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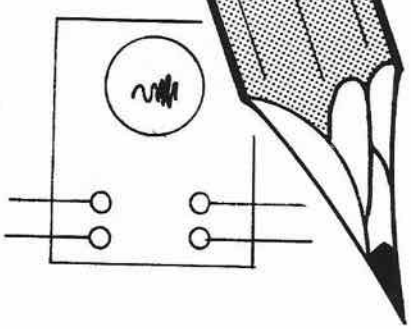
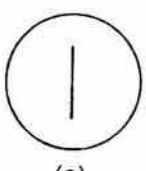
THE CANADIAN AMATEUR

Amateur Exams

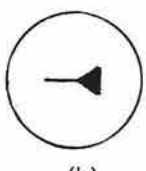
Can you pass them?

12. An osc[illator] [is c]onnected to a transmitter as shown below. Under w[hich] [con]ditions would the trace be as shown in diagram (a)? diag[ram (b)?]





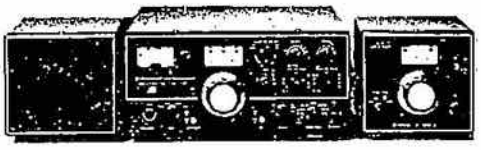
(a)



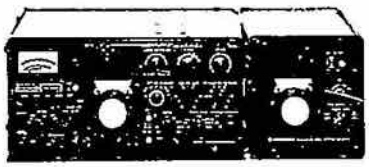
(b)

KENWOOD COMMUNICATIONS EQUIPMENT

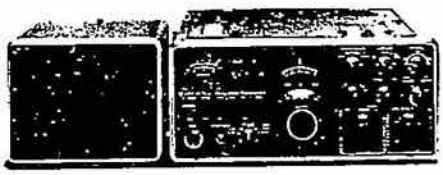
TS-520



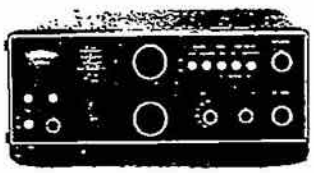
TS-820



TS-700A



R-300



Desk Top Microphone
MC-50

VOX-3
(TS-600)
Voice Control Unit

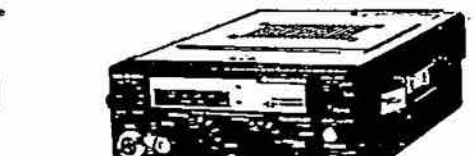
DS-1A
DC-DC Converter

TV-502

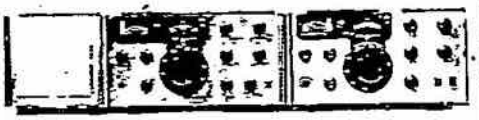
TV-506

Headphone
HS-4

TS-600

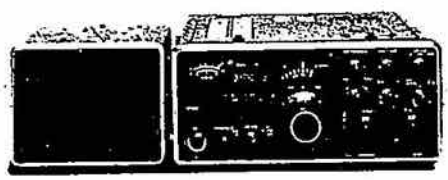


599D SERIES



TR-2200A

TR-7400A



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c/c J.H. Williams VE3XY
Wayne Deactis VE3JFV

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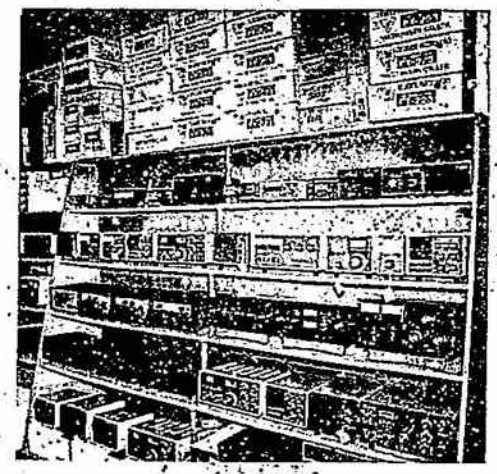

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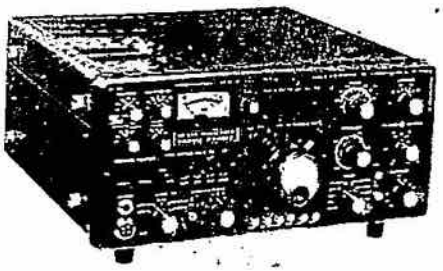

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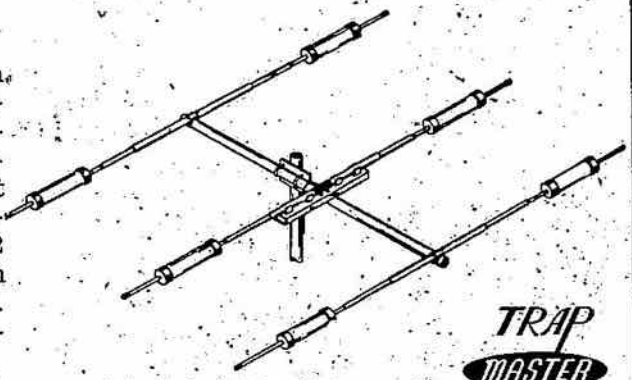
The Classic 33 10, 15, and 20 meters

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

Forward Gain: Full 8 db compared to reference dipole or 10. 1 db over isotropic source.

Front-to-Back: 20 db or better on 15 & 20; 15 db on 10 metres.

Standing Wave Ratio: 1.5/1 or better.



MAXIMUM ELEMENT LENGTH: 27 ft.
ASSEMBLED WEIGHT: 42 lbs.
SHIPPING WEIGHT: 47 lbs.
WIND LOAD (80 MPH EIA Std) 120 lbs.
WIND SURFACE: 6 sq. ft.
MATCH: Broad band capacitive.
Pat. Pend.

BOOM LENGTH: 18 ft.
TURNING RADIUS: 16 ft.

(Note: Beam is not designed for 40 metre or other type of conversion.)

TA 33 Jr.	239.00
TA 33	329.00
CL-33	369.00
CL-36	459.00
MPK-3 pwr kit for TA-33Jr.	85.00
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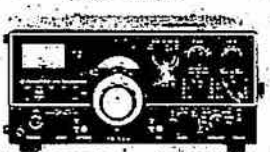
TS-520S



KENWOOD Transceiver TS-520S
160 thru 10M

KENWOOD RADIO

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TR-7500	399.00
TR-7400	579.00

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Big Talk	125.00
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Ham III	199.00
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RG8U foam	.32/ft
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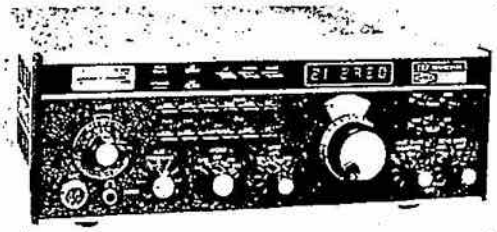
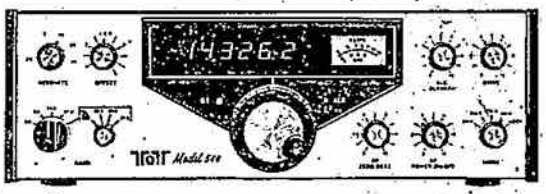
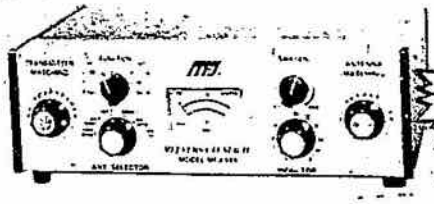
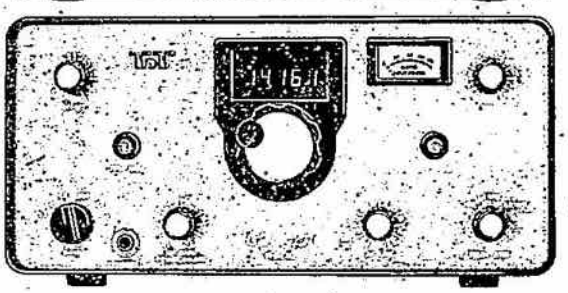






BRAND NEW



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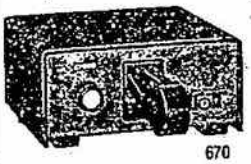

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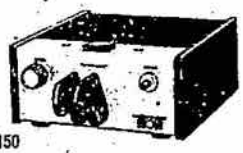
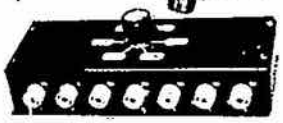


KR50

Swan 100MX



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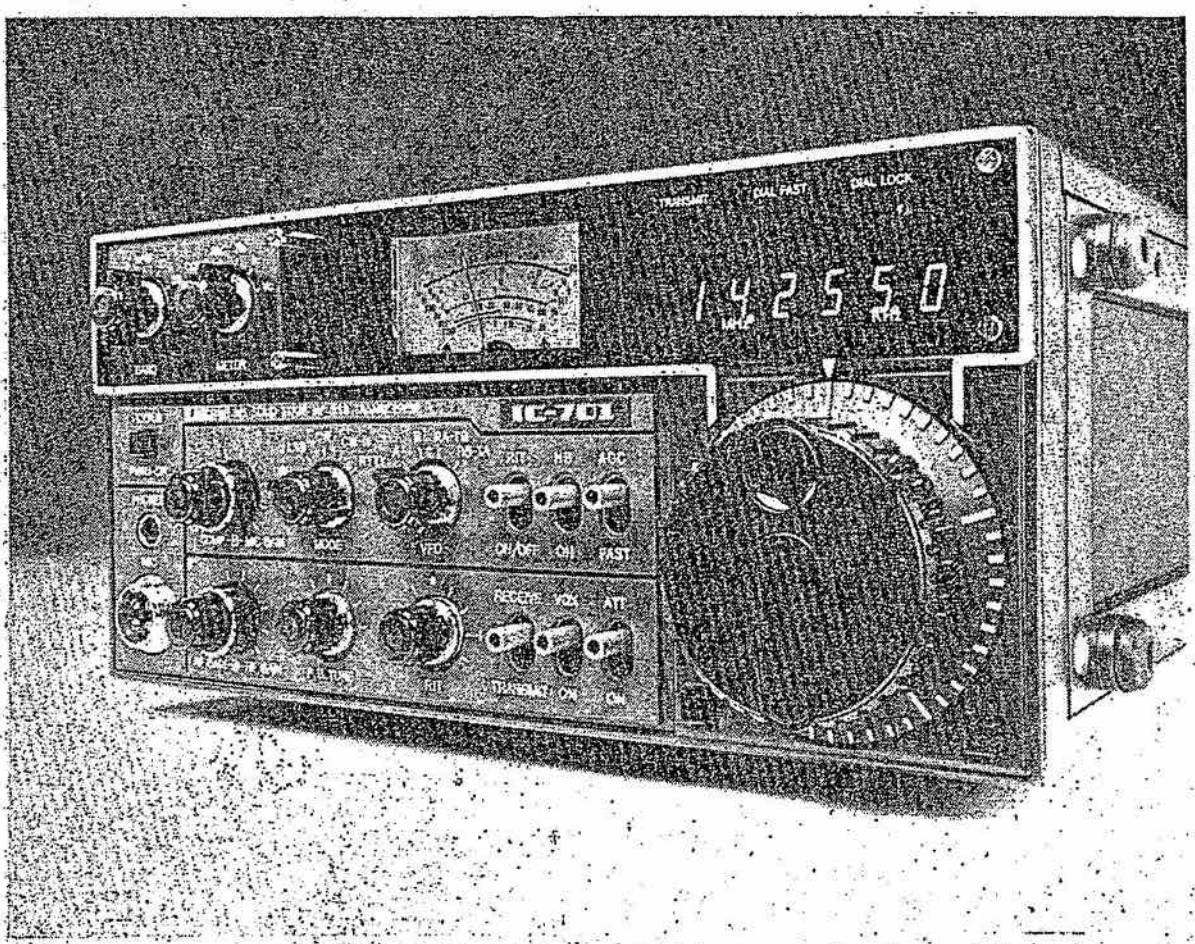

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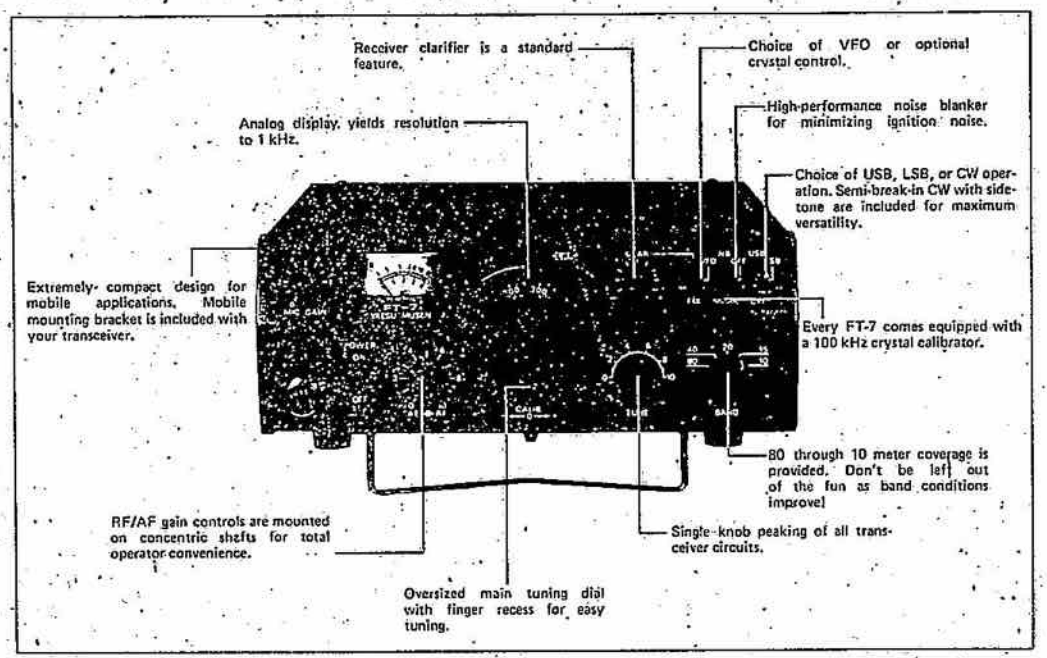

For the ultimate in operating ease while HF mobile, go with the exciting new FT-7 from YAESU. Extremely small size, light weight, and uncompromising performance are the hallmarks of the FT-7. With mobile activity on the upswing, don't be left behind! Join the fun with the perky FT-7, the latest from the back room at YAESU.

YAESU

HF Mobile FT-7

Broadband Design
A single knob peaks all transceiver circuits for the frequency in use. No more fumbling for plate and load controls while in traffic!

Ready When You Are
The FT-7 comes ready for mobile operation on 80 through 10 meters, SSB and CW. Just hook up an antenna and 13.5 volt DC power source, and you're on the air.

High Performance Noise Blanker
A state-of-the-art noise blanker, effectively minimizes impulse noise that can ruin reception while mobile.

Superb Receiver Performance
The receiver front end features MOS FET and Schottky diode circuitry for maximum sensitivity and immunity from overload.

Compact Solid-State Design
Fully solid state, the FT-7 draws less current on receive than your auto dash lights. What's more, the FT-7 is not much larger than many 2 meter rigs.

Versatility Features
Built-in convenience features include a 100 kHz crystal calibrator, semi-break-in CW with sidetone, and receiver offset tuning (clarifier). You have the choice, too, of the velvety-smooth VFO or an optional fixed channel for frequency control.

Engineered for Mobile
The rugged, no-nonsense front panel and case are built to withstand the rigors of mobile operation.

Operate from Car or Home
You can use your FT-7 as a compact base station, too, with the FP-4 AC power supply. And for high-power operation from base or mobile, the FL-110 solid state amplifier may be used to secure 100 watts of output power.

