

Second Class Mail
Registration Number
5073

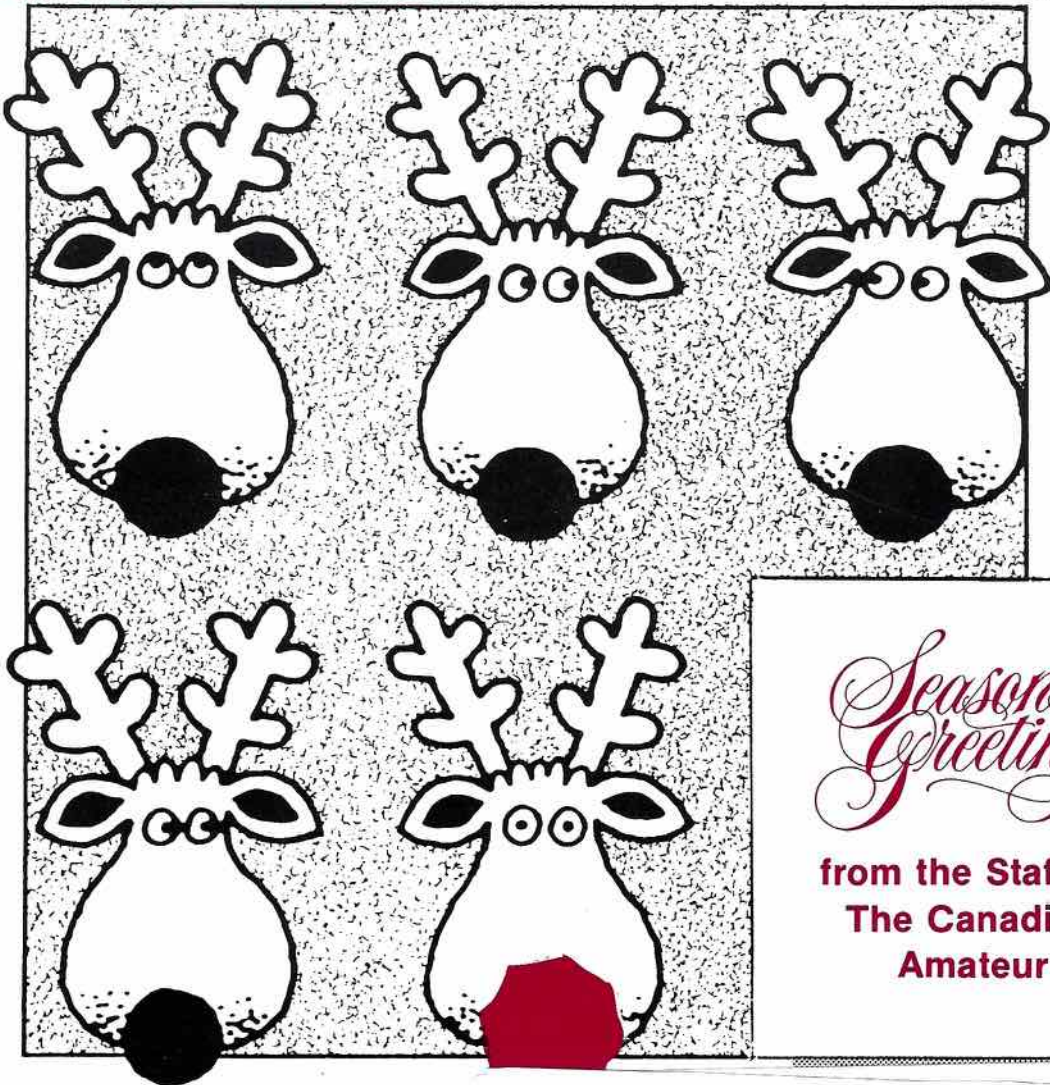
THE CANADIAN AMATEUR

\$250

Canada's Amateur Radio Magazine

La Revue des Radio Amateurs Canadiens

DECEMBER 1989



*Season's
Greetings*

from the Staff of
The Canadian
Amateur

1990 CALLBOOKS



North American Edition **\$39.00**

International Edition **\$41.00**

PACKAGE DEAL:

1 each NA & INTL Editions **\$69.95**

Supplement (available July 1990) **\$14.00**

[B.C. Residence add 6% PST

Prices include shipping To Callbooks and Supp. only.]

The 1990 ARRL HANDBOOK



This is the most comprehensive edition since the **Handbook** was first published in 1926. The sixty-seventh edition contains over 1200 pages and over 2100 tables, figures and charts. Added to this edition are new antenna projects including three high-performance Yagis for 144, 220 and 432 MHz designed by Steve Powlishen, K1FO. Dick Jansson, WD4FAB, has completely revised the space communications chapter, which includes his innovative helical array for AO-13 Mode L.

\$28.00 plus \$2.00 shipping

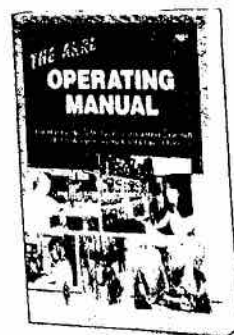
The ARRL ANTENNA BOOK



The *Antenna Book* contains over 700 pages and 987 figures covering everything from antenna fundamentals to spacecraft antennas. You'll find a host of antenna projects ranging from dipoles to high performance yagis. The *Antenna Book* can't be beat.

\$22.00 plus \$2.00 shipping

The ARRL OPERATING MANUAL



The *ARRL Operating Manual* was written by hams for hams. With 688 pages, it is packed with tips on basic operating, repeaters, packet, DX, traffic, emergencies, VHF/UHF, satellites, contests, RTTY and awards. You can learn what it takes to become a top operator.

\$18.00 plus \$2.00 shipping

COM-WEST carries an extensive stock of various publications.
Call or write us for a complete listing.

**COM-
WEST**
Radio Systems Ltd.

(604) 321-1833

Fax: (604) 321-6560

8179 Main Street Vancouver, B.C. V5X 3L2

Store Hours:

Monday - Thursday
Friday
Saturday

(PST)

9:00 am to 5:00 pm
9:00 am to 6:00 pm
9:00 am to 4:00 pm

THE CANADIAN AMATEUR

Canada's Amateur Radio Magazine

CIRCULATION OFFICE

CARF Head Office
P.O. Box 356,
370 King St. West,
Kingston
Ont. K7L 4W2
613-545-9100

EDITOR

George Sansom VE3GWS

ASSISTANT EDITOR

Debbie Norman

COLUMN EDITOR

Clayton Bannister VE3LYN

CONTEST SCENE

Dave Goodwin VE2ZP

CROSSWAVES

Ralph Cameron VE3BBM

AFFILIATE CLUBS

J.P. LeBlanc VO1SK

CQ DX CQ DX

Paul Cooper VE3JLP

QRP COLUMN

Moe Lynn VE6BLY

YL NEWS AND VIEWS

Cathy Hrischenko VE3GJH

LISTENING TO THE WORLD

Sheldon Harvey

ARES

Bob Boyd VE3SV

LINE OF SIGHT

Robert Smits VE7EMD

NYBLES & BITS

Antonio Salvadori VE3NXQ

PACKET RAP

Bernie Murphy VE3FWF

IARN NEWS

Glenn Baxter K1MAN

OVER THE HORIZON

Bob Brown NM7M

TECHNICAL EDITOR

Bill Richardson VY1CW
36 Range Rd.,
Whitehorse, YT Y1A 3V1

LOOKING AROUND

Art Blick VE3AHU

THE GAIN GAME

Gerry King VE3GK

INDEXING

Bill Watts VE3DWW

ADVERTISING

REPRESENTATIVE

Don Slater VE3BID
RR 1 Lombardy, Ont. K0G 1L0
613-283-3570

PRODUCTION

Steve Campbell,
County Magazine Printshop Ltd.
P.O. Box 30, 71 Main St.
Bloomfield, Ont. K0K 1G0
613-393-3355

Please address correspondence to the
Editor at Box 356, Kingston, Ontario K7L
4W2, telephone 613-545-9100.

EDITORIAL, VE3GWS	3
LETTERS	4
FEATURES	
Broadcasting Bill tabled	5
Ionospheric Disturbances and World War II, NM7M	7
Hands across the Sea, BZ5TU	10
International 'Code Free' Ham Experience	12
IARU Region 2 10th General Assembly	15
Radio Technology and World War II, VE7AHB	16
The Shack Handbook, VE3DQB	18
Operating Aid— Antennas	20
Canada Winter Contest	22
SWAP SHOP	17
CQ DX CQ DX	27
CONTEST SCENE	29
LISTENING TO THE WORLD	31
NYBLES & BITS	33
ARES COLUMN	36
QRP COLUMN	38
YL NEWS & VIEWS	39
PACKET RAP	40
LOOKING AROUND	42
GK ANTENNAS	44

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

Unsolicited articles, reviews, features, criticisms, photographs and essays are welcomed. Manuscripts should be legible and include the contributor's name and address. A signed article expresses the view of the author and not necessarily that of C.A.R.F. Publications Limited.

The contents of this publication are copyright and may not be reproduced without prior consent except by a bonafide Amateur organization which may reproduce them provided the source is acknowledged.

The Advertisement Department of The Canadian Amateur on behalf of the magazine wholly disclaim any responsibility for the content of any advertisement contained herein and make no representations on behalf of The Canadian Amateur as to the truth of any statement contained in any such advertising.

C.A.R.F. Publications Limited and the publisher and editors of The Canadian Amateur hereby disclaim any responsibility for any statement of opinion or other statement that may be contained in any article published by The Canadian Amateur and any such statement of opinion or other statement contained in such article is solely the opinion of the author of the article and not that of C.A.R.F. Publications Limited, the publisher or editors of the magazine unless it is specifically stated to be the case therein.

The Canadian Amateur is published by C.A.R.F. Publications Limited, 370 King St. West, P.O. Box 356, Kingston, Ontario, Canada K7L 4W2. It is recommended by the Canadian Amateur Radio Federation Inc. and its members receive it automatically. Indexed in the Canadian Periodical Index: ISSN 0834-3977.

Second Class Mail Registration Number 5073



INC. EXECUTIVE

C.A.R.F. PRESIDENT

John Iliffe VE3CES, 387 Selby Crescent, Newmarket, Ontario L3Y 6E2
(416) 898-4875

PAST PRESIDENT

Ron Walsh VE3IDW, 869 Haverhill Dr., Kingston, Ont. K7M 4V1
(613) 389-3301

VICE-PRESIDENT

Clayton Bannister VE3LYN, 705 Fleet St., Kingston, Ont. K7M 5A4

SENIOR VICE-PRESIDENT

Earle Smith VE6NM, P.O. Box 412, Grande Prairie, Alta. T8V 3A5
(403) 532-4279

GENERAL MANAGER

Bernie Burdsall VE3NB, Box 356, Kingston, Ont. K7L 4W2

TREASURER

R.K. (Bob) Wanless VE3PSC, Box 356, Kingston, Ontario K7L 4W2

SECRETARY

Eric Ilott VE3XE, RR3 Yarker, Ont. KOK 3N0 613-378-2590

HONORARY LEGAL COUNSEL

Timothy Ray VE3RBK, Hughes, Laishley, Barristers & Solicitors,
116 Lisgar St., Suite 600, Ottawa, Ont. K2P 0C2 (613) 236-7333

MID-WEST DIRECTOR

Norm Waltho VE6VW, Box 1890, Morinville, Alta. T0G 1P0
(403) 939-3514

ONTARIO DIRECTORS

Dan Holmes VE3EBI, 33 Crownhill St., Gloucester, Ont. K1J 7K5
(613) 746-0968

QUEBEC DIRECTOR

PACIFIC DIRECTOR

J.F. Hopwood VE7AHB, 1209 Kilmer Rd., North Vancouver, B.C. V7K 1P9
(604) 985-1267

ATLANTIC DIRECTOR

Nate Penney VO1NP, P.O. Box 10, Shoal Harbour, Nfld. A0C 2L0
709-466-2931

ASSISTANT REGIONAL DIRECTORS

Stuart Harvey VO1CO
Susan Harvey VO1OI
R.G. White VO1RW
Dr. Roger Côté VE1BWC
Jeannine Côté VE1BWP
Burt Amero VE1AMA
Geoff Smith VE1GRS
Camille Tremblay VE2DNO
Tony Pattinson VE2KM
Ben Cuperman VE2LRB
Antonietta Avanzini VE2AAV
Gordon Roberts VE3IMA
Mel Brown VE3ACD
Barry Baggs VE3IVV
Charles Baker VE3PAP
Hans Zekai VE3ZHM
Cecil Fardoe VE4AEE
Max Geras VE4IX
Malcolm Timlick VE4MG
Vic Allen VE5AE
Bjarne Madsen VESFX
William J. Wood VE5EE
Bob Shehyn VESFY
Ken Schneider VE6COH
David Roberts VE6XY
Jim McKenna VE6SU
Gene Graham VE7GAS
Vol Riley VE7EYG
Larry Reid VE7LR
George Stephens VE7YF
Tony Van Wouw VE7CCI
Jim Voight VE7CWC
Hu Reijne VE7CHW
Ron McFayden VY1AD

WHAT IS C.A.R.F.?

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

C.A.R.F. Committee

Chairmen

D.O.C. Liaison— Bill Wilson VE3NR

News Service

Bernie Burdsall VE3NB, Box 356, Kingston, Ont. K7L 4W2

Electromagnetic Interference— Ralph Cameron VE3BBM
CSA Committee

Ivor Nixon VE3IHN, 17 Romney Rd., Islington, Ont. M9A 4E9

Canada Winter Contest

J. Parsons VE6CB, RR#1 Oxford Mills, Ont. K0G 1S0.

Canada Day Contest

John Clarke VE1CCM, 16 Keele Ave., Sydney, N.S. B1R 2C7.

CARF Awards

Awards Manager, P.O. Box 356, Kingston, Ont. K7L 4W2

Reciprocal Licencing & International Affairs

Francis Salter VE3MGY

Publications Committee— John Iliffe VE3CES

RABC Land Fixed and Mobile Committee

Paul Cooper VE3JLP

C.A.R.F. QSL Service

Jean Evans VE3DGG, P.O. Box 66, Islington, Ont. M9A 4X1

Government Relations

Dan Holmes VE3EBI, 33 Crownhill St., Gloucester, Ont. K1J 7K5

CARF Head Office

Debbie Norman, Office Manager (613) 545-9100

EDITORIAL

At Christmas Time

By George W. Sansom VE3GWS

Season's Greetings from the Staff of *The Canadian Amateur*.

We hope you have enjoyed our offering as much as we have enjoyed putting it together.

At this time of year our thoughts turn to all the good things that have happened in the past 12 months. We at *The Canadian Amateur* have been particularly fortunate; our magazine has continued to grow and the wolf has been kept from the door. My special thanks to all the columnists and contributors. You come from all over Canada and the U.S. and really make my job easy.

But... what will the next year bring? We have tossed the question around quite a bit over the last few months and are still studying the situation. It has been suggested that we should increase to 12 issues per year or possibly upgrade to a colour cover. These choices are being weighed and studied. Both would cost money. Lots! How do we fund them without either reducing the number of pages or raising CARF Membership dues. What do the members want? Less for more, or maintain the status quo and retain the current fee structure? I'm open to suggestions.

With that I leave you and pass along the best of Season's Greetings from the Staff at *The Canadian Amateur*.

Assistant Editor/Professional Spell Checker— Debbie Norman;

Column Editor— Clayton Banister;
Technical Editor— Bill Richardson;
Bulletin Editor— Bernie Burdsall;
Production— Steve Campbell and crew at County Magazine...

MERRY CHRISTMAS AND A
HAPPY NEW YEAR ■

DOC STARTS PREPARING FOR WARC '92

The first preparatory meeting of the Canadian Preparatory Committee for the World Administrative Radio Conference to be held in 1992 was held in Ottawa on Oct. 3, 1989.

In its invitation to take part in the meeting, DOC advises that this conference is expected to deal with frequency allocations in certain parts of the spectrum, taking into account resolutions and recommendations of the HF Broadcasting and the Mobile Services Conferences, both held in 1987 and the Space Services Conference held in 1988.

The ranges of spectrum which DOC says "could be considered" by WARC '92 are 2-30 MHz, 500 MHz-3 GHz, 12.7-23 GHz and 20-30 GHz.

We should certainly expect all Amateur bands to be subject to scrutiny at WARC '92. As recommended in CARF bulletins, Canadian Amateurs should start now to organize their views and get them to CARF and CRRL for presentation to the Preparatory Committee.

Dr. Bruce Gracie, Head of WARC/CCI Affairs in the International Relations Branch of DOC will be heading up the preparatory work. CARF will keep you informed regarding the progress made in this preparatory work.

LETTERS

ORBITAL ELEMENTS

Is it possible to publish, monthly, the orbital elements of the most important satellites, as Oscar-10 and Oscar-13? I think it will be very useful for many radio Amateurs who use the satellites.

I hope that you can do this and I thank you very much in anticipation.

Eugene Baggia VE3OYT

The Orbital Elements are available on all WORLI type Packet BBS's in North America. The charts listed here were obtained from that system and come to us from W3IWI... Editor.

HR AMSAT Orbital Elements for OSCAR Satellites from WORPK, Indianola, Iowa, Oct. 16, 1989.

Satellite: AO-10
 Catalog number: 14129
 Epoch time: 89281.27063449
 Element set: 432
 Inclination: 25.9445 deg
 RA of node: 240.4299 deg
 Eccentricity: 0.6036744
 Arg of perigee: 82.8035 deg
 Mean anomaly: 338.1676 deg
 Mean motion: 2.05882809 rev/day
 Decay rate: -6.3e-07 rev/day²
 Epoch rev: 4754

Satellite: UO-11
 Catalog number: 14781
 Epoch time: 89284.10753364
 Element set: 526
 Inclination: 97.9904 deg
 RA of node: 339.4958 deg
 Eccentricity: 0.0013494
 Arg of perigee: 320.3445 deg
 Mean anomaly: 39.6907 deg
 Mean motion: 14.64112723 rev/day
 Decay rate: 2.538e-05 rev/day²
 Epoch rev: 29950

Satellite: FO-12
 Catalog number: 10909
 Epoch time: 89280.46642003
 Element set: 173
 Inclination: 50.0162 deg
 RA of node: 313.1889 deg
 Eccentricity: 0.0010955
 Arg of perigee: 268.6628 deg
 Mean anomaly: 91.2950 deg
 Mean motion: 12.44401240 rev/day
 Decay rate: -2.5e-07 rev/day²
 Epoch rev: 14338

Satellite: AO-13
 Catalog number: 19216
 Epoch time: 89280.07958878
 Element set: 49
 Inclination: 57.1815 deg
 RA of node: 187.6673 deg
 Eccentricity: 0.6809834
 Arg of perigee: 212.8443 deg
 Mean anomaly: 75.8148 deg
 Mean motion: 2.09699553 rev/day
 Decay rate: 4.94e-06 rev/day²
 Epoch rev: 1008

Satellite: RS-10/11
 Catalog number: 18129
 Epoch time: 89284.86047371
 Element set: 905
 Inclination: 82.9281 deg
 RA of node: 151.9931 deg
 Eccentricity: 0.0013103
 Arg of perigee: 87.6258 deg
 Mean anomaly: 272.6375 deg
 Mean motion: 13.72012138 rev/day
 Decay rate: 3.5e-07 rev/day²
 Epoch rev: 11539

DISCOURAGED TO ENCOURAGED!

In the 1988 February issue of *The Canadian Amateur* my letter was published entitled 'From a discouraged prospective Amateur' I told of how a course I took with an Amateur Radio Club turned out to be a waste of time and in no way did it prepare me for the DOC Amateur exam. After that I decided to put my nose to the grindstone and studied on my own, and I'm happy to say that I have recently become VE3WDM. I would like to say a special thank you to all the Amateurs who helped me and encouraged me along the way. Dah dah dit dit dit dit dit dit dah dah!

From a discouraged prospective Amateur to an encouraged Amateur.

Mike Weir VE3WDM

SMITHERS HAMFEST DOORPRIZE

I wish to take this opportunity to thank CARF for the donation of a years' membership as the doorprize at the Smithers 1989 Hamfest. This is the first doorprize for me.

Several years ago, when I was limiting ham radio to \$15/month, I was faced with choosing between CARF or ARRL. I chose the ARRL for access to *QST*. Sometimes I glance at *The*

SILENT KEYS

VE5EG— Vic Honeysett, of Assiniboia, Sask., died Oct. 11 at the age of 92. Vic was one of the oldest and longest licensed Amateurs in the province of Saskatchewan. In 1985, the Sask. Hamfest in Regina recognized Vic for his achievements and time as an Amateur. Vic will be missed by his many friends and fellow Saskatchewan Amateurs.

—Bill Wood VE5EE

Canadian Amateur; I see steady progress.

I again hear the concept of merging CRRL and CARF. I strongly support such an initiative. The Amateur community can no longer afford the luxury of ancient OMs bickering over past wrongs, real or imagined.

I look forward to reading, in the pages of *The Canadian Amateur*, that the membership of CARF and CRRL have chosen to merge. The first major project: to develop and distribute high interest kits of materials to draw young people into our hi-tech playground.

Frank Gibbons VE7DSN

P.S. This letter by 'packet'. Just think of the potential in this corner of ham radio.

You know you're getting old when you walk into a record store and everything you like has been marked down to \$1.99.

Tx PARC

Last Call— Nominations for Regional Directors 1990-92

A healthy organization is one in which the members take a serious interest in how well it is run. CARF policy is set by its Board of Directors who are six in number, of whom three are elected each year for a two-year term of office. Often, too many directors are elected by acclamation. Let's have plenty of nominations this time so that we can actually hold elections.

The following positions will become vacant Summer 1990. The terms of office will be for two years.

Atlantic Region

Ontario Region

Pacific Region

Nominations are required from full voting CARF members (Canadian residents with Canadian licences) of each region. Each nomination must be supported by the signatures of Five CARF full members and the acceptance signature of the nominee. If you wish your incumbent Regional Director to continue in office, he must be re-nominated.

Ontario members should note that the term of only one of their two Regional Directors (Toni Salvadori VE3NXQ) will expire in 1990. The term of the other (Dan Holmes VE3EBI) will expire Summer 1991.

The deadline for receipt of nominations is Jan. 15, 1990. Please address your nominations to Secretary CARF, Box 356, Kingston, Ontario K7L 4W2. Send by REGISTERED MAIL.

Broadcasting Bill tabled

New broadcasting legislation to replace the 1968 Broadcasting Act was tabled Oct. 12 in the House of Commons by Communications Minister Marcel Masse.

The bill is the result of a lengthy public review and consultation process and incorporates recommendations made during study by the legislative committee of Bill C-136. Although substantially unchanged, a few modifications have been made to the new bill to clarify points of concern raised during recent consultations.

"During the past six months, I have met with representatives of the broadcasting and cultural communities across Canada," Mr. Masse said. "These discussions showed widespread support for a new broadcasting legislation. A number of suggestions were made to further improve the Bill C-136, such as the recognition of the important role of educational broadcasters and the need for increased cultural and artistic programming. I am pleased to be able to take account of these points of concern in the new bill which is being presented to Parliament today."

"For Canadians, this amended bill will offer a greater choice of more and better Canadian programming, enriching Canadian life and strengthening Canadian identity," added the Minister.

In addition to this primary objective, major elements of the bill, compared to the 1968 act, include:

— Women, children, cultural minorities, aboriginal peoples and the disabled are specifically mentioned in the legislation, as is the need to portray more accurately the multicultural nature of our society.

— For the first time, the special nature of the French-language broadcasting environment is recognized. The CRTC will thus be required to take these market differences into account when making licensing decisions.

— Measures to strengthen the CBC's management structure and financial accountability to Parliament and to guarantee its journalistic freedoms and artistic independence are included.

— The new act will be 'technology neutral', allowing for adaptation to new technologies such as fibre optics, high definition television, digital transmission and multi-channel, multi-point microwave distribution services.

— It will permit cable television operators to create programming services, but will give the CRTC the power to review potential conflicts of interest and, if necessary, to require cable operators to carry other specified programming services.

— The CRTC is given the power to implement, if necessary, an incentive system to encourage broadcasters to exceed current Canadian-content quotas.

— The Governor in Council will give broad policy direction to the CRTC subject to preliminary review by Parliament.

— The number of full-time Commissioners will be increased from 9 to 13, the number of part-time Commissioners reduced from 10 to 6. Terms for all members will be five years.

— The CRTC's head office will stay in the National Capital Region, but regional Commissioners, who live in the regions they represent, may be appointed.

— New wording will permit originators of programme signals—and their authorized agents, such as cable operators—to take action in the

courts against commercial pirates stealing their scrambled signals.

— In addition, provisions have been included to amend the Railway Act to enable the CRTC, in regulating telecommunications, to take into account the requirements of the Broadcasting Act.

In addition, several new modifications to Bill C-136 include:

A clause has been added to make educational broadcasting an integral part of the law.

The wording of the mandates of the CBC and the proposed alternate programming service will clearly underline their responsibility to include cultural programming among their range of programme choices.

Local stations will be given priority status when carried by cable.

Provision has been made to make the President of the CBC a member of the board of directors and to be appointed by order in council.

The definition of 'broadcasting' has been changed to give the CRTC more flexibility in dealing with new types of programming services. ■

HF Packet Radio design initiative

The American Radio Relay League (ARRL) has announced the creation of a new project to develop the next generation of modems and protocols for high frequency packet radio transmission. The project will co-ordinate the efforts of Amateur radio designers whose proposals are adopted by the ARRL. Modest funding will be available for reimbursement of approved direct out-of-pocket expenses relating to the development of prototypes, but not labour, overheads or other costs. General information concerning this project can be found in the May 1989 issue of *QST* magazine.

Funding for this project is to come from two sources: on the one hand, from the ARRL's Technology Fund, which welcomes individual and corporate contributions and on the other, from the United States Federal Emergency

Management Agency (FEMA) to which the ARRL has applied for a small grant to help underwrite this project. FEMA has indicated keen interest since they want to retain their ability to communicate directly with ham radio operators using packet radio. Furthermore, they wish to encourage interoperability between equipment owned by FEMA and Amateurs and they believe that hams will develop equipment that is inexpensive enough to permit large-quantity procurement by the Federal Government.

Serious designers interested in participating in this development project, may obtain further information from: Lori Weinberg, ARRL Headquarters, 225 Main Street, Newington, CT, U.S.A. 06111 Tel: (203)-666-1541.

— *Telecommunications Journal*

FROM KENWOOD



Kenwood R-5000 Deluxe SWL receiver	\$1169.00
Kenwood TS-440S transceiver	\$1695.00
Kenwood 940SAT deluxe transceiver	\$2995.00
Kenwood TS-140S transceiver	\$1195.00
Kenwood 680S 10-80 mtr. plus 6 mtr.	\$1349.00

FULL LINE AVAILABLE

Kenwood and Yaesu Handhelds in Stock at Bargain Prices!

INTERFACES AND PACKET

MFJ-1224 CW-RTTY interface	\$169.00
MFJ 1229 Deluxe RTTY and CW interface	\$239.00
MFJ 1274 VHF-HF Packet Unit	\$199.00
MFJ 1278 Multimode Controller	\$439.00
AEA- PK-232 All mode interface	\$549.00

TUNERS, KEYERS, ETC.

MFJ-941D 300 watt tuner	\$179.00
MFJ-949D Deluxe 300 watt tuner	\$259.00
MFJ-962C 1.5 KW Tuner	\$349.00
MFJ-989C 3 KW with roller inductor	\$595.00
MFJ-407 Deluxe Keyer	\$129.00
MFJ-401 Econo Keyer	\$89
MFJ-484 Deluxe Memory Keyer	\$229.00

**WISHING ALL MY
CUSTOMERS A MERRY
CHRISTMAS AND A HAPPY
NEW YEAR**

TELEX ROTORS

CD-45	\$429.00
Ham IV	\$595.00
T2-X	\$695.00

CUSHCRAFT

A#3 Triband Beam	\$489.00
A4S Triband beam	\$669.00
AP8 10-80 Vertical (8 bands)	\$319.00
ARX-2B 2 mtr. Ringo	\$79.00
124WB 4 el 2 mtr beam	\$79.00
A-147-11 2 mtr. beam	\$98.00
A-147-20T 2 mtr. Twist	\$195.00
A-50-6 6 el 6 mtr beam	\$349.00

TELEX HY-GAIN

TH3JR. 3 el Tri-band Beam	\$479.00
TH7DXX 7 el tri-band	\$1095.00
Explorer 14 tri-band	\$769.00
18AVT WBS 10-80 vertical	\$295.00
205BAS 5 el. 20 mtr.	\$895.00
18HT 10-80 Hytower	\$895.00
25BS 5 el. 2 mtr.	\$85.00
214BS 14 el. 2 mtr.	\$109.00

H.C. MacFarlane Electronics Ltd.

**CHECK OUR
SPECIAL PRICES
ON USED GEAR**

R.R. #2 Battersea, Ont. K0H 1H0, Phone 613-353-2800 VE3BPM
IN BUSINESS SINCE 1958

Open Monday to Saturday 7:30 a.m. to 9 p.m. Closed Sunday.

YOUR ONE-STOP HAM SHOP

ANTENNA SYSTEMS INSTALLED WITHIN RADIUS 150 KM; EXPERTISE FREELY GIVEN ANYWHERE!

Dealer for Delhi Towers, CDE Rotors, Hy-Gain, Mosley, Cushcraft and Hustler Antennas, MFJ and B&W products.

SPECIFICATIONS AND PRICES
SUBJECT TO CHANGE

Ionospheric Disturbances and World War II

By Bob Brown NM7M

At the end of the first part of this series, I left you with a remark that I'd stumbled across something that was interesting, even mind-boggling, to me: the installation of an ionosonde on Spitzbergen by the Allies in late 1942. How did I come by that information and what's so special about it anyway, you ask; let me explain.

First, I was winding up my search for ionospheric disruptions of communications during WW-II when I got a reply from the World Data Centre in England to an earlier inquiry. That letter brought me a list of all ionosonde operations during WW-II as well as a brief remark, something like, "By the way, we also have some data from Operation Gearbox, the Allied ionosonde installed on Spitzbergen in 1942." On reading that, my reaction was "SPITZBERGEN! OPERATION GEARBOX? 1942? Can this be for real? What's this all about?"

Now I'm old enough to know that a war was going on in '42 and fighting was hot and heavy in that region. In addition, in my own working days I've used some ionospheric data from several sites in Spitzbergen, places like Longyearbyen, Ny Alesund and Bjornoya, but that was much later in time and when far more was known about the polar ionosphere. Given that, I became extremely curious about Operation Gearbox, apparently a military operation conducted, at least in part, to set up an ionosonde to explore ionospheric conditions in the polar cap. To me, that was startling, to suddenly learn about something done in a unusual place, back in the distant past. As a result, I just had to dig out the story: trying to do radio physics right in the middle of a remote, isolated part of the war zone.

By way of background, radio physicists use ionosondes to probe the ionosphere by sending RF pulses upward and then seeing whether they're returned as echos and how much time elapses between the outgoing pulse and the echo. In essence, the device is something like a radar except that the RF frequency of the pulses is swept from about 2 to 15 MHz

and the target is weakly ionized regions of the upper atmosphere. The information that comes out of this probing is the daily variation of the height and critical frequencies of the local D-, E- and F- regions as well as information as to whether the ionosphere is disturbed or not. Clearly, those features bear on propagation matters, but why install an ionosonde over 2,000 km north of the U.K., on Spitzbergen of all places?

The answer, of course, was in the location, Spitzbergen being close to the war-time convoy route to Murmansk and a key location for weather information and communications. Now while those remarks cover the generalities, real matters of substance come when we get down to cases, the state of ionospheric knowledge or ignorance at the time and whether that would warrant or support such a dangerous undertaking. After all, there was a brutal war in progress at the time and the Allies suffered heavy losses in that region, carrying out the convoy operations to and from Murmansk.

Just to give you a feeling for those times, consider the Allied landings on Spitzbergen: first, there was Operation Frithamn in May '42, landing a small contingent commanded by a Norwegian officer. At that time there was a four-man party of Germans in the area, making a change-over to an automatic weather station. There were some skirmishes with the Germans and the weather station was eventually destroyed. The next landing was Operation Gearbox I in early July '42, putting ashore 100 Norwegians and 150 tons of supplies at Barentsburg. Then in Sept. '42 Operation Gearbox II was carried out, with ships from Convoy PQ-18 landing some 250 tons of additional supplies with 'wireless equipment and direction finding equipment' included.

Convoy PQ-18 fared far better than the previous convoy, PQ-18 only losing 13 ships out of the 40 that started, thanks to the presence of a stronger escort force of three cruisers, 24 destroyers and an escort carrier from the British Home Fleet. In attacking Convoy PQ-18, there were losses on the other side as well, the Germans losing

three submarines in the waters around Spitzbergen, U-88, U-457 and U-589, as well as more than 20 aircraft based in Norway.

But that wasn't the end of it; the Allied base was shelled by a U-boat and then almost a year later, in Sept. '43, the two German battle-cruisers, Scharnhorst and Tirpitz, appeared out of the mist and proceeded to bombard the base on Spitzbergen.

Thus, given those events, I think you can see that the establishment of an ionosonde operation on Spitzbergen was a very risky venture, it being uncertain at the outset that it would actually become a reality once the convoy left Loch Ewe, much less continue to function in that hostile environment.

After those remarks, let's go back to the ionosphere, what we know about it now and what was known in '42. Now with today's knowledge we can say that Spitzbergen is a unique region, north of the auroral zone and part of the polar cap, where the solar protons are concentrated by the geomagnetic field during PCA events. However, at the time of Operation Gearbox, the most recent PCA events were those early in '42, noted only by the Germans as 'Effects of Unknown Origin'.

Whether the Allies had serious difficulties communicating with the Murmansk convoys and their military escorts earlier in the War is not known. Such convoys undoubtedly operated under radio silence and any disruption of even brief communications with their escorts and the British Admiralty could have been viewed as due to sporadic effects of auroral origin, not effects of long duration as with PCA events. But Convoy PQ-12 was en-route to Murmansk when the PCA event of March 7 occurred, making it a good candidate for a test of the importance of ionospheric disturbances in disrupting military operations.

In that instance, however, the historical record shows that convoy PQ-12 was sighted by German air reconnaissance on March 5, even before the PCA event, and by noon of the next day, the battle-cruiser *Tirpitz* and three

Continued on next page ►

... were ordered to intercept the ... their departure was ... an Allied submarine on ... Trondheim and that ... the covering force, ... Admiral Sir John Tovey on the ... King George V after midnight ...

When that Admiral Tovey turned the covering force for convoy PQ12 northward to close on the *Tirpitz* and ordered the aircraft carrier *Victorious* to prepare for an air search the next morning, March 7. At dawn, snow squalls and fog prevented launching of aircraft from the *Victorious* and on the other side, the seaplanes on the *Tirpitz* were unable to fly missions in search of the convoy. About that time (0530 GMT), the solar flare event of March 7 occurred.

The weather did not improve until the morning of March 9 and in the meantime, the two naval forces maneuvered south of Bear Island, searching for each other without making contact. Now those operations were set in motion before the PCA event of March 7 and were sustained solely by the momentum of the occasion, at least into the evening hours of the 7th. At that time, Admiral Tovey received a message from the Admiralty, suggesting the *Tirpitz* might be operating to the east of Bear Island, and he altered course accordingly. Other instructions reached both naval forces and the convoy on the 8th, indicating there was not any breakdown in radio communications to the region.

Both naval forces detached destroyers from the main forces for search missions and also had to release them for refueling, either to Iceland or Norway. On the evening of the 8th, Admiral Tovey broke radio silence to advise the Admiralty that he was without an effective anti-submarine screen of destroyers. Further, as radio contacts were poor in that area, he asked the Admiralty to control the cruisers and destroyers that were to rejoin his force. The historical record suggests, however, that his action was more to deflect the German force from the convoy by revealing the presence of the Home Fleet in that area than precipitated by actual problems with radio propagation.

The reader may examine a detailed account of those events by going to the volume *The Russian Convoys* by B.B. Schofield, published by B.T. Batsford, Ltd. London (1964). But everything considered, there seems to be no evidence of a serious disruption of operations by any ionospheric effects, even when a solar proton event was in progress. Historically, the matter would seem to turn on the fact that the PCA event of March 7 was less intense than

that of Feb. 28 but it is quite difficult, in retrospect, to make a quantitative comparison of the effects.

Thus, the role of ionospheric disturbances during WW-II still remains the same, unclear, and given that PCA events were unknown to the British, the impetus of the ionospheric portion of Operation Gearbox must have been in connection with the study of auroral disturbances. Since Allied ionospheric data all came from observations at sub-auroral latitudes, observations from a site at higher latitude would certainly have been in order.

That is in contrast to the German situation in Occupied Norway where ionospheric observations were taken at Tromsø, essentially in the auroral zone. Further, the Germans had frequent, regular communications on fixed paths across Norway and readily noted the disruption of communications during auroral activity as well as the long-duration PCA events of '42.

Today, we know that ionosondes can serve to good advantage in identifying polar cap and auroral absorption events. While it is not an instrument to measure ionospheric absorption directly, so many dB on a certain frequency, it was used in the 50's to detect blackouts at weak absorption levels, thus providing data on the beginning and ending times for PCA events through an entire solar cycle. In '42, it had been known for a decade that 'no echo' conditions were found in ionosonde records. However, the experimental approach of the times was more that of making surveys, developing information on the diurnal variations of the ionospheric regions rather than examining their behaviour on an event-by-event basis.

Thus, the ionosonde at Spitzbergen actually had the capability of revealing data on the new ionospheric phenomena, polar cap absorption of long duration, provided one or more of those events occurred and stood out in the records. Accordingly, we should direct our attention to the observations from Spitzbergen to see if they brought forward any such information. For that, we can turn to an article that was published in a British scientific journal in 1949 and written by the late Lt. Col. A.B. Whatman, Royal Signals, the ionospheric observer and British liaison officer with the Norwegian garrison. According to his account, observations were made on behalf of the British Admiralty at Barentsburg (78N, 15E), an abandoned Russian mining town near the port of Longyearbyen.

But those were not the first ionosonde observations in the area, earlier work having been carried out by Lt. Col. Whatman and R.A. Hamilton in Northeastland (80N, 20E) during the Oxford University Arctic Expedition in

'35-'36. That was 2-3 years into Cycle 17, when the sunspot number ranged from 35 to 75. The later observations in '42-'43 were during the end of Cycle 17, the sunspot number then dropping from 23 to 17. However, those later observations were obtained with an ionosonde of improved design, using a motor-driven frequency sweep instead of a manual one, requiring only 10 seconds for a complete record in contrast to 20 minutes required earlier. That improvement was aimed at reducing errors that would result from changes in ionization during the time when an ionogram was made. Beside the ionosonde recordings, continuous observations were made of the vertical component (Z) of the geomagnetic field.

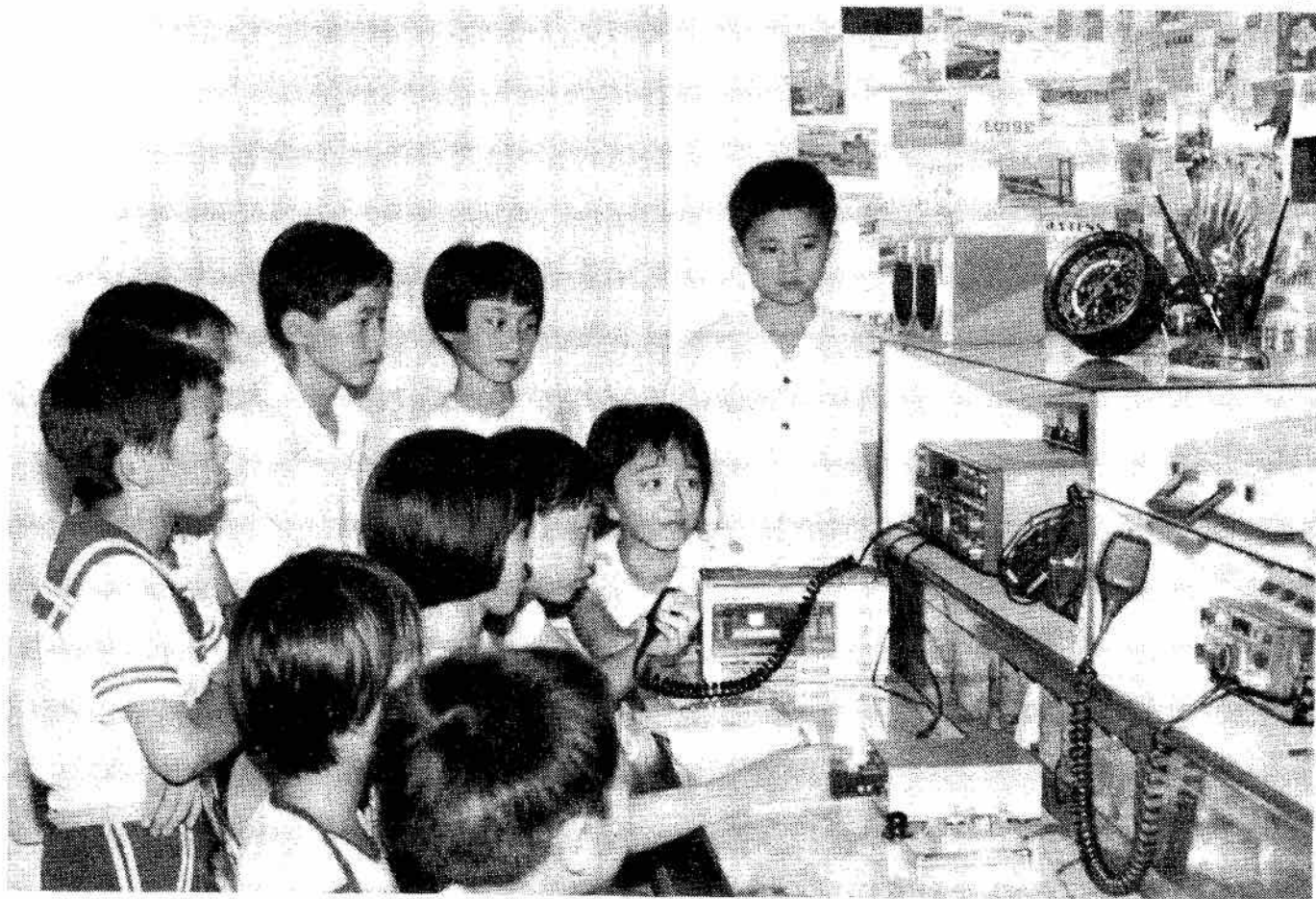
Power for the ionosonde was obtained from a gasoline-fueled generator (2 kva) while batteries were used for the magnetic recordings. Those arrangements proved satisfactory for the ionosonde but less so for the magnetometer as not only did its sensitivity depend on the state of charge of the batteries but it also lacked a means of absolute calibration.

Vertically-directed, crossed rhombic antennas were used with the ionosonde, the transmitting antenna aligned in the N-S direction while the receiving antenna was aligned in the E-W direction; terminating resistors were at the top of a 60 ft. mast. All of the electronic equipment was housed in a small hut, described as 'made bullet and splinter proof'. That one remark was the only mention of wartime conditions in the report.

Once established, the ionosonde operated on an hourly basis from Oct. 12, 1942 to June 8, 1943, except for some special recordings made more frequently from time to time. Only three months of the recordings—December, March, and May received a thorough analysis in the fall of '43. After that, nothing further was done with the data, even up to as late as 1949; however, all the data was examined at times of special interest.

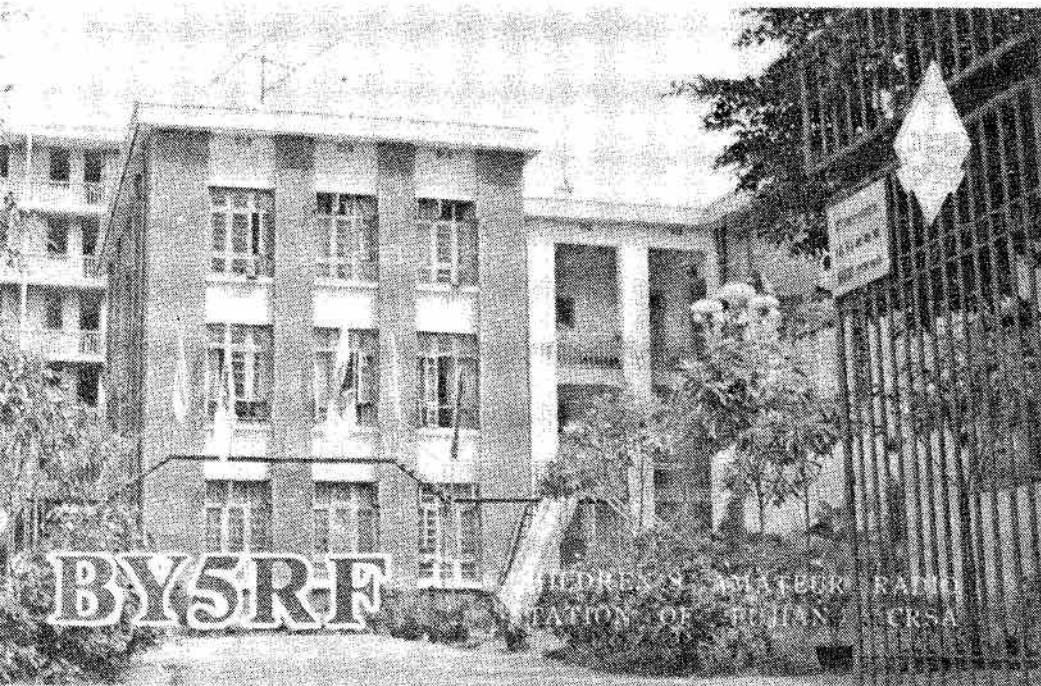
For example, with the faster collection time for each record, it proved possible to obtain records spaced at three-minute and 15-second intervals; this confirmed the earlier suspicion that high-latitude ionospheric conditions change much more rapidly than at lower latitudes. With such variability, unusual conditions for the main ionospheric regions were reported to be the rule rather than the exception; as a result, predictions of the maximum useable frequency (MUF) based on such observations were considered to be unreliable.

Once learning of the Spitzbergen ionosonde operation, the point of great interest for me was the possibility that other long-duration blackouts or PCA events might be contained in the



Above: Zhao, a nine-year-old YL (seated left), holds regular skeds in English with VE7BG and VE7TG. Zhao is one of 80 elementary and high school students who learned their radio at club station BY5RF.

Below: The children's Amateur radio station, BY5RF, QSL card— this one confirming VE7BG's first QSO with Zhao at the Children's Palace of Science.



Hands Across The Sea



Left: Teacher Ruan BZ5TU (right) and her OM, Jiang, operators at BY5RF in Fuzhou Children's Palace of Sciences, China.



Below: Ruan BZ5TU and OM Jiang and the children, ages 10 to 16, who operate BY5RF, frequently heard on the RF frequencies.

By Ruan Yunging BZ5TU

Gerry VE7BG was surprised at the young voice calling CQ from China, with no-one answering. He was more surprised at the comeback, "This is BY5RF, an elementary school in Fuzhou, China. My name is Zhao, I am a YL, and I am nine years old"—all in perfect English!

It was the beginning of a great friendship with Gerry and with Roy VE7TG in Victoria—on the air and by mail, too.

The Children's Palace of Science and Arts in Fuzhou City is a primary school where pupils get some special courses in singing, dancing, writing, drawing, musical instruments and also Amateur Radio.

The club station at BY5RF was donated in January 1985, and went on the air soon after with a TS 930S and a

three-element yaagi, 15 metres above the ground, on top of the building.

Since that time, over 20,000 stations have been worked, in 128 DXCC countries, mostly with the young operators—ages 9 to 16. The children spend a year learning how to handle the equipment, and finding out a great deal about other countries, and languages as well. It is a challenging task to teach so many youngsters of different ages to be active hams, often speaking a foreign language. So far more than 80 young people of primary and high school age have been trained in radio.

There are two teachers for radio—XYL Ruan Yunging BZ5TU and YL Jiang Dao-tan BZ5TNX.

Language training here has been made easier by Gerry and Roy's continuing friendship with Zhao, whose first name is Zheng Ying. In China the family name is given first. They sent Zheng Ying and I 20 lessons in English

for Chinese speakers, and followed it up later with 40 lessons, complete with instructions and language tapes, in English and Mandarin.

Zheng Ying lives with her father. On Saturdays she visits her grandfather, but on Sundays she arrives early at the school, to talk with her Canadian friends. The pupils can also arrange to use the club station at unusual times, in order to keep skeds with overseas stations.

Mr. Jiang and I recently received our personal calls, so we hope to have two more Fuzhou stations on the air soon. If you are visiting China, please plan to visit BY5RF, or BZ5TU and BZ5TNX.

Roy VE7TG has visited China several times, but it was prior to finding friends at BY5RF. We hope that he will come to our country again, this time to visit us. The welcome mat is always out for our Canadian friends! ■

International 'Code Free' Ham Experience

Reprinted through the courtesy of Fred Maia's W5YI Report, Aug 15/89.

BRITAIN'S CLASS 'B' AMATEUR LICENCE

Tony Smith G4FAI is a London, England, journalist who writes a monthly 'Reporting Amateur Radio' column for the British magazine, *Everyday Electronics*. He also authors the 'Morse Report' for *Amateur Radio* magazine.

The United Kingdom has had a code-free Amateur licence class for some 25 years. Great Britain does not, however, have an entry level Novice licence class. I wrote Tony to learn more about their Class B code-free licence class and how it has affected their Amateur Radio Service. The following is his unedited response. Keep in mind that Smith is a 'Morse Man' (as he calls it) and current chairman of the European CW Association.

HISTORY

"Before 1964, all British Amateurs were required to use CW on the Amateur bands for one year before being allowed to use telephony. That year a new no-code licence was introduced which allowed operation on frequencies 420 MHz and above. In 1968 the 2-metre band, 144-146 MHz (the U.K. does not allocate 146-148 MHz to their Amateur Service) was released to holders of the no-code licence, and in 1986 50 MHz also became available. In the same year no-code licensees were allowed to send Morse code on-the-air as part of their preparation for the Amateur Morse test if they wished to upgrade to a full all-bands licence.

PRESENT LICENCE

Under present regulations there are just two general types of licence in the U.K. (United Kingdom). The 'Class A', requires successful completion of the Radio Amateurs Examination (RAE), plus a 12 w.p.m. Morse sending and receiving test. This licence gives access to all Amateur bands with all approved modes.

The 'Class B' licence requires a pass in the same examination, but no Morse test, and licensees have access to all

bands, except those below 30 MHz. When 'B' licensees operate a station under the licence and supervision of an 'A' licensee, this restriction does not apply. Class 'B'ers can transfer to class 'A' by taking and passing the Morse test.

EXAMINATIONS

The RAE is set by an academic body, the City and Guilds of London Institute (CGLI) and the examinations are held at colleges and other centres twice yearly throughout the U.K. and overseas. The contents of the examination are supervised by an advisory group comprising members representing the CGLI, Radio Society of Great Britain (RSGB), Department of Trade and Industry (DTI), plus various professional and educational bodies. Since 1986, the Morse test has been administered by the RSGB throughout the U.K. on behalf of the DTI, the country's licensing body.

NUMBERS

A big boost for Amateur radio numbers was experienced as a result of the U.K. CB boom in the early 80s. Many of the new CBers, experiencing radio communication for the first time were attracted by the wider opportunities offered by Amateur radio and came into the hobby, mainly as class 'B' licensees. Probably as a result of that boom, in 1984, the actual number of class 'B' licensees in the U.K. exceeded the number of class 'A' licences. The latest figures (June 1989) show a reversal of the trend with 31,905 class 'A' and 26,819 class 'B'. According to the DTI, this is due to more class 'B'ers now transferring to class 'A'.

TAKEN FOR GRANTED

Whatever apprehension there was back in 1964 about issuing VHF licences without Morse qualifications, most U.K. Amateurs today take the system for granted, although there remains a feeling in some circles that somehow class 'B' is inferior to class 'A'.

Class 'B' has resulted in VHF/UHF operation becoming a major part of the U.K. Amateur radio scene with activities taking place over the whole spectrum. The RSGM has a Microwave

Committee, a VHF Committee, a VHF Contest Committee, and runs an annual VHF convention usually covering the more serious aspects of experimentation and operation.

While undoubtedly the greatest activity by class 'B' operators is on channelized 2-metres FM, most other modes are also used and data-comms is a popular growth area. (Data-comms is computer-to-computer packet radio.) There are currently well over 100 mailboxes in operation with new authorizations going through at the rate of about four a week. It should be remembered, however, that VHF/UHF is not the exclusive domain of class 'B', and many class 'A' operators use these bands as well.

NEED TO RECRUIT

Most newcomers come into the hobby via the class 'B' licence, nearly always declaring their intention to 'go on to take the Morse'. Despite the current trend, many abandon this intention and remain on the higher frequencies. For some this is because Morse presents an insurmountable barrier, but others clearly find the specialization of VHF and higher to their liking and have no wish to operate on the HF bands.

As in the United States, opinion is frequently expressed in the U.K. Amateur press that the Morse code test is outmoded and serves no useful purpose. "If there was no Morse test at all," it is said, "plenty more young people would come into Amateur radio." The purpose of this report is not to argue on this subject but suffice to say that in the U.K. there seems little likelihood at present of further liberalization of the existing no-code route into Amateur radio.

Like the FCC, the DTI recognizes and abides by the stipulation in the International Radio Regulations requiring licensed Amateurs operating below 30 MHz to prove a certain proficiency in sending and receiving Morse. No matter what people want, and how they argue, this situation is unlikely to change overnight!

RSGB CONCERN

Undoubtedly, without the class 'B' licence, the U.K. Amateur population

would be much smaller than it is today, but this fact has done little to allay the anxiety of the RSGB about the future of Amateur radio.

Despite the availability of a no-code entry in Britain, the Society shares the concern of the ARRL and others about the failure of Amateur radio to attract bright young newcomers (it has less than 200 members under the age of 18) It too attaches great importance to recruiting many more Amateurs as the greatest safeguard for the future.

The RSGB's answer under Project YEAR (Youth into Electronics via Amateur Radio), is to promote the idea of a new Novice licence with an easier entrance examination— and a 5 wpm Morse test! This would be a low-cost entry to the hobby involving home-construction of QRP equipment from approved kits. Operation is suggested on designated HF, VHF and UHF bands, mainly on CW, but possibly with other modes. More on this later when firm proposals are put to the DTI. (Signed Tony Smith G4FAI, 1 Tash Place, New Southgate, London N11 1PA, England.)

Tony also sent along a DTI (British government) press release (dated July 20, 1989) entitled 'Robert Atkins Calls for More Recruitment of Communication Engineers'. It reads in part:

Industry Minister Robert Atkins today told an audience of communications industry specialists that they "... must recruit and train young people if Britain's spectacular expansion of communications is to be maintained." Mr. Atkins was giving the opening address at the Radio Society of Great Britain (RSGB) special conference in London on its training initiative— Project YEAR, Youth into Electronics via Amateur Radio. "New telecommunication services are being licensed by the government to meet increasingly sophisticated communication needs. Mobile cellular radio has seen non-stop growth in demand. Telepoint (CT2— new cordless telephony) is coming."

"I would like to see industry help encourage young people into a communications career through the RSGB by supporting its request for help with training resources. Government," he continued, "is contributing through DTI's Enterprise and Education Initiative and through our support for Amateur Radio. Young people with Amateur radio skills make a valuable contribution to our national skills base with their technical knowledge and hands-on experience. To encourage them we have supported again the Young Amateur of the Year award for the most outstanding achievement by a young person under 18. Project YEAR is an initiative launched last year by HRH The Duke of Edinburgh and aims to bring young people into Amateur radio."

NO-CODE INTERNATIONAL EXPERIENCE

To obtain information for their Code-free Study Committee, the American Radio Relay League contacted many member societies of the International Amateur Radio Union to learn of their experiences with a code-free licence. The responses include:

SWEDEN introduced a code-free licence in 1970. 35% (or 3,750) of their 120,739 licensed Amateurs hold their T-licence. About 50% of the new Amateurs enter Amateur radio via the code-free licensing route... 95% renew. Gunnar Eriksson SM4GL feels Sweden should have limited the licence to a term of 3 or 5 years to encourage upgrading. "Most of the 'would-be Amateurs' consider code is outmoded and do not like to learn it because it sounds difficult without trying to learn it! Otherwise we have mostly positive experience of those T-licensees because they have helped in the way to build up a good deal of the repeaters on 2M and 70 cm. But 'T' means a technical licence and many of them are not technical enough because the examination is too easy."

Tony Bugeja 9H1FM of the MALTA Amateur Radio Club reported 150 of their 300 Amateurs hold a code-free ham ticket. 90% of all of their Amateurs enter ham radio in that manner.

"Practically all code-free renew. They tend to be very enthusiastic and therefore participate" in IARU activities. There is no difference in the technical examination material between the code-free and the full ticket. Code-free privileges include full power levels (400 watts PEP) on any frequency upwards of 144 MHz. "Code free entry is an easy way to familiarize (one) with ham radio. As most proceed to the full ticket, (experience) is positive."

The FEDERAL REPUBLIC OF GERMANY introduced a Class 'B' code-free class of Amateur licence in 1967. 24,428 out of 58,144 Amateurs Amateurs hold that class... a lifetime licence. About 30% enter Amateur radio via the code-free route and 45% of these eventually pass the code to upgrade further. The Class 'C' technical questionnaire is the same as the Class 'B' (full) licence except that a pass mark of only 50% (versus 75% for the 'B') is required. Candidates who do not achieve 75% must take the written exam again along with the code to upgrade to full Amateur status.

AUSTRIA introduced their code-free Amateur licence in 1964 and 70% of their 5,400 Amateurs hold that licence. Most eventually upgrade to full

Continued on next page ➤

Electro-Cross 3

By Dave Bennett VE7YJ

Electronic terms and their terms of measurement are featured. They may be found horizontally, vertically or diagonally, backwards or forwards, up or down. Draw a ring around each word you find. Not every letter is part of a word, and not every word you may find is one in the word list.

S	T	A	N	D	I	N	G	W	A	V	E
I	M	H	O	F	E	H	I	A	V	O	C
M	E	A	A	R	E	T	G	R	I	L	N
P	G	R	E	R	N	O	A	T	O	T	A
E	A	P	T	E	L	P	A	R	T	O	T
D	M	Z	R	I	O	R	A	T	A	H	C
A	M	R	K	U	B	E	A	M	U	P	U
N	U	B	A	N	D	W	I	D	T	H	D
C	R	M	I	C	R	O	C	I	P	I	N
E	D	U	T	I	L	P	M	A	M	H	O
D	E	C	N	A	T	I	C	A	P	A	C
I	N	D	U	C	T	A	N	C	E	H	A

WORDS: Ampere, Amplitude, Bandwidth, Capacitance, Conductance, Current, Farad / - Micro, / - Pico, Hertz / - Giga / - Kilo / - Mega, Impedance, Inductance, Mho, Ohm, Power, Standing Wave / Ratio, Volt, Watt

CODE FREE (cont'd)

Amateur status. The code-free written examination is exactly the same as for the full licence except for the Morse test. Code-free licensees are allowed to operate CW on 2M and 70 cm for training purposes.

According to Herwig Cuypers ON8MC, 2,500 of BELGUIM's 4,000 Amateurs hold a code-free ticket. 95% of Belgium's new Amateurs obtain their first ticket in this manner. About half eventually pass the code to upgrade. The technical examination requirements for the code-free licence is exactly the same as for the 'full privilege' licence. Code-free privileges carry the same power levels, and (except for CW) modes and emissions as the full ticket on all frequencies above 30 MHz. Herwig says their code-free experience has been "... very positive. We have now a lot of so-called VHF/UHF/SHF Amateurs (OSCAR-13, VHF-DXing, etc.) In response to the question about doing things differently,

Herwig, said Belgium "would do exactly the same."

Irwin Provence P43IDP of the ARUBA Amateur Radio Club said eight of Aruba's 54 Amateurs hold no-code Amateur licences. Their licences are issued as being valued 'until further notice'. The difficulty on the technical material for the code-free licensee is the same as for the full privilege ticket. Code-free licensees must pass 13 wpm code to upgrade to full privilege status. Code-free privileges at 50 MHz and above with a maximum transmitter power of 150 watts. Permission is granted to practice CW on 2 metres.

There are three classes of Amateur licences in Aruba and the Neth. Antilles: Licence A, B and C. If you pass the law and technical examination, but fail the code, you automatically qualify for the 'C' (code-free) licence. All in all, Provence said he thinks the system works fine and he would not change it.

R.G. Henderson of the Wireless Institute of AUSTRALIA says they are pleased with their no-code system. "We are aiming for (a) four class licence system... no-code Novice (VHF only), Novice, No-Code Full licence (VHF/UHF) and a full licence. 25% of Australia's 17,936 licensees (December, 1988) hold a code-free ticket. 95% eventually upgrade to obtain greater operating privileges. Henderson says the volunteer involvement by the code-free licensees

is "Equal to or better than full licensees." The no-code written examination is identical to the full licence. Privileges: All frequencies allocated above 50 MHz... same transmitter power and emission modes as the full licensee.

CANADA responded by reporting less than 1% of their 3,703 licensees hold the code-free Digital licence. Very few Canadian Amateurs obtain the digital licence already hold Amateur licences. The examination is very difficult and consists of a multiple choice test on the Amateur regulations, an essay type test on electronic theory at the Advanced Amateur level and an essay type test on digital communication theory.

Paul Johnson ZS1BR of the SOUTH AFRICA Radio League reports that 1,164 (25.3%) of their 4,596 Amateurs (1988 figures) hold the 'ZR' (versus a ZS prefix) code-free licence. "83.7% obtained a code-free licence as their first Amateur licence... and 23% of these licensees eventually pass a Morse examination to obtain greater operating privileges.— There is 'no difference' between the written examination (administered) to no-code and full Amateur licensees. "No (code-free) operation is allowed below 50 MHz (no-code licensees have) exactly the same conditions, power, modes, etc., as the full privileged licence above 50 MHz." ■

BE CAREFUL OF YOUR FREQUENCY

There is a big problem with terrestrial 10M stations, particularly FM and RTTY transmitting in the 29.300 to 29.500 MHz range, causing QRM to satellites operating there.

The frequency range of 29.300-29.400 MHz has been set aside under International Radio laws as a satellite downlink only segment. There are not supposed to be any signals of terrestrial origin at all in this range.

Please! Folks, you are wiping out satellite operations for the rest of us. You have plenty of spectrum above and below there for modes of operation.

— Captain John H. McReynolds, N7JBO Charleston, OR, courtesy *Worldradio*

ALL LOBBYISTS NOW HAVE TO REGISTER

Effective on Aug. 24, all those persons wishing to influence the federal government by presenting the views of an organization must be registered according to the requirements of 'Lobbyists Registration Act'.

Lobbyists are being grouped into two categories or 'tiers': those who are employees of an organization wishing to influence government and those employed by a professional lobbying organization working on behalf of an organization wishing to influence government need to register. Full details are available from the Lobbyists Registration Branch, Consumer & Corporate Affairs, Hull, Quebec, K1A 0C9.

Our Certificate of Thanks

Do you know anyone who instructed an Amateur radio class last fall? If you do, please let Debbie know, for they surely deserve one of these certificates.

Write Debbie at Box 356, Kingston, Ontario K7L 4W2.



The Canadian Amateur Radio Federation thanks -

CALL SIGN _____

FOR SERVING AS A _____

DATE _____ SIGNATURE _____

International Amateur Radio Union

Region 2

10th General Assembly

The Tenth Triennial Conference of IARU Region 2 in Orlando, Florida has just concluded, with a record attendance and an extremely full agenda.

A total of 97 delegates and observers were present, with 24 countries being represented in person or by proxy. Total registration of 136. Michael Owen VK3KI, Vice-President of IARU, participated in the Conference and chaired the Administrative Council meeting following the General Assembly.

Also in attendance were representatives from IARU Regions 1 and 3, as well as from RSGB, DARC and JARL.

Representing Canada were:

George Spencer VE3OZW, Jordan, Ont. Head of Delegation (Appointed Chairman of Conference Committee A); Bruce Balla VE2QO, CRRL Quebec Director, Montreal, P.Q.; Malcolm Hamon VE3KXH, Newcastle, Ont.;

Clark Campbell VE3KSQ, London, Ont.

Canada also carried the proxy for Jamaica.

The new Region 2 Executive Committee, elected by the delegates, will serve for three years until the next Conference in Curacao, Netherlands Antilles.

President: Alberto Shaio HK3DEU

Vice-President: Fabian Zarrabe YS1FI

Secretary: Steve Dunkerley VP9IM

Area Directors:

Frank Butler W4RH

Guillermo Nunez XE1NJ

Willy Gravenhorst PJ2WG

Alfonso Calderon OA4PQ

Reinaldo Szama LU2AH

DARF RECRUITS VE3BBM

A Defence of Amateur Radio Fund (DARF) has been set up by CRRL. Monies received will be used to help defray the costs incurred in sending Amateur representatives to WARC 92. A committee of Amateurs will administer the Fund with members from across Canada. Ralph Cameron VE3BBM has accepted a position on this committee. His involvement with the JRSD Fund has made him a trusted advisor and his professional occupation makes his advice on technical matters a sought after commodity.

Congratulations Ralph!

There was an extremely full agenda, with more than 100 documents for discussion, ranging from active preparation for WARC 1992, including a special WARC budget of U.S. \$150,000 (in addition to the approval of the normal three-year Region 2 operating budget), to the customary band-planning and operational matters, including a large number of papers considered by Committee C, the VHF/UHF committee.

Further details of the many matters discussed will be forthcoming shortly as they become available for general release.

This meeting of radio Amateurs from Region 2, and other parts of the world, emphasized once again our need to work closely with each other to protect our privileges.

A special vote of thanks to ARRL President Larry Price W4RA and the Directors and staff of ARRL for splendid planning, excellent facilities and warm hospitality, as hosts for this international gathering, which coincided with the 7th Anniversary of ARRL. ■

— CRRL News Service

CCIR celebrates 60th Anniversary

Sixty years ago, in September, 1929, the ITU's newly established International Radio Consultative Committee (CCIR) held its first meeting in The Hague.

The CCIR today commemorated the event, with participation of some 450 delegates to Study Group meetings in progress, officials of ITU and international organizations. Technical Study Group meetings are underway in Geneva in preparation for the XVIIth Plenary Assembly, to be held in Dusseldorf in 1990.

The decision to establish the Consultative Committee which is today the CCIR was taken by the Third International Radio Conference, Washington, 1927. The original purpose of the CCIR was to carry out the necessary technical studies between international radio conferences. The first post-war Plenary Assembly was held in Stockholm, 1948. Under today's mandate of the International Telecommunication Convention (Nice, 1989), CCIR "studies technical and operating questions in radiocommunications and issues recommendations, with a view to worldwide standardization of telecommunications."

CCIR continues its unique worldwide role in ITU to recommend technical bases for international sharing and management of the frequency spectrum resource and the geostationary satellite orbit. CCIR issues Recommendations on system characteristics to assure

compatible performance and interworking of radio systems in telecommunications. Such texts cover television and sound broadcasting, microwave radio-relay and satellite networks, mobile radio and other services. Among current studies are digital microwave radio relay, future public land mobile telecommunications, digital satellite communications and very small antenna terminals, and high definition television.

The commemorative programme opened with presentation of Honour Awards to 65 participants in CCIR work, nominated by their national administrations for outstanding technical contributions or leadership of CCIR activities for more than a 10-year period. The last Honour Award ceremony was held at the XIVth Plenary Assembly in Kyoto, on the occasion of the 50th Anniversary.

Following the ceremony, Prof. Dr. F.M.L. Stumpers gave an historical sketch of 'Van der Pol and the early CCIR'. Prof. Dr. Balth Van der Pol, a pioneer radio scientist active in CCIR work, was elected its first Director in 1948.

Dr. John Norbury presented the CCIR 60th Anniversary Lecture, 'Radio Propagation and Bad Weather', Dr. Norbury is with the Science and Engineering Research Council, Rutherford Appelton Laboratory, United Kingdom. ■

Radio Technology and World War II in Europe

By J.F. Hopwood VE7AHB

World War II started 50 years ago! It's incredible how time flies! I remember hearing newspaper boys on the street outside our family home shouting "Extra! Extra! read all about it— Britain declares war on Germany!" For a young lad like myself it was a time of tension and excitement. I did not fully understand the terrible suffering and tragedy it was to bring to families with sons, brothers and fathers who left to fight, some never to return again.

Until recently, I never understood the critical role radio technology played in winning the war for the Allies. Communication was almost exclusively carried out by radio. For Germany, links with her armies in occupied territory and signalling to her U-Boats at sea, radio was absolutely essential. For Britain, with the ability to decode all enemy signals using a copy of the secret German 'Enigma' ciphering system machine, Morse code operators and radio teletype specialists were a vital resource for monitoring activity. And, of course, radio operators were essential to all military

operations. Experienced Amateur Radio operators served with distinction in training recruits and as a backbone corps of operators and technicians.

Reading Dr. R.V. Jones's classic *Most Secret War*, Brian Johnson's *The Secret War* and more recently *Winning the Radar War*, a memoir by Jack Nissen, opened my eyes to the critical race for superiority in electronic surveillance and communications. For the record, Amateur Radio operators were a 'trump card' for Britain and her allies during the war. Get a copy of one or all of these books for some absolutely fascinating tales on how the Allies used technology and talented people to win the war through the use of radio and radar.

THE FAMOUS R.V. JONES ACCOUNT

Most Secret War is R.V. Jones's account of his part in British Scientific Intelligence between 1939 and 1945. It was his responsibility to anticipate the German applications of science warfare, so that Britain could counter their new weapons before they were used. Much of his work had to do with radio navigation, as in the Battle of the Beams, with radar, as in the Allied Bomber Offensive and in the preparations for D-Day and in the war at sea. He was also in charge of intelligence against the V-1 (flying bomb) and V-2 (rocket) retaliation weapons and, although fortunately the Germans were some distance from success, against their nuclear developments.

Jones recognizes the important resource radio Amateurs were to the cause when he states, "... our community of radio Amateurs in Britain was to prove an invaluable reserve, both in Signals Intelligence and in Signals proper, as well as furnishing many of the staff for our rapidly increasing number of radar stations."

He recounts, "When I met General Martini, the Head of German Air Signals and Radar, after the war, ...he pointed out he had a very low priority in demanding personnel and had to make do with those who were deemed unsuitable for other duties. He had no skilled reserve to draw upon among radio Amateurs, as we had, because Hitler had banned Amateur Radio before the war since it might provide

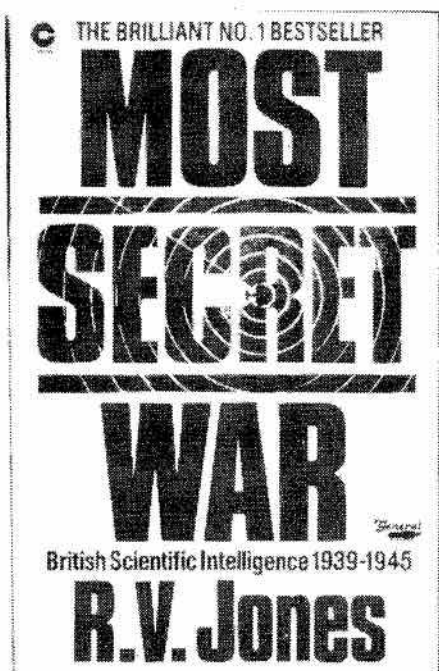


communication links for disaffected organizations."

THE BATTLE OF THE BEAMS AND OF THE ATLANTIC!

The Secret War by Brian Johnson gives some excellent detail accounts of the use of radio electronics in the chapters on 'The Battle of the Beams', 'Radar' and 'The Battle of the Atlantic'. He draws on some of R.V. Jones' accounts, but relies mostly on research for a BBC TV series using interviews with participants from both sides. The British coastal 'Chain Home Radar' credited as a decisive key in winning the Battle of Britain, operated between 10 and 13.5 metres. When it was tested in the late 1930's, the Radio Society of Great Britain was discreetly asked by the Government to refrain from publishing in their Bulletin letters from Amateurs on the subject of the strange pulse signals heard on 10 metres. Needless to say they did!

The Battle of the Atlantic with its deadly U-Boat menace was a losing battle for the Allies until Radar came into its own through the invention of the Cavity Magnetron, the result of research commissioned by the Royal



Navy at the University of Birmingham. New powerful 50 cm radar for gunnery and 10 cm radar for U-Boat surveillance gave the Allies 'eyes' at sea and in the air with which to seek and destroy the enemy. While Germany had operational radar, it could not compete with the power of the cavity magnetron radar systems.

U-Boat 'Wolf Packs' hunting for ship convoys used radio communications to advantage until a very special system of HF direction finding called 'Huff Duff' was introduced in mid-1941. It was deadly! Not only was it of very long range and able to plot positions of loquacious U-Boats at distances of over 1000 miles, but the type FH4 sets incorporated a cathode ray tube which gave an accurate signal bearing on any signal they picked up in a matter of seconds. Losses after radio transmissions aroused the suspicion of the German Navy command and they arranged for Morse code group messages to be abbreviated to less than 30 seconds. Even these were long enough for Huff Duff to get a 'fix'.

ONE MAN'S FASCINATING RADAR STORY

Jack Nissen's book *Winning the Radar War* is an important well-written and entertaining insight into the development, uses and counter-measures of the early radar war. World War II was the first 'technological war', and nothing was more important in winning that war than radar. His is a suspense-filled story of the experiments, the inventive breakthroughs, the electronic eavesdropping, and the sheer good luck that sometimes determined the outcome.

He talks in praise of Sir Victor Hubert Tait, the quiet Canadian from Winnipeg who masterminded the radar war as Director General of RAF Signals and Radar. Jack Nissen (code name Professor Wendell) also tells the gripping true story of the Canadian commando mission to obtain secret German radar equipment at Dieppe and about the Canadians who lost their lives helping him succeed in uncovering vital information to the success of D-Day and, ultimately the Allied victory in WWII.

GOOD READING FOR HISTORY BUFFS

Each of these books is worthwhile reading for anyone who is seriously interested in the history of radio and the use of radio technologies. While subjects other than radio are also reviewed, such as magnetic mines, rockets and mechanical guidance systems, radio technology and its people are the main story.

Though the subject of Amateur Radio is strictly an aside, many WW II veterans will find the tales and accounts of what went on and how it was done a

nostalgic visit to their past. Those born since the war will gain an appreciation of the tremendous effort and excitement that accompanied the first world war ever to be fought (hopefully the last) using sophisticated technology in surveillance and weaponry.

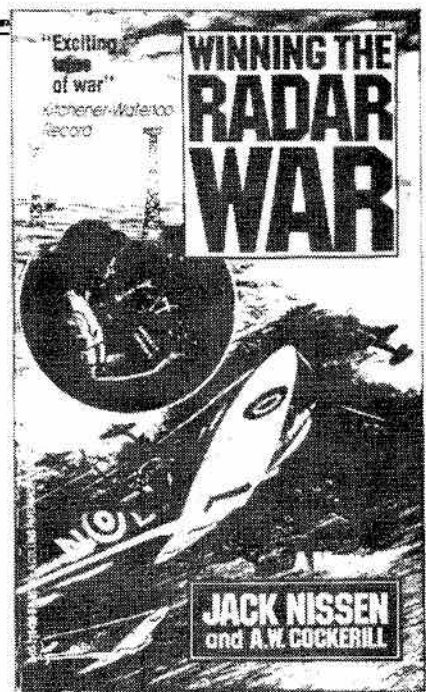
PUBLISHING INFORMATION

Jones, R.V. *MOST SECRET WAR*, Hamish Hamilton Ltd, 1978 (paperback edition) Coronet Books 1979

Johnson Brian. *THE SECRET WAR*, Arrow Books Ltd., London, 1979

Nissen Jack. *WINNING THE RADAR WAR*, Macmillan of Canada, 1987 (paperback edition) Collins Paperbacks, 1988

Winning the Radar War is available in paperback at many book stores for \$5.95. It is possible that *Most Secret War* and *The Secret War* are out of print. However, they are often available at libraries and at second-hand book stores shelved under Military Intelligence and/or Espionage. ■



FOR SALE: HOME in Nakusp, B.C., 733 Columbia Crescent. Nine yrs. young, 1450 sq. ft. plus 325 sq.ft. court-yard-sundeck. Beautifully fenced and landscaped. Double garage, Sauna with pool. Underground wiring, sewer, street lights, side walks. **EXCELLENT DX-Location.** Curling, fishing, golf, Hot Springs, Ski Hill. Contact VE7EHD, 604-265-3175.

WANTED: Wireless set no. 19 equipment and accessories. Especially looking for power amplifier and pocket-watch. I am willing to buy and/or trade equipment. Please write to Chris Bisailion VE3CBK, RR#1 Old Carp Road, Kanata, Ont. K2K 1X7.

FLORIDA QTH: For Rent, Indian Rocks, St. Pete's, 1 bedroom condo, Beach, Year Round Sun, Pool, tennis, hot tub. Contact Ron VE3NKS, week/monthly rates. Call: 416-875-2621.

FOR SALE: Tubes, over 600 types, including 811A, 829B, 832A. All tubes are \$2.00 each plus shipping. Send \$1.00 for complete listing to Al Ryan VE1TI, 313 Old Sackville Road, Lower Sackville, N.S. B4C 2J5.

WANTED: Heathkit Harmonic Distortion Analyzer, Model IM-5258 in working or repairable condition. Please write FP/VE1KM, Ron Thompson, B.P. 383 Saint Pierre, Saint Pierre et Miquelon, F (via Halifax) B3K 1S0.

FOR SALE: Antenna, Explorer 14 partially assembled with 30 metre kit \$275. Moving, Exc. condition. Dave VE3MUQ 416-493-9455.

FOR SALE: PK 64 TNC, includes packet (HF and VHF), AMTOR, RTTY and CW. Complete with manual and software. Asking \$250.00. Call 705-474-7485.

FOR SALE: Drake receiver R-4C with solid state tubes, fully modified. T-4XC transmitter MS-4 speaker power supply, perfect working condition. (514) 473-4758.

WANTED: Set of coils for National 'HRO' including Broadcast Band. Others with General Coverage and Amateur Frequencies as follows: 1.7-4 m.c.; 3.5-7.3 m.c.; 7.0-14.4 m.c.; and 4.0-30.0 m.c. Five in all. Will buy or swap. Contact: Derm Whelan, 31 Middleton Street, St. John's, Newfoundland A1A 3J2.

Please send your 'Swap Shop' notices to the *The Canadian Amateur Swap Shop*, Box 356, Kingston, Ont. K7L 4W2. Single insertion is \$1.00 minimum (10 words) and \$1.00 for each additional 10 words. To renew, send copy and payment again. Please TYPE OR PRINT CLEARLY! and put your membership number and call (not counted) at the end of your ad. Include your full address with postal code; if using a phone number, include the area code. The *Canadian Amateur* accepts no responsibility for content or matters arising from ads.

BACK ISSUES

Back issues of *The Canadian Amateur* magazine for 1988/89 are available from the CARF office for \$2.50 each post paid.

The Shack Handbook

By Frank Hughes VE3DQB

TOOLS

Soldering needs a soldering iron and a reel of solder. The iron should be a 30 watt one, more or less, and get one you find comfortable to grip. The tip has to be kept from touching things while you are waiting, for it is hot. Mine lives on an outlet box fitted with an on-off switch, and a momentary switch that switches a diode in series with it when the iron is put down (cutting the voltage in half when not in use). This keeps the tip warm but not hot, ready for action but not burning away. The hot end goes into a wire mesh guard for safety.

A bigger iron, 100 watt or so, is useful at times. Soldering to sheet metal of any thick gauge is beyond the capacity of a 30-watt iron. Get hold of some scrap lengths of 10 gauge copper wire and make your own tips for it. The stores charge an extortionate price for replacement tips.

A reel of *rosin cored solder* (acid core will not do), 20 gauge (0.75 mm) is suitable for all the Amateurs work. Get as much as you can afford, on a good solid reel, and fit a shelf under your bench front. Drive a nail or screw into the shelf, and put the reel on that. Ahead of the reel, that is, closer to you, put a small screw-eye. Run the solder wire through the eye. The solder is always ready then, always in the same place. You never have to hunt for the reel, you do not even have to look for it—the end of the solder is always there, just put your hand down and draw it up. This beats any other method of storing solder, including (as I read once) "just littering the bench with 35 mm film reels of solder."

However, do wind one 35 mm reel full of solder wire. When you have to do a soldering job away from the bench, slip this in your pocket.

The shelf under the bench front is a useful place to store tools in use.

A hand-drill and a set of bits are needed. A set of good twist-bits from 1/16 to 1/4 inch will suffice for the heavy work. A 5/16 bit is sometimes needed to fit components that have control shafts. For the light work, we are in a bit of a quandary. The bits needed to pierce printed-circuit boards for components are thin, and don't last

long in use with an ordinary hand-drill before they break.

What is really needed is a drill of the old-fashioned type, rotated by sliding a nut down a coarse thread. These, one can handle gently and not overstrain a fine drill. However, I have not seen one for sale in decades. Small electric drills are available, suitable for the work. I use a miniature vertical drill press. If such equipment is not available to you, make a fine drill from a sewing needle with a broken eye. Grind the end similar to the end of a twist bit, two flats at a double angle to the needle axis. The needle steel will bend before it breaks, and gives a chance to finish the hole with a hand drill. And it isn't a tragedy if it does break.

"By all means make a watchmaker's apron. This will save grovelling on the floor to find the 'just dropped' tiny piece without which the project cannot be completed."

Pliers of several kinds are needed. The ordinary kind with flat jaws, a pair of needle-nosed ones (used for twisting neat eyelets on the ends of wires to fit screws), and a larger pair, to handle heavier gauge wire. All these should have insulated handles, as should the diagonal cutters. I think I shall recommend the midget size for close-quarter work. The ones I have were perfectly good before the PCB revolution, but they cannot nip the ends of component wires off quite as neatly as I would wish.

A small adjustable wrench will take the place of a plethora of fixed wrenches and nut-drivers. It fits metric as well as rational. Indeed, it is a 'must' tightening the nuts on the ends of variable controls. Nut drivers are in the nice-to-have category, but don't buy a full set all at once. You may never use some of them.

A knife, either a pocket-knife or one of the Exacto kind, is extremely useful. A

set of small files, tweezers, a reamer, a two-inch vise, a microscope needle (make it by forcing a 2-inch sewing needle eye first into a short length of 1/4 inch dowel), a fine carborundum stone, a good rule in 1/16ths and mm, a notebook pen.

All these items need a home. I have a couple of shelves over the construction area of the bench, and the tools are laid there ready for use. A tool is needed, taken down, used, and replaced at once. At least, that is the theory. When the tool needed is not immediately visible, start to put those lying on the bench back on the shelf.

Look after your tools. Sharpen knives, drills, screwdrivers whenever they get dull. The blades of diagonal cutters get blunt after a time, and can be sharpened with the carborundum stone if you work out the correct angle. If you don't, sharpening one side dulls the other.

A smidgen of oil on pivots, like those on pliers, keeps them easy-working. The very faintest trace of oil on metallic surfaces will prevent rust.

CONVENIENCES

I have already told how to store solder so that it is always conveniently to hand. Clipleads—they are two alligator clips connected by a length of flexible wire—are another essential, and nowhere have I seen any means of storing them easily. I use a length of 18 gauge steel sheet, about 2 inches by 8, screwed to the bench so that leads can be clipped to the underedge of it. When a clip is needed, it is only necessary to pull it off. The free clip is caught on the lead an inch or so below the fixed one.

By all means make a watchmaker's apron. This will save grovelling on the floor to find the 'just dropped' tiny piece without which the project cannot be completed. The apron is a piece of cloth about 2 feet by 18 inches. One longer edge is screwed under the bench, or better, to the shelf under the bench, and tapes are sewn to the free corners. On starting work, the tapes are tied round the waist. The cloth then forms a catchall for anything dropped accidentally. Also, it will catch items deliberately dropped because it is not convenient to hold on to them, or perhaps because they are soldering iron hot.

Large plastic magnifiers are available very cheaply. Get one and fit it to the shade on the bench light. This is to examine projects. PCBs should always be so inspected, to ensure that there are no solder bridges between the traces. The bifocal brigade will find many uses for it, as well.

STORES

A certain amount of hardware is needed, even if you are going to start by constructing a kit. Many electronic things never wear out. Wire is a case in point. Electricians throw away short lengths of wire at any construction site. Six inches of 10 gauge wire will give a year's light service as a 100 watt soldering iron tip. Telephone installers discard 20 gauge solid copper wire, plastic covered—most useful stuff. An excellent wire to buy, if you don't have the luck to find it, is speaker extension wire. A roll should last a lifetime. It is light, flexible, colour-coded twinlead, easily split into separate conductors, and small enough to fit the PCB age.

Electronic components—Resistors and capacitors need one of those many drawered cabinets, or a cabinet drawer divided eggbox fashion. Divide them logically by value, one drawer for each decade. You will collect many as you progress. An acquaintance of mine has a well-matured stock of them, and someone casually enquired how many resistors he possessed. He guessed several hundred: a rough count later told him he had six thousand!

Any old radio, TV, tape deck or similar unit is worth pulling to pieces for the components it contains. Unbend a paper clip, make a small hook on one end, file chisel-pointed, and twist a finger ring on the other end. Slip the point under a component on a PCB, apply a hot iron to the other side of the board and pull gently. It will usually come free without breaking. This is the cheap way to multiply stocks. I was fortunate enough to be close at hand when the first generation of transistorized TV transmission chassis were discarded (they were not temperature compensated and acted weirdly in summer). They were a mine of good parts—I still have some of them.

Attend every hamfest you can. Scrutinize what is on sale and do not buy any article you have not planned for. 'Nothing is a bargain if it does not fill an immediate need'. For small items like resistors or capacitors in bulk, wait till the crowds are gone. Then pick up what you need cheaply. I was once given a set of computer boards of 1960 vintage, covered with small components of the 1/4 watt kind, that is, before things shrunk to chips. I am still mining them, particularly for the precision 100 pF capacitors there.

Specific items needed for a project will often have to be purchased one-off.

While some items are available at Radio Shack, the more exotic ones, like high quality variable capacitors, you won't find there. There are several excellent parts suppliers in the country. Artzt Electronics, J&J and Noramel are three I use constantly.

UNITS

Electrons are minute particles of matter. 'Minute' means they are very small, 'particles' means they may be considered as points, and 'matter' means they have weight. Check any other strange words in the dictionary.

Since electrons are so small, we deal with them in bulk. The accepted parcel of electrons includes 6,000,000,000,000,000,000,000 of them, and this is one coulomb. Now if one coulomb of electrons passes a given point in one second, we say one ampere of electrical current is flowing. Amperemeters—ammeters for short—count electrons. Ohms Coulomb, Ampere and Ohm are honoured in our everyday speech.

Matter, as we know it, consists of equal quantities of electrons and protons. It is difficult to separate them one from the other because they possess a property called charge. The electron possesses negative charge, the proton positive, and they strongly attract one another. The proton is 1840 times heavier than the electron, so naturally it is easier to move electrons than protons.

Some materials, called metals, allow electrons to flow freely through them. Visualize a metal as a vast number of tiny spheres, the atoms, in a fairly regular pattern, between which electrons bounce back and forth. If a source of electrical energy, for instance a battery, is connected between the ends of a metal wire, the electrons start to travel in one direction, from the negative pole of the battery (marked -) to the positive pole (marked +).

RESISTANCE

As the electrons stream along the wire, they collide with the atoms from time to time and generate heat by friction as they do so. The metal shows resistance to the flow of electrons. If the battery is strong enough, the wire will get warm, or red-hot, or melt. A relationship can be found experimentally between the current flowing, the heat generated, and the electrical pressure, measured in volts, exerted by the battery. The square of the current, measured in amperes (amps) times the electrical pressure, in volts, equals the heat generated, in watts. James Watt, the steam engine man, and Alessandro Volta, who first observed the bioelectrical effects of dissimilar metals in the twitching of frogs' legs hung up to dry before degustation, are honoured here.

The resistivities of metals vary. Every metal has been tested, and the measured resistivities are tabulated. That of tungsten is high, as is its melting-point, so it is the wire of preference to seal in a glass bulb to generate light by the passage of electrons. The light bulb is a witness to these paragraphs.

Ohm's Laws relate these measurements. One volt is the electrical pressure which, driving one ampere through a circuit, produce one watt of heat energy. One volt drives one amp through a circuit possessing one ohm of resistance. Since electricity is bought and sold, government laboratories painstakingly maintain standards of volts, amperes and ohms. Ohm's Law for DC should be well-known to you. Any elementary text gives it, with mnemonic illustrations. I learned it as 'Amps = volts divided by ohms'. At first I was puzzled by the use of 'I' for current. I still am. ■

Up or Down?

Is the number of Radio Amateurs in your province increasing or decreasing? Is there room for improvement?

— CARF News Service

OCTOBER 1988

VE0	165
VE1	2105
VE2	4474
VE3	9086
VE4	842
VE5	830
VE6	2024
VE7	4249
VE8	90
VO1	483
VO2	32
VY1	50
VY9	-

OCTOBER 1989

172
2158
4594
9256
841
826
2049
4393
85
499
29
50
2

Operating Aid

Courtesy SPARC-GAP

ANTENNA LENGTH CHART BY K5KG

FREQUENCY (MHZ)	WAVELENGTH - FEET				WAVELENGTH - METERS			
	1/4	1/2	1/2+5%	FULL	1/4	1/2	1/2+5%	FULL
1.8	129.87	259.75	272.73	519.49	39.58	79.17	83.13	158.33
1.825	128.09	256.19	269.00	512.38	39.04	78.08	81.99	156.16
1.85	126.36	252.73	265.36	505.45	38.51	77.03	80.88	154.05
1.9	123.04	246.08	258.38	492.15	37.50	75.00	78.75	150.00
3.5	66.79	133.58	140.26	267.17	20.36	40.71	42.75	81.43
3.6	64.94	129.87	136.37	259.75	19.79	39.58	41.56	79.17
3.7	63.18	126.36	132.68	252.73	19.26	38.51	40.44	77.03
3.8	61.52	123.04	129.19	246.08	18.75	37.50	39.38	75.00
3.9	59.94	119.88	125.88	239.77	18.27	36.54	38.37	73.08
4	58.44	116.89	122.73	233.77	17.81	35.63	37.41	71.25
7	33.40	66.79	70.13	133.58	10.18	20.36	21.38	40.71
7.05	33.16	66.32	69.63	132.64	10.11	20.21	21.22	40.43
7.1	32.93	65.85	69.14	131.70	10.04	20.07	21.07	40.14
7.2	32.47	64.94	68.18	129.87	9.90	19.79	20.78	39.58
7.3	32.02	64.05	67.25	128.09	9.76	19.52	20.50	39.04
10	23.38	46.75	49.09	93.51	7.13	14.25	14.96	28.50
10.5	22.26	44.53	46.75	89.06	6.79	13.57	14.25	27.14
14	16.70	33.40	35.07	66.79	5.09	10.18	10.69	20.36
14.1	16.58	33.16	34.82	66.32	5.05	10.11	10.61	20.21
14.2	16.46	32.93	34.57	65.85	5.02	10.04	10.54	20.07
14.35	16.29	32.58	34.21	65.16	4.97	9.93	10.43	19.86
18	12.99	25.97	27.27	51.95	3.96	7.92	8.31	15.00
18.5	12.64	25.27	26.54	50.55	3.85	7.70	8.09	15.41
21	11.13	22.26	23.38	44.53	3.39	6.79	7.13	13.57
21.1	11.08	22.16	23.27	44.32	3.38	6.75	7.09	13.51
21.25	11.00	22.00	23.10	44.00	3.35	6.71	7.04	13.41
21.45	10.90	21.80	22.89	43.59	3.32	6.64	6.98	13.29
24.89	9.39	18.78	19.72	37.57	2.86	5.73	6.01	11.45
24.93	9.38	18.75	19.69	37.51	2.86	5.72	6.00	11.43
24.99	9.35	18.71	19.64	37.42	2.85	5.70	5.99	11.40
28	8.35	16.70	17.53	33.40	2.54	5.09	5.34	10.18
28.5	8.20	16.41	17.23	32.81	2.50	5.00	5.25	10.00
29	8.06	16.12	16.93	32.24	2.46	4.91	5.16	9.83

FORMULAS USED

1 METER = 3.21 FEET

LENGTH OF 1/2 WAVELENGTH ANTENNA (METERS) =

$$(300 * .95 * .5) / \text{FREQ(MHZ)} = 142.50 / \text{FREQ(MHZ)}$$

LENGTH OF 1/2 WAVELENGTH ANTENNA (FEET) =

$$(300 * .95 * .5 * 3.281\text{M/FT}) / \text{FREQ(MHZ)} = 467.54 / \text{FREQ(MHZ)}$$

NOTE: 1/2 WAVELENGTH + 5% IS USED FOR INVERTED VEE ANTENNAS

THE CARF NATIONAL QSL BUREAU

THE CARF NATIONAL QSL BUREAU has an outgoing service for members. In other words, we send your cards to other Bureaux for you. This includes Overseas, American and other Canadian Bureaux. This service is free to CARF members. If you consider current airmail rates, it takes only 30 cards per year to pay for your CARF membership. Here's how it works:

1. Sort all cards alphabetically by prefix.
2. Sort Canadian cards numerically by call area.
3. Place small lots of cards in strong heavy envelopes and seal securely. Wrap heavier packages in strong paper or put in cardboard box. Tie securely. Do not staple!
4. Address your package as shown in diagram to Box 66, Islington, Ont.
5. Do not register cards. This only delays them, costs more, and is not really necessary.
6. If you want proof that CARF has received your cards, enclose a self-addressed stamped postcard or envelope with 'Receipt' marked on it.
7. If a package has been damaged on arrival (very rare), CARF will send you a list of cards received so that you can check if any were lost.
8. As proof of CARF membership include your current label from *The Canadian Amateur* or copy of same.

Name, Call Return Address	PRINTED MATTER	<div style="border: 1px solid black; padding: 2px; display: inline-block;">Correct Postage</div>
CARF National QSL Bureau P.O. Box 66 ISLINGTON, ONTARIO M9A 4X1		

Provincial Bureaux (sponsored by CRRL)

Your finished package
should look like this.

To RECEIVE cards from YOUR Provincial Bureau, send a quantity of pre-addressed (including your callsign) 5"x7" envelopes, along with money for postage (money is better than stamps as the postal rates are always changing). Your Provincial Bureau will forward cards to you on a regular basis and inform you of the need for more postage money. Although the addresses of the Provincial Bureaux are found in the latest International Callbook, we have included them here for the benefit of CARF members. This service is for all Canadian Amateurs. These bureaux are operated by Volunteers— please give them your help, consideration and thanks.

VE1QSL Bureau
Box 51
Saint John, N.B.
E2L 3X1

VE4QSL Bureau
Box 365,
Carman, Man.
ROG OJO

VE7QSL Bureau
8922-148 Street
Surrey, B.C.
V3R 3W4

VO1/VO2QSL Bureau
Box 6,
St. John's, Nfld.
A1C 5H5

VE2QSL Bureau
2960 Douglas Avenue
Montreal, Quebec
H3R 2E3

VE5QSL Bureau
739 Washington Dr.
Weyburn, Sask.
S4H 3C7

VE8QSL Bureau
2 Taylor Road,
Yellowknife, N.W.T.
X1A 2K9

VE3QSL Bureau
Box 157,
Downsview, Ont.
M3M 3A3

VE6QSL Bureau
Box 1890,
Morinville, Alta.
TOG 1P0

VY1QSL Bureau
Box 4597,
Whitehorse, Yukon
Y1A 2R8

For more information write **CANADIAN AMATEUR RADIO FEDERATION,**
P.O. Box 356, Kingston, Ont. K7L 4W2, (613) 545-9100.

Canada Winter Contest

It's that time again! Time to dust off the old Rig and get ready to work the world. Yes, it's the annual CARF Canada Winter Contest.

As an incentive, the results of last year's contest are printed below. This who's who of Big Guns should whet

your appetite and give you some indication of the scores to beat.

The CARF-sponsored Canada Winter Contest is being administered by Jeff Parsons VE6CB. Rules and multiplier chart can be found in the centre pull-out section.

Results of 1988 Canada Winter Contest

CALL	PROVINCE/ CALL AREA/ COUNTRY	QSO'S	VE'S	OTHERS	TCA/VCA	MULT	TOTAL	MULTI/SINGLE							
ALL BAND MIXED CLASS								* VE6AO	ALTA	511	145	366	11	42	131628
* WK7V	W7	582	157	425	12	32	112320	* VE3JWZ	ONT	507	162	345	9	34	108120
* VE3NXQ	ONT	179	138	41	7	51	85884	* VY1TCA	YUKON	513	135	378	7	24	72048
* VE2VCA	QUE	124	110	14	19	50	76800	VE6NOV	ALTA	134	87	47	14	35	46830
VE6VCA	ALTA	169	123	46	12	44	72776	VE3SPC	ONT	116	60	56	7	36	34704
VE3TCA	ONT	184	87	97	4	36	48168	VE3VCA	ONT	51	35	16	5	18	9252
VE7TCA	BC	150	59	91	8	28	31192	* WBXT	W8	28	21	7	5	12	4056
* G4LQI	ENGLAND	63	59	4	4	29	19894	SINGLE BAND 10 METERS							
* W6HAL	W6	78	39	39	5	17	10982	* VE3NPY	ONT	179	8	171	1	8	6272
* VE6RI	ALTA	47	35	12	9	16	9248	* DJ1ZU	GERMANY	237	35	202	0	4	4632
VE3NYT	ONT	24	20	4	5	18	5688	* JH7MSQ	JAPAN	4	2	2	0	1	28
VE6CB/3	ONT	36	25	11	2	17	5678	SINGLE BAND 15 METERS							
VE6DZ	ALTA	30	25	5	5	10	3700	* VE5XU	SASK	91	46	45	2	15	10200
* W5HR	W5	33	26	7	2	11	3608	* VE7NMM	BC	62	14	48	2	5	1860
* N01ZZ	W0	27	20	7	2	13	3484	* L22TU	BULGARIA	16	1	15	0	1	70
VE3TPB	ONT	14	13	1	1	8	1232	SINGLE BAND 20 METERS							
ALL BAND PHONE CLASS								* VE7ARS	BC	321	144	177	6	21	47628
* XE2NNZ	MEXICO	107	98	9	2	30	31680	* VE6CPP	ALTA	144	111	33	5	15	20130
* VE7VCS	BC	92	64	28	8	16	14592	* VE3SDX	ONT	105	71	34	8	15	15090
VE7EJS	BC	57	43	14	6	20	12120	VE7GCS	BC	50	48	2	7	11	6908
VE7CAL	BC	49	30	19	4	16	7296	* VE18M	NS	38	32	6	5	14	6216
* VE3GRA	ONT	27	21	6	6	15	5310	* K8OC	W0	8	7	1	4	5	770
VE7XO	BC	24	21	3	6	13	4446	* KD9CC	W9	5	5	0	0	4	200
* WK4F	W4	18	16	2	4	10	2480	* N17DU	ALASKA	1	1	0	0	1	10
ALL BAND CW CLASS								SINGLE BAND 40 METERS							
* VE68MX	ALTA	171	58	113	7	24	28128	* VE7DLM	BC	116	82	34	6	12	12912
* VE2RO	QUE	77	46	31	7	19	13756	VE7BS	BC	72	35	37	3	7	3906
* VE7CNW	BC	68	38	30	7	16	10240	VE7DAV	BC	24	17	7	2	9	2142
* W4OF	W0	60	39	21	4	17	9418	SINGLE BAND 80 METERS							
* VE3NRU	ONT	94	33	61	1	13	7722	* VE6GUS	ALTA	129	109	20	5	11	13970
VE3NXB	ONT	41	26	15	4	14	5600	CHECKLOGS: VE1ACK, VO1SK							
NE4F/D	W0	36	23	13	3	11	3762	MULTIOP STATIONS:							
VE2BLX	QUE	37	22	15	1	10	3000	VE4VCA - OPS VE4FJ AND VE4MG * VE6AO - OPS VE6AMR, VE6CIZ AND VE6SH							
* VE1BAN	NB	52	23	29	1	7	2562	VE3JWZ - OPS VE3JWZ AND VE3PHH * VY1TCA - OPS VY1CW, VY1AU, VY1AL, VY1BR,							
* KA7FEF	W7	15	13	2	3	8	1584	VY1DW, VY1DU, AND VY1BE * VE6NOV - OPS VE6CTJ, VE6KC, VE6LB, VE6APY, VE6KZ,							
MULTI/MULTI								AND VE6BLA. * VE3SPC - VE3KZE, VE33MCZ, VE3PUA, VE3SLI, VE3ERT, VE3PYA,							
VE4VCA	MAN	179	107	72	9	18	27684	VE3PKM AND VE3POS * VE3VCA - VE3NK, VE3IDW, VE3DXY, AND VE3LXA *							
								WBXT - WBXT AND NB1JT *							

The
Canada Winter Contest
will be held on
December 17, 1989

CANADA CONTEST

0000Z to 2400 Z
CANADA DAY CONTEST
1 July every year.

YEAR

0000Z to 2400 Z
CANADA WINTER CONTEST
Last Sunday in December every year.

CALL _____ TRANSMITTER _____

NAME _____ ANTENNAS _____

ADDRESS _____ OPERATORS _____

SINGLE OPERATOR

- All Band/Mixed Mode CW/SSB
- All Band CW
- All Band SSB
- Single Band Mixed Mode CW/SSB _____ MHz

MULTI OPERATOR

- Single TX- All Band
- Multi TX- All Band

SCORE CALCULATION

TOTAL QSO's

CANADIAN QSO's

X 10

OTHER QSO's

X 4

BONUS QSO's

X 20

TOTAL QSO POINTS

MULTIPLIERS

TOTAL SCORE = QSO Points X Multiplier

PTS.

PTS.

PTS.

PTS.

See Chart

PTS.

This is to certify that in this contest I have operated my station within the limitations of my licence and have observed fully the rules and regulations of the contest.

(Signature) _____

Logs must be postmarked no later than 30 days from the date of the contest.
Results will be published in TCA- The Canadian Amateur Magazine prior to the next contest.
Non-members of CARF must include an SASE to receive contest results.

The decision of the Contest Committee is final.

KENWOOD



TS-950S \$3750
TS-950SD \$4650
TS-950

The New Super Performer Is On Its Way.
High Tech Features With The Kenwood Touch.

Call For Details And Place Your Order Today!

YAESU



FT-767GX HF/VHF/UHF BASE STATION

- Add Optional 6m, 2m & 70cm Modules
- Dual VFO's \$3049
- Full CW Break-in
- Lots More Features

\$3899 ICOM NEW!



IC-765 NEW HF TRANSCEIVER

- Built-in Automatic Antenna Tuner and Power Supply
- 99 Memories • 100 W Output
- 160-10M General Coverage Receiver
- Band Stacking Registers

uniden

HR-2600
\$499
OFFSE
CTCS



- Mobile 10 Meter Transceiver
 - SSB/AM/FM/CW
 - 25 Watts PEP \$399
 - Computer Controlled Operation
- SALE PRICED

KENWOOD

\$1199



TS-140S AFFORDABLE DX-ing!

- HF Transceiver With General Coverage Receiver
- All HF Amateur Bands
- 100 W Output
- Compact, Lots of Features

YAESU

\$2649



FT-736R VHF/UHF BASE STATION

- SSB, CW, FM on 2 Meters and 70 cm
- Optional 50 MHz, 220 MHz or 1.2 GHz
- 25 Watts Output on 2 Meters, 220 and 70 cm
- 10 Watts Output on 6 Meters and 1.2 GHz • 100 Memories

IC-725
NEW ULTRA-COMPACT
HF TRANSCEIVER



- USB/LSB/CW, AM Receive
 - Optional Module for AM Transmit and FM TX/RX
 - 160-10M Operation • 100 W Output
 - Receive 30 kHz to 33 MHz
 - 26 Memories with Band Stacking Registers
- \$1199

Kantronics



- \$499 KAM
- Packet, WEFA, ASCII, AMTOR, RTTY, CW
 - Simultaneous Operation on HF and VHF
 - Personal Packet Mailbox™

KENWOOD

TH-25AT
POCKET-SIZED
AND POWERFUL

- \$ 399
- Frequency Coverage: 141-163 MHz (Rx), 144-148 MHz (Tx)
 - Front Panel DTMF Pad
 - 5 Watts Output
 - 14 Memories
 - TH-45AT Available \$369 for 440 MHz

YAESU



\$699 FT-212 RH

THE "ANSWERING MACHINE" 2 METER MOBILE

- 45 Watts Output
- 10 Memories
- Multiple Scanning Routines
- Hi/Lo Power Switch

ICOM NEW!

IC-2 SAT \$539

- MINI 2 METERS FM HANDHELD
- Receive 138-174 MHz
 - Transmit 140-150 MHz
 - Up to 5 Watts Output
 - 48 Memories
 - Band and Memory Scanning
 - Automatic Power Shut-Off

ASTRON



- RS7A ... \$109
- RS12A ... \$159
- RS20A ... \$219
- RS20M ... \$249
- VS20M ... \$299
- RS35A ... \$319
- RS35M ... \$359
- VS35M ... \$419
- RS50A ... \$459
- RS50M ... \$519
- VS50M ... \$579

KENWOOD

\$669

TH-75A
2M/70CM DUAL BAND HT

-
- Receive 141-163.995 & 438-449.995 MHz
 - One Watt Power on Each Band
 - Monitor Both Bands at Same Time
 - CTCSS Encode/Decode Built-in

YAESU

\$779

FT-470
COMPACT DUAL BAND FM HANDHELD (2M/70CM)

-
- 21 Memories for Each Band
 - Dual VFO's for Each Band
 - Up to 5 Watts Power
 - Built-in CTCSS
 - Built-in 10-Memory DTMF Autodialer

ICOM \$799

IC-32AT
SUPER DUAL BAND FM HANDHELD

-
- 5 Watts on Both Bands
 - Receive 138-174 MHz
 - 440-450 MHz
 - Stores Standard and Odd Offsets

MFJ SALE MFJ

LARGEST STOCK OF ALL YOUR MFJ FAVORITE ACCESSORIES CALL TODAY FOR BEST PRICE



SPECIAL KENWOOD SPECIAL

REAL BARGAIN AVAILABLE ON THE FOLLOWING GEAR. LIMITED STOCK, LIMITED TIME

KENWOOD	LIST	REG DISCOUNT	SPECIAL	SAVE
TH-75A 2M/440 DualBand Handy	\$749	\$669	\$599	\$ 70
TM-231A 2M 45W FM Mobile Transceiver	\$619	\$579	\$499	\$ 80
TM-431A 440MHz FM Mobile Transceiver	\$649	\$599	\$450	\$149
TM-701A 2M/440 DualBand Mobile	\$869	\$789	\$699	\$ 90
TM-621A 2M/220MHz Dual Band Mobile	\$949	\$899	\$699	\$200
TH-25AT 2M FM Handy Xcvr	\$489	\$469	\$399	\$ 70
TS-140S Gen Cov HF Xcvr	\$1379	\$1199	\$1050	\$149
TS-680S Gen Cov HF Xcvr with 6M	\$1489	\$1429	\$1250	\$179
TL-922A 2kW HF Amplifier with 2 Eimac 3-500Z Tubes	\$2799	\$2599	\$2199	\$400

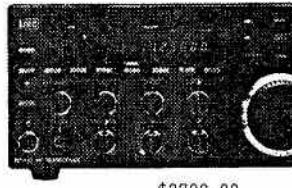
SORRY, WE DONT GIVE YOU 800 NUMBERS.

We Just give you great SAVINGS like these Kenwood Bargains above !!

AT THESE PRICES STOCK WILL NOT LAST LONG. GET YOUR FAVOURITE BARGAIN BEFORE IT'S GONE.

JRC Japan Radio Co., Ltd.

The GL HF TRANSCEIVER JST-13



\$2799.00

- General
- Electronic Tuning
- Transceive Operation with the

Receiving Frequency range 100kHz - 30MHz
Type of emission SSB(LSB/USB), CW
Frequency stability Within ±10ppm 5 to 60 min. and within ±2ppm one hour after powered on



Now AEA's popular PK-232M controller has all of the features asking for...PakMail™ mail traffic, seven-character AMTOR s Division Multiplexing) Rx for SW knowledge features. Compare every computer or data terminal full spectrum of digital communi PK-232MBX.

All Operational Modes. The P all of the recognized data modes: AMTOR, ASCII, Baudot, CW, FAX marine and packet.

Modem Superiority. An eight-bandpass filter limiter-discrimin ces the signal-to-noise ratio at th tually eliminates interference fro This system is superior to PLL m which was designed for minimal

PakMail™ PakMail™ mailbox traffic is now a standard feature packet messages around the clo plug-in board/update is compat Contact factory for details. The TDM (Time Division Multiplexing character AMTOR sel-call. Priori also included to reduce packet c

- DUAL BAND DISPLAY CHANNELS
- 2 PROGRAMMABLE CALL
- 24-HOUR SYSTEM CLOCK
- AUTO POWER ON AND POWER OFF TIMER FUNCTIONS



- SUPER COMPACT AND LIGHTWEIGHT
- CROSSBAND FULL DUPL OPERATION
- 5 W OUTPUT POWER WITH EXTERNAL 13.8 V DC

NEW DUALBAND ICOM HANDIE IC-24AT \$789

IC-24AT DUAL BAND FM TRANSCEIVER

IC-24

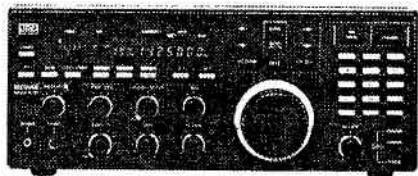
AT Tues.-F Saturda After 7

Global-Communicator

JRC HF GENERAL COVERAGE COMMUNICATIONS RECEIVER

NRD-525

1 DEMO JST-135 AVAILABLE AT \$2299



\$1999.00

- Wide Frequency Range
- Scan Reception • Sweep Reception
- Fully Solid-State, Modular Design

Coverage Receiver Heavy-Duty Design NRD-525 Receiver

Power Output 150W
Dimensions 330W x 130(H) x 280(D)mm
Approx. 8.5kg

Receiving frequency range	0.09 - 34MHz 34 - 60MHz (w) 114 - 174MHz (w) 423 - 456MHz (w)	NOTES	*With option mounted 330(W) x 130(H) x 280(D) (excluding projected parts)
Receiving mode	RTTY, CW, SSB(USB/LSB), AM, FM, FAX	Weight	Approx. 8.5kg
Channel memory	200 channels		

NEW PK-232MBX With PakMail™

PK-232MBX multi-mode data transmitter you've been waiting for with third-party call, TDM (Time Division Multiplexing) and priority access with almost any computer you can enjoy the convenience with the

FAX Transmission. The first multi-mode TNC to transmit FAX, the PK-232/MBX supports the widest range of printers using the optional RS-232/printer cable.

Host Mode. Only AEA provides a fully functional Host Mode which enables programs to control the TNC more efficiently. Programs include PC-Pakratt with FAX for IBM PC and compatible computers, COM-Pakratt with FAX for the Commodore 64 and 128, and now MacRATT with FAX for the Macintosh.

Two Radio Ports. Independent radio connection ports allow interchangeable HF or VHF operation, selectable from the front panel for convenience.

Signal Analysis. The PK-232MBX internal software has the exclusive SIAM™ (Signal Identification and Acquisition Mode) feature which lets you tune an unidentified signal. The PK-232MBX can automatically determine the signal's mode, baud rate or speed and configuration.

You Deserve the Original. AEA was the first to produce a multi-mode TNC, and it still remains the standard by which all other TNC's are compared. Don't settle for less.

- PK-232 Multi-Mode Data Controller with PacMail---\$549
- PK-3 New Morsematic Memory Keyer with Serial #'s-\$299
- STV-430 FastScan TV Transceiver with 2 Crystals-\$649
- PC-PacRatt/Fax-\$75 MacRatt/Fax-\$99 ComPacRatt/Fax\$125

- 4 DTMF CODE MEMORY CHANNELS FOR AUTO DIALING
- VERSATILE SCAN FUNCTIONS AND PRIORITY WATCH
- 40 DOUBLE-SPACED MEMORY CHANNELS

- A VARIETY OF TUNING STEPS
- MONITOR FUNCTION FOR CHECKING REPEATER INPUT FREQUENCY
- OPTIONAL TONE SQUELCH FUNCTION

ANTIC HAM RADIO LTD.

10 a.m.-6 p.m. 378 WILSON AVE.
10 a.m.-2 p.m. DOWNSVIEW, ONT.
Call (416) 222-2506 CANADA M3H 1S9
For Orders. (416) 636-3636

1990 CALLBOOKS

IN STOCK NOW !! WE CAN SHIP FOR CHRISTMAS !!



THE QSL BOOK!

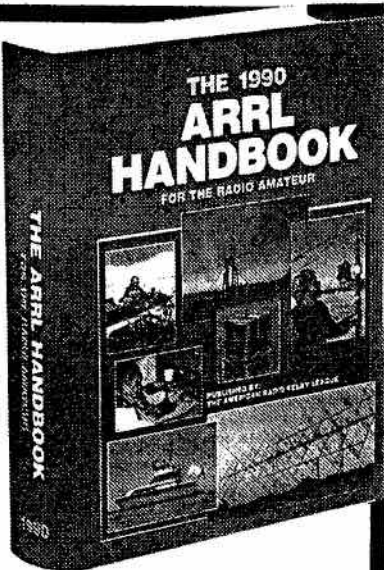
Extending a 69 year tradition, we bring you new Callbooks for 1990 with more features than ever before.

The 1990 North American Callbook lists the calls, names, and address information for over 500,000 licensed radio amateurs in all countries of North America, from Panama to Canada including Greenland, Bermuda, and the Caribbean Islands plus Hawaii and the U.S. possessions.

The new 1990 International Callbook lists 500,000 licensed radio amateurs in the countries outside North America. It covers South America, Europe, Africa, Asia, and the Pacific area (exclusive of Hawaii and the U.S. possessions).

- 1990 NORTH AMERICAN CALLBOOK-\$39
- 1990 INTERNATIONAL CALLBOOK-\$41
- BOTH 1990 CALLBOOKS-----\$72

ADD \$5 SHIPPING TO BOOK ORDERS

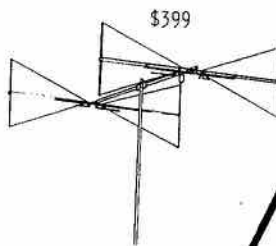


1990 HANDBOOK

This is the most comprehensive edition since the Handbook was first published in 1926. It is updated yearly to present the cutting edge of rf communication techniques while presenting hundreds of projects the average Amateur Radio operator can build. The 67th edition is packed with information on digital communication modes as well as new power supplies and amplifiers. Ready-to-use etching patterns are provided for many projects. This Handbook belongs in every ham shack. 1216 pages. Hardcover only

- 1990 A.R.R.L. HANDBOOK-----\$35
- CALLBOOK MAP LIBRARY-----\$20
- includes 8x11 Atlas and Prefix Map of North America and 2 World Prefix Maps.....

The HF5B "Butterfly"™
A Compact Two Element Beam
for 20-15-12-10 Meters.
Operates as a Dipole on 17 Meters.



ANTENNAS FROM BUTTERNUT

Butternut Verticals

Butternut's HF verticals use highest-Q tuning circuits (not lossy traps!) to outperform all multiband designs of comparable size!

- \$249 Model HF6V
•80, 40, 30, 20 15 and 10 meters automatic bandswitching
•Add-on kit for 17 and 12 meters available now.
•26 ft. tall

- \$229 Model HF2V
•Designed for the low-band DXer
•Automatic bandswitching on 80 and 40 meters
•Add-on units for 160 and 30 or 20 meters
•32 feet tall - may be top loaded for additional bandwidth

- Unique design reduces size but not performance.
- No lossy traps: full element radiates on all bands.
- Turns with TV rotor
- Only 19 lbs.

Insured Shipping & Handling -- Please add 2% (\$5.00 Minimum) to all orders. Some heavy or long items are subject to freight collect. ONTARIO RESIDENTS ADD 8% SALES TAX AFTER ADDING SHIPPING. All prices are subject to change without notice. Please send 2 first class stamps for catalogue and info requests. Special prices are based on cash or cheque with order. Credit Card orders add 2% to discount prices only. New Fax Fone 631-0747

Canada Contest Multiplier Chart

Province Province Territory Territoire	VO1 VO2	VE1 NS	VE1 NB	VE1 PEI	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VY1	VE0	TOTAL
Band/Mode Bande/Emission														
1.8 cw														
1.8 phone														
3.5 cw														
3.5 phone														
7 cw														
7 phone														
14 cw														
14 phone														
21 cw														
21 phone														
28 cw														
28 phone														
50 cw														
50 phone														

Rules: contests are open to all Amateurs. Everybody works everyone.

Classes:

In the single op section there are 10 classes of entry. They are All Band Mixed Mode (CW-SSB), All Band CW, All Band SSB, and Single Band Mixed Mode (CW-SSB). There are two multi op classes and they are Single TX All Band (Multi-single) and Multi TX All Band (Multi-multi).

Exchange: Operator's name; Signal report; Consecutive serial number; Province, territory, state or country. Multi-multi entrants use separate numbers for each band.

QSO Points: 10 points for each station operating in Canada and for all VE0 stations, and 4 points for stations operating outside Canada. An additional 20 points may be claimed for each official station using the VCA or TCA suffix.

Multipliers: As listed above for a possible total of 182.

Frequencies, kHz: 1825/75, 3525/3775, 7025/7070/7155, 14025/14150, 21025/250, 28025/500, 50040/50125 kHz

Entries: A valid entry must contain log sheets, signed statement, summary sheet showing claimed score, QSO's, a list of multipliers and bonus stations. Entries must be postmarked within 30 days of the contest. Please send in your comments and photos.

Awards: Certificates will be awarded to top scoring entries in each class in each province, territory, DXCC country and each U.S.A. call area. Trophies for All band Mixed mode, All band CW, All Band SSB, Single Band 14 MHz, Single Band 7 MHz, Multi op single, Multi op multi. Trophy winners may win the same award only once within a two year period.

No Cross mode QSO's are allowed. Single ops must use own station.

CANADA DAY CONTEST ENTRIES go to:
John Clarke VE1CCM, 16 Keefe Ave., Sydney, N.S. B1R 2C7

CANADA WINTER CONTEST ENTRIES go to:
J. Parsons VE6CB, Acton Corners Rd. Oxford Mills, Ont. K0G 1S0

•CQ DX•CQ DX•

Paul Cooper VE3JLP, RR 2 Metcalfe, Ontario K0A 2P0
613-821-2167



BOUVET NEWS

Readers will remember that I mentioned in the September column the 'Club Bouvet' DXpedition that plans to put Bouvet Island, in the South Atlantic, on the air this Christmas. This is the same group of Norwegian hams who put Peter 1st Island on the air last year. Now it appears that there are two more DXpeditions with plans for the island around the same time!

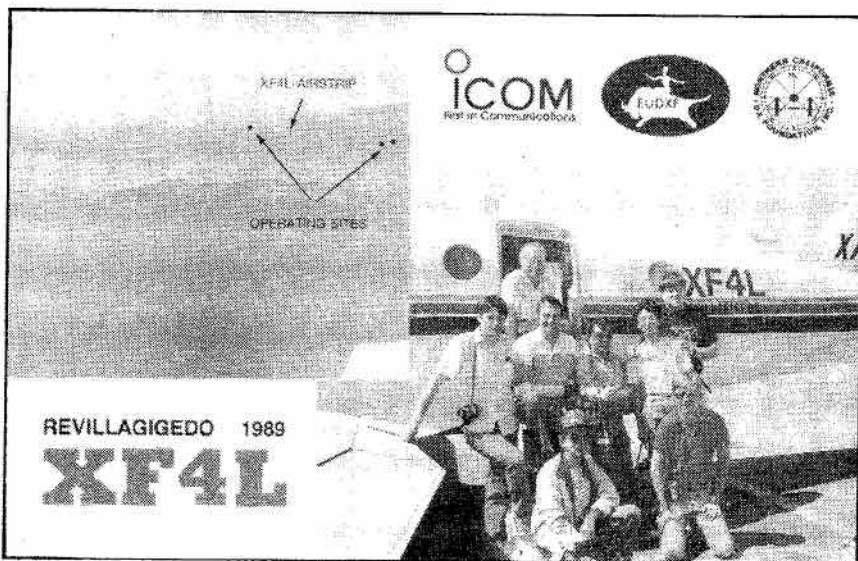
The latest 'serious' contender is the Legion of Indianapolis DXers who have been working for two years to get their expedition organized. Theirs will be a combined scientific research, Amateur Radio party of 18 which includes geochemical, marine biology and paleontological research scientists, survival and rescue experts, scuba divers, rock climbing specialists, emergency medical technicians, a two-man film/photography team representing the *National Geographic Magazine* and the TV program *Explorer* and, of course, the Amateur Radio team. The latter will establish seven stations, three on SSB, three on CW and one satellite. The operators are all from the U.S. and are under the direction of Mike W9SU.

We read that transportation to the island will be aboard the 184 foot S.A. *Deep Salvage 1*, which will sail from South Africa on Jan. 25. The plan is that they will put 3Y on the air around Feb. 3 and stay for 10 to 12 days. Unlike the Club Bouvet DXpedition, the Indianapolis group are already fully funded by non-Amateur money.

'Club Bouvet' had a major funding problem with \$100,000 to raise from the worldwide Amateur community. Apparently they now have raised 65% of the money needed with the great majority of contributions coming from Japanese operators. Contributions from U.S. Amateurs have only raised 6% of the total and for some strange reason no major U.S. DX foundation has participated. This is surprising news indeed, as the NCDXF supported the Peter 1st DXpedition, and with that good experience behind them, one would have thought that they would be delighted to help our Norwegian friends again.

The *Club Bouvet Newsletter* provides an interesting glimpse of the very difficult conditions any group faces in attempting to land and operate on the island.

The setting is similar to Peter 1st Island "... with its isolated and remote location and surrounded by virtually endless, cold ocean. Sea and air



A nice card I received for my contact with the April DXpedition to Revillagigedo. XF4L made a total of 47,943 QSOs!

temperatures are near the freezing point. Visibility is poor most of the time."

"But many things are different: Strong, frightening gusts of wind on the lee side of the island, 'impossible' landing conditions with worst case ocean wave heights up to 30 feet making landing, and especially departure, very difficult.

"Multitudes of living creatures, weighing up to 5 tons, will be guarding the shore. They are savage, do not love DXing and will attack us during the landing. The smell of the penguin colony is disgusting. We may have to carry 1 to 2 tons of fuel and equipment about half a mile from the landing to the camp site. Local fresh water will not be available. Special precautions will be taken to safeguard the welfare of the actors enroute and on stage as well as the interests of the local 'population', which is protected by National Law. We also wish to take good care of you, as audience and participant, without favouring any particular nation, club or group."

The Norwegian group plans to be QRV starting Christmas eve with a stay of one or two weeks (?).

According to I2MQP, I2NTN and I2DMK also have plans for a Bouvet operation in January/February 1990. We read that financing apparently poses no problem. With the strong possibility of two other groups operating from the Island at just about the same time this smacks of 'me-tooism' and a lack of consideration for

the organizers of the other DXpeditions. My guess is that we shall not be hearing much more about this particular group and Bouvet!

THAILAND UPDATE

It was with a real sense of déjà vu that I read a full page newspaper cutting from the *Bangkok Post* that my special correspondent had mailed to me. A little over a year ago I received a similar article from the same paper covering some of the same ground. The author, Tony Waltham, sensibly used material supplied by IARU as the basis of his article. The result: in those six columns of closely printed material I couldn't find a single mistake. This is very unusual for reports on the hobby in non-Amateur periodicals, they usually get something wrong! Do I detect a soft sell campaign to persuade the Government to open up the hobby in Thailand? It certainly isn't ham radio as we know it here in North America.

Until very recently, operations on the HF bands were restricted to club or special demonstration stations working, for the most part, on weekends and contests. Also, only stations in the provinces close to Bangkok were licensed. Now the Government will allow those who have passed either the intermediate or advanced licence class "for the first time to contact Amateur Radio stations abroad on the international shortwave bands". The authorities will also consider

Continued on next page ▶

DX (cont'd)

applications from Amateur associations in the other provinces provided there are at least 20 qualified operators in the area.

This all sounds quite hopeful, especially when you read that 15,000 people had applied to take the exam to qualify as a Novice and a further 50,000 (!) had purchased application forms for future exams.

We may feel frustrated at the slow pace of development of Amateur radio in Thailand. However, when you compare the situation there with what is going on in neighbouring South East Asian countries, you realize that things could be a lot worse. Burma, Laos, Vietnam and Cambodia... apart from one or two well-publicized DXpeditions... have been silent for years and there is no sign that things are getting any better for the hobby in these countries.

In closing, I should say that I liked Tony Waltham's headlines for his article. I think they would be equally appropriate for an article on Amateur Radio written almost anywhere else in the world. I quote, "Broadcasting on a human wavelength" and, "Perhaps best of all, Amateur Radio offers a challenging, enriching, productive and socially-constructive activity for young people in our increasingly complex society." Not bad, eh?

BITS AND PIECES

S7, Seychelles— You will remember

that this is an island group in the Indian Ocean north of Madagascar. Several stations are reported to be active. I heard Simon S79SC on Oct. 2 on the 20 metre band, long path. Details, 14.164 MHz at 1300 UTC.

He mentioned that he is also active on: Thursdays 14.135 MHz, 1230 UTC (working VKs) Saturdays 14.140 MHz, 1030 UTC (working into VU)

He is sometimes to be found at other times on his favourite range of frequencies 14.135-14.140 MHz. (QSLs to Box 234, Seychelles, Indian Ocean)

Long Skip reports the following other stations active from S7:

S79MC 21.310 MHz at 1814 UTC & 21.253 MHz at 1857 UTC (QSLs to AK3F).

S79MST 21.335 MHz at 1705 UTC.

S79YA 21.274 MHz at 1737 UTC & 14.160 MHz at 1420 UTC (QSLs to W6YA)

4U1WB, World Bank— No, it's not a new country, nor is it a pirate. It's the radio station of the World Bank in Washington, DC! They acquired their call sign in August and have a nice station at the World Bank HQ building, running 1 kW into a tri-bander and assorted dipoles at the 12-story level. Members will operate the station with an emphasis on weekends and weekday lunch hours. Contacts with the station will count as the U.S. for DXCC purposes. QSL via the buro or to KK4HD, their QSL manager.

9H, Malta— While not rare, Malta doesn't seem to have all that many active Amateurs, so it was nice to see that Claus DL2GBT mounted a mini DXpedition to the island from Sept. 21 to Oct. 19. He planned to be active on 6, 10, 12, 15 and 20 metres and if conditions were good 40 and 80 metres. His call was 9H3EH. I worked him on Oct. 5 on 28.410 MHz at 1730 UTC.

Other Maltese stations recently reported active include:

9H1JH on 21.287 MHz at 2021 UTC, 9H3KE on 21.250 MHz at 0154 UTC 9K3KN on 21.024 MHz at 0415 UTC and 9H3HV on 21.194 MHz at 1803 UTC.

F6FNU, Rogue QSL Manager— For once I don't feel I have the full story. It appears that F6FNU, who is QSL manager for 28 DX stations, is setting some odd standards for those who attempt to use his services.

His refusal to follow normal procedures has resulted in the French National Amateur organization refusing to redirect cards that arrive for him at their National Bureau. If you have to use him to get a card from one of the stations he manages please write to him direct at: Antoine Baldeck, Box 14, F-91291, Arpajon Cedex, FRANCE.

Thanks are due to the following sources for some of the material appearing in this column: Sarah Godoy, *Long Skip*, *The Bangkok Post*, *QRZ-DX*, *The Club Bouvet Newsletter* and VE3BTQ. ■

A SPECIAL THANK YOU

This 'different' Letter to the Editor appeared in *The Whitehorse Star*, April 12, 1989.

Brian Warner VY1BE was on his way home on Sunday, April 9th after attending a morning meeting of the Yukon Amateur Radio Association. He came upon an accident where a young girl had caught her foot between the frame and the pedal of her bicycle.

Brian stopped and asked if he could help... called the ambulance service who in turn called the Fire Department for the 'Jaws of Life'. The girl's leg had to be removed from the bike by breaking the frame of the bike, using the Fire Department equipment. VY1DU was listening to the VY1RBW repeater at 28/88 and made the appropriate calls, including one to the girl's mother, who came to the scene of the mishap.

Brian was the right person on the scene, and used his 2 metre handheld to help the injured young lady.

Public Service... the name of the game for 'Ham Radio'!

— Ron McFadyen VY1AD,
Assistant Regional
Director CARF

Band Reports

Thanks to Jack VE3BTQ for these extracts from his log.

<u>CALL</u>	<u>FREQ (MHz)</u>	<u>UTC</u>	<u>DATE</u>	<u>QSL</u>
TL8JL	21.225	1642	AUG 10	K4UTE
YC6KOS	21.246	2240	AUG 16	
CN2AQ	21.229	2230	AUG 17	
ZS1IS	21.295	2143	SEP 1	
"	28.469	1859	SEP 10	
7P8DP	28.469	1906	SEP 10	
3X1SG	21.281	1728	SEP 13	
5T5SR	14.130	0010	SEP 19	
4S7AVR	21.325	1810	SEP 22	Direct
JT0DX	21.223	1318	SEP 25	HA6KNB
5B4TI	21.307	1631	SEP 26	
5Z4BP	14.256	2319	SEP 26	
TT8GA	21.230	2332	SEP 28	
FK1RS	14.188	1155	SEP 29	ZL4DO

CONTEST SCENE

Dave Goodwin VE2ZP, 15 Oval, Aylmer, Quebec J9H 1T9

CONTEST CALENDAR

Dec 1-3 ARRL 160M Contest
 Dec 2-3 TOPS 3.5 MHz Activity
 Dec 2-3 Telco Pioneers QSO Party
 Dec 9-10 ARRL 10M Contest
 Dec 10 ARCI QRP CW Sprint
 Dec. 17 CANADA WINTER CONTEST
 Jan 6-7 Hunting Lions CW Contest
 Jan 6-7 ARRL RTTY Roundup
 Jan 13-14 Hunting Lions SSB Contest
 Jan 13-15 ARRL Jan VHF Sweepstakes
 Jan 20-21 Texas QSO Party
 Jan 26-28 CQ WW 160M CW Contest
 Jan 27-28 UBA CW Contest
 Jan 27-28 YL-SSB YL/OM CW Contest
 In 27-Feb 4 ARRL Novice Roundup
 Jan 28-29 1990 Winter Classic Radio Ex
 Feb 3 Carnival de Quebec CW
 Feb 3-4 Vermont QSO Party
 Feb 10 Carnival de Quebec SSB
 Feb 10-11 QCWA CW Party
 Feb 17-18 ARRL DX CW Contest
 Feb 23-25 CQ WW 160M SSB Contest
 Feb 24-25 UBA SSB Contest

Courtesy John Dorr K1AR and CQ Magazine

RESULTS— CQ WW DX SSB and CW

The results of the 1988 WVs were published in September and October CQ, and Canadian scores are reprinted below. As mentioned in my last column, the Phone records table took a severe bashing, and those records shown tentatively in September TCA are all good. The CW records table was changed only slightly, with John VE6OU/3 pushing up the Canadian all band mark by a small margin with VO1MP close on his heels.

Canadians making the box scores in the Phone included VO1SA #2 on 21 MHz, VE2ZP #3 on 14 MHz, and VE1ZZ, VE3PN and VE3DO, #3, 5 and 6 respectively on 1.8 MHz. VE2XY was the top score in Zone 2, and Garry VE3XN's superb score was the top in highly competitive Zone 4.

No Canadians made the box in the CW, although single-bander VE2LJ was the top score in Zone 2.

The difference in the scores between SSB and CW was particularly great this year, as conditions were incredibly good in October, and only fair in November.

At the time of writing, we're counting down to the WW SSB, and conditions look to be every bit as good as they were last year. It will be interesting to see how many of 88's new records will stand the challenge of 89.

VY2IDX

After a long, difficult struggle, P.E.I. finally has a prefix it can call its own. As of the end of October, Islanders have the option of changing their prefixes to VY2 from the old VE1 label which they

shared with New Brunswick and Nova Scotia Amateurs. I had the privilege of visiting the members of the Island DX Club at the home of their host, Dave Hunter VE1CIT (VY2CIT?). The lads were very excited by the prospect of the new prefix, and most looked forward to using it as soon as possible. Having a block of their own also opens up the possibilities for new two-letter calls. While they were reluctant to lose the connection with the other Maritimes contained in the figure '1', I'm sure the new prefix will be taken up with enthusiasm. Look for VY2s to start making their impact in the CQ WW CW.

On the down side, the whole debate about separate prefixes seems to have been fairly uncontentious on the island, but the reaction of a few Mainland VEs was unbelievable. One character is

rumoured to have threatened legal action over the matter, and the usual doomsayers predicted the demise of everything from their favourite net to next year's apple crop. Anyway, no-one will be forced to change anything, and those who fought the good fight and won deserve congratulations.

In closing, I want to apologize for missing last month's column. Holidays and work got in the way. Next month I will have a review of W2GGE's contest software, and I may toot my own horn a bit with a story of my CQ WW SSB trip to Zone 2.

CANADIAN RESULTS, CQ WW DX SSB 1988

Single Operators

Canada				
VO1AW	A	95,151	229	55 106
VO1SA	21	1,650,176	3169	39 137
VE1TI	"	120,990	392	24 87
VE1ZZ	1.8	23,188	134	15 53
CH2PJ	A	2,143,375	2389	89 236
VE2AYU	"	1,147,680	1171	96 264
VE2XY	"	604,950	1156	65 153
VE2DYX	"	448,168	793	67 145
VE2FTU	"	32,542	115	37 69
VE2ANE	28	73,108	255	27 71
VE2EW	21	63,438	229	25 72
VE2ZP	14	1,254,282	2573	39 144
VE2RL	3.7	23,240	268	11 29
VB3XN	A	5,373,693	3881	131 376
VE3JGC	"	951,465	878	113 298
VE3BXY	"	227,164	330	77 189
VE3NYT	"	85,058	214	47 95
VE3NTW	28	534,996	1244	33 121
VE3FWO	"	373,395	873	32 123
VE1BHA/3	"	71,708	269	21 70
VE3LYV	"	19,504	150	18 35
VE3MNV	"	15,272	69	25 58
VE3HX/M	"	13,623	89	17 40
VE3NEL	"	9,894	77	15 36
VE3PYA	"	2,925	55	11 14
VE3CHZ	21	37,367	183	22 57
VE3CPA	14	909,658	2290	38 119
VE3PN	1.8	22,008	403	10 18
VE3DO	"	20,091	284	12 25
VE3DEO	"	576	54	3 3
VE4IM	A	671,265	838	100 215
VE4RP	"	303,269	741	60 113
VE4NU	28	96,129	358	28 71
VE4DO	"	92,664	370	26 73
VE5FX	A	646,272	867	90 198
VE5DX	28	1,340,184	3509	35 117
VE6OZ	A	406,658	740	72 145
VE6AGV	"	39,198	147	40 57
VE6RI	"	19,173	90	29 48
VE6WQ	21	1,169,968	2623	37 129
VE7QO	A	605,395	982	92 153
VE7XO	"	225,720	433	57 123
VE7WJ	"	202,872	420	77 137
VE7HDX	"	115,639	229	71 126
VE7CXN	"	109,138	305	50 84
VE7AID	"	47,616	196	35 60
VE7ELC	"	31,262	113	41 57
VE7CA	"	27,795	94	43 66
VE7YD	28	3,045	61	11 10
VE7EIK	21	804,531	2022	36 111
VE7BW	"	430,440	1299	30 93
VE7ABC	"	185,907	761	28 65

Multi-Operator, Single Transmitter

VE6OU/3	9,406,875	4851	176	549
VE1ZJ	6,627,234	4720	142	440
VE5GF	2,924,389	3368	113	264
VE7SZ	2,835,549	3033	122	265
VE6AO	1,558,280	1910	108	218
VE1DX	1,233,408	1561	76	216
VE6CRS	587,125	1446	38	127
VE3SPC	490,248	714	70	194
CH2FOT	329,670	667	64	121
VE4ATC	305,900	542	60	170
VE3UHM	119,850	403	28	74
VE2UMS	59,697	269	27	54

Multi-Operator, Multi-Transmitter

VE7ZZZ 9,614,228 7876 157 369

CANADIAN RESULTS, CQ WW DX CW 1988

Single Operators

VO1MP	A	2,721,759	2482	104	313
VO1AW	"	8,340	53	24	36
VO1NA	1.8	10,138	183	10	27
VE2AYU	A	974,688	1075	105	247
VE2UL	"	93,940	255	48	106
VE2LJ	21	438,840	1534	28	87
VE2ZP	14	532,740	1354	40	116
VE6OU/3	A	2,725,002	2189	144	342
VE3IY	"	1,833,920	1708	131	309
VE3KP	"	1,174,568	1501	99	229
VE3ST	"	107,672	219	55	117
VE3PYA	"	72,080	232	53	83
VE3TEE	"	7,239	48	24	33
VE3SMA	28	67,776	256	26	70
VE3NBE	"	55,040	248	25	61
VE2AEJ/3	"	10,450	79	19	31
VE3VN	21	264,620	774	35	96
VE3CHZ	"	12,852	101	15	36
VE3DUS	7	44,250	243	18	57
VE6CB/3	3.5	76,314	458	16	53
VE3DO	1.8	30,495	256	17	40
VE3PN	"	20,038	225	13	30
VE3HCT	"	2,025	121	5	4
VE4IM	A	300,384	452	90	162
VE4MF	28	9,261	64	18	31
VE6DZ	A	258,700	524	74	125
VE6BMX	"	155,925	287	85	149
VE6SVL	"	9,048	90	21	18
					(Opr. VE6BPI)
VE6FB	21	107,476	474	28	69
VE7QO	A	766,303	1259	95	156
VE7HDX	"	163,386	231	105	156
VE7CXR	21	228,420	974	29	65
VE7BC	14	268,500	873	38	87
					(Opr. VE7XR)
W7DRA					
/VE7	3.5	1,749	76	6	5

Multi-Operator, Single Transmitter

VO2WL	1,318,900	2168	88	187
VE2UMS	199,356	601	58	90
VE3SPC	205,254	473	61	120
VE6AO	391,428	1053	64	102
VE7ZZZ	3,295,416	2802	155	337

CONTEST (cont'd)

TOPS ACTIVITY CONTEST

3.5 MHz CW

1800Z Sat. to 1800 Sun., Dec. 2-3

TOPS is an International club founded in Great Britain in 1946 for the benefit of CW enthusiasts. This year's 3.5 MHz competition is a 24-hour event in which the participants contact any Amateur worldwide. Call 'CQ TAC' to solicit QSOs.

Classes: Single operator, multi-operator, QRP (5 watts or less). Single operators must take one or two breaks totalling 7 hours. Multi-operator stations may operate the entire time period.

Exchange: RST plus serial number. TOPS members will also send their membership number (e.g. 599001/883).

Scoring: QSO with own country 1 point (each call area in W, VE, VK, PY, U and JA counts as separate multiplier); QSO with same continent 2 points; QSO with other continent 6 points; TOPS member QSOs 2 bonus points (TOPS members working each other can take credit for 3 bonus points due to longer exchange).

Final score: Total points times the number of prefixes worked (WPX prefix rules apply).

Frequencies: 3500-3585 kHz. The lower 12 kHz must be used for DX contacts only. It is strictly forbidden to work your own continent in this part of the band.

Awards: Certificates of merit will be issued to the highest scorers as designated by the awards committee.

Send logs no later than Jan. 31 to:

Helmut Klein OE1TKW, Nausegasse 24/26, A-1160 Wein, Austria. Results will be sent via the QSO bureaus or direct if one IRC is included. Questions regarding the TOPS organization should be sent to: Phil Evans GW8WJ, 2 Ffordd Ty Newydd, Prestatyn, Clywd, LL19 8BP, Wales, United Kingdom.

ARRL 10 METRE CONTEST

0000Z Sat. to 2400Z Sun., Dec. 9-10

This is the 17th annual 10 metre Contest organized by the ARRL. It's a worldwide activity in which DX stations can work other DX and are not limited to working W/Ks and VEs only.

A maximum of 36 hours operating time is permitted out of the 48-hour contest period for all stations. The same station can be worked on SSB and again on CW for QSO points.

Categories: Single operator, mixed mode, SSB only and CW only. Multi-operator, single transmitter, mixed mode only.

Exchange: W/VE stations (including KH6 and KL7) send RS(T) and state or province. DX stations (including KH2, KP4, etc.) send RS(T) and QSO number starting with 001. Maritime or aeronautical mobile RS(T) and ITU region. Novice/Tech must identify (/N or /T).

Scoring: SSB QSOs are worth 2 points, CW 4 points, Novice Tech CW QSOs 8 points.

Multiplier: U.S. states (50 plus District of Columbia) Canadian provinces (NB, PEI, NS, VE2-8, VY1, VO1, VO2,) DXCC countries and ITU regions (1, 2, or 3).

Final Score: Total QSO points times the sum of U.S. States, Canadian Provinces, DX countries and ITU regions, per mode.

Awards: Certificates to the top-scoring single operator station in each category (including /N and /T) for each ARRL section and DXCC country. And to the top-scoring multi-operator station in each ARRL division and each continent.

Indicate the multiplier only the first time it is worked. Dupe sheets are required for logs with 500 or more QSOs. The usual disqualification criteria will be enforced. A large SASE will get you log and instruction forms.

Mailing deadline for all entries is Jan. 10 to ARRL 10 Metre Contest, 225 Main Street, Newington, CT 06111.

CANADA WINTER CONTEST

0000Z to 2400Z Sun., Dec 17

Again sponsored by the Canadian Amateur Radio Federation, this activity is held on the last Sunday in December.

Everyone works everyone on both sides of the border and overseas.

Classes: Single operator, all band and single band, CW, SSB and mixed modes. Multi-operators, all band, single and multi-transmitter.

Exchange: QSO number RS(T), name and QTH province, state or DX country. **Points:** 10 points for each VE, VO or VY contact. Four points for non-VEs, and 20 points for working any CARF official station with the TCA or VCA suffix.

Multiplier: Each Canadian area (10) territory (VE8/VY1), and maritime mobile (VE0) worked on each band.

Final Score: Total QSO points multiplied by the sum of the multipliers worked on each band.

Awards: Certificates to the top entry in each Canadian area, U.S. Call area and DX country in each class. Plaques to the top all-band, CW, SSB and mixed mode. Top single band on 14 and 7 MHz. And top multi-single and multi-transmitter.

Results will be published in CARF's *The Canadian Amateur* magazine. Non-members should include an SASE with their log.

Mailing deadline is Jan. 31 and logs go to Jeff Parsons, VE6CB/3, R.R. #1, Oxford Mills, Ontario, Canada K0G 1S0.

CANADIAN RECORDS — CQ WW DX SSB

		Score	QSO	Zon	DXC	
A	VB3XN	5,373,693	3881	131	376	1988
2E	VE5DX	1,340,184	3509	35	117	1988
21	VO1SA	1,650,176	3169	39	137	1988
14	VE2ZP	1,254,282	2573	39	144	1988
7	XN3BMV	546,615	1882	31	104	1984
3.5	VE3BMV	383,040	1629	25	89	1985
1.8	VE3BMV	52,240	662	14	26	1986
MS	VE6OU/3	9,406,875	4851	176	549	1988
MM	VE3KZ	10,612,755	6960	152	483	1978

CANADIAN RECORDS — CQ WW DX CW

		Score	QSO	Zon	DXC	
A	VE6OU/3	2,725,002	2189	144	342	1988
2E	VE3BMV	504,063	1505	30	97	1980
21	VE3BMV	653,856	1665	35	112	1981
14	VE3BMV	662,454	1730	36	113	1982
7	XN3BMV	436,100	1306	36	104	1984
3.5	VE2HQ	176,180	793	22	70	1985
1.8	VE3MFA	32,276	340	15	32	1985
MS	VE3PCA	3,711,956	2794	135	373	1981
MM	XN3BVD	2,996,269	3096	124	295	1984

PRESIDENTS GET TOGETHER

The Presidents of the B.C. Lower Mainland Clubs have formed an Amateur Radio President's Council to 'Observe and Advise' on matters of interest to Amateur Radio. The inaugural meeting was held Sept. 28, 1989, in Burnaby, B.C., representatives from 12 clubs attended. Info Hu Reijne VE7CHW.

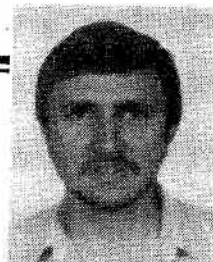
— CARF News Service

LETTERS

Send Letters to the Editor to: the Editor, *The Canadian Amateur*, Box 356, Kingston, Ont. K7L 4W2.

Listening To The World

Sheldon Harvey, 79 Kipps St., Greenfield Park, Quebec J4V 3B1



Let me take a moment to extend my best wishes to all *The Canadian Amateur* readers for a happy and healthful holiday season, as well as a wonderful 1990. I look forward to presenting this column to you again throughout the New Year.

Once again we were faced with another major natural disaster in North America; this being the California earthquake. Again the Amateur community stepped forward to help out with emergency communications. I was also busy with my monitoring activities, supplying local media with information throughout the crisis. It is so unfortunate, though, that it takes disasters to really bring our interests to the forefront.

COUNTRY OF THE MONTH

We have a truly unique place and an even more unique station to look at this month. We arrive at our destination through the country of Italy which surrounds this tiny country and the major world broadcaster which it houses.

We are in the Vatican City State and the station is the world famous Vatican Radio. From one of the smallest countries of the world comes one of the most powerful and most listened to voices on the shortwave bands. Whether you are a Catholic or not, you will find yourself intrigued by this unique broadcasting organization. The State of Vatican City is as unique as the broadcaster it houses.

Made up of only 44 hectares located in the city of Rome, the Vatican includes St. Peter's, the Vatican Palace and Museum, the Vatican gardens and neighbouring buildings. One of these buildings is the Palazzo Pio which houses the Vatican Radio's Production Centre. In February 1931, Pope Pius XI inaugurated the Vatican Radio Transmission Centre, built by the man who invented radio, Guglielmo Marconi.

The production centre has 14 studios producing programming in 45 languages for broadcasts on medium-wave, shortwave and FM to all parts of the world, together with a 24 hour a day broadcast for the city of Rome.

The Leo XIII Tower is the Vatican Radio's technical headquarters where the studio-chapel is located from which the Rosary and Mass in Latin are broadcast daily. On the first Saturday of each month the Pope himself leads the Rosary recitation. Programming is relayed to the transmitter site at Santa Maria di Galeria, 20 km north of Rome.

This site of 440 hectares has 11 medium and shortwave transmitters ranging from 100 to 500 kilowatts.

Vatican Radio is the owner of one of the largest rotating antennas in the world. It employs close to 400 people representing 44 nationalities including 34 Jesuit priests who head the various language departments.

Vatican Radio now broadcasts 45 hours of programming daily. Programming includes liturgical, spiritual, apostolic journeys, actuality, culture, music and news. In particular, their coverage of the numerous journeys of Pope John Paul II is very unique and informative. Also their news broadcasts are very well-produced and highly respected.

It receives over 50,000 letters each year, and surveys indicate that several million people tune into their broadcasts every day. The station produces a very informative quarterly programme and frequency schedule, free for the asking. In 1988, over 400,000 copies of this schedule were sent out to 173 countries. You can receive a copy by writing to Vatican Radio, 00120 Vatican City State. They will also respond to reception reports with a QSL verification card.

There are two English and French broadcasts beamed to North America daily. Here are the times and frequencies: English Service, daily at 00500 UTC on 9605 and 11780 kHz, repeated at 0310 UTC on 6150 and 11725 kHz. French broadcasts can be heard at 0030 UTC and 0250 UTC on the same frequencies.

One of their most unique annual broadcasts takes place on Dec. 24, Christmas Eve, from 1600 to 1700 UTC on 15190 and 17865 kHz, when they broadcast a special Mass in the Chinese language. You will find broadcasts audible in many different languages and to many different target areas. Give a listen to these unique programmes and I am sure you will find them fascinating.

THE MONTREAL HOBBY SHOW

Thanksgiving Weekend saw the 5th edition of this show presented in Montreal at Place Bonaventure. Each year the show grows in size and attendance. This year attendance was up by about 25%. For the first time we had the pleasure of having one of the local Amateur Radio Clubs present to display to the public the hobby of Amateur Radio.

Our radio monitoring club, the

Canadian International DX Club has been with the show since the beginning and each year we have had the opportunity to introduce the public to our unique hobby. We find that more people are aware of shortwave broadcasting and the number of questions increase each year as more people become interested in shortwave. If you have a hobby show or similar type of exhibition in your city or town, contact the organizers and see about setting up an exhibit or Amateur or Shortwave Radio (or both!)

BOOK REVIEW

The 1990 *Passport to World Band Radio* has arrived and it is quite a book. *The New York Times* describes the book as the *TV Guide* for shortwave radio. This year, in its 385 pages, *Passport* spans all aspects of shortwave radio monitoring with a very professional presentation.

Here is a summary of the feature articles appearing in this year's edition: Getting Started with World Band Radio—a guide to get you going; Ten of the Best Shows for 1990 picks the 10 best on shortwave radio; BBC: Dispatches from the Front Lines, features news reporting on shortwave; Eavesdropping on Disaster—looks at monitoring disasters and rescues on land, sea and in the air; 20 Easy to Hear Stations—20 easy to hear target countries outlined; Music: The Best of the World—a feature on the variety of music featured on shortwave around the world; Geography That Stays Tuned In—a look at using shortwave radio in the classroom; I Don't Leave Home Without It—a report by Voice of America Reporter Dan Robinson who uses shortwave as a reporter's tool; When Radio is Forbidden—featuring places in the world where shortwave monitoring can be dangerous; Wide, Wide World of Science—a summary of science programming on shortwave; The Baseball Fan's Guide to Cricket—a crash course on the game of cricket, heard often on shortwave; What's on Tonight—an hour by hour guide of programme highlights.

The book also includes the annual Buyer's Guide, featuring tips on choosing the right receiver, plus comparative ratings of portable and tabletop receivers. The bulk of *Passport* is taken up by the Worldscan Section which gives a country-by-country guide to English broadcasts and a

Continued on next page

► LISTENING (cont'd)

section entitled 'Voices from Home' featuring some of the major foreign language broadcasts by language, station and frequencies. The Blue Pages section is a frequency listing in a graph format giving details of all frequencies on the shortwave bands with time and language details of transmissions.

The book closes with the glossaries and guides in English, French, Spanish and German. It is chock-full of glossy colour photos from around the world, plus interesting advertisements from the major shortwave manufacturers and broadcast organizations around the world.

The print quality of the blue page section has improved greatly and is very easy to follow. *The Passport to World Band Radio* is the perfect companion to the annual *World Radio TV Handbook* (issued early in the New Year). Many people have tried to decide if one book is better than the other. In my opinion, each book has its own merits and I strongly feel that the well-informed shortwave listener should consider having both on their bookshelf.

My 1989 *Passport* gets a well-deserved rest as the 1990 edition steps forward. Should you wish to obtain a copy of this publication, you can order it for \$20 including postage and

handling. You can send your cheque or money order, payable to Sheldon Harvey at my address indicated above. If you're like me you will find this book to be a constant companion beside your radio as a major source of quick reference material.

That wraps things up for 1989. I look forward to the New Year in radio, particularly with the improved reception conditions we have experienced in the latter part of 1989. Indications show that reception levels will continue to improve throughout the

New Year. I hope to take you to many more new and exciting parts of the world through your shortwave receiver in the months ahead. Please feel free to continue to write to me and express your comments on the column. I am always pleased to hear from you. ■

VE3OBH UPDATE

Bert Wilson VE3OBH, the survivor of that dramatic rescue at sea (see September '89 issue of *The Canadian Amateur*) is now VE1OBH, living in Pictou, N.S. Bert is well but needs more therapy to regain use of his badly scarred hands. Good Luck OM.

— CARF News Service

OUTGOING QSLs

Please send your outgoing QSL cards to Box 66, Islington, Ontario, NOT to Box 356, Kingston. This causes delay to you and extra cost to CARF.

— CARF News Service

THIS SPACE FOR SALE

Remember...
people do
read ads!

\$50 per month
Write or call us
at



TRANSMITTERS - RECEIVERS - TEST EQUIPMENT - LAB EQUIPMENT - COMPONENTS

CARF

VE3 KHB

ARRL/CRRL

RSGB

Wholesale/Retail

W. J. FORD SURPLUS ENTERPRISES

Buy/Trade



Our warehouse 21 Market St., Smiths Falls.
(corner Market & William)

Mail to: P.O.Box 606
Smiths Falls, Ontario
K7A 4T6

Phone: Bus. (613) 283-5195 Res. (613) 283-0637

We are now open Saturdays from 9 a.m. to 5 p.m. Weekdays, for the present, are restricted to appointments for any time between 5 a.m. to 10 p.m. We normally are not maintaining a regular schedule during the week and therefore an advance appointment is essential to ensure your visit is successful. Sundays and holidays we are closed.

We carry a vast assortment of items ranging from medical, laboratory, scientific, photographic, optical, antiques and other strange pieces for the experimenter and enthusiasts as well as schools, labs and electronic firms. If in the area when we are open, feel free to drop in and browse through two floors loaded with surplus.

We are always happy to answer queries by phone or mail. Don't hesitate to phone us any time at home or warehouse. If by mail, a postage stamp to defray the cost of a reply would be appreciated. Due to the nature of surplus very few items are stocked in depth and as a result it is impossible to prepare a catalogue or listing which would remain valid for even a short period of time.

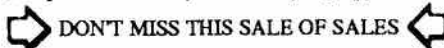
★ ★ ★
IMPORTANT ANNOUNCEMENTS ★ ★ ★

(1) To celebrate our 2nd year at this location we are offering an unprecedented SALE. To all our WALK-IN customers, 50% off the ticket price of ALL items in our warehouse.

This sale is running for three weeks starting Saturday, December 9 at 9:00 a.m. and ending Saturday, December 30 at 5:00 p.m.

————— EARLY BIRDS HAVE THE ADVANTAGE —————

Hours of operation are 9:00 a.m. to 5:00 p.m. on Saturdays. Weekdays by appointment or by chance.



(2) Starting the first of January we will be offering a new service. Small aluminum "U" chassis and panels will be available cut and bent to your dimensions. Prices will be extremely attractive to builders. Typical prices: 1 3/4 h x 4 1/4 d x 11 w = \$2.00. Some sizes will be stocked. More details on request and in the next issue of TCA.

BYTES AND BITS

Antonio Salvadori VE3NXQ, 17 Colborn St., Guelph, Ontario N1G 2M4

A Brief Introduction to MS DOS

I think you should read this month's column whether you own an IBM PC compatible or not. If you own an IBM compatible, well and good, if you don't you may get a few pointers on how to manage the activities on your own computer and also get an insight into what you may face if you should ever upgrade— or is it downgrade— to such a system. I also hope to satisfy some of you who felt that my initial treatise on software was a little shallow.

What is an operating system? It is a large and complicated program that manages or controls all of the peripherals attached to your CPU (central processing unit), and all of the programmes that are executed or stored in your machine. Since the operating system is a program, it is stored on a diskette like any other program. There is nothing magical about this program except that it is very complex and it has taken many people many years to write. There are many such operating systems. Some of the most common are MS DOS on IBM compatibles; GEOS on Commodore machines; ProDOS on Apples; Unix on a variety of machines; etc. They all have different names and do different things, but by and large the ideas behind them are the same.

Since the operating system (OS) manages the machine and the program it must be booted or loaded into the machine's memory before you can do anything. To do this you simply put the diskette containing the OS into your main drive, close the door and turn the machine on. The red light on your drive should come on to show you that your program is being read. After some time you should be asked to enter the date and time. If the date and time are correct just press the Enter/Return key (I will abbreviate this to <—) twice otherwise, enter each in turn as shown in my example.

Enter new date (mm-dd-yy):
06-23-89<—

Enter new time: 17:45<—

The time should be entered using the 24 hour clock that we hams are familiar with. Make sure you type it as shown exactly with the : separating the hours and minutes. Computers are very unforgiving if you make any mistakes. Also note that you should not leave any blanks whatsoever.

When this is done the DOS prompt:
A>

should appear. This prompt tells you that the system is waiting for instructions from you. It is the computer's way of telling you: Master, I await your wish. You may then enter any of a wide variety of commands to get the computer to do what you want it to.

The A stands for disk drive A. This is the drive on which the computer will always look for the DOS system disk. If you have two drives, the second one will be referred to as the B drive. If you have a hard or fixed disk this will be referred to as the C drive. If no system disk is present in the A drive, the computer will automatically search the C drive if one exists for the DOS programs. You can change drives by typing the drive letter and a: . For example

B:<—

will bring up the DOS prompt B telling you that drive B is now the active one.

Let me explain some simple commands to start with. Type

DIR<—

This is a DOS command telling the computer to give you a listing of the files in the current directory. I will explain what directories are in next month's article, for now just observe the results. Your screen should have five columns of information with a title and some information at the bottom. Let us look at the information in the columns. A typical set of items may be seen in Fig. 1.

The first entry is the *filename*, i.e. SORT, SYS, etc. File names identify the file and can be up to eight characters in length. The second entry is the file *extension* which is another item attached to a file name to give some extra meaning to the file. For example, extensions of EXE or COM designate that the file is a program which can be run on the system; an extension of BAS means that the file contains a BASIC language program; an extension of SYS designates a system file; etc.

As you get to create your own files, you get to create your own file names and extensions. For example, you may

want to give all of your documents the extension DOC; you may want to give a letter to VE3NXQ the name LEVE3NXQ and the extension AU9 to signify that it was sent in August 1989, etc. You combine names and extensions together by means of a . (period). I.e. in the example above you would have LEVE3NXQ.AU9. No two files can have the same name.extension. A little confusing? It will become clearer as we go along.

The third column tells you how many bytes, i.e. characters of space, your file takes up. In the example above, SORT contains 8608 characters of information. The next two columns tell you the date and time on which the file was created or last modified.

You may have noticed that the information just raced by and part of it ran off the screen. Slight variations of the DIR command fix this problem.

By typing

DIR/P<—

the computer will stop as each screen is filled. You may press any key to continue to the next screen full. The command

DIR/W<—

will arrange the filenames in columns without showing the size, date or time. Try all of these combinations on your machine to see the effect.

Voila! you have learned your first and one of the most commonly used commands in DOS.

I find that looking at a screen full of garbage is very distracting hence I clear the screen using the DOS command

CLS<—

This clears the screen and places the DOS prompt in the top lefthand corner.

When you buy a new program or get one from a friend, the first thing that you should do is make a copy of it and use the copy. Never, but never, use the original just in case something goes wrong and you destroy it. Always keep

Continued on next page ▶

Figure 1

SORT	EXE	8608	03-17-87	12:00p
SYS	COM	4766	12-01-87	07:10a
MORTGAGE	BAS	6251	05-13-88	13:45p
PRINTER	SYS	13590	03-17-87	12:00p

► NYBLES (cont'd)

your originals in a safe place and if possible, in a different QTH to protect yourself against any damage to your own QTH by fire, flood or excessive RF!

Remember, in case of fire, you can always go out and buy programs BUT you cannot go out and buy your data. Those of you who keep computerized logs should pay particular attention to this. Let a friend keep a copy of your valuable diskettes and you keep theirs in turn. The chances of both places going up in smoke together is rather remote.

How do we make copies for backup/protection? First of all let me make another very important point. Different operating systems read diskettes in different ways. Unfortunately if you have a friend with an Apple and you won a C64, even though the chips are identical you just cannot exchange diskettes because they are both running different operating systems. When you buy a diskette the dealer does not know what computer system you are going to run it on so you get a totally useless piece of plastic that cannot be read by any machine!

Before you can write or read to it you must get it ready for your particular machine's operating system. We call this process *formatting the diskette*. To do this is quite simple. You type the command

```
FORMAT<—
```

You will be prompted to place the diskette in the drive and press <— . Clanking noises will be heard as the operating system goes to work in getting the diskette ready. When finished you will be asked if you want to format another one. If so type

```
Y<—
```

otherwise type

```
N<—
```

A word of caution: when the system formats your disk it destroys all of the information on it, so make sure that you put in the correct disk otherwise you may lose some priceless information! The formatting operation not only prepares your disk for the operating system but it also checks for defects on the disk and prepares the *home directory*— more about this later. If you have more than one drive you can format a diskette in another drive by typing the drive name. For example

```
FORMAT B:<—
```

will format the diskette in drive B. Hard disk users be careful about using this command as you can very easily destroy the information on your hard drive if you make a typing error.

The DOS original disk contains *hidden files* which are used by the system. If you want to copy these to a

new diskette you must use the command `FORMAT/S` when formatting such a diskette. For example `FORMAT B:/S` formats the diskette in drive B and copies over the hidden system files.

Finally we are ready to copy information from one disk to another to make a backup. Assuming that you have two drives you can place the original diskette in drive A and the formatted diskette, which will contain the copy to be made, in drive B. The DOS command

```
COPY A:*. * B:<—
```

will now copy all of the contents from diskette A to diskette B. The system will clatter for a short period displaying the names of the files being copied and then a message will appear telling you the number of files copied.

You do not have to copy all of the files from one diskette to another. You can simply copy one file by using the command

```
COPY FileA FileB<—
```

where FileA is the file to be copied and FileB is the copied file. A couple of examples will clarify the process.

```
COPY QSL.AUG LOGFOR.AUG
```

makes a copy, in the same director and diskette, of QSL.AUG calling it LOGFOR.AUG

```
COPY A:QSL B:
```

copies the file QSL from the A drive to the B drive calling it QSL.

Sometimes you may want to delete files from your diskettes. The `DEL` command allows you to do this and is similar to the `COPY` command. For example

```
DEL *.*<—
```

will delete all of your files in the current directory. This is a potentially dangerous situation so the system asks you if you really want to do that. If you are, press `Y<—` if not press `N<—`

```
DEL QSL.AUG<—
```

will delete QSL.AUG from the current directory.

```
DEL B:QSL<—
```

deletes file QSL in the current directory of diskette B.

Be careful about deleting files. However, if you accidentally delete a file do not despair. Immediately remove your diskette from the drive and contact a friend who may have a file recovery program such as PC Tools or the Norton Utilities to help you. When you delete a file the information is not destroyed, it is just inaccessible to ordinary programs. Why MSDOS does not have such a recovery program beats me, but then the MSDOS people never consulted me! Please note you must remove the diskette immediately before doing any

DOS operation otherwise your data may be lost forever.

The final command I want to discuss this month is the printing of the information that appears on the screen. You can easily print this information for as long as you have a printer connected to your machine by first turning on the printer— make sure you do this first, and then pressing the keys

```
<Shift><PrtSc>
```

at the same time. The information should be printed in the exact same way as it appears on the screen.

If by accident your printer was not connected, the system may come to a grinding halt. When this happens, do not turn the machine off and on, simply press

```
<Ctrl><Alt><Del>
```

simultaneously. This is called a *warm boot* and you should be back at the start. However, if you were in the middle of editing a file or program, chances are that your program or file will be lost.

So much for this month. I will continue with more commands next month and the creation of your own commands by using *batch files*.

CORRESPONDENCE

Thanks to CN8VE (VE6AHT), CN8YL (Paul's XYL), VE2EDS, VE1CIT, NF4E (thanks for the kind words Paul), VE7PHD, VE3GRA, VE7FIL and VE1OT.

Dave VE1CIT sends me a C64 diskette packed with goodies. I will pass on Dave's excellent work in future articles. Thanks a million.

Burt VE7PHD asks if I have a version of my GEMRADIO database system for an Apple. Sorry Burt, even though I originally wrote it for my apple it soon outgrew my little Apple with its four floppy drives and extended memory!

The current version of the system is only available for an IBM clone with a Hard Drive. This version has a complete database retrieval system built into it originally suggested by Radhames HI3ADI. (However I still market a floppy disk version for people that do not have a hard drive.)

Brian VE3GRA sends me a GWBASIC contest logging program on a diskette. Thanks a million Brian, I really appreciate receiving reader's programs like yours. If anyone is interested please contact Brian directly with a SASE and a formatted 5 1/4" diskette. The software is free.

Philip VE7FIL is another Apple II user. Philip would like me to convert the programs that appear in my column so that they could be run on an Apple. Sorry Philip but I just do not have the time. I do own an Apple but I rarely use it nowadays. Perhaps some of the readers of this column may help you. If anyone is making the changes to run the programs on the Apple we would

NYBLES (cont'd)

certainly love to hear from you so that we may share the software. Philip also has an MFJ-1224 RTTY/CW/ASCII and particularly AMTOR operation.

John VE1OT points out an error in the GEMDUP program (April 1989) if you want to run it on a C64. You should insert the following two lines

1420 OPEN 4,4
1635 CLOSE 4

John is perfectly correct. Please note that my Basic programs are now written in GWBasic and small changes will have to be made for running them on a C64. I will do my best to point out all of the changes necessary, but I may make mistakes. John also sends me a sound producing routine. I will carry this in an article in a future column. Again thanks John.

I hope C64 users do not feel that I am abandoning them. I have to run the column for the greatest readership. If you want to be heard, please fill in the questionnaire which appeared in the May issue.

Hopefully by means of this column we can put hams in QSO with one another so that you can mutually help one another. Please keep me informed and keep the mail coming but please do include a SASE if you want a more complete personal reply. ■

Prosecution made under Radio Act

A Maple Ridge, B.C. resident has pleaded guilty to two charges laid under the Radio Act for possession of unlicensed radio equipment and establishment of a radio station without a licence.

In April, 1988 the DOC received a complaint from the RCMP that Michael Courtney Johns was in possession of unlicensed radio equipment and was alleged to be interfering with RCMP communications.

As a result of this complaint and further supporting evidence, a search warrant was served on Mr. Johns' residence and 14 pieces of radio equipment were seized. Some of the radio equipment was programmed for frequencies assigned to a local detachment of the RCMP.

On March 20, 1989 Mr. Johns pleaded guilty to two counts charged against him under the Radio Act. Count 1: possession of radio equipment without a licence (s. 3(1)(b) of the Radio Act R.S.C. 1970), Count 2: establishment of a radio station without a licence (s.3(1)(a) of the Radio Act R.S.C. 1970).

Judge Diebolt of the Maple Ridge Court passed a sentence of three

months incarceration on each count to be served concurrently. The Judge recognized that this was more than just a case of an innocent citizen in possession of a scanner or 'walkie talkie'. He said there were reasonable grounds to believe that Mr. Johns had the capability to cause interference to police frequencies, and the sophistication of the equipment in question was more than a minor concern.

The Judge's main argument for imposing this sentence was that a sufficient deterrent must be provided to Mr. Johns and the public. He emphasized that interference to police frequencies can be a very serious matter and that such action will not be tolerated.

If a radio operator violates provisions of the Radio Act, the DOC seeks to resolve the problems in a cooperative manner with the operator, and in most cases this approach is effective. When this is not successful, the Minister of Communications may suspend or revoke the operator's licence or start legal proceedings under the Radio Act. ■

QNC

We have warned you before of the Radio bug,
And how baleful it is to be bitten.
Now recent research has uncovered new facts
About ways that the victim is smitten.

As this bug takes a hold, the Ham burns with a fever
To buy a small box that he calls a Transceiver.
Which just makes him worse, and in this grave condition.
His wife only sees him when he needs nutrition.

This Transceiver, reputed as state of the art,
No sooner obtained, it starts falling apart.
Distracted, frustrated, and in a dilemma,
He now seeks the cure in a higher antenna.

He calls in some friends, who all have the disease,
And soon we can see them ascending tall trees,
Where the resident black squirrels, both children and dams,
Take a very dim view of arboreal Hams.

The lofty antennas don't answer the question.
It seems that this rig has acute indigestion,
And then he finds out, what we knew all along,
He can't get it fixed except in Hong Kong.

His condition at this stage is too sad to tell.
We very much doubt if he'll ever get well.
We will keep you informed of the signs symptomatic
Of this dread disease. Stay tuned for more traffic.

Barbara Lester, XYL of John VE3MB
from Quinte ARC Newsletter

QSL CARDS FOR THE CANADIAN AMATEUR SINCE 1965



ARES AMATEUR RADIO EMERGENCY SERVICE

Bob Boyd VE3SV, P.O. Box 356, Kingston, Ontario K7L 4W2



Working with Volunteers

At the suggestion of Ken Oelke VEGAF0, EC for Calgary District and CRRL's Midwest Director, we'll be covering some of the content of the Emergency Coordinators Manual in this and subsequent columns. This manual was published several years ago by the ARRL for the guidance of ARES ECs and AECs. This month we'll look at the subject of working with volunteers, with quotations from the Manual.

"Volunteers are the lifeblood of ARES. They are difficult to find, more difficult to keep and, at times, difficult to work with. Volunteers come in a wide variety of shapes, colours, sizes, backgrounds, skills, experience and levels of motivation. They have their own reason for participating and their own specific needs, which must be met if they are to continue to volunteer. Their needs, abilities and accomplishments determine the ultimate success or failure of ARES. The task of the EC is to discover and meet their needs while guiding them in the best use of their abilities, thus helping them to achieve significant accomplishments in public service.

"Volunteers are individuals who are willing to work with others to perform a necessary public service. They are human beings with human needs, goals, attitudes, abilities, strengths and weaknesses. Since volunteers will be the basic resource of the ARES group, it will be to the advantage of the EC to get to know each of them as well as possible.

"Generally, volunteers will do precisely what the EC wants them to do—no more and no less. It is up to the EC to convince them that the assignment selected for them is both needed and appropriate. Having their own likes and dislikes, it may be necessary to talk the volunteers into some assignments which are important though unpopular. Volunteers must be convinced that what they are being asked to do is really needed. Volunteers don't like to be underutilized, and tend to disappear when kept cooling their heels for a significant length of time. They will work for long hours under the worst conditions as long as they can see the need for it. Most will do anything

you ask as long as they're treated properly. If they are mistreated or abused, they may not volunteer their help again.

Why do they volunteer? "The majority join out of a desire to serve the public in a way they best know how: as communicators.

"Volunteers have a right to expect courteous, considerate, fair and impartial treatment from the EC. Courtesy is always in order; rudeness will cost dearly. In addition to learning and compensating for their weaknesses and being tolerant of their faults, the EC must also consider their feelings. Never forget that ARES is taking precious time from their families.

"Unfortunately, some members will expect much more of the EC than they have a right to expect, and often more than can be given. They may expect the EC to change situations over which the EC has no control, force other volunteers to change their habits, provide them with privileged treatment or status, fire a useful assistant because they happen to dislike the person and other equally inappropriate actions.

"Each member has different job demands and family requirements, as well as other outside interests. This affects training and preparedness and is especially applicable to their availability in disasters, as some of them may be affected by the disaster. Some volunteers may join ARES and never be heard from again. Others will join and not find time for training, but will come out for disaster operations. The rest will be willing to take different amounts of training, and their availability for disaster service will change as their situations and interests change. Very few will be willing to take sufficient training to be able to lead, and even fewer will be willing to do the extra work. It should be remembered that volunteers are individuals and should be treated as such.

Various approaches are suggested in the Manual.

"First, most volunteers don't respond well to orders. They will honour requests, particularly if information is included on the need for the request.

"Second, if their loyalty is desired, the EC must be prepared to reciprocate. The responsibility for the ARES group's success or failure lies with the EC whose loyalty must remain steadfast.

"Third, a member should never be criticized in public. People will respond better to criticism in private. A member should never be criticized personally—the criticism should be directed toward the person's actions.

"Fourth, it should be recognized that factions and cliques will develop within ARES as they do with any other group. The impartiality of the EC will be questioned when it seems to members that 'Bill always gets the best job'.

"Fifth, when a member of the group complains about another member's lack of knowledge or operating skills, it should be kept in mind that some people simply learn faster than others. In an emergency, the member who is learning will still be needed.

"Sixth, a member's weaknesses, faults or limitations should never be discussed on the air or in public. If someone complains about another member in public, the situation should be handled as diplomatically as possible. The responsibility of the EC in such a situation is to solve the problem—not to take sides.

"Lastly, when a member is causing more harm than good in the ARES unit,

Continued on next page ▶

INTRODUCING

QSL's

By VE3IWF

QUALITY CARDS AND FAST SERVICE!

USE YOUR OWN CUSTOM DESIGNS
OR SELECT ONE OF MY SAMPLES
-BOTH ARE PRICED FROM ONLY-
\$29.00 FOR 250 CARDS.

ACTIVE DXERS***

*****CONTESTERS**

SUPER LOW PRICES FOR ORDERS
OF 1000 OR MORE CARDS.
SEND OR CALL FOR FREE SAMPLES
AND A COMPLETE PRICE LIST.

O.M.PRESS

JEFF PARSONS, VE3IWF

R.R. #1

OXFORD MILLS, ONT. K0G-1S0
(613) 258-7131

* Reproduced courtesy ARRL.

ARES (cont'd)

It is important that the EC be diplomatic in any actions while keeping the effectiveness of the unit as the primary consideration.

"Working with volunteers is the most critical aspect of the EC's job and will call for the most time and effort. When leading his volunteers, the EC should not try to be 'all things to all people'. The EC must be a diplomat, a leader, a friend, an expert in emergency communications and an excellent listener. It probably won't be possible to

please all of the members all of the time. The approach should be to *lead* the group, not simply to *manage* it."

NANAIMO GROUP FORMED

We welcome the Nanaimo Amateur Emergency Communications Group recently organized by Wilf VE7US, Al VE7BEQ and Tony VE7FGT. With the formation of this group, emergency coverage is extended to an important area of B.C. We wish the group every success in their efforts.

EMERGENCY COMMUNICATIONS IN NEW ZEALAND

The N.Z. Amateur Radio Emergency Communications group was formed in 1932, following a disastrous earthquake. There are 74 sections throughout New Zealand, each with its own Section Leader. These groups liaise with other emergency services including police, St. John's Ambulance,

Red Cross, Civil Defence and Search and Rescue units.

The organization, training programs and operating procedures are very similar to those we use in ARES. Over many years, ARES has made a strong contribution in severe storms, power failures, earthquakes, searches for lost mountain climbers, etc. ■

It is hoped that this column, which is being submitted to both The Canadian Amateur and to QST Canada, can become an ongoing source of news and information for members of both organizations on ARES activities across Canada. ARES members and particularly ECs are invited to send along information on what they are doing and on any developments they would like to share with other ARES groups. Yours truly will pull this together in future columns, all with the objective of increasing our collective ability to serve our community and our nation, should disaster strike.

CONFLICT OF INTEREST?

Mimi Dawson, now former FCC Commissioner, has joined the law firm of Wiley, Rein and Fielding. This is the same group of lawyers which is handling the lobbying effort for United Parcel Service in regard to the company's claim for need of spectrum for its digital/voice national dispatch system in the recently reallocated 220 to 222 MHz Amateur Radio band.

Although President Bush has not yet named a replacement for Dawson, one of the names which appears to be under consideration is Sherrie Marshall. Interestingly, Marshall is also currently an attorney with the same law firm.

If Marshall is nominated and confirmed by the Senate, it would probably be a blow to the Amateur community in the matters of retention of current spectrum allocations and in issues such as the recent reallocation of the lower 40% of 1¼M.

Further, it would make it difficult, if not impossible, for a three-member Commission to effectively and impartially deal with the 87-14 reallocation forcing the FCC to go to a four member or full five member level to function on this issue.

— Westlink Report

(Sherrie Marshall was appointed and approved by the U.S. Congress... Editor)

CORRECTION

In Book Review, Nov. 1989, Page 17, Radio Manufacturer's of the 1920s, the correct name of the publisher is Vestal Press Ltd. of Vestal, N.Y. Remember, Vestal as in Virgin.

LETTERS TO THE EDITOR

All signed letters to the Editor are eligible to be printed, space permitting. The Editorial staff reserves the right to omit libelous and slanderous material and make spelling and grammatical corrections. Please make an effort to type, print or write very neatly. Thank you... Editor.

The QSL Card

I was reading an article in one of the Ham magazines a little while ago about QSL cards. It seems the author was of the opinion that there was no need in a modern age to send out cards.

His deceptively seductive proposition was that QSL cards are primarily used for collectors of awards, to confirm that a certain country or province has been worked a certain number of times on a certain number of bands and modes. What he wanted to do was to set up a computerized registry of who had worked whom, when and where and on how many bands. The idea was that, for a small fee, you could get a transcript of your score and send it to whichever association was about to issue your pet award, and they would accept it without the usual necessity to send in the cards.

The corollary to that position is that, in the early days, each contact was a scientific miracle, and should be commemorated; whereas now the average contact is unmemorable, so why waste the paper and stamps to send QSL cards?

I disagree. Certainly many of my contacts are with people I will promptly forget, and who will promptly forget me. But there are as many, or more, QSOs that I remember for a long time. For example the G-QRP station who was so excited that I had been able to work him through heavy QRN that he sent his cards by airmail special delivery. Or any number of QSOs in the U.S. novice band where I was their first 'DX' contact!

When one sees what some people have for a station, maybe to them every QSO is a scientific breakthrough!

There is another side to the QSL card too. It says something (a great deal, I think) about the character of the station operator. Some cards are works of art, some come off the shelf. Some are homemade, others are distributed by commercial concerns as advertising. I remember one card that came from a W4— it said 'See the U.S.A. in your wide-tracking 1967 Pontiac', with the station call in miniature letters in a corner. I have another, from Utah, which is a replica of a U.S. dollar bill, with the operator's head where George Washington's used to be.

QSL cards make fine wallpaper, and never fail to attract the attention of visitors, Ham and non-Ham alike. As an aid to interesting the neighbourhood youngsters, it is hard to imagine anything better.

There is some question about the cost. If you are a DX station, then there is a substantial cost, since you will be making a lot of QSOs. In this case, a QSL manager is a great investment. For those of us who live in Canada, the mail cost can be negligible if you join one of the national societies with outgoing QSL bureaus, or a DX society such as Canad-X.

One old-timer called the QSL card the 'final courtesy'. It may not be that any longer, but I, for one, shall continue to QSL one hundred per cent. ■

— John Iliffe VE3CES in *Splatter*,
York Region Amateur Radio Club

QRP

Moe Lynn VE6BLY, 10644-146 St., Edmonton, Alberta T5N 3A7



Merry Christmas to all you happy readers and good wishes to all your families. Christmas often comes early to some people and Ward VE6FLY is no exception having his 30' tower up just waiting his Cushcraft A3 to arrive from Vancouver. Wonder if the proverbial mink coat is under the tree this year?

GLEANINGS

Bill VE7DGY wrote asking for a QRP kit address after reading about the TWO-FER II in our September issue. GL Bill, hope to see you on QRP nets or direct very soon.

Tom VE7BNI wrote another letter expounding the virtues of QRP with his 50mW 3 stage VFO. Will try to get a schematic with more information so anyone can try the same rig. Tom has quit active net reporting but is reportedly on a morning schedule with Angela VE7ANG and Al VEGAXW. I stand corrected by Angela and Al: the TWO-FER II test was carried out on 7040 kHz, not as shown in the picture on page 41 of *The Canadian Amateur* of October 1989. (My mistake, or was it the computer?)

Rick VE7FOU has been hiding down in Inuvik since leaving Bull Harbour, he enjoys QRP, having worked Nick VE7NJP, heard me once and occasionally working others sporadically. He was expecting to be in Victoria by the end of September for a sojourn of 'work' inactivity, but in the spring will let us know his new QRA. His TWO-FER transceiver is built into a pair of 'Captain' tobacco tins that plug together with a little jumper to feed the oscillator into the receiver. He designed

the receiver so it can be used with other bands and transmitters. He has promised us a photo and Rick is usually true to his word!

Steve VE7SL wrote an excellent article on The Joy of QRP, not to be confused with the book by Ade WORSP, but his own 'Joy' in recent weeks. He counts 18 states besides SM3, OH6, YU2, YU1, DL4, DJ6, OK2, OK1, HA5 and many more over the pole. Several of his contacts were with a miserly half-watt output! He managed a long experimental QSO with Ed W6TTE, a well-known QRP enthusiast. Their exchanges were all solid copy using as little as 10 milliwatts toward the end of their QSO. Steve credits the improved band conditions and recommends anyone vaguely interested to get serious now for the next year at least. See the recent *QST Canada* for his full story.

Warren VE7EHL again sent me the VE7RAM Newsletter (11 sheets double-sided) indicating news, notes and carryings-on in and around Sorrento with his multitude of repeaters, packet and otherwise.

Al VEGAXW was slowed down with his W7EL kit from Small Parts Center. It seems that Al had a couple of problems with his ICOM R71A and was advised by ICOM to replace certain electrolytic capacitors with the tantalum variety. Now he is convinced that for the small extra cost we should all consider using tantalum in kit building to avoid future breakdowns. He also suggests we be very careful with polarity; make sure they are properly installed.

Jack VE6BOX is back in hospital for

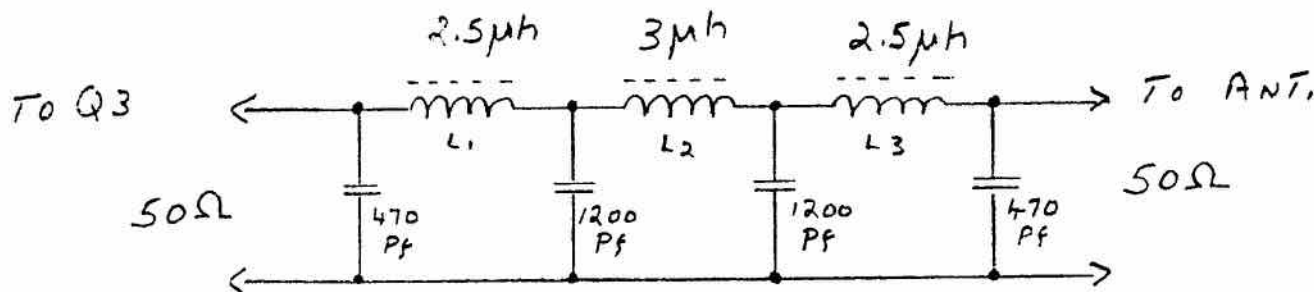
some more tests. He is taking advantage of the respite from Amateur radio but misses it considerably.

Mike WB8VGE wrote one of his best columns, in my opinion published in *73 Amateur Radio* for June 1989. He wrote, "For those of you who just can't seem to get enough solder smoke in your face, I've got some modifications to the TWO-FER. These mods are by Don WA9TGT. They make for better output filtering, full QSK, automatic antenna switching, high SWR protection and power output adjustment. The 12v line on the oscillator has been moved to the collector of Q4. (Anyone with an early model TWO-FER should be interested... Ed.) Those wishing a copy of the mods can have two data sheets for an SASE. That is U.S. postage to Mike Bryce WB8VGE, 2225 Mayflower NW, Massillon, OH. USA. 44646. No SASE—no data! Tell him you saw it here!

The Society of Wireless Pioneers now call their quarterly newsletter *The World Wireless Beacon*. The Sept-Oct '89 issue was 16 pages, slightly larger than *The Canadian Amateur* format. Olive VE7ERA, heard weekly on the Jack Binns SOWP net 3555 kHz at 0300 UTC, writes a very nice column entitled Buoy and Gills. She borrowed some memories from Ron G. Martin #81: SGP (Spark Gap Pioneer) who wrote about the Graf Zeppelin callsign DENNE working back to KUP in San Francisco. For a full account of the history of this famous ship, your library should have, or can get, a copy of *The Adventures of an Aerial Globetrotter*, copyright 1958 by J.

Continued on next page

80 Metre Lo Pass Filter



L_1 and L_3 = 22T #22 on T44-2 Toroid— Cardinal
 L_2 = 24T #22 on T44-2 Toroid— Cardinal
Filters for 40 and 20 can be scaled

Filter adaptation designed by W3NQN
Drawn by VE6AXW

YL News & Views

Cathy Hrischenko VE3GJH, 2 Dalmeny Road, Thornhill, Ontario L3T 1L9



The National Convention held in Winnipeg, Manitoba, this summer brought together a few Canadian YLs.

The main speakers were the Colvins—Iris and Lloyd. Known the world over, these two have probably given more new countries to DXers than anyone else. Iris, of course, has made possible some YL countries that we never thought would come to be.

Two of the YLs in the group picture had recently received their calls. They are: Cathy VE3JJS from Kenora, and Vivian VE4YL from Winnipeg. Also in attendance was Marg VE6AMN. I'm

QRP (cont'd)

Gordon Vaeth, and published by Harper and Brothers, New York, N.Y., U.S.A. It may even mention the radio power being in the then QRP range.

As my deadline approaches for the December 1989 issue I am listening to the QRP frequency of 14060 and notice many calls for San Francisco, CA., no doubt looking for news of relatives and friends in or near the earthquake but not getting any answer as yet. Those results are not new, of course, as we all expect an answer at one time or another if for no other reason than to add grist to the mill. Your input could liven up this column to the extent that more readers would become members, and our TCA could expand to enfold all those hidden journalists cum Amateurs.

Be kind to the animals over the festive season and all year round but don't forget the QRP frequencies 1810, 3560, 7030/40 10106, 14060, 18106, 22106, 24906, 28060, all 24 hours per day. 14060 on Sundays at 1900 UTC for VE QRP get together followed by ARCI TCN at 2300Z on or about the same 14060 +/- QRM. Make it a memorable Christmas and come on with your QRP for a check-in. Net control or just QSO. See you again in the New Year. ■

HELP WANTED

The CARF Office needs the current addresses of the following Amateurs, listed by name and last known address. Let Debbie know at P.O. Box 356, Kingston, Ont. K7L 4W2.

Dan Clarke VE7DAN, RR 1 Summerland, B.C.
Albrecht Meinshausen VE3HAB, 1800 Simcoe St. N., Oshawa, Ont.

Several clubs run a code phone. Does yours?

told 'A Good Time was had by All'. (Thanks to Diana VE7XYL for the photos.) News from Elizabeth VE7YL (she is mentioned in the article Wireless Women in the October '89 *The Canadian Amateur*) tells me that after the YLRL Convention in Hawaii, a group of YLs went on a DXpedition to Wallia and Fiji. It was led by Marylou Brown NM7N, with Elizabeth as QSL Manager. They made about 3500 contacts from each Island.

Recently many of us were keeping daily tabs on the whereabouts of Jane Weber VE3JWE, the first Canadian woman to sail across the Atlantic solo. More about Jane later.

Another YL, Sue VE3SVS is making a trip around the world. She may be using

the call VEOMLT. She had a mail pickup address in Maryland for six weeks. As yet, I don't have her new one. Daily skeds are all in eastern daylight time at 2200, on 14.055-60 and 7025 +/- . We'll try to keep you posted. If any of you are in contact or have more information, please let me know.

With winter here I thought I'd give you some Canadian winter trivia. Reginald Fessenden made the first two-way voice transmission in 1906. His question to Mr. Thiessen was apropos. The question was, "Is it snowing where you are?"

Don't forget Guides On The Air, Feb. 24 & 25, 1990. Merry Christmas and Happy Holidays. 73/33/88 as the case may be. ■



Above: 'Newies' Cathy VE3JJS, Kenora, Ont.; Vivian VE4YL, Winnipeg, Man.; Mae VE3MIA, Kenora, Ont.; and 'Oldies' Iris W6QL, Bubbles VE4ST, Winnipeg, Man.; Diana VE7XYL, Prince George, B.C.

Right: Iris and Lloyd Colvin at the Winnipeg Convention, August '89.



PACKET RAP

Bernie Murphy VE3FWF, 3 Herrington Court, Nepean, Ont. K2H 6B9

MOVING THE BITS (PART 2)

This month's column is a continuation of a discussion on the interface between the Terminal Node Controller (TNC) and a terminal device in a typical Packet Radio station. To understand what is going on this month, you should have a copy of the November 1989 edition of *The Canadian Amateur*. Please refer to the 'Packet Rap' column and locate the ASCII code tables.

ASCII REVIEW

As mentioned last month, it is possible to generate all 128 ASCII codes on an ASCII keyboard. Certain codes will require the use of a special key called the control key. Some keyboards, such as the one found on the IBM PC, use the designation *CTRL* to indicate the control key.

RS-232 SIGNALLING USING ASCII CODES

Assuming the reader has mastered the concept of the ASCII codes and how to generate these codes, the next step is to understand exactly what is going on in the actual RS-232 cable from an electrical point of view. Recall that the RS-232 standard indicates that the signal level on the interface should be in the nominal range of plus or minus 12 volts. For a refresher on RS-232 you may want to look at the 'Packet Rap' column in the March 1989 of *The Canadian Amateur*.

For the following discussion, we will assume that we have an ASCII terminal connected to a TNC via an RS-232 cable. If you look at the Transmit Data line (pin 2) of the RS-232 connector with an oscilloscope you would see a steady voltage on the cable. The scope trace on the Transmit Data (Tx) line would appear as shown in Figure 1.

The -12 volt level is called mark and the +12 volt level is called space. Assume that the letter A is typed on the keyboard at the terminal that is connected to the RS-232 line. The scope trace will now appear as outlined in Figure 2.

Notice that there are at least 9 'bits' of data here. The beginning of every ASCII character on the line begins with a transition from mark to space. This first bit is called the start bit and is used to indicate to the hardware that decodes the bits on the line that a new ASCII character is on the way. This type of signalling is called *asynchronous* as each ASCII character is timed by the presence of the start bit. In order to always guarantee that there will be no confusion with other bits, a marking bit

is always sent at the end of the ASCII character. Thus our ASCII character has a start bit, 7 data bits and a stop bit. This is not the usual situation, as most of the time another bit, called the parity bit, is placed at the end of the ASCII character just before the stop bit. Thus, most ASCII codes on the RS-232 interface actually use 10 bits, not 7 bits as one would assume. Full annotation of all the bits is shown in Figure 3.

Notice that logic level 1 or true is mark (-12 volts) and logic level 0 or false is space (+12 volts). Although not shown in the examples here, the space between any two ASCII characters can be anything as long as there is at least one stop bit per ASCII character. Now refer to Figure 4 for a scope trace of the letter B.

Decoding the character that was sent, the result is 0100001 in binary or hex



Fig. 1— Oscilloscope Trace of Quiescent RS-232 TX Line.



Fig. 2— Oscilloscope Trace of Letter A.

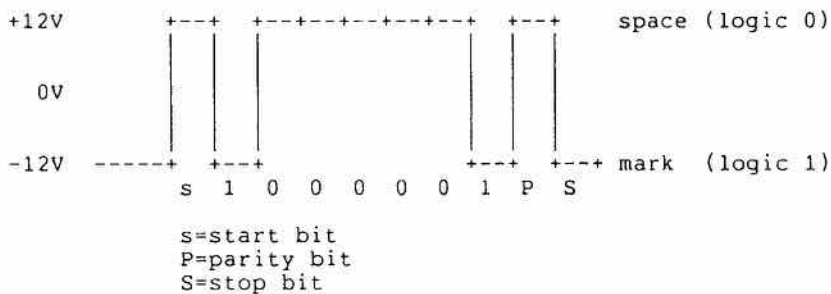


Fig. 3— Annotation of Oscilloscope Trace of Letter A.

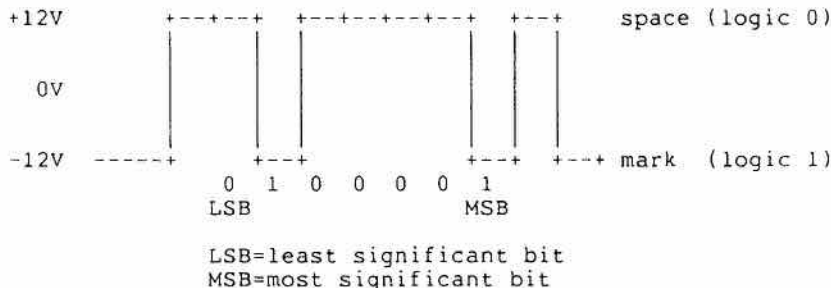


Fig. 4— Oscilloscope Trace of Letter B.

PACKET (cont'd)

21. If we now examine our trusty ASCII table, we discover that a hex 21 is the exclamation character (!) not a B as we expected. It turns out that the ASCII characters are sent out least significant bit first and most significant bit last.

Most Intense for 30 years?

It seems that working DX on the HF bands is capturing the imaginations of both the newcomers and old-timers in the hobbies of Amateur radio and shortwave listening.

We are on the upward part of the 11-year sunspot cycle which brings with it improved DX propagation. The current sunspot cycle forecast to peak late this year could be the second most intense since Italian astronomer-physicist, Galileo first saw the solar eruptions in 1610.

But apart from improving shortwave propagation—some scientists think this cycle's sunspot radiation might knock satellites off course and disrupt long-distance ground based radio and cable communications.

Sunspots emit solar flares, explosions that send protons, X-rays, electrons and other radiation streaming outward, sometimes causing magnetic storms on earth by disrupting