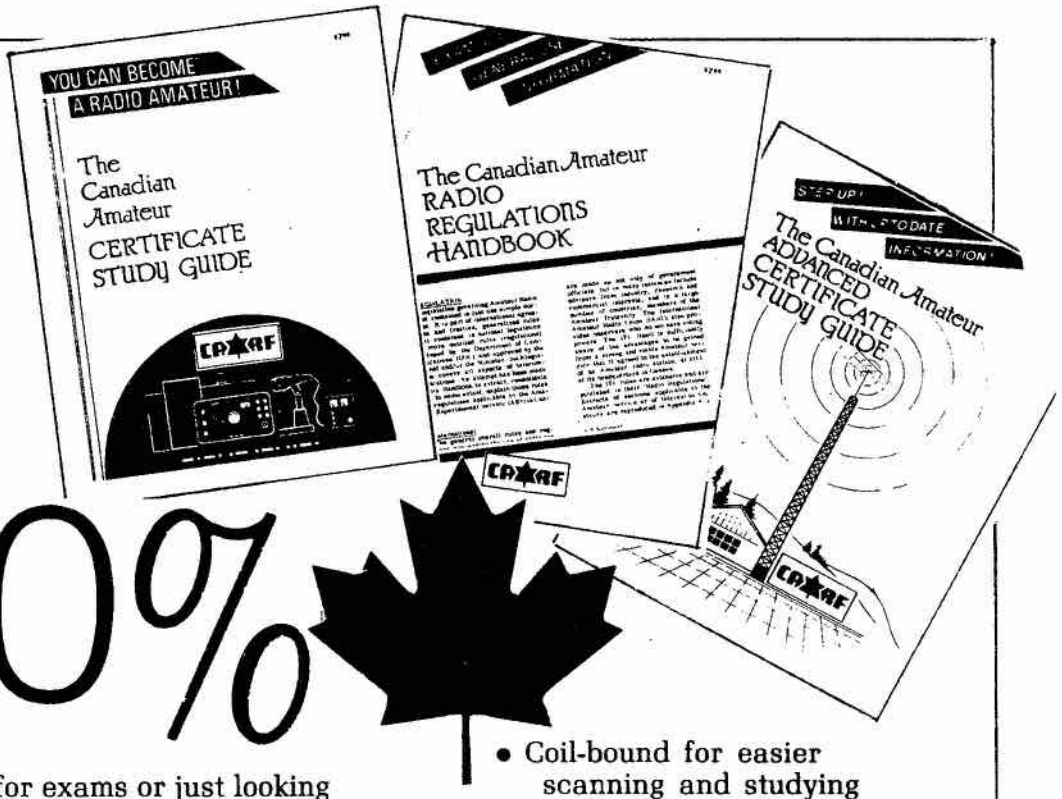


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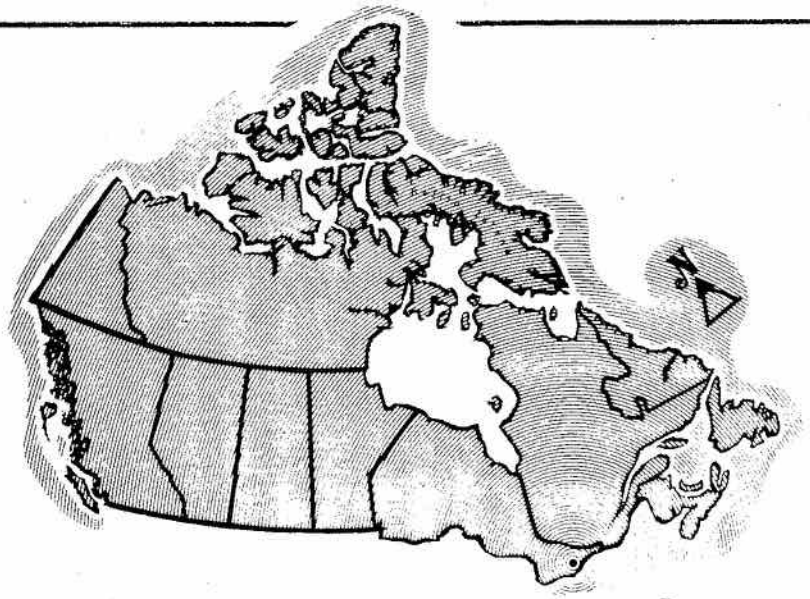

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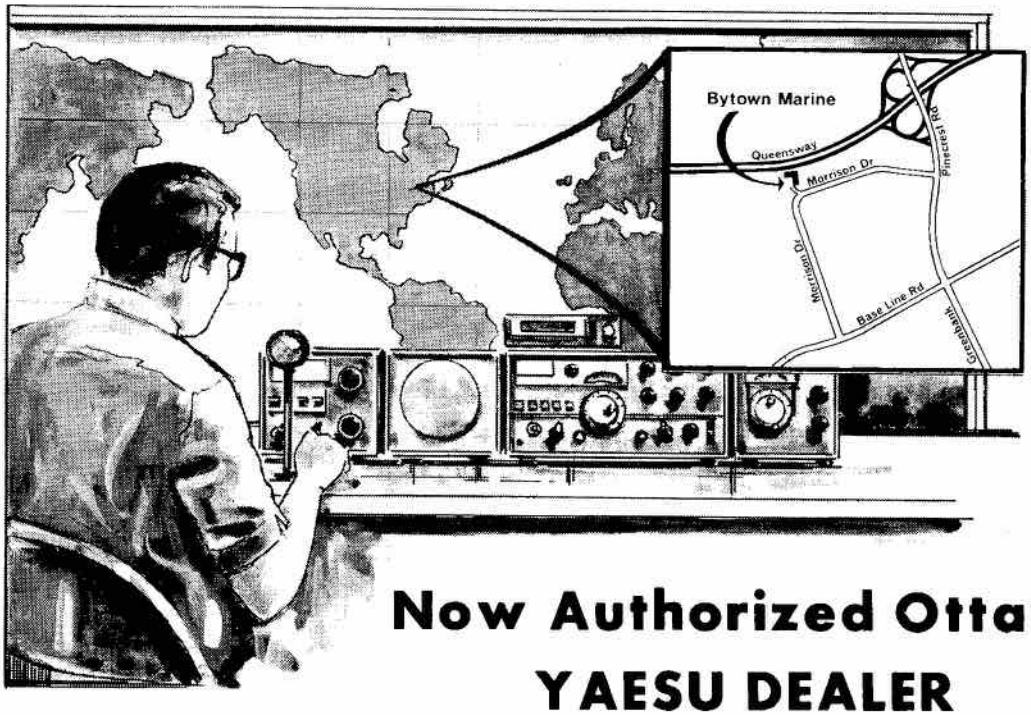


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