SPECIFICATIONS

GENERAL	
Frequency Coverage:	80 m 3.5 - 4.0 MHz, 40 m 7.0 - 7.5 MHz, 20 m 14.0 - 14.5 MHz, 15 m 21.0 - 21.5 MHz, 10 m 28.5 - 29.0 MHz installed, any 500 kHz segment between 28.0 and 29.7 MHz available as option.
Power Requirements:	13.5 VDC ±10%, (100/110/117/200 220/234 VAC 50/60 Hz with FP-4 AC power supply).
Power Consumption:	13.5 VDC — 3 A transmit, 0.4 A receive.
Dimensions:	230(W) x 80(H) x 290(D) mm.
Weight:	Approx. 5 kg.
TRANSMITTER	
Emission:	LSB, USB, CW
Input Power:	20 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
Transmitter Frequency Response:	350 - 2700 Hz –6 dB
Frequency Stability:	Less than 300 Hz drift from a cold start; less than 100 Hz over a 30 minute period after warmup.
Antenna Output Impedance:	50 ohms nominal
Microphone Input Impedance:	600 ohms nominal
RECEIVER	
Sensitivity:	0.3 µV for S/N 10 dB or better
Image Rejection:	Better than 50 dB
IF Rejection:	Better than 60 dB
Selectivity:	–6 dB: 2.4 kHz, –60 dB: 4.0 kHz
Audio Output:	3 Watts @ 10% THD
Audio Output Impedance:	4 ohms

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New Ham IV Rotor, 15.0 sq. ft. wind load
Steel Ring Gear, Stainless Steel Drive Gears,
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Comm/Plus Proudly Introduces the New Canadian Frequency Counter by Digi-Comm. 115V/8 digit/ 0-600 meg/crystal time base/25 MV sens/Stab 1 part in 10^7 /acc. to plus or minus 1 count 259.00

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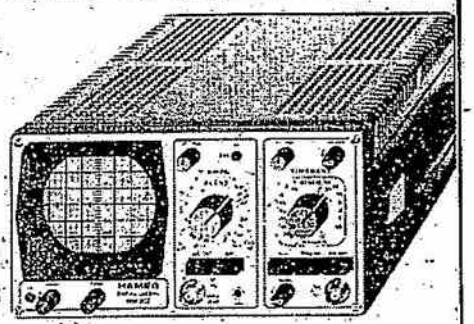

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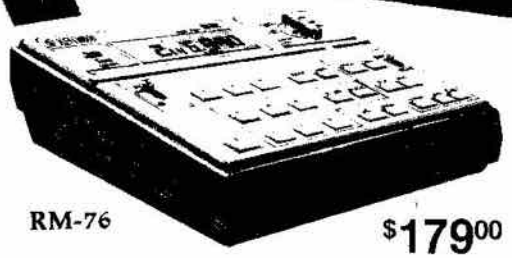
ATB-34	— Tribander 7.5 DB	$319.95
ATV-3	— 10/15/20 Vertical	$ 69.95
ATV-4	— 10-40 Vertical	$119.95
ATV-5	— 10-80 Vertical	$149.95
A144-10T	— Oscar Twist 2 mtr	$ 54.95
A432-20T	— Oscar Twist 432 MHZ	$ 69.95

Kenwood's TR-7600 with optional RM-76

TR-7600

$599.00



RM-76

$179.00

TR-7600 WITH RM-76

- Store frequencies in six memories.
- Scan all memory channels.
- Automatically scan up the band in 5 kHz steps.
- Manually scan up or down in 5-kHz steps.
- Set lower and upper scan frequency limits.
- Reset scan to 144 MHz.
- Stop scan (with HOLD button).
- Cancel scan (for transmitting).
- Scan for busy or open channel.
- Select repeater mode (simplex plus transmit frequency offset, minus offset, or one memory transmit frequency).
- Select transmit offset (±600 kHz / ±1 MHz).
- Operate on MARS (143.95 MHz simplex only).
- Display indicates frequency (even while scanning) and functions (such as auto-scan, lower scan frequency limit, upper scan limit, error, and call channel).

TR-7600 (only)

- Memory channel...with simplex or repeater (plus or minus 600 kHz transmitter offset) operation.
- Mode switch for operating simplex or for switching the transmit frequency up or down...or for switching the transmitter to the frequency you have stored in the TR-7600's memory (while the receiver remains on the frequency you have selected with the dual knobs).
- Select any 2-meter frequency.
- Even without the optional RM-76, the TR-7600 gives you full 4-MHz coverage (144.000-147.995 MHz) on 2 meters; 800 channels; dual concentric knobs for fast frequency change (100 kHz and 10-kHz steps); 5-kHz offset switch, and MHz selector switch...for desired band (144, 145, 146, or 147 MHz).
- Digital frequency display (large, bright, orange LEDS).
- UNLOCK indicator...an LED that indicates transceiver protection when the frequency selector switches are improperly positioned or the PLL has malfunctioned.
- 10 watts RF output (switchable to 1 watt low power).

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This new machine can entertain your whole family with spectacular video games and cartoons, made possible by its ultra high resolution graphics and super fast BASIC. It can help you with your personal finances and budget planning, made possible by its decimal arithmetic ability and cassette data storage capabilities. It can assist you in school or industry as an ultra powerful scientific calculator, made possible by its advanced scientific math functions and built-in "immediate" mode which allows complex problem solving without programming! This computer can actually entertain your children while it educates them in topics ranging from naming the Presidents of the United States to tutoring trigonometry all possible by its fast extended BASIC, graphics and data storage ability.

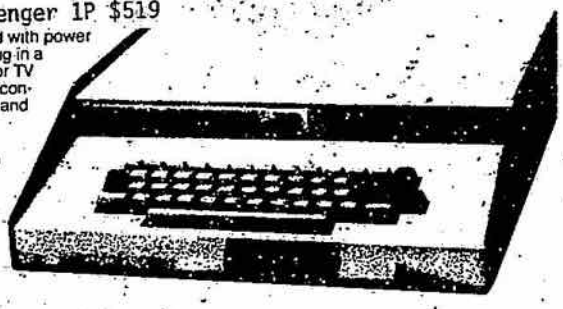
The machine can be economically expanded to assist in your business, remotely control your home, communicate with other computers and perform many other tasks via the broadest line of expansion accessories in the microcomputer industry.

This machine is super easy to use because it communicates naturally in BASIC, an English-like programming language. So you can easily instruct it or program it to do whatever you want, *but you don't have to.* You don't because it comes with a complete software library on cassette including programs for each application stated above. Ohio Scientific also offers you hundreds of inexpensive programs on ready-to-run cassettes. Program it yourself or just enjoy it; the choice is yours.

Ohio Scientific offers you this remarkable new computer three ways.

** Challenger 1P $519

Fully packaged with power supply. Just plug in a video monitor or TV through an RF converter to be up and running.



** Superboard 2 $419

For electronic buffs. Fully assembled and tested. Requires +5V. at 3 Amps and a video monitor or TV with RF converter to be up and running.

Standard Features

- Uses the ultra powerful 6502 microprocessor
- 8K Microsoft BASIC-in-ROM
  Full feature BASIC runs faster than currently available personal computers and all 8080-based business computers.
- 4K static RAM on board expandable to 8K
- Full 53-key keyboard with upper/lower case and user programmability
- Kansas City standard audio cassette interface for high reliability.
- Full machine code monitor and I/O utilities in ROM
- Direct access video display has 1K of dedicated memory (besides 4K user memory), features upper case, lower case, graphics and gaming characters for an effective screen resolution of up to 256 by 256 points. Normal TV's with overscan display about 24 rows of 24 characters; without overscan up to 30 X 30 characters.

Extras

- Available expander board features 24K static RAM (additional), dual mini-floppy interface, port adapter for printer and modem and an OSI 48 line expansion interface.
- Assembler/editor and extended machine code monitor available.

** Challenger 1P Disk $1,779

Complete mini-floppy system expandable to 32K RAM.
(16K RAM Standard config.)

ORDER TO

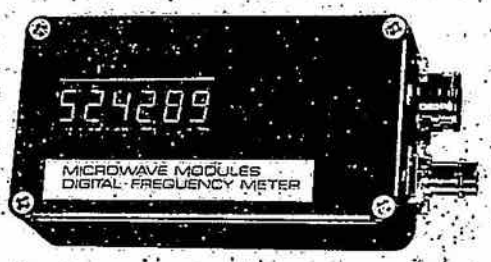
D.C.B. ELECTRONICS

333 Denison St. Unit 3
Markham, Ontario
Canada, L3R 2Z4
416-495-1599

Interested in a bigger system? Ohio Scientific offers 15 other models of microcomputer systems ranging from single board units to 74 mega byte hard disk systems. Call OMEGA Computing Ltd. 416-425-9200 for detail informations.

** These prices include import duty, federal sales tax & 90 days full warranty service by D.C.B.Electronics. Ontario residents add 7% Sales tax. Price subject change without notice.

500 MHz DIGITAL FREQUENCY METER MMD050/500



Specification

Digit Height	:	10 mm
Display Width	:	45 mm
Case Size	:	111 x 60 x 27 mm
Frequency Ranges	:	0.45 - 50 MHz
	:	50 - 500 MHz
Sensitivity	:	Better than 50 mV RMS over 0.45 - 50 MHz.
	:	Better than 200 mV RMS over 50 - 500 MHz
Input Connector	:	50 ohm BNC
Input Impedance	:	50 ohm
Power Connector	:	5 pin 270° locking DIN socket
Power Requirements	:	11 - 15 volts DC at 300 mA approximately

$150.

H. Peters
Electronics Ltd.

Box 6266, Station 'A'
Toronto, Ontario M5W 1P3
(416)-423-9446 after 1700 EST

General Description

Recent advances in MOS technology have made possible the development of this extremely compact frequency meter which for the first time offers the user a convenient cost-effective means of frequency measurement.

A close tolerance quartz crystal in the 5 MHz range together with CMOS binary divider integrated circuits generate the accurate 400 mS gating period for the main counter MOS LSI circuitry.

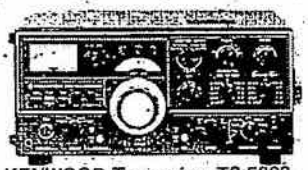
This LSI circuitry drives a multiplexed 6 digit LED display through current amplifiers. This display is fed from an internal store which is constantly updated from the main counter register and thus the display is continuous and flicker-free for a constant frequency reading. The display uses the latest high efficiency red LED's with a digit height of 10mm and overall display width of 45mm.

This counter has two ranges which are selected by supplying +12 volts to one of two pins on the DIN socket. Internal diode switching brings the input in the 0.45 – 50 MHz range to a wide-band amplifier which drives a high speed TTL divider in the main counter logic. On the 50 – 500 MHz range the diodes switch in a high speed ECL prescaler and the decimal point is changed accordingly.

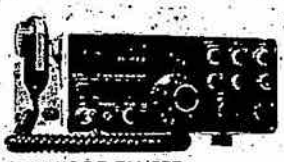
A low angle AT cut quartz crystal is used giving a typical temperature stability of 0.5 ppm per degree C. Provision is made for setting the crystal frequency, and the accuracy of reading is normally better than 200 Hz at 50 MHz., or 2 KHz at 500 MHz.

The counter has reverse polarity protection and operates satisfactorily from a nominal 12 V DC supply. A suitable 5 pin DIN plug is supplied.

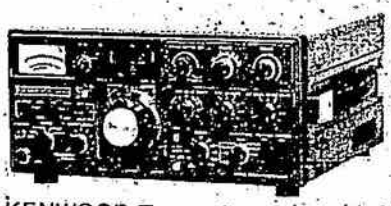
KENWOOD



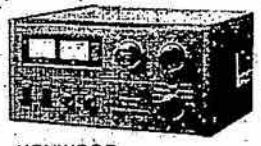
KENWOOD Transceiver TS-520S
160 thru 10M



KENWOOD FM/SSB
TS-700SP

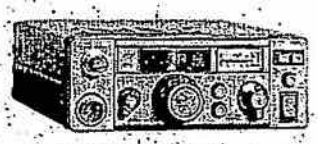


KENWOOD Transceiver
TS-820S 160 thru 10M



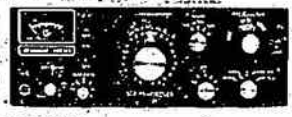
KENWOOD
TL-922

KENWOOD 2M FM
TR-7400A



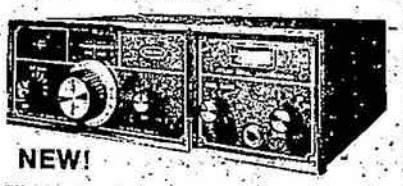
KENWOOD 2M FM
TR-7600

SWAN



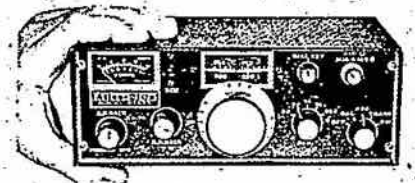
SWAN 100MX
80 thru 10M
1 KC readout
built-in noise
blanker and VOX

ATLAS



NEW!

RX-110 Receiver
TX-110-L Low Power transmit module
TX-100-H High Power transmit module



210X 80-10m solid-state Xcvr

IN STOCK *at* **GLENWOOD TRADING COMPANY LTD.**

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EDITOR
Doug Burrill VE3CDC
151 Fanshaw Ave.
Ottawa, Ont. K1H 6C8
(613)-733-7108

DESIGN & PRODUCTION
Steve Campbell
RR#2 Bloomfield,
Ont. K0K 1G0
(613)-399-2209

ADVERTISING REPRESENTATIVE
Don Slater VE3BID
3 Kirkstall Ave.
Ottawa, Ont. K2G 3M2
(613)-825-1686

TECHNICAL EDITOR
Ed Hartlin VE3FXZ
P.O. Box 356,
Kingston, Ont.
K7L 4W2

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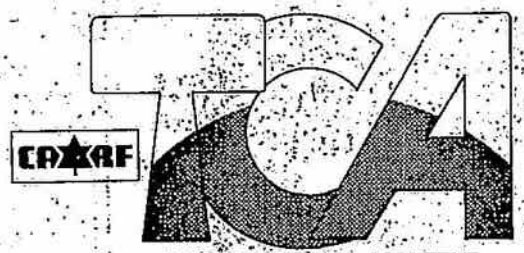

THE CANADIAN AMATEUR

April 1979 Vol. 7 No. 3

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LETTERS:

'Twinning' Classes

Each year classrooms in Canada send applications to their provincial education departments to be 'twinned' with classrooms in other provinces. They write letters, send pictures and sometimes (but I suspect not too often) get to talk to each other by Amateur radio.

This seemed to me to be a good chance to expose kids in their early teens to our hobby (most of them think it's CB) so I wrote to the Ontario Ministry of Education and suggested a more systematic method of pairing off Amateurs and classrooms.

The system I suggested works as follows:

1) The Ministry's coordinator receives an application from, let's say Calgary, asking for a 'twin' classroom in Ontario.

2) He looks at his list of cities in Alberta where there are Amateurs willing to participate.

3) He looks at his similar list of Ontario cities and pairs the Calgary class having nearby Amateurs willing to help.

4) He sends the Ontario class the usual 'your class has been twinned with ....' letter, and includes a sheet giving my address and an offer to identify nearby Amateurs willing to provide radio communication between classes.

The question arises as to where he gets his lists of cities with willing hams. This is where CARF, I, and our Grade 8 class come in. If you will run a notice, and if Canadian Amateurs who are willing to help students communicate (and be exposed to Amateur radio) will volunteer to help, the Grade 8's and I will sort out the hams and make up lists for the Ministry of Education 'twinning' coordinator to use. How about it?

Bob Hulme VE3DNG
Temagami, Ont.

(Original idea, Bob -- here's the notice:)

Any Canadian Amateur who is willing to take his portable rig to school, or have about a half dozen kids visit his shack to talk to students in another province, is requested to send a QSL card or note to Bob Hulme VE3DNG, Box 430, Temagami, Ontario P0H 2H0. On the blank side of the card list the bands you can use and the modes (AM, SSB, RTTY, OSCAR, SSTV), to help match you to the Amateur in the other province. Our Ministry of Education 'school to school' coordinator seems quite interested in helping me match up classes and Amateurs.

Anti-Soviet?

Keep up the good work. I am sure when Canadians get more nationalistic you will be further acknowledged. Some technical articles would be appreciated, but let's not have any more anti-soviet tirades as written by VE1??. Most people have a hobby to temporarily get away from politics.

Harold Beamish VE7AAH

(Figured you had CARF mixed up with the John Birch Society, Harold, until in a stroke of genius we figured you were sniping at Peter Ruderman VE1PZ and his recent story on the Russian buzz saw and its radiation effects or lack of them. Beefing about the Russky buzz saw is anti-Soviet? .... that's stretching it, OM!)

French TCA

Congratulations on the new look -- TCA is indeed very interesting. A friend of mine, F6CIJ, Maurice in Roeze, near Le Mans, France, is also pleased to be an associate member and has asked me to extend his congratulations.

As TCA is serving the needs of all Canadians, would you have spare room for a French article every month?

Claire Bell VE2DDR

(Thanks for idea, Claire. It has been

TCA welcomes Letters to the Editor. For speedy processing, send correspondence directly to Doug Burrill VE3CDC, Editor TCA, 151 Fanshaw Ave., Ottawa, Ont. K1H 6C8.

looked at before but the only practical solution is a French edition of TCA and that, unfortunately, is beyond our present resources. Claire, by the way, was one of the 'anchor men' who kept in contact with Willi de Roos on his epic North west Passage adventure last year, reported in our January 1978 issue.)

You're Welcome!

Although I have been an Amateur only about two years, the time spent in Amateur radio to me has been well spent. I have enjoyed the fellowship of other Hams from around the world and the thrill of accomplishment in the design, construction and use of the various pieces of equipment (other than the rig proper) that this LID has been using.

Becoming a Life Member in CARF is just one of my ways of saying Thank You to Amateur Radio in general and CARF in particular.

Edmond 'CHIP' Schoenherr
VE3JLL
Metcalfe, Ontario

Justifying Amateurs

Here is an interesting letter from south of the border on the subject of WARC '79 from one who is involved officially with the Amateur input to the U.S. government. The writer, Henry Ruh WB9WWM, is executive secretary of the U.S. Federal Communications Commission's Advisory Committee on Amateur Radio for WARC '79. He comments on the story in our February issue, "Must our Hobby be justified?":

"The question of whether our hobby should be justified (Amateur radio) is not an either/or problem. Nor is the answer simply "yes" or "no".

"Our hobby is a luxury of our civilization. Boating, basketball, radio, photography, etc., are all unnecessary which does not mean that we would like to do without them, but they contribute nothing to our basic needs.

"We enjoy a great level of luxury activities which many nations do not have. Indeed, the undeveloped nations see no logic in our Amateur privileges at all, and would just as soon do us out of them so that they could use the frequencies for their purposes which are generally political, military, propaganda, or internal communications.

"The question of whether or not to build or buy is also not an either/or situation. We need both modern reliable equipment which can be depended upon in a crisis, and we need experimentation and 'tinkering' which will increase the individual's knowledge and understanding of the principles and practices involved, so that if 'modern reliable' equipment is not available, we can make do with make-shift whatnots.

"Amateur radio uses a natural resource; however, while there are many sources for oil (at a price) there are no other 'spectrums' of frequency bands. As such, we have to share, and distribute on a priority basis, those frequencies which are available among all users. If gas and oil become acutely short in the future, we will have to allocate gas and oil on a priority basis. This will quickly kill recreational vehicles, motor races, etc. -- unpleasant but true. The world has a need to communicate, and the priorities of the other nations do not include 'squandering' valuable spectrum space for 'personal pleasure hobbies'. For example, you would not have a spark station operating on 20 metres today since it would wipe out most of the band.

"Spectrum conservation techniques of many types are employed so that, while we can all be a little more squashed together, we are still able to communicate. The problem is to retain what few frequencies we have left.

"Therefore, we need to establish some priority to the uses, including

Continued overleaf

Amateur, for the frequencies. To establish the priority list, we need to know what social, economic, political and technical values are available from each user. Some, such as the military, broadcasting and safety services, will take precedence over others. There is a question also of amount, how many broadcasting, how many safety, how many military frequencies are enough. Then the utility users, cabs, mobile phone, and other non-emergency uses, finally, technical and hobby.

"As there is more and more pressure from large user groups, such as CB (GRS), land-mobile, and broadcasting, it is necessary to re-divide the pie. Unless you have the economic clout of broadcasting, or land mobile, or the political clout of these groups, to simply 'do it because we like it', it is going to net you a big nothing. There are few sacred cows when the hogs are in the trough.

"Amateur radio is justified by what it contributes to the welfare, security and technology of society. Our emergency communications ability, our immunity to sabotage or other disaster, our ability to overcome hardships in order to communicate, our ability to provide free research and development of technology, and to discover newer and better or more cost-effective ways of doing things provides a benefit to society. How much benefit we can show (justify) will determine how much of the pie is served to our table.

"Unfortunately, Amateurs are not politically motivated. At every WARC conference, Amateurs have lost parts of the spectrum. This trend will not change this go-round. We will always have the leftovers, those frequencies which are supposedly not good for other uses.

"I predict losses in HF, VHF, UHF for the Amateurs in this go-round at WARC, and in 1999, we will be lucky to retain any frequency above 50 MHz, unless we 'justify' ourselves to our society.

"Inasmuch as raw numbers are impressive to politicians who know nothing about technology (they understand 10,000 voters but not 10,000 volts), it is also politically expedient to simply say, we have 10,000 users on this frequency, and it would be uneconomical to move them to another frequency. Thus, the attempt to populate the upper frequencies with CB, licence-free hams and such. We may not like such motives but politically it is a trump card in the process of pie-slicing. Just try to move the broadcast stations to new frequencies!

"So in the end, it is not a question of why we need to justify our hobby, but how can we justify our hobby."

Henry B. Ruh

(So it's back to stamp collecting in 1980, Henry?)

Notice

Annual General Meeting

Notice is hereby given that the Annual General Meeting of the Members of the Canadian Amateur Radio Federation Inc. will be held in Ottawa on Saturday, May 26, 1979, at 9:00 a.m. at a place to be announced in the next issue of 'TCA' for the purpose of receiving and considering the Operating Report and Financial Statement, revising section 4 of By-law Number 2 to provide that all Directors of the Federation be elected by the Full Members, approving Supplementary Letters Patent to change the name of the Federation to include the name of the Federation in French, appointing Auditors and transacting such other business as may properly come before the meeting. Those planning to attend the Meeting should advise the General Manager of the Federation by May 14, 1979.

Dated at Ottawa this 17th day of March, 1979.

Joan Powell VE3FVO,
Secretary.

Police radios go data

Developed by DOC and the RCMP in conjunction with the Vancouver Police Department's its new mobile radio data system is the first operational system of its kind in Canada. It is a revolution in police tactical communications.

Patrol cars in the Vancouver system have small, ruggedized data entry, retrieval and display packages mounted on vehicle transmission humps. These packages have full alpha-numeric keyboards and 9"-by-3" display screens for messages of up to six lines, each consisting of a maximum of 40 characters.

The system eliminates the time-consuming necessity of police radio dispatchers having to serve as middlemen for patrolman's enquiries concerning such matters as stolen cars or wanted persons.

Voice channels used by most major Canadian police forces can frequently be so congested with peak-hour radio traffic that officers have to figuratively "stand-in-line" to get on the air -- sometimes even in life-threatening emergencies.

The Vancouver dispatching channels will now be much less congested, while field officers will be free to make as much use of instant computer power as they wish.

The system makes the patrol car officer more efficient, giving him direct, instant access to needed information and ending much unauthorized eavesdropping on police communications.

There is another advantage inherent in the digital transmission used by the system: It conserves radio frequency spectrum.

Demand for frequencies is so great that saturation points have almost been reached in densely-populated regions of Canada. Either new frequencies will have to be found -- taken away from other radio services, such as television -- or more efficient means of using existing frequencies, such as MRDS systems, developed and more widely used.

WARC NEWS

Final Canadian proposals for WARC '79 appeared late last month with both good news and bad news for Canadian Amateurs. A note of caution, however, when reading this: the proposals are just that ... Canada's delegation to Geneva in September will work out its position from an amalgam of these proposals and changes, if any, in view of proposals received from other countries. The final outcome, of course, is anybody's guess.

Three new bands are proposed: 10100-10300 kHz, 24000-24500 kHz and 902-928 MHz. No change to 2, 6, 10, 15, or 20 metres. Changes would make 160 metres from 1800-1900 kHz exclusive, 6900-7100 kHz exclusive, worldwide on 40 metres and promote Amateur to primary service on 220-225 MHz. The proposed amendment to ITU regulation 41 which would have deleted the mandatory code requirement, which was in the last draft, has been dropped. An Amateur request to allocate 10 kHz of HF bands to emergency use in the event of large-scale natural disasters was not accepted.

* * * * * *

Although on an international basis the Canadian WARC '79 proposal left the 450 MHz band as it is, in a domestic re-shuffle of frequencies in the UHF bands, Amateurs are to lose 420-430 MHz to domestic commercial users and are to get the 902-928 MHz allocation at the same time. These allocations will be effective as soon as regulation changes can be published in the Canada Gazette. This could take as long as six months.

VE3CGU's QSL Card Contest

Back in our September issue we published a notice of an interesting and different 'QSL Contest'. VE3CGU had set up a panel to judge entrants in a contest to determine the three best card designs submitted. Closing date was January 1 and entries were judged on the basis of originality, completeness of information and good design.

Prizes were a Nye hand key for #1, a Bill Orr Wire Antenna Book to #2, and a Callbook Radio Amateur World Atlas to #3. CARF has donated a Regulations Handbook to each winner and one to the honorable mention who came fourth.

Here's Glen's report:

Well, it's all over but the shouting! We've judged the cards and let me tell you it was no easy task but we finally have three winners. In order they were VE3KQL, VE3KLA and VE7PB.

There was one change to the list of judges. Fred VE3ZL was unable to be here as he was in Florida, so Norris McEwen VE3FBQ substituted. The rest of the info is unchanged.

We had just under 100 submissions from just about the whole country, except P.E.I., Labrador and N.W.T. Surprisingly, we had more entries from the Yukon than from Alberta. There were many excellent designs submitted and we are very grateful for the response from so many interested Amateurs.

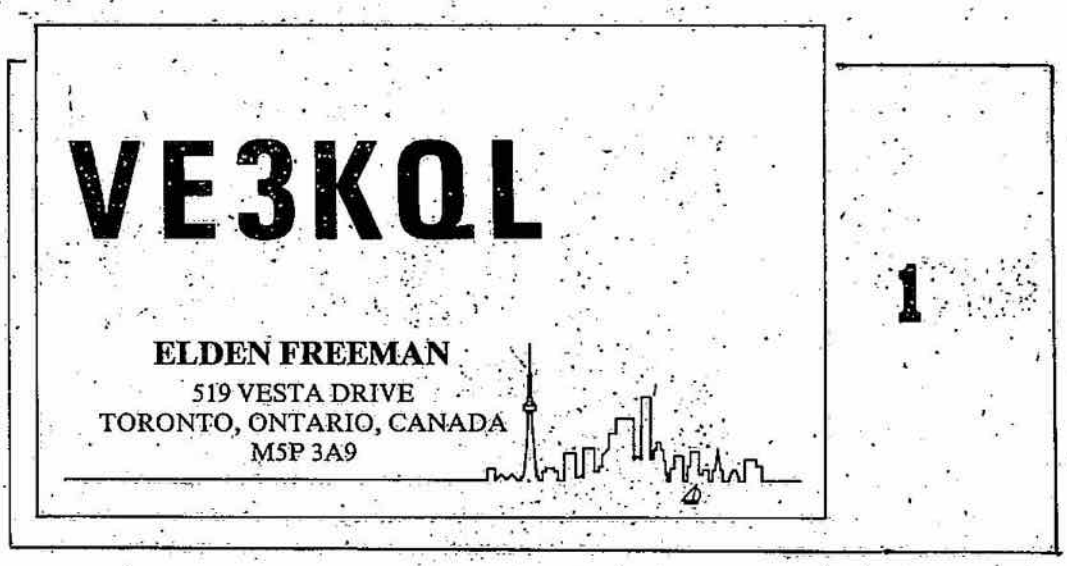
The judges selected those cards which they thought showed eye-catching artistic layout, completeness of information and distinctive design. Once we got the finalists down to about a dozen and a half, we discussed at length the relative merit of each card and eventually narrowed selection down to four cards. It was interesting to see what designs were favoured by the various judges.

The fourth design from VE3DQ got edged out in final selection but we felt it should receive an honorable mention although there was no fourth prize.

Winners have been informed by mail that their prizes will be sent direct from the dealer and from CARF.

We enjoyed judging the entries as it showed a good sample of designs. Perhaps at a later date, some other group will see fit to sponsor another QSL card design contest. It seems a popular thing to do and it generates a lot of interest. I'd like to get my card into a contest sometime to see how it fares!

Glenn McMichael VE3CGU



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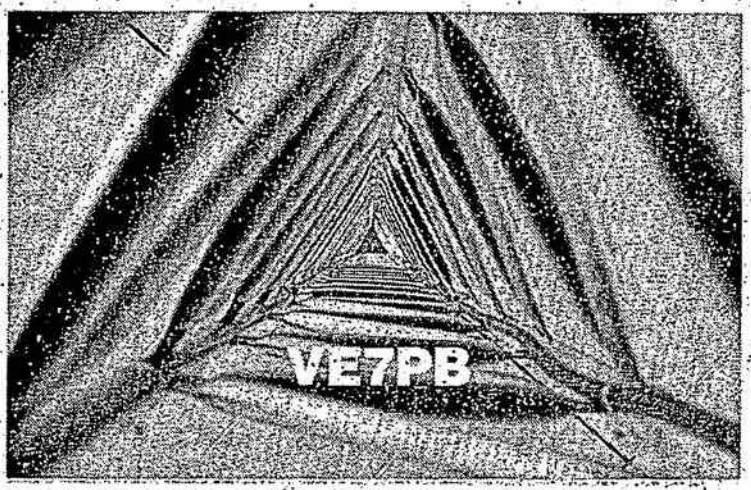
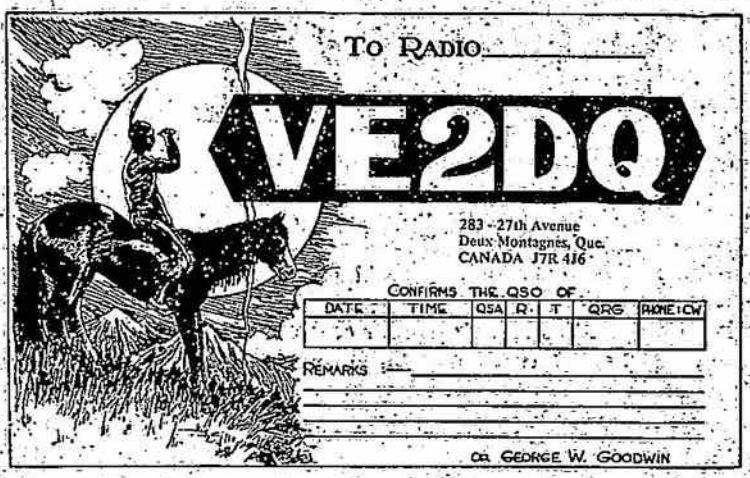
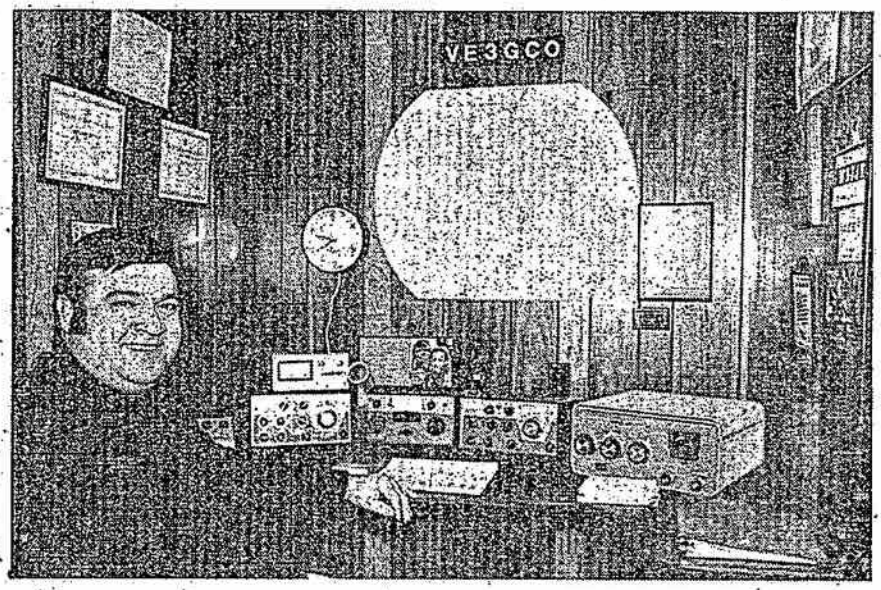
Hugh Dollard,
Vancouver, B.C.



HONORABLE MENTION





Garry V. Hammond,
VE3GCO

HOW I GOT THE 5 Band CANADAWARD

"10, 9, 8, 7...4, 3, 2, 1!! July 1, 1977 and CARF's new CANADAWARD was launched.

As an avid awards chaser I decided to go after the No. 1 certificate on 14 MHz. After all, 20 metres was about the only band you could count on for fairly reliable QSOs to all parts of Canada in the summer of '77.

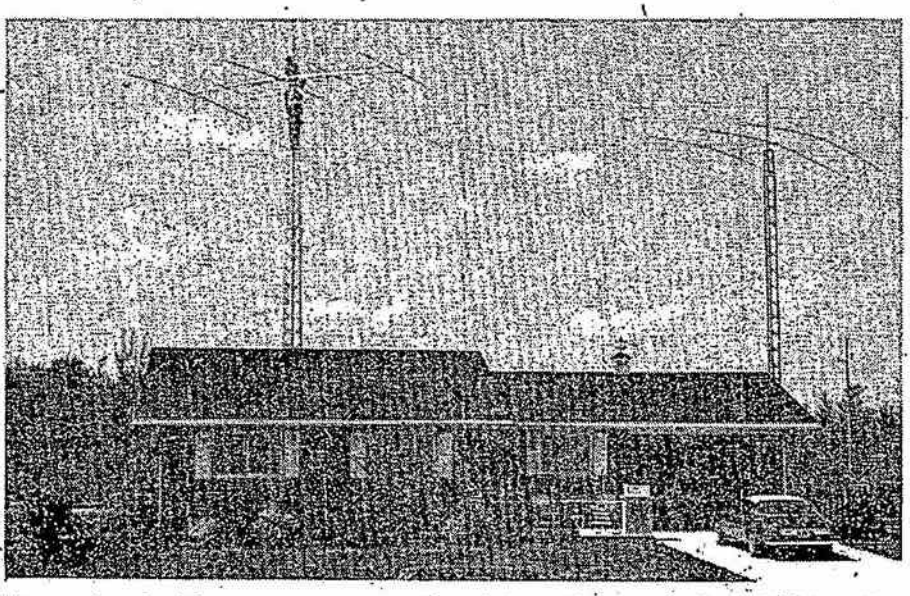
Work all the provinces and territories in VE land; it sounded easy. But wait! Where were Canada's more than 18,000 Amateurs. Certainly not all on 20 metres or any other HF band either. What I thought would take a few hours did take longer. Consider the fact that Canadian Amateurs do try to enjoy the limited summers we have. Many prefer the out-of doors, golf, gardening, BBQ's or whatever, as opposed to sitting in a hot shack tuning the bands. And then, there are holidays for many of us and ... the few active VE8/VY1 Amateurs. It took until July 13, 1977 to finally track down a Ujkon contact. (Thanks, Vic-VE8AM) Actually, I found the Yukon to be the last one on every one of the five bands. As it turned out, VE3GCO received the number two 14 MHz award. Number one went to another Amateur who found them all by July 4th! Congratulations OM!

Working towards the Five Band Plaque was something else. Here are some of the observations, frustrations, and suggestions from my own effort.

Firstly, you'll be surprised at how many Canadian Amateurs do not have five band capability. Most have 2 and 80 and something in-between but not always, hi. I suggest using 20 metres as your "base" band. Often, but not always, your 20 metre contact will have a triband beam so it's simple (?) to change to 15 and 10 metres. Now that the solar flux is up to 175-200 plus you'll find it relatively easy to make contacts on these 'upper' bands. Back in '77 it was in the 80's and 90's and when it reached 100 plus according to WWV I was trying for QSO's on 21 and 28 metres for sure!

When you arrange to QSY to another band, e.g. 21.200; 28.400; 7.175; 3.750 MHz, etc. It always helps to choose a frequency which can be checked easily against your crystal calibrator. If you have one of the new broadband rigs with either no or minimum tuning you really have it made! Don't forget to designate who will do the calling, who the listening, and for how long. (Five minutes should be sufficient to allow for tuning and the determination of propagation.)

Band switching is often fine for at least two or three different band contacts. However, it may be necessary for you to set up schedules for some of the other frequency bands, especially on 40 and 80 metres. Keep in mind the great longitudinal extent of our large country ... remember we have seven different time



VE3IZH & VE3HLL on tower working on securing the TH6DXX at 50'. The second beam is a TH3 at 40'.

zones! So, when setting up a sked know your times and the bands . . e.g. Will Radio Moscow, Tirana, or Peking clobber your choice of a frequency on 40 metres or will you interfere with a net on another band? Be considerate too! If you want the sked, YOU should be prepared to make the sacrifice and to make it as easy as possible for the other op. Choose a time that suits both of you. (You should be the one who gets up at the odd hour if necessary, like my last 80 metre contacts with the N.W.T. and Yukon were at 0120 hours local time. With the help of a couple of VE6 and VE7 stations who located Whitehorse and Yellowknife stations we chatted until propagation changed and allowed a short "window" to those VE8, VY1 areas of just 15 minutes ... 55 reports were exchanged, thanks expressed, and in just a quarter of an hour we each disappeared in the hiss of a dead band. I suggest that most schedules be arranged for the weekends. Don't forget that various nets can be useful in locating stations for skeds ... and be sure to tune the contest weekends of SS, CanAm, ARRL, etc. You'll often find Canadians on bands you wouldn't normally hear them on.

Be versatile ... 40 metres proved to be the toughest for me... as it turned out more than half of my 7 MHz QSO's were on CW ... including the last two, VE8RR and VY1BT. SSB or an operator with only an Amateur Certificate were not possible at the time of those two contacts. For all contacts, a TH6DXX beam was used on 10, 15, and 20 and simple inverted V's did the trick on 40 and 80. An SB-200 amplifier was useful on 40 and 80 but was not necessary on the HF bands.

I'm pleased to say that QSLing the sixty contacts was relatively easy. Multiple-band contacts really ran up the total and cut down on postage costs. Many operators sent me their cards even before they received mine. That really is the Amateur spirit! But, do keep in mind though that the operators in relatively rare VE5, PEI, VO, and the Territories deserve a self-addressed stamped envelope (SASE) ... that's easy enough to supply isn't it?

Be sure to keep checklists of worked and confirmed stations by band. In that way you know exactly where you stand and what you need!

Peter Driessen, VE7BBQ, the CARF awards manager looks forward to your application and cards but be sure to check to see if the QSL's have been made out correctly. I've had to request duplicate cards from a few operators worked to replace a small number of cards carelessly made out to the wrong call sign or for the wrong band or with insufficient date, etc.

The CANADAWARDS are beautiful certificates. CARF is to be commended for offering such a uniquely designed series of diplomas. Anyone earning them will proudly display them.

You may be interested to know that the order in which I finished the five bands was 14., then 21., then 3.5, then 28 metres and finally 7 metres.

Yes! There is a challenge to work ALL of Canada. However, it is attainable and with the sunspots in our favour, now is the time for You to work on your 1,2,3,4,5, or even 6 or 7 band CANADAWARD's certificates or plaques. GOOD LUCK!

Sun powers VE7RAC

On June 10, 1978, VE7RAC on Mount Arrowsmith in B.C. began using solar cells to charge the storage batteries running the repeater. Sites that could supply hydro would not give suitable coverage outside the Alberni Valley, so a peak at 3600 feet near Mount Arrowsmith on Vancouver Island was selected.

One year earlier, VE7RAC had gone on the air but kept running into Murphy's Law, ending up being off the air for the winter.

A windmill has been built and taken up the hill to run a charger, but where was the wind? Gusts everywhere except at the repeater site. The gas-powered generator needed a whole day's time to top off the batteries. All this while, batteries were being packed up every ten days to keep operating and volunteers were getting harder to find each trip. Finally, along came Old Man Winter and snowed the site in, ending all attempts and VE7RAC was off the air for the duration.

Solar panels had been considered when the repeater was in the original planning stages and now seemed to be the only solution. Two panels, fully assembled, were purchased, each rated at 14.4 volts 1 amp and hooked to four six-volt low specific gravity batteries which are in series parallel supplying 200 amp hours. Measurements at the site show a maximum of 1.8 amps from panels to batteries under direct bright sunlight; in fog or drizzle or with the panels right in the clouds, from 50 to 150 millamps, giving some charge even on the worst days.

In order to keep current consumption as low as possible, the whole package was gone over, with fantastic results. ICs were replaced with Cmoss low drain (also necessary in the cold weather), the final stage of the transmitter by-passed, and the receiver put on a pulsing system, coming on for 1/8 second every three seconds, then shutting down again. Along with other alterations, this gave a standby current of of 10 milliamps down from about 150. On low input, because of by-passing the final stage, the ERP is about 8 watts.

During the longer days, the panels keep the batteries bubbling happily, however the shorter days still need some degree of conservation. On the shortest day of the year, the batteries were down 3% with about one hour per day transmit time recorded. The site is snowed in again but this time we are still on the air and hopefully the batteries are up again with the longer days.

Overall we are very pleased with the panels; so much so, more are being added with auto-patch, telemetry, and whatever else we can think of, to be installed as power becomes available.

Anyone using the repeater might keep in mind the pulsing system used on the receiver. In order for your call to be heard completely, your mike must be keyed for at least three seconds to allow the receiver to come on; then make your call.

If more information is desired by interested parties, write to the Arrowsmith Amateur Radio Club, Box 245, Port Alberni, B.C. V9Y 7M7 or if within range of any of the B.C. nets on 75 metres, give someone here a call and we will try to answer your questions or be of whatever assistance we can.

-VE7DGQ

news briefs

Amateurs will provide the communications backbone for an EMO exercise in Ontario slated for May. The simulated disaster will be an earthquake hitting Central and Eastern Ontario. Local EMO co-ordinators, assisted by federal authorities, will carry out the exercise. The provincial government has dismantled its EMO radio system so Amateurs and GRS ops will fill in the gap.

* * * * * * *

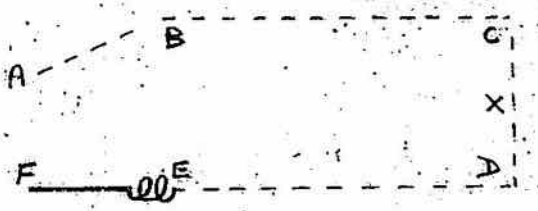
Amateurs and GRS ops escaped an increase in station licence fees set for April 1. DOC operates on a 'cost recovery' basis and other services are being hit with fees of varying magnitude.

Wire Antennas

(The second article in a series by Bob Eldridge VE7BS.)

The basic G8ON was described in Part 1 last month, and it was briefly mentioned that the overall length can be shortened by adding a loading coil and extension at the (electrically) far end. There is a little more to it than that, as the extension can also be used to change the phasing of the parts of the antenna on bands higher than the 'design frequency' so it warrants a separate article.

Just to recap on the basic design, here is the original antenna, shown in dotted lines, with the extra pieces now to be discussed shown in full lines:



Design Frequency	A-B	B-C D-E	C-D (vert)	H	E-F
1.8	44	116	33	5-10	
Shortened version with loading coil and extension					
1.8	44	84	30	5-10	see text

THE LOADING COIL

G8ON does not give a specific value for the inductance of the loading coil, which is quite understandable because the value required is dependent upon several variable conditions -for example the height of D-E-F above ground, and end loading effects because of the physical surroundings. Also, as far as use on 1.8 MHz is concerned, there is no special merit to the length given for E-F. Eleven feet happens to be a useful length for changing the phase of the top and bottom portions on the higher bands. It is best to understand what is to be achieved, and do whatever is convenient in your own particular case. To make a loading coil effective there must be some length of wire beyond it, and at 1.8 MHz, 11 feet is about as short as you could go. The shorter the end-section, the more turns you will need on the coil - because of the beneficial effect of the very presence of the end-section on the action of the coil, a shortening of the wire by a very small amount may necessitate a surprisingly large increase in the size of the coil. This would increase the voltage appearing across the coil, and make it necessary to protect it more carefully from dirt and the weather. Make the end-section as long as possible (up to a maximum of 25 feet if you want to have some latitude for adjustment in the coil) if 1.8 MHz is the band of interest.

The far end of the antenna is a high impedance point, the point at which the

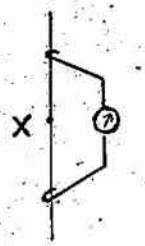
direction of current reverses. So, to achieve a current maximum at point X, the electrical length X-D-E-coil-F must be a quarter wave or an odd number of quarter waves. The physical length is dependent on proximity to the ground and the nature of the surroundings.

A roller inductor like those used in the old surplus Command sets or supplied now for transmatch construction is very useful to find the right inductance to shift the current maximum or minimum into point X; otherwise 2" diameter coil stock with shorting clips will do the job, maybe 4 or 5 inches at 8 or 10 turns to the inch.

You need a good insulator on the end of the total antenna.

FINDING THE MAXIMUM CURRENT POINT

The best way to measure current without breaking the antenna is to shunt a portion of the wire with an RF ammeter (the old fashioned hot-wire type) or a low-voltage incandescent lamp, like this:



Meter or lamp

Adjust the loading coil for maximum brightness (maximum current) with the measuring device straddled across point X. If you are using only a few watts of power for testing, you will have to bypass four or five feet of wire to get a glow - aim for a yellow colour as it is easier to see a change. Some people say it works okay with a continuous loop coupled to the wire, convenient if using insulated wire, but I haven't tried that method myself. The adjustment is not very critical, and when you have established how many turns you need you can replace the adjustable coil with a permanent one.

If you are really keen on giving this antenna a try, it is not much trouble to actually break the antenna at X and put a small lamp in series; then after notes have been made of the coil settings and extension lengths for various phasing conditions the lamp can be permanently shorted out. This is useful for searching for current minimum at X when you want to put the upper and lower wires in phase at the higher frequencies (like using the full size antenna on 3.5 or 7 MHz).

SPECIAL CASE OF THREE HALF-WAVE OPERATION

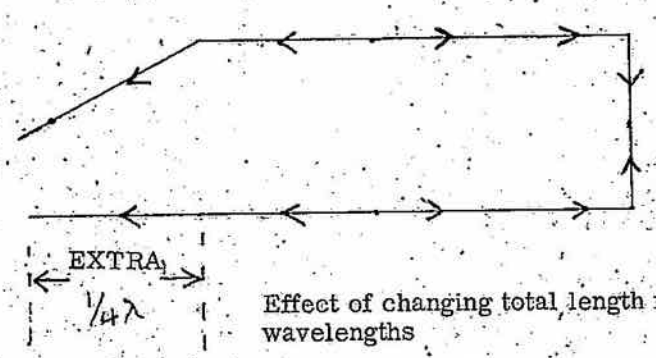
G8ON discusses the operation of the 7 MHz version on 21 MHz with typical British humour. He says, "One is tempted to sacrifice a white cockerel before switching on the rig". Draw the current-direction arrows for yourself and you will see why.

But add an 11 foot section at E-F, without a loading coil, and trim for a current minimum at X. The upper and lower wires are now in phase, and the pattern will be something like that of a single full-wave horizontal but with some gain.

USEFUL FEATURES OF THE G8ON

There are three major advantages of this antenna at the lower frequencies, for which it was originally designed.

1. It can be fed at a relatively high



Effect of changing total length from 1 1/2 to 1 3/4 wavelengths

impedance point, which makes the quality of the ground connection much less critical;

2. It radiates vertically polarized signals at a usefully low angle because of the high current in the vertical portion, and the 'displacement current effect' of the out-of-phase portions of the basic halfwave bent in the right places.

3. It works well over poorly-conducting ground, which most of us have (in fact, it is reported to be disappointing over good ground).

It also makes a useful model for discussion of the effects of moving the current and voltage nodes of an antenna into different places for different effects, which is the reason it was chosen as the first design to be discussed in this series.

Safety First

By Stan Hill VE3DQ

In spite of some Amateurs deploring the almost total use of store-bought gear in Hamshacks today, still there is one thing to be said for manufactured gear: it is almost totally idiot-proof safe! Unless you forget to pull the plug and poke around inside the lid, it is almost impossible to get yourself zapped.

Homebrewing gear is another story because you generally have to have exposed voltages in order to do voltage checks. Before manufacturers smelled green in the Amateur radio field, it was not uncommon to hear of Amateurs getting zapped, something that is almost unheard-of today. Breadboard construction was the vogue with components entirely exposed on top of the breadboard.

For those of us accustomed to this type of construction there is no problem, however there is the possibility that the uninitiated will be unwary and make a mistake. It is for this reason that it is recommended that a plywood or hardboard shield be placed over the 'Junkbox 2' transmitter shown in the Feb. '79 issue of TCA.

Being of breadboard construction, there are exposed voltages on this rig. For instance, if you grab the plug-in tank coil before pulling the plug and/or opening the voltage switches, you grab yourself a handful of volts --300 of them to be exact. Likewise if you touch the terminals of the meter or any part of the dual-section variable tank circuit capacitor, or touch a number of the tie points. The tank capacitor must be fitted with an insulated dial. Although rare, there are a few metallic dial knobs kicking around. Throw them out, they are dangerous!

The recommended cover would be of 3/16 inch thick plywood or hardboard with two ends, a top, and a rear panel, glued together with epoxy or aliphatic resin glue. Outside front and bottom of the cover would be open.

Dimensions would be 10-3/8" W x 6-3/16"D x 5-5/8"H if plywood or hardboard is used. This is based on inside dimensions of 10"W x 6" D x 5-7/16" H. If thicker material is used, the outside dimensions would increase accordingly. For example, if 1/4" material is used, the outside dimensions would be 10-1/2"W x 6-1/4"D x 5 11/16H.

The cover should slide down neatly over the breadboard. Fastening would be with #6 x 1/2" R.H. Wood screws driven through 1/8" holes in each side panel into each end of the breadboard.

(Technical Editor's note: A metal cover, with adequate clearance over 'live' components, is preferable to a wooden one as it provides a shielding effect to keep in any unwanted radiation.)

Wirewrap

By Art Blick VE3AHU

The use of integrated circuits (ICs) in the construction of electronic equipment means that a large number of connections must be made in a small space. Wirewrap (WW) has become a very attractive alternative to soldering.

Wirewrap has been used extensively for wiring telephone and telegraph switchboards and racks for many years and is a proven technique. The basic principle is that a special type of wire -- Kynar - is used and this wire is wrapped around a sharp-edged terminal so that the edges of the terminal bite into the wire to give a permanent, shock-proof joint. This puts an end to the "Cold joint" problem of soldering.

The normal size of wire used in WW for point-to-point wiring is No. 30, larger sizes may be used for power wiring. A WW tool is required, this can either be a hand tool or a power operated gun.

A typical hand tool is the 'OK Model WSU-30' which includes a wrapping end, an unwrapping end (to correct mistakes) and a stripper for #30 wire. These tools are available from the major suppliers of electronics components (for example, Radio Shack 276-1570 at $9.95). Battery or AC operated tools cost $50 and up and are used mainly for production work. Kynar wire costs about 6¢ per foot in small quantities and can be obtained in 50-foot rolls in several colours of insulation. Wirewrap IC sockets must be used and these are available in all standard sizes at reasonable cost.

Using the WW tool is simple and readily mastered. First strip the insulation off the wire for about 3/4 of an inch. Looking into the end of the WW tool, the longer end of the WSU-30, you will see two holes, the centre one larger than the outside one. Insert the bare end of the wire into the smaller hole so that the insulation butts against the end of the tool. Bend the wire back along the tool and hold with your finger. Insert the terminal to be wrapped into the larger centre hole and turn the tool in a clockwise direction until all the bare wire is wrapped around the terminal. And that's all there is to it!

You'll find you have about six to eight tight turns of wire around the terminal, which gives you about 30 mechanically and electrically sound connections between the wire and the terminal - one each time a corner of the terminal has bitten into the wire.

To unwrap, push the shorter end of the WSU-30 down over the terminal as far as it will go and turn the tool counter-clockwise. You can continue until the wire is completely unwrapped, or after two or three turns you can remove the tool and slide the wire off the terminal. It is better not to re-use the end of the wire, you will have a large number of small nicks in it where it was wrapped around the terminal and these could cause the wire to break easily.

If you are dealing with short pieces of wire, e.g. joining two pins on an IC socket, two methods can be used. The first is to cut off a suitable length of wire and strip both ends before wrapping. The other, more professional, method is to wrap one end and then use a wire stripper or small diagonal pliers to cut and strip the second end. This latter method takes practice!

The combination of wirewrap and pre-drilled phenolic circuit boards provides a convenient method of assembling IC circuits. You will need the type of circuit board that has holes drilled on 0.100 x 0.100 inch centres to fit the IC sockets. If you are using unclad boards, the IC sockets can be fastened to the boards with a couple of drops of cement.

Leads of other components (resistors, capacitors, etc.) can be bent at right angles to the components and pushed through holes in the board, then cut off to about the same length as the IC socket pins. You can wirewrap directly to the component leads, but do not expect to get a good electrical connection this way. Since the component leads do not have sharp corners to cut into the wire, you will need to add a drop of solder to each wirewrapped component connection.

By Frank Davis VO1HP

A 40-metre DX Antenna

Many articles have appeared in recent literature describing shunt feeding of tower systems for operation on 1.8/3.5/7 MHz. One of the most useful was written by John True, N4BA (ex-W4OQ) and appeared in the May 1975 issue of Ham Radio Magazine. The tower at VO1 HP has been successfully shunt fed for operation on 7.0 MHz based on the design information in the HR article.

The tower is a garden variety 40 foot DMX44 installed about 50 feet from the house. It supports a small 2-element homebrew 14 MHz Yagi, a 3.8 MHz dipole and a G5RV tunable dipole. (See Fig. 1)

The electrical height of the tower plus Yagi top loading is about 80 feet. For this electrical height, the gamma rod length should be about 20 feet, the series capacitor Cs about 50 pF and the parallel capacitor Cp about 320 pF. See Fig. 2 for details of the network.

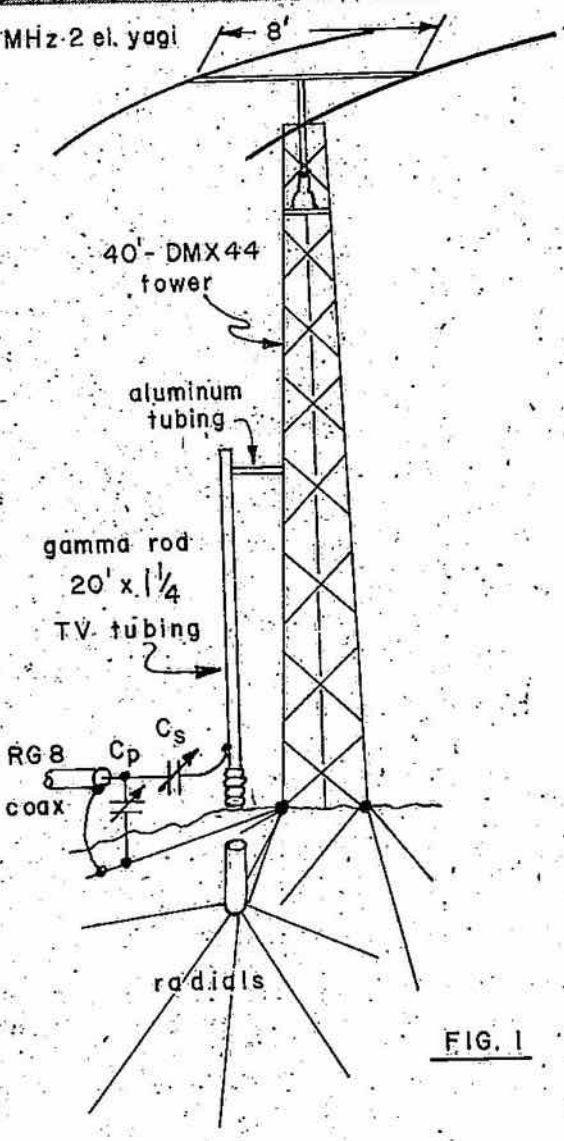


FIG. 1

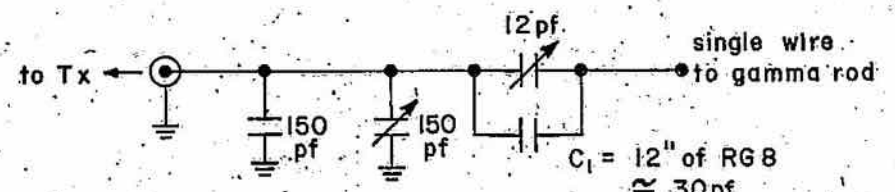


FIG. 2

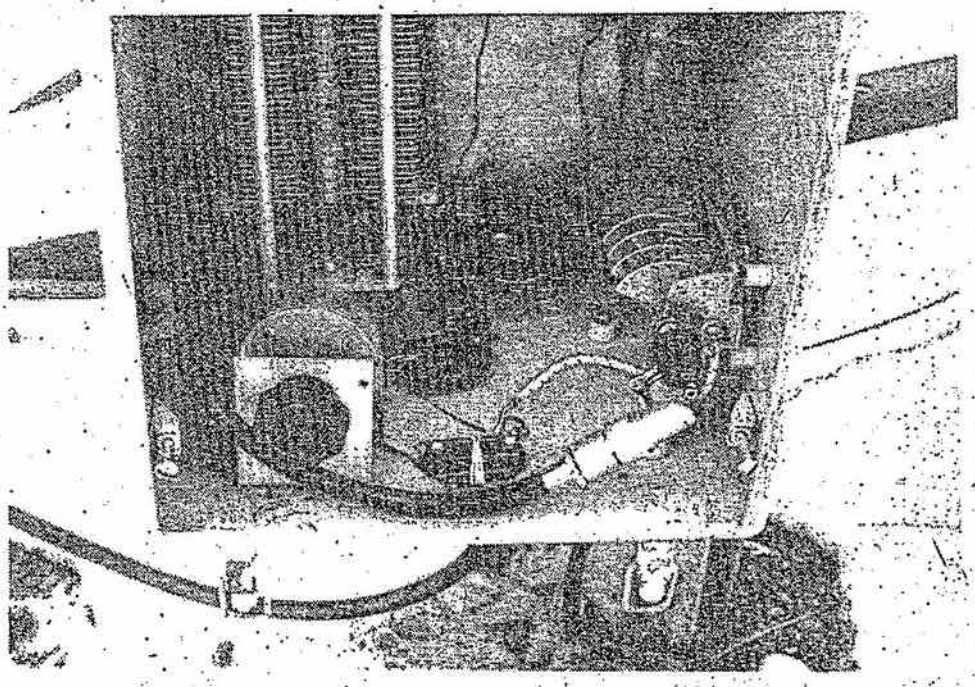


Figure 2: This is a partial view of the matching network. The 40m network is in the foreground with Cs on the right and Cp on the left. The fixed capacitor is shunted across Cp to make up the required value. The short piece of RG-8 is shunted across Cs as explained in the text. The large variable and fixed capacitors in the background are part of the 160M matching network. A snap-on cover protects the capacitors from the elements.

The gamma rod itself was constructed of two sections of one and a quarter inch swaged TV tubing, giving the total length of 20 feet. The lower end of the gamma rod rests on a large porcelain insulator which is partially buried. The upper end of the rod is secured to the tower by a length of aluminum tubing. Both ends of the tubing can be flattened and fastened with two sheet metal screws. Actually this shorting bar should be variable and may need to be adjusted up or down during tuning of the system, so don't fasten it permanently until you've achieved the lowest SWR.

The matching network consisting of Cs and Cp was mounted in an old equipment case that happened to be on hand, and the case fastened to the base of the tower with sheet metal screws. Since I did not have a wide-spaced variable capacitor of sufficient value for Cs I had to use a short length of RG-8 co-ax as shown in Fig. 2 to make up the proper value.

The tuning procedure consists simply of varying the two capacitors for minimum SWR. If the SWR will not approach unity try moving the position of the shorting bar on the gamma rod. The final position of my shorting bar was at the 20-foot mark as shown in Fig. 1. By the way, the gamma rod is spaced about 16 inches from one tower leg. It may become necessary to move the gamma rod closer to or further from the tower, however this is unlikely.

As with any vertical antenna, it is important to lay down a good ground system. I have about 25 radials on and under the sod, they vary in length from 30 to 50 feet. The main ground system consists of a 4-foot length of pipe driven into the ground with 19 radials arranged around it like the spokes of a wheel. The pipe is bonded to the tower by a heavy strap and there are also two radials attached to each tower leg and laid out on the ground. The radials bonded to the pipe are buried just underneath the sod. This may not be the most elaborate ground screen you've read about, but it seems to be quite adequate for this antenna configuration.

I resonated the system for the CW end of the 40-metre band and the SWR plot is shown in Fig. 3.

I have used the system for about 18 months on 40 metres CW and am quite pleased with the reports received from all over the world. In casual operating, 50 watts output is used and Europe, South America and North America are quite easy to work. In the last CQ WW CW contest, 500 watts output was used and 508 QSO's were made in a single-single effort. 'WAC' (Worked All Continents) has been achieved several times over since this antenna was put in operation.

Some comparisons have been carried out between this antenna and the recently erected G5RV dipole, and the vertical has a one- to two-S-unit advantage over the dipole on European signals.

This tower has also been successfully resonated as a 'folded unipole' on 1.8 MHz. This may be described in a subsequent article.

-VO1HP

Reference: John R. True "Grounded Vertical Radiators", Ham Radio, May 1975, Pg. 34.

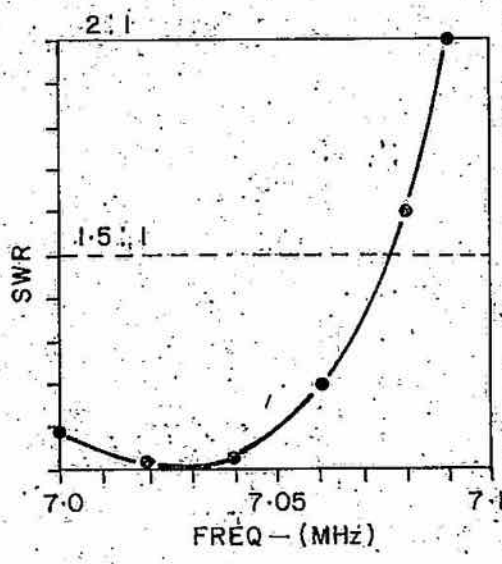


FIG. 3 SWR PLOT

NOTES ON TUNING THE SINCLAIR

H-150 Cavities

By Colin Edge VE3CPK

For commercial use, three of these cavities are used to make up a duplexer unit.

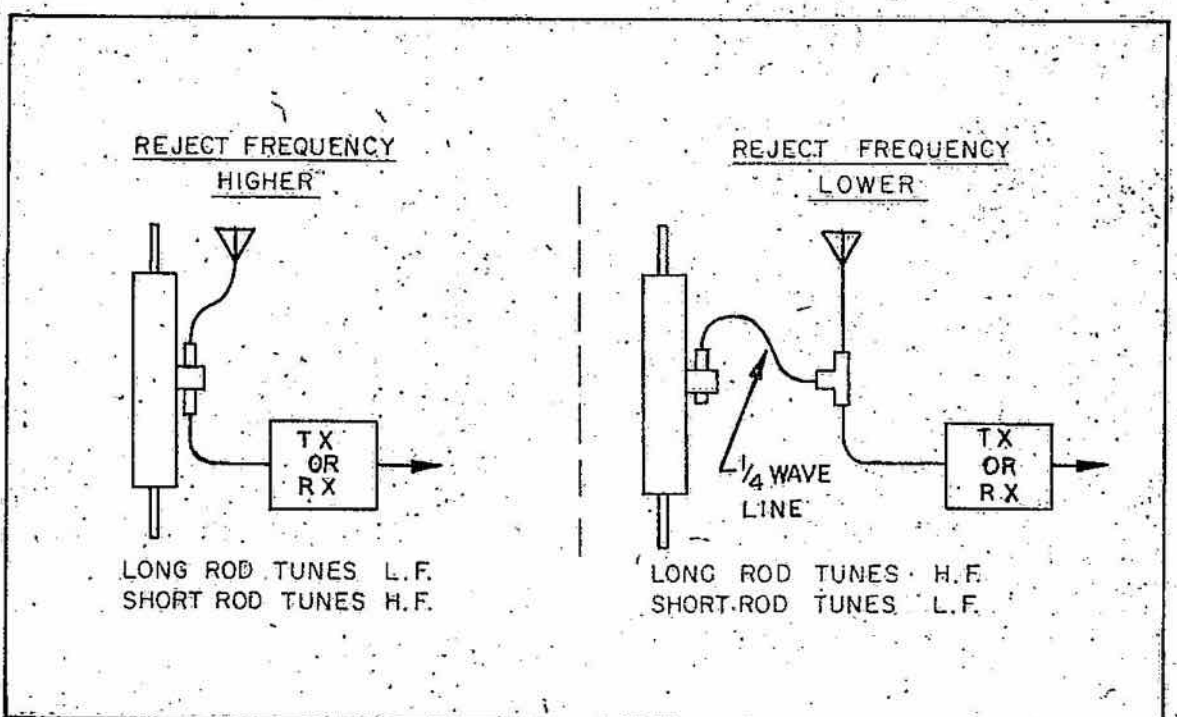
They are designed to be used in applications where the transmit and receive frequencies are at least two megahertz apart; any separation less than this will show an increase in insertion loss, or much less rejection of the unwanted frequency.

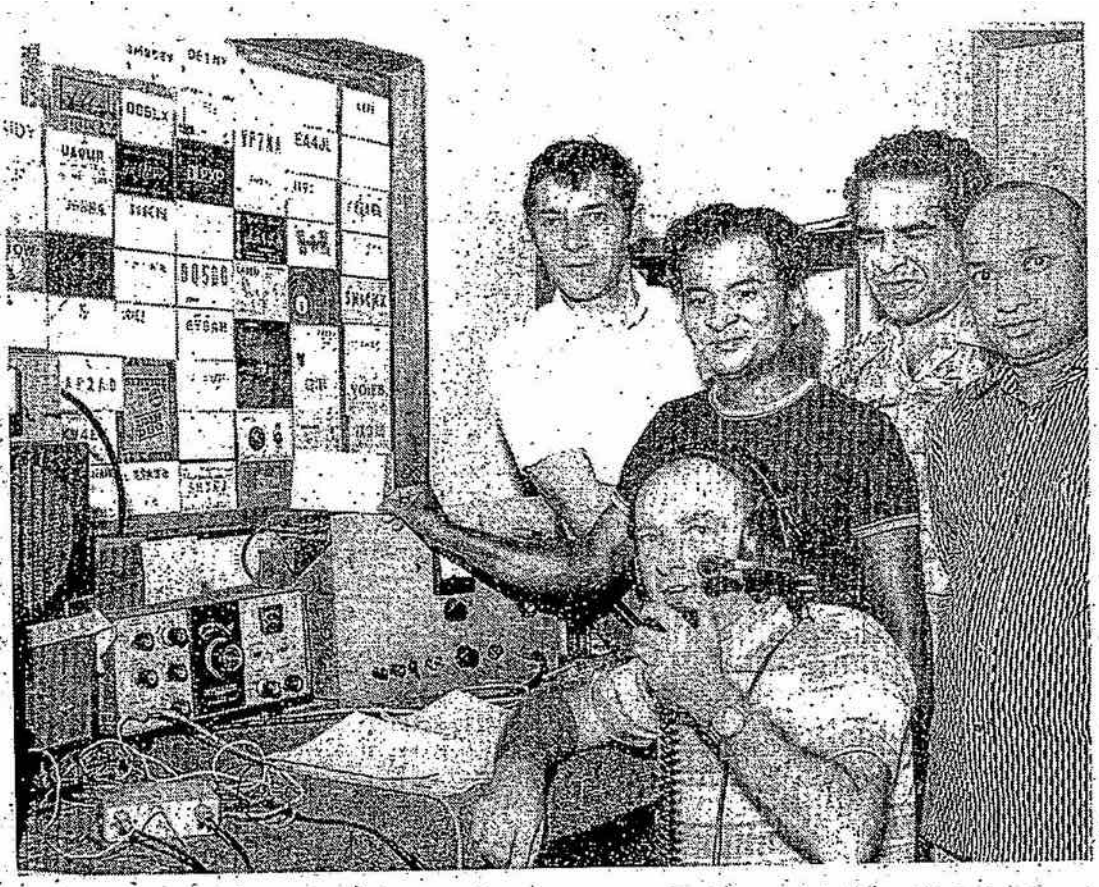
When separate receive and transmit antennas are used on a repeater, a single cavity may be used on each antenna to reject the unwanted signal. Method of construction depends on whether the unwanted signal is higher or lower than the required signal.

Tuning Procedure: Use a low level signal generator and an R.F. voltmeter or receiver. Tune for peak reading on the required frequency, and a null on the reject frequency. Repeat until maximum difference is obtained. Do not use a transmitter and dummy load for tuning procedures as the cavity when out of tune may appear as a short circuit to the transmitter output with disastrous results!!

Tuning Rods: When the original rods are too short, new ones can be made out of solid brass rod. The inner end of the new rod must be shaped to a spherical radius as high voltages can appear at this point resulting in flash-over and damage to the cavity.

Closer frequency results can be obtained by using the larger diameter cavities F-150-4E, F or H and the above methods.





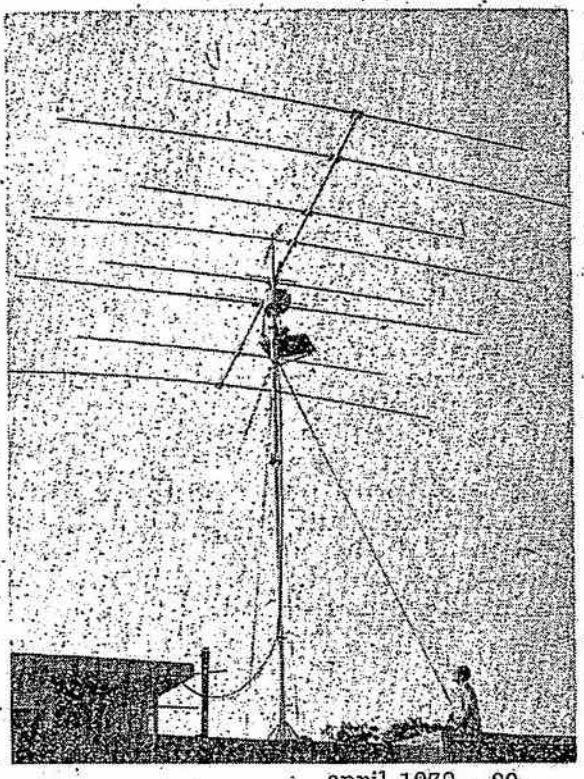
Above, left to right: I2BCL. Luciano, VU2XX Patil, VU2AT Ashok, VU2XO Patel, VE3HDC Steve at the mike; Right: Homebrewed beam antenna at VU2XX.

CQ VE de VU

VE3DHC G.B. 'Steve' Stevens

In late September last year I was sent by my company to assist in the start-up of a synthetic rubber plant at Baroda in Northwest India. With the aid of the Callbook pages for VU2 plus nothing much to do on a 747 for 9 hours, I found out that there were six Amateurs in Baroda. Within a few days I had contacted VU2XO, M.R. Patel, who is a Maintenance Superintendent at the petrochemical complex. He showed me all

Continued on Page 41



The Exams examined:

(Elsewhere in this issue we have reprinted a portion of the January exam paper. Amid criticism levelled at the new exams, the first in-depth, objective analysis of the problems posed to candidates and instructors by the new format and system has appeared in an excellent paper from the Slemon Park ARC in P.E.I., forwarded to CARF by its president, Ted King VE1BPW.)

This analysis of the January exams was made the day after writing, in conjunction with the 17 students who wrote, club instructors, and other Amateurs whose experience ranged from 1 to 22 years. Because of the possible subjective nature of the examination marking, we withheld the results of our analysis until students were formally notified of their examination results ... only one passed!

The analysis is being forwarded to you in hope that it will be of benefit to other clubs across Canada and that it will also be of use in future discussions with DOC.

AN IRREGULAR TIME SQEEZE?

Initial review of the exams proved difficult because the candidates were not certain themselves just what was being asked. A significant problem was overlooked on examination day due to the pressure of writing. This was the time allocated to write the exam. The total time for writing was about two hours and five minutes -- from the time that the Advanced group was given its morse until the Amateur Certificate exams were collected. This meant that by the time the Amateur Certificate group completed its morse code, only 90 minutes were available to read exam instructions and to complete both the theory and regulations portions of the exam, although TRC-24 (Oct. 1, 1978), Table 1 indicates that 60 minutes is allotted to each section. As a consequence, candidates barely completed each section -- or did not complete each section -- within the available time. Little or no time was available to review the questions and their answers.

THEORY MAJOR PROBLEM

Once results were announced, it was clear that the major problem area was theory. Most had passed their regulations. Morse code caused some grief; however, to be honest, much of this was attributed to the compressed time available (before exam date), lack of adequate practice in between classes and/or nervousness during the test. Most students were at a level of 9-12 wpm prior to the exam, but none were copying solid at 12 wpm which was recommended. Quality of the code tape was considered good.

The system we used to teach morse worked well. Characters were introduced at a 10-12 wpm speed, but spaced out to produce an effective speed of 5 wpm. Easy characters were introduced first (e, i, s, etc.), progressing at 5-7 new characters per week through the more difficult letters, with numbers and operating characters introduced last. A micro-computer was used to generate 5 character random code groups which were altered weekly to practice recognition of new characters and to practice all characters learned to date. When all characters were mastered, spacing between characters was reduced to effect practice at 8, 10 and 12 wpm. All sessions were taped prior to class and duplicate tapes were made at class for interested students. An interesting micro-computer approach appeared in January 1979 issue of 73 Magazine (The Morse Maker by WB9TNW) which will be adapted for future classes, but using the previously described approach.

The fact that our students did well on regulations is interesting because there was not much classroom time

spent on regulations compared to time spent on theory and morse. This could be interpreted to mean that they knew their regulations well and/or that multiple choice questions are easier to answer than written questions. Nonetheless, the regulations section had some aspects which the students did not like. These were:

a. questions which included a requirement to know something about other types of radio operator licences in order to properly respond (e.g. General Maritime Radio Operator, etc.);

b. questions whose correct response included information that was either wrong or irrelevant and thus confused the issue, and;

c. multiple 'multiple choice' questions.

The latter is a type of question which has a series of statements in which more than one statement is correct, and the response requires that various combinations must be individually checked for validity.

Lawyers may have no problem handling this type of question, but most who wrote the exam did not like them -- preferring instead straightforward questions.

Without a doubt, theory was the worst area on the examination. During the post-exam review, it was apparent that many candidates did not understand many of the questions, because it was difficult to get agreement on what the specific wording was for any given exam question.

The feeling of Amateurs in our club was that questions were relatively vague (more than one possible correct answer) yet only one specific answer was acceptable. It was felt that the exam was written in a manner (through the use of key words and/or difficult words such as 'impervious') which made it difficult for the candidates who wrote it.

Another problem was that most candidates had not 'written' any exams for several years. Apart from two high school students, most persons taking the course were over 35 years in age. Expressing oneself clearly and correctly when making a written response can be very difficult if one is not accustomed to doing so. Therefore, if written responses are to continue in future exams (versus multiple choice) it would be prudent for instructors to periodically pass out practice exams to ensure that their candidates develop the necessary writing skills.

READ THE (BLEEP) QUESTION

A second but complementary problem with written exams is getting the candidates to read the questions carefully. This too was apparent during the debriefing. On a multiple choice exam, if the responses don't seem to fit the question, most people will go back and re-read the question. On a written exam, one must first read the question carefully, prepare one's answer, then re-read the question to ensure that they've answered what was being asked. All questions and answers should again be reviewed before handing in the exam. Insufficient time was available to do so -- even by those who had a strong background in electronics.

Thirdly, it was apparent that our rush to get students ready by exam date caused us to skip some areas that should have been covered. Vacuum tube theory was skipped, as were voltage doublers (possible response for one question) and FM Modulation Index. Consequently, students were handicapped by not being able to answer these questions (working from less than 100% at the outset). The best remedy is to be aware of all knowledge required, draft lesson plans that include them, and ensure that they are covered.

TIPS FOR CANDIDATES

Fourthly, although it is not certain what the exam instructions were, candidates should be pre-briefed on how to write an exam. Some tips are:

a. bring your own paper to copy morse;

b. bring a reliable pen to copy morse (one person failed morse because his pencil broke);

c. the volume of morse might cause problems. If it's too loud or too low, move to a different location before the main test starts, or ask the examiner to adjust the volume;

d. clear your desk of all reference material before exam begins. You could be disqualified!;

e. read the questions carefully -- both before and after making your response;

f. answer the easy questions, or questions you know, first. Skip questions that seem difficult, note the question number on a scratch pad, then come back to them later;

g. read the exam instructions. Determine whether your answer is required on an exam answer sheet, or in the booklet, etc., which questions, how many questions, etc. that you have to answer and where they are located in the book.

h. if using an answer sheet, ensure that your response is recorded against the correct question number. Use a pencil and eraser to make changes if required.

Nervousness is a problem with candidates, but it can be lessened by a pre-exam pep talk that includes the above points.

"... many candidates did not understand many of the questions ..."

TIPS FOR INSTRUCTORS

Finally, it was recognized that some means of reinforcing theory instruction is needed to help get concepts across. This could be done either by means of training aids (practical demonstrations) and/or the use of films. Films may be available through local schools, community colleges or company sources. Training aids should be breadboarded showing the connecting circuit wiring and symbols, and be specifically designed around the types of circuits which prospective Amateurs are required to understand. We are now rummaging through our junkboxes to see what we can come up with. Unfortunately, if this high a profile of training became essential to pass the DOC exam, many prospective Amateurs in remote or small communities would be at a disadvantage.

"....candidates should be pre-briefed on how to write an exam...."

Commercial products are available (Heath, Radio Shack, etc.) but also are costly. Minimum test equipment would be a multimeter, audio oscillator, signal generator and oscilloscope.

Most of our students were reasonably well versed in their theory prior to the exam, as evidenced by our review sessions. Therefore, the results were disheartening. It suffices to say that the current theory exam and exam administration should be reviewed by our national Amateur radio organizations in conjunction with DOC (CARF is doing this...Ed.). However, clubs and instructors can also do a lot to help prospective Amateurs get their ticket. In summary, these actions include:

-developing thorough and comprehensive training plans, following these plans, and passing along outlines to students who missed classes so they can review and study the material;

-acquiring good training aids to reinforce theory lectures;

-giving students practice exams to get them used to writing exams;

-ensuring that students are pre-briefed on 'exam writing tips'; and

-allowing adequate time to cover all pertinent material prior to examination day, including review sessions.

We've learned a lot from this experience and so have our students. Next time, we hope for a 100% pass rate. If it doesn't happen, there will be little doubt where the problem lies.

How it turned out

A table prepared by DOC shows that more than 550 candidates wrote the January exam for the three Amateur certificates. Three hundred and ninety-seven wrote the Amateur class exam, 144 tried the Advanced ticket test and 35 opted for the new, no-code Digital Op ticket. The success rate was 32% for the Amateur; only 23% for the Advanced and 34% for the Digital class. It is interesting to note that of the 35 who wrote the Digital, 52.9% of those who already held Amateur qualifications passed. Of those with no previous Amateur tickets, only 17.6% made the grade.

The areas of weakness are shown in this table which shows the success rate (or lack of it) for the three parts of the Amateur and Advanced tests:

	MORSE	THEORY	REGS	
AMATEUR CLASS	41%	37%	56%	253 wrote Morse; 397 wrote theory and Regulations
ADVANCED AMATEUR	63%	32%	72%	108 tried Morse, 144 wrote theory and Regulations

VO for the Maritimes?

The VE1 call sign is again being discussed on P.E.I. The three Maritime Provinces are the only ones in Canada that do not have their own permanent call signs. As a result, anyone working a VE1 station doesn't know if he is working a Nova Scotia, a New Brunswick, or a Prince Edward Island station.

Some people find award hunting the most fascinating part of Amateur radio and they are entitled to their preference, regardless of what part of the world they inhabit. They often complain about the lack of identification of separate Maritime Province call signs.

The results of a small poll taken show a sharp difference of opinion among local Amateurs. Operators who do a lot of DX operating were mainly in favour of it. Operators who operate a lot on two metres were mainly against such a change in prefix. Many abstained from voting and a swing of the abstainers to one side or the other could give a majority. One possibility is to extend the VO call sign. This might mean that station VE1XYZ could become VO3XYZ.

On one point the vote was unanimous ... everyone wants to keep the traditional 'V' connection in the call sign and everyone is fed up with temporary call signs. You never know if you are working a Japanese-Canadian, a Canadian-Japanese, or an American celebrating the earth-shattering 71st anniversary of the Discovery of Pickled Eggs in Toledo. There is very little heat coming from N.S. or N.B. for separate prefixes and P.E.I. doesn't seem to be wildly enthusiastic either. As all of the Maritime Provinces would have to agree to a change, don't hold your breath waiting to hear a VO3 or a VO4 on the air.

-Doug Cormier VE1BCN

(We won't, Doug. One vibe we get is that with DOC operating on what bureaucrats call "cost recovery' that the cost of any additional administration wouldn't help the cause of lower licence fees!)

GRS STATIONS IN CANADA

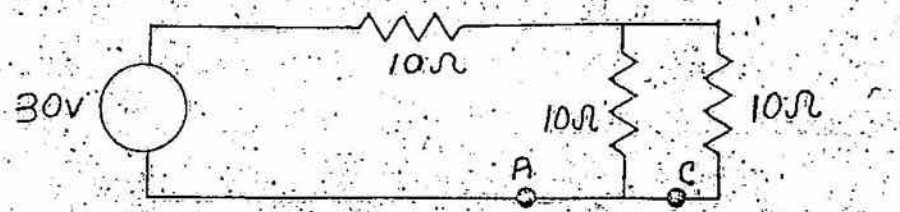
as of September 30, 1978

DOC Region	Station Permits
Atlantic	99,892
Quebec	131,755
Ontario	334,395
Central	227,521
Pacific	100,097
Total	893,660

Amateur Exams

How's your knowledge of radio theory? Try ten out of twelve questions in this quiz.....

1. What would be the current in amperes measured at:
   a) point A?
   b) point C?



2. What is the transformation ratio of a transformer which has an open-circuit secondary voltage of 300V rms when the primary is connected to a 120V, 60 Hz source?
3. a) What are the three basic areas of a junction diode?
   b) Identify the electrodes of an FET transistor.
4. a) What is the principal function of the filter network in a power supply?
   b) Explain how it is possible to rectify an A-C voltage and produce a d-c voltage almost twice the a-c value.
5. Define 100% modulation with respect to an AM DSB signal.
6. With respect to a frequency modulated transmission, define modulation index.
7. In an SSB USB transmitter, the audio input to a balanced modulator contains signals of 100 to 1000 Hz, and the RF carrier input is 14.1 MHz. What output frequency band would be transmitted?
8. When two frequencies are mixed, what frequencies are produced?
9. Why is fixed bias necessary in a transmitter vacuum tube RF amplifier?
10. a) What is the velocity of propagation of radio waves in space?
    b) What frequencies have line-of-sight propagation and are relatively unaffected by the ionosphere?
11. How is a wire antenna made resonant to a particular frequency?
12. a) What are key clicks in a radio transmission?
    b) What effects may they have on other services and stations?

If you came up with the correct answers, Congratulations! You've just passed the DOC Amateur Certificate exam* which was conducted across the country on January 26. The answers are not given here ... you have a Certificate which says you know them. If, however, you missed any, how about buying the CARF Amateur Study Guide and burning a little of the old midnight oil?

As a help to those who will be writing for their Advanced and/or Digital Op. Certificate, here is the January theory exam for both, which may give candidates a 'feel' for the type of questions to be encountered on the May 9th sitting. (Applications for all three exams, by the way, were to be in District Office by April 12.)

*Courtesy DOC HQ. The next set will, of course, have a different set of questions.

ADVANCED AMATEUR THEORY EXAM

Each question had a value if ten points and only ten had to be answered.

1 (a) What is the highest voltage that can be applied to a 5 kilohm, 2 watt resistor, without exceeding its heat dissipating capability?

(b). When an inductor is inserted in a d.c. circuit, what effect does the magnitude of the inductor's resistance have upon:

(i) the initial rate of change of current?

(ii) the final steady state current?

(iii) the time it takes the current to reach its steady state value?

2 (a) What are the characteristics of a series and parallel resonant circuit?

(b) If the secondary voltage of a power transformer was measured at no-load and full-load conditions, the readings would not be equal. Under which condition will a higher reading be obtained? What factors are primarily responsible for the difference in the readings?

3. Draw a circuit diagram of a transistor amplifier in the common emitter configuration.

4. In a power supply, what are the advantages and disadvantages of a choke and capacitor input filter?

5. An operator of a DSB amplitude modulated transmitter reduces the percentage of modulation from 100% to 50%. If the RF input to the final stage was 100 watts, to what level would the applied audio signal be reduced?

6. With respect to an FM modulated transmission, what determines

(a) the amount of deviation of the transmitter frequency?

(b) the rate of change of the transmitted frequency?

(c) With respect to an FM signal, define modulation index.

7. Describe briefly how a ring type or bridge type balanced modulator works, and what signals will be present in the output.

8. Draw a block diagram of a superheterodyne receiver with an RF stage, capable of receiving telephony and A1 telegraphy. If the receiver is tuned to 14,100 kHz, indicate the frequencies present in the various stages. Explain briefly the function of each stage.

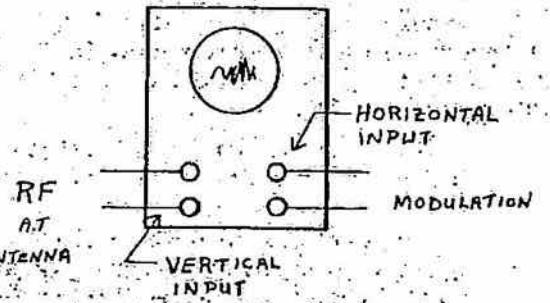
9. Name and describe briefly two methods of amplitude modulating an RF carrier.

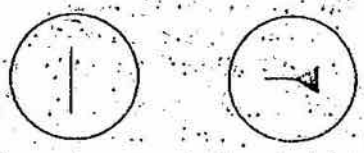
10. The maximum usable frequency for skywave propagation varies for day and night time operation. Explain why it varies.

11. (a) What is the impedance of a folded dipole?

(b) What is the relationship between the length of a transmission line and its characteristic impedance?

12. An oscilloscope is connected to a transmitter as shown below. Under what conditions would the trace be as shown in diagram (a)? diagram (b)





That's the end of the Advanced Ticket exam.

Next time you hear anyone on the air beefing about the 'tough' new DOC exams, read him these questions and then ask him if he really believes they are tough.

For the 'no-code' Digital Operator's Certificate, candidates had to write the Advanced Theory and the Digital Technique (theory) Exam.

As promised by DOC, the Digital Op certificate would not be an easy back door to the Amateur world. Here it is:

Each question had a value of 20 points and candidates could answer any four of the first five questions plus either one of the last two.

1. A. Explain the difference between direct modulation and subcarrier modulation. Use a block diagram.
   B. What is meant by Rayleigh fading? Illustrate the principle with a simple diagram of waveform.
2. A. Describe the function of a modem. Use a block diagram.
   B. Compare frequency shift keying (FSK) with phase shift keying (PSK) by listing the typical data rates in bits/sec that can be derived from a 3 kilohertz channel by each of these two techniques.
3. A. Describe by means of a block diagram the Automatic Repeat-Request (ARQ) error control technique.
   B. What is meant by an end to end acknowledgement on a packet radio network?
4. A. How many terminals can be supported by a 9.6 KB/s channel using the pure Aloha packet radio access mode if each terminal sends on the average one packet per minute? Assume a packet size of 300 bits.
   B. Describe the instability region of this channel by means of a curve of throughput versus offered traffic.
   C. Which routing techniques can be used in packet radio networks?
5. Packets arrive at a repeater according to a Poisson distribution with mean λ. The time taken to service each packet follows an exponential distribution with mean $1/\mu$. A queue forms for the service of this repeater. Plot a curve showing:
   A. The mean delay per packet (vertical axis) against the traffic intensity (horizontal axis).
   B. The average queue occupancy (vertical axis) against the traffic intensity (horizontal axis).
6. A radio channel of 9.6 kilohertz can be shared by a number of bursty traffic sources using 1) FDMA (frequency division multiple access) and 2) pure Aloha random access. Assuming a modulation of 1 bit/hertz compare the above two channel sharing modes on the basis of (state your assumptions): Determine
   A. Maximum number of simultaneous user terminals.
   B. Expendability (i.e. adding additional traffic sources.)
   C. Average and peak data rates.
7. What do you understand by the concept of "resource sharing", in particular, compare the relative "resource sharing" effectiveness of the following access schemes by estimating the number of teletypes that could use a 9.6 KB/S channel simultaneously, using:
   A. FDMA
   B. TDMA
   C. Slotted Aloha.

The time allotted for the Amateur and the Advanced exam was two hours. The Digital ticket was allotted three hours. These times did not include the time used in Morse code tests.

There were 40 questions on Regulations on the Amateur exam and 50 for the Advanced and Digital exams. When CARF pointed out to DOC that publishing the January set would serve both to assist those writing in the future by familiarizing them with the new theory exam format and would allow Amateurs to judge for themselves as to the level of the exams, DOC granted permission to

Continued on Page 41

Recipe for Ham Stew

In which the author finds out that the ingredients of Amateur Radio operating make a pretty wild concoction in the eyes of the uninitiated.

My XYL does a fair amount of operating, but seldom when there are guests in the shack. On the occasion of a visit from her sister, who had never seen Amateur radio before, I suggested that we give her a little demonstration in the bedroom. (For those new to the game, or not too swift, the radio gear was in the bedroom). Now it took a little convincing, but finally she agreed, and we loaded up at 28.6 megs.

I come back to the bedroom and sister-in-law is sitting with a smile of sweet contentment on her face and dear XYL has hooked up with a WB5. Fine business. But then the peaceful setting is shattered and the overalls are deposited in Mrs. Murphy's chowder. The XYL (Dot by name and VE1BIC by number) is telling the American that she is copying him fine. But the sister-in-law sees that Dot doesn't have a pencil in her hand and isn't copying a damn thing. The smile disappears from sister-in-law's face and she looks quite solemn. Oh well!

Next, Dot tells the guy from south of the border that he is a five-by-five. The solemn look disappears. The guy may be fat, but you never tell a complete stranger he is a five-by-five and expect to have a friendly chat. By now sister-in-law is getting a wee bit suspicious of this Mother-turned-Amateur.

The QSO flips back to Dot who in a very matter-of-fact manner advises yon American that her husband is a ham. Cripes Kate! Sister-in-law looks in utter disbelief. How brazen can you get? Now she is knocking her husband! She waits for the next bomb-shell ... and it's not long coming. "I've a guest in the shack". With a look of complete astonishment and consternation sister-in-law looks around the bedroom. Now a palace it's not; but a shack? Shish, by now sister-in-law is fairly sizzling, and one glare from those beady eyes would penetrate three inches of solid steel armour plate at fifty yards. As she hops from the bed, the final blast rocks her socks. Dot says "Here I'll let you talk to my old man". Her knees buckle and she falls back on the bed. Her mind is fogged with visions of murder, at least dismemberment or at the very least, a case for intensive care. Now fibbing a little about copying is not too bad; Calling a complete stranger a five-by-five is a bit hairy; knocking her husband by calling him a 'ham' is not a hanging crime; and the shack does have co-ax coming in over the bed. But when you try to hide your age by saying your husband is your old man that is just more than she can hack. She looks at me expecting to witness immediate violence probably accompanied by the roof falling in. It takes several minutes to convince her that Dot was being nice and that what she heard was just the lingo of the trade.

Would she like another demonstration?

No Thanks!

THE CANADIAN *Contest Scene*

By Sid Kemp VE7BGK

CONTEST CALENDAR

April
7- 8 ARRL Open CD CW
11-12 DX-YL to NA-YL CW
14-15 SP DX Phone
18-19 DX-YL to NA-YL Phone
21-22 ARRL Open CD Phone

May
19-20 ARRL EME Contest
26-27 CQ WPX CW

June
23-24 ARRL Field Day

By the time you read this, WPX and the new shortened versions of the ARRL DX Test will be over. March is certainly the most taxing month for the serious contester. At the time of writing, however, I am still anticipating the beginning of this marathon. As a result, the next few issues will have high claimed scores and a summary, so please send me your high claimed scores and any comments as soon as possible. The address is: 4743 Belmont Ave, Vancouver, B.C. V6T 1A8.

This month features an article by Henry VE7WJ, who can be found in the winner's circle of any contest his station enters. More recently, his station has proved its ability as one of the top 'Multi Multi' stations in the world. In this column, Henry traces the development of his station, offering an insight into the process of experimentation and trial and error that goes into the development of a top contest station.

Handy Hints

LISTEN. Spend a little time, the week before the contest, listening to the band or bands you intend to operate. Note when it closes, opens and to what part of the world it is opening to. Also take a listen to WWV's hourly propagation forecasts.

MAKE A GAME PLAN. After listening to the band, you should have a rough idea of what to expect, so make a rough outline of what to work when. For example, if in your previous listening you find the band to be open to Asia from 2200 to 0200 Z, then your plan should remind you to beam in this direction. The plan should also include an idea of when the band dies, which is when you should take your breaks. Remember that propagation can unexpectedly change, so be flexible. If in the contest you find some unexpected opening, take advantage of it.

LOGS AND MULTIPLIER CHECK SHEETS. Get some logs, preferably the ones the sponsor of the contest will send you if you mail them a SASE. But if you can't get them in time, any log sheets will do. Lastly, make up a check list that you can enter all the multipliers in that you have worked. This will serve as a quick reference to indicate if you need that multiplier you hear.

AVOID SEARCHING. So when do you look for multipliers and when do you run stations? The answer to this is one that you will decide as you get more experienced at contesting. What I can suggest is that if you can work stations at a good rate (60 or more an hour), don't search -- stay and run the stations. Surprisingly, most of the multipliers will call you. If your rate drops well below this rate, then it may pay you to do some searching for multipliers.

BE EFFICIENT. Don't repeat calls unless it's necessary. The shorter and quicker your exchange, the more exchanges you will be able to make and thus the more contacts you will end up with when it's all over. If a station calls you and you're not sure of his call, don't say, "the station with 'Y' in your call, sign again please". Instead say, "The station with 'Y' in your call sign, you are 59 001." This way the other station gets his report, and when he calls back to give you your's, you will get his call sign.

Antennas for Contesting

OR SERIOUS DXING

By Henry Thel VE7WJ

I started building antennas 28 years ago. The first one was a simple dipole, but not for long. Someone said, "try long wires," (What? In the city?). The neighbours in those days seemed to be a lot more understanding, especially when a teenager pleading that a longwire ent-enna was needed to hear foreign broadcasts asked, "Can I use your roof peak or tree?". Then, even the hydro men would help you put up antennas. Now they help to remove them!

I lived in the centre of the block, so that made it easier to put up three longwires. They went north and south and one went east-west over one street and over the top of six houses. When the wire went over the Hydro power lines, they supplied me with insulated wires!

In 1954 I heard about wire beams. I built them out of 2x4's for the boom and 2x2's for the elements, on which I taped copper. Between my neighbours, on either side, and our own house, I had three beams, two elements on 20, two elements on 15 and four on 10 metres; one on either house. I used a steering wheel to rotate them. I had to run outside and turn the wheel on the neighbours' houses to rotate my 20 and 15 metre antennas. My 10 metre antenna steering wheel angled through my bedroom window. Don't ask what the SWR was, I never heard of the fellow before!

on Contests

By Sid Kemp VE7BGK

TAKE SHORT CUTS IN LOGGING. Only write the time out in full once per page, then for each contact you need only write the last two digits. If you worked several stations in one minute, write the time beside only the first one. You will find that most of the reports you will receive and give will be 5 and 9, so use the ditto sign extensively. Lastly, if you can train yourself to print and speak at the same time, you will find it to be a tremendous advantage.

BE PERSISTENT AND CONSISTENT. When your rate drops off, don't be discouraged. Every station experiences lull periods when no-one is calling them. Be persistent, call CQ, break into QSOs (politely), look for multipliers, but whatever you do, don't give up. How an operator performs in these periods may well determine if he wins. Don't worry if you only work 10 or 20 in an hour, that may well be 10 more than your competition.

'DUP' SHEETS. The use of check sheets, to see if you have worked a station, depends on your rate and the contest. For WPX, if your rate is good I wouldn't use one. When you start running three or more stations a minute, it quickly becomes impossible to both record the call signs in the log and the dup sheet.

ANTENNA. If after reading all this you have decided that you don't have the signal to make a go of it, think again. A lot of the top contestants' antennas probably aren't any different from yours. VE7CC uses a tribander beam, VE5DX for a long time relied on a CL36, K7SS uses a TH6 DXX. If after the contest is all over you still think you need a better antenna, read the above article by Henry VE7WJ on antennas for contesting and serious DXing.

EXPERIENCE. This is one of the key elements to success in contesting. It can't be obtained instantly or by anything anyone can tell you, but rather through your own efforts. So get out there and get some experience!

I hope these hints will be of some help to you. Good luck and please send in your logs and drop me a note with your score so I can publish it.

73 and hope to see you in WPX — Sid VE7BGK.

Then in 1958, I learned what winds can do to a wooden beam; I lost all three. My folks said no more antennas, so back to the drawing board. I moved to Arizona and then to California, where one didn't need a beam because the bands were open 20 hours a day. In W6 and W7 land I had fixed two-element beams. Then I moved to W1, W2, VE1 and VE3. From these locations I began to believe that there was nothing else but Africans and Europeans. Then in 1964 came the rude awakening. I was now back in Vancouver where there were no signals, except W6's and some JA's. It was then that I started to think seriously about DXing antennas and contesting (what a dumb time to start).

I started with a three element triband at 32 feet. Soon after came a four element tribander on a 48-foot tower which was not much better. Next I put up a TH6DXX on a 72-foot tower. Wow! Results at last! My first contest with results was the 1965 VE/W. After the contest was over the incentive was there to improve. During the winter months I built beams and extended my towers, just to keep warm! It was then that I met Dale VE7SV (now ZF1SV and VE8RR) who told me the antennas weren't large enough. I took his word to heart and changes were made.

I believe I was the first in Canada to build an aluminum 'Xmas tree', In 1967 I had a five element 20, five element 15, five element 10, a two element 40 and a two-metre vertical. All were spaced 5 1/2 feet apart on a 4 1/2 inch OD mast. The tower grew to 78 feet, guyed six ways on the top and six ways at the 48-foot level. I had a reduction gear and electric motor in a 3 1/2-foot-long steel box. All this was on a 66 X 120 foot lot. In addition I had a 1/4 wave vertical on 80 metres with the radials in the neighbours lawn.

With new ideas on the drawing board I took the whole thing down in 1971. I had a new idea for more towers on some acreage. The result was my present QTH, which is 200 feet above sea level. In April of 1972 I poured the first tower footings of what seemed to be my final antenna building program. Lee then VE7 BDJ, now VE7CC, helped in erecting the 105 ft 15-metre tower and the 115 ft-40 metre tower. By the end of July 1973 I had three elements on 40 at 115 ft on a 51-foot boom which was interlaced with a six element 10 metre beam. As well, I had six on 15 metre at 105 feet and six on 20 at 120 feet plus a 1/4 wave vertical on 80 metres. Finally, a 58-foot tower holding three elements on each of the high bands. That's when I learned the value of 2 beams on the same band at different heights. Lee, VE7CC, plus many others, including myself, did a terrific job in different contests over the years.

In the Winter of 1974, we had winds of peaks up to 130 mph, which removed two elements of my 40 metre beam (2-inch diameter elements, 1/16-inch wall). As well, it removed two elements on the six element beam and broke the small tower with the 3 beams.

In 1975-6 I rebuilt, using much heavier material (heavier than telrex) and I also added two more towers and verticals and slopers. As of 1977 I had a three element on 40 with a 44-foot boom at 115 feet. Seven feet above it I have six elements on 10 metre on a 36-foot boom on a separate rotator above the 40 meter beam. A six element on 20 on a 60 foot boom at 135 feet, six on 15 on a 47 foot boom at 105 feet, four on 15 at 66 feet, four on 15 at 68 feet and four on 20 at 73 feet on a 38-foot boom. (Nine towers in all)

In addition I have two 80-metre verticals --one on the ground and one elevated with the base at 55 feet -- a 160 metre inverted vee with the apex at 110 feet and a 160 metre 'E' antenna, and lastly an 80 metre sloper.

Some final comments: yes, I have tried quads, but I just can't keep them up. We just had another windstorm and I'm happy to report that everything is still AOK. After all my years of experience I can tell you the QTH is No.1. I would say you can gain about two 'S' units if you are surrounded by saltwater, like a small island or like VE7BC up 1000 feet with a sharp drop-off to the salt water. Another example is W7RM up 400 feet and surrounded by salt water for 200 degrees. (Get yourself your own island in some ocean and you are bound to be a winner without big antennas!)

Yes, I did have access to a machine shop and a steel company! It goes without saying that without this my antenna farm would not exist.

VU

Continued from Page 29

over his plant that was then under construction and which is destined to make plastic fibres. He subsequently arranged a meeting with other Baroda Amateurs at the home of VU2XX, Wishvas P. Patil.

I also bumped into I2BCL, Luciano, who is a technical representative for a firm specializing in chemical process analysers. Quite an international gathering really, on the roof of Patil's home. His shack is also on the roof and his enormous homebrewed beam is shown in the accompanying photograph. We met VU2XX, VU2XO, VU2XW (Arvind), VU2AT (Ashok) and VU2MMD (Dixit). Rayu VU2YY was unable to be present that night but he did entertain us royally on another evening. Rayu is a most pleasant chap and runs a large chemical company and glass works.

During my stay, Patil VU2XX placed his station at the disposal of the visitors from Canada and Italy, and his hospitality knew no bounds. All the Amateurs in Baroda made me feel very welcome indeed.

I worked many Canadians on the 'long path' from India during my brief stay, together with contacts to most parts of the world. It was amazing to find so many people who had not worked India, particularly the Australians. I think it was Ron VE3AUM in Ottawa who made the comment that "in 20 years of working DX I have not spoken to VU2 land for more than 20 seconds at a time!", so I guess we achieved something Hi!

It was fascinating to be 'DX' myself for a while; I must admit it was a terrific thrill to call "CQ Canada" and have VE4EA in Winnipeg come back to me after only a very brief call. That really opened the floodgates.

A thank you to VE3AMH, VE3AUM, VE3SW and others for 'services rendered'.

Exams

Continued from Page 36

print them. Obviously the next set of exams will not be the same as those published here.

Some District Offices are now permitting Morse Code tests to be taken and credited separately. One Ontario office is holding code tests on the last Friday of each month. Check with your District before writing.

Advertisers' Corner

February's TCA got us off to a terrific bang, and we have more to come with each issue. So, advertisers, keep that copy coming. Spring is just around the corner, and now is the time for that extra space. Your May deadline is March 31.

Swap * Shop

Single insertion is $1.00 (minimum charge) for 10 words and $1.00 for each additional 10 words. To renew, send copy and payment again. Deadline is first of month preceding publication.

Put your membership number and call (not counted), if any, at the end of your ad. Print or type your ad and include your address with postal code. If using a phone number, include the area code. CARF and The Canadian Amateur accept no responsibility or liability for content or matters arising from ads.

Send to CARF, Inc., Box 356, Kingston, Ont. K7L 4W2.

FOR SALE: New Atronics CR101 Code Reader. $185.00. VE4QU, Ashton Ave., Winnipeg, R2M 1E2. Ph. 204-253-9854.

CIRCUIT BOARDS: Single sided, glass epoxy or phenolic from your artwork or magazine article. Send your requirements for a quote - G. Coulombe VE2HY, 127 Hastings Ave., Pointe Claire, Que H9R 3P4.

FOR SALE: KLM Multi-2000 transceiver. Price -- Negot. Contact Gord Woroshelo VE3EYW, 15 Grandmont Cres., Sault Ste. Marie, Ontario P6B 3W1 (705-942-4283).

WANTED: SB-104A Transceiver, SB-604 Speaker, HP-1144A Power Supply, SB-634 Console, SB-644A VFO; VE3GTF, Glentassie Farm, Box 100, Green Valley, Ontario K0C 1L0.

Advertiser's Directory

For the convenience of our readers, we list those advertisers who appear in this issue of TCA. Remember, when responding to advertisements, say you saw it in TCA - The Canadian Amateur.

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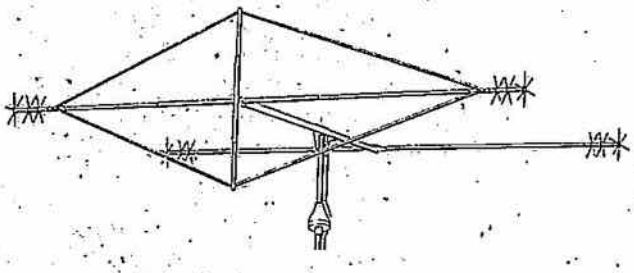

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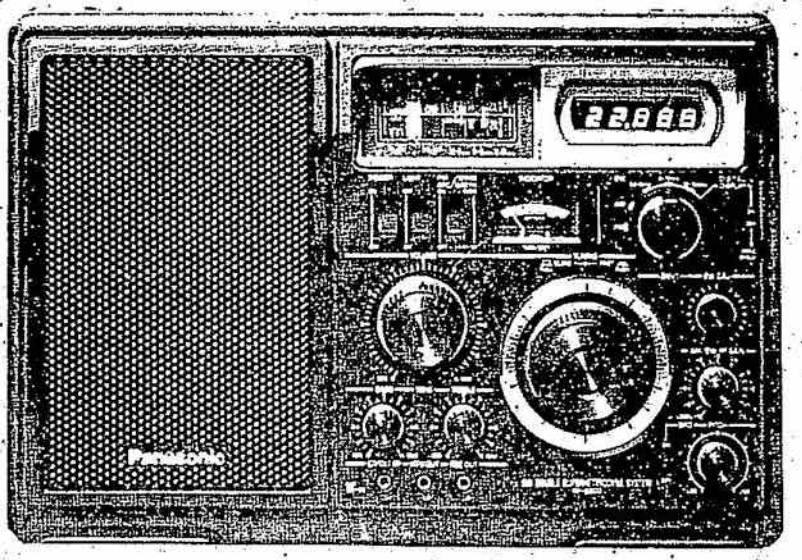

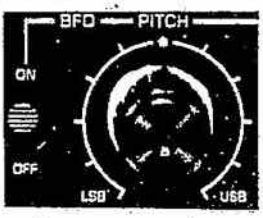

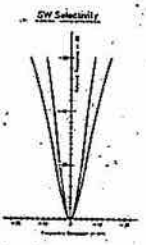

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CARF

The Canadian Amateur Radio Federation Inc. is incorporated and operates under a federal charter, with the following objectives:

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

OFFICERS

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Imm. Past Pres.	VE2DNM	John M. Henry
Vice-President	VE2NM	Fred Towner
Secretary	VE3FVO	Joan Powell
Treasurer	VE3NB	Bernie Burdsall
General Manager	VE3AHU	Art Blick

BOARD OF DIRECTORS

(If you want to contact the Federation, write or call a Director in your region or write to CARF, Box 356, Kingston, Ont. K7L 4W2.)

VE7BBQ Peter Driessen, 1946 York Ave., Apt. 203, Vancouver, B.C. V6J 1E3, 604-732-3298.
VE6VF Stella Broughton, Ellersleid, RR3 South Edmonton, Alta.
VE6HO Jim McKenna, Box 703, Ft. McLeod, Alta. T0L 0Z0.
VE5YY Martha Pankratz, 1212 Temperance St., Saskatoon, Sask. S7N 0N9.
VE3GCP Fred Robinson, 126 West 19th St., Hamilton, Ont. L9C 4H6.
VE2RA Gene Lajoie, RR 2 Perkins, Que. J0X 2R0.
VO1NP Nate Penney, Box 10, Shoal Harbor, Nfld. A0C 2L0.
VE2PY Bob Rocleau, 1050 Churchill, Mount Royal, P.Q. H3R 3B6.

CARF News Service Stations

Your Federation is looking for individual and club stations to broadcast news items and information of interest to Canadian Amateurs.

As bulletins become available, they will be sent as quickly as possible to 'Official CNS Stations', appointed by the CARF Executive from time to time to give the best geographical coverage. A variety of modes and frequencies will be used to transmit bulletins at regular times and dates.

Stations wishing to participate in this new CARF service for Canadians can contact CARF, Box 356, Kingston, Ont. K7L 4W2 for full details.

WANTED:

For TCA: News Items, Pictures, Original Stories, Technical Articles!

Make pocket money by writing for The Canadian Amateur!

Technical articles are especially welcome. We can use simple construction projects, antennas, hints and kinks, explanations of the theory and practice of modern Amateur operations and equipment.

Photos should be glossy black & white prints, although we can use colour prints. Written material should be typed, double spaced. Legible handwriting is acceptable. Finished artwork and drawings will add to the value, but sketches and rough drawings are acceptable.

Technical material only: Technical Editor, CARF Inc., Box 356, Kingston, Ont. K7L 4W2.

All other material: Editor TCA, 151 Fanshaw Ave., Ottawa, Ont. K1H 6C8.

VE3VCA

Thursdays
0030-0130 Z 14.060 MHz CW
0130-0230 Z 14.160 MHz SSB
Saturdays
1900-2000 Z 14.060 MHz CW
2000-2100 Z 14.160 MHz SSB
Sundays*
1500-1600 Z 14.060 MHz CW
1600-1700 Z 14.160 MHz SSB
*Third Sunday of each month only.

Note that the Thursday Zulu times are Wednesday evening or afternoon in Canadian time zones. During the months when most of Canada is on Daylight time, operating hours will be one hour earlier 'Z' time, thus the same local time for those regions of Canada on DST.

All frequencies are plus or minus a few kHz of the listed frequency if interference is encountered. VE3VCA is operated by volunteers from the Kingston, Ont. ARC.

Infosection

CARF Bulletin Station sked

CARF Newsletters and News Bulletins will be heard over VE3TCA the first official CARF News Service Station, utilizing the facilities of VE3OCU, Carleton University Ottawa, on the following sked:

14.140 MHz SSB Sundays 1745 GMT
14.080 MHz TTY Sundays 1830 GMT
14.070 MHz CW Sundays 1930 GMT
3.755 MHz SSB Sundays 2300 GMT
3.590 MHz CW Tuesdays 0100 GMT
3.610 MHz TTY Tuesdays 0130 GMT

Carleton's three repeaters will also transmit the bulletins simultaneously on MCW using their own call sign VE3OCU on 146.85 MHz, 224.94 MHz and 53.15 MHz on Wednesdays at 0100 GMT. (Note that GMT times for Tuesdays and Wednesdays are Monday and Tuesday in Canadian time zones.)

With the advent of Daylight Time in the summer, the GMT times will be one hour earlier, thus local times in areas which use DST will be same as now.

Free QSL Service for members

1. Sort QSLs by prefix and stack face up in a single stack.
2. Keep weight of one parcel under one pound. Parcel carefully and seal securely.
3. Put your name, call, etc. in upper left corner
4. Put your CARF membership no. in lower left corner.
5. Send to CARF QSL Services, P.O. Box 66, Islington, Ont. M9A 4X1.
6. Do NOT register parcel. This causes delay.
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CARF Logo Adhesive Labels and Window Decals are available from CARF, Box 356, Kingston, Ont. K7L 4W2. Size: 6 x 2 1/2". 4/$1.00.

Name Badges

Name Badges: Hot stamped foil logo in vivid Royal Blue on a White background with your name and call in contrasting Black. Size: 3 x 1 1/2".

BANNED COUNTRIES LIST

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

** 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.

THIRD PARTY TRAFFIC AGREEMENTS

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

RECIPROCAL LICENCING AGREEMENTS

Barbados, Belgium, Bermuda, Brazil, Columbia, Costa Rica, Dominica, Dominican Republic, France Ecuador, Federal Republic of Germany, Guatemala, Honduras, Israel, Peru, Luxemburg, Netherlands, New Zealand, Norway, Nicaragua, Phillipines, Poland, Portugal, Republic of Panama, Senegal, Sweden, Switzerland, United Kingdom, U.S.A., Uruguay, Venezuela, Denmark, Iceland and Finland.

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.

CARF

Order Form

Please send Certificate, The Canadian Amateur, with free QSL service, as a CARF:

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CARF LOGOS (6"x2½") adhesive sticker ☐ window decal ☐ 4/$1 ____
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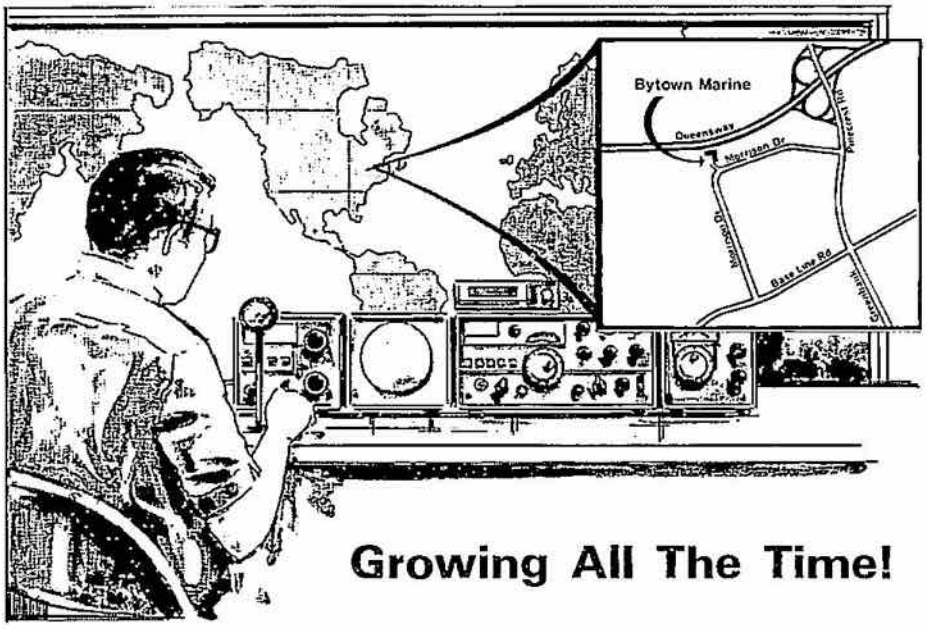

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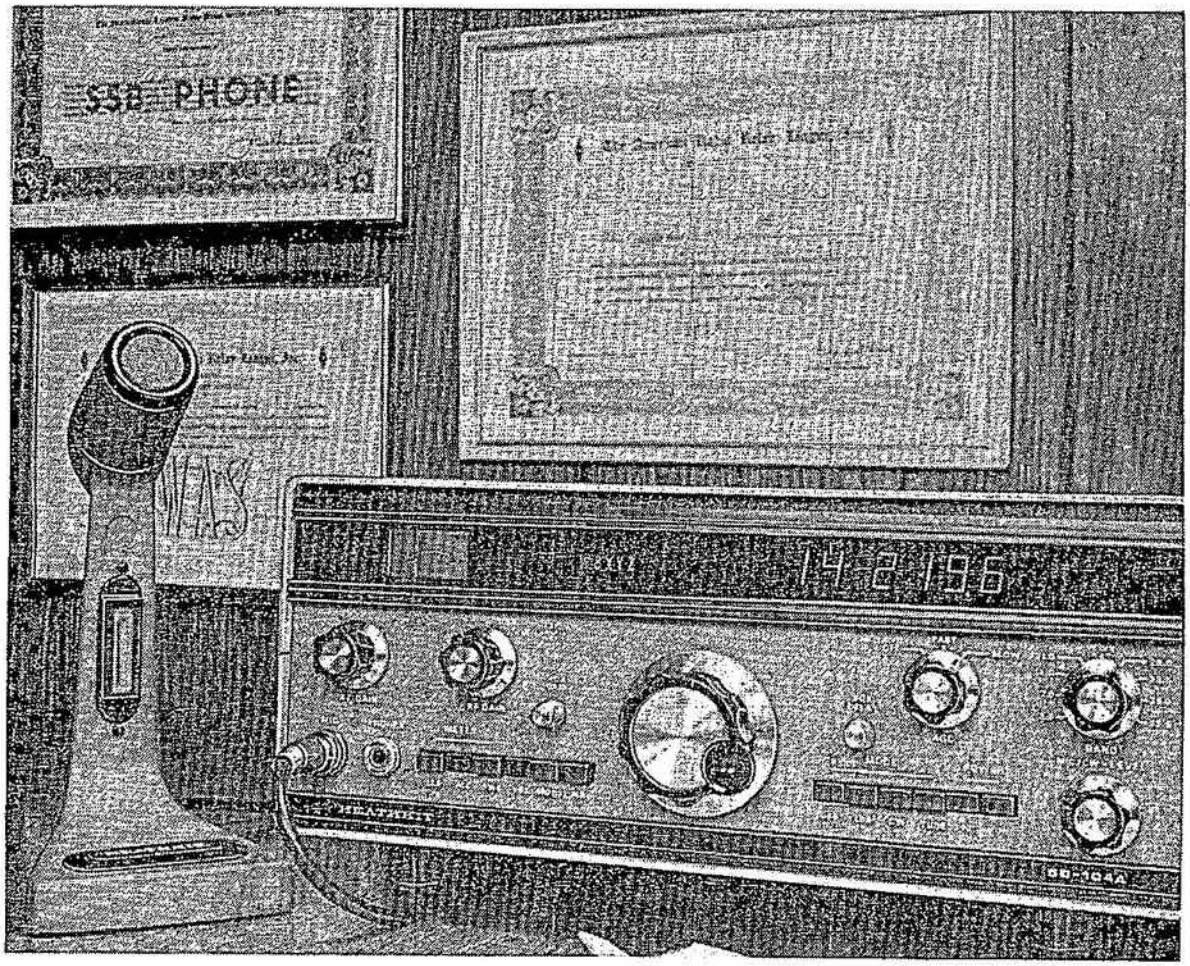

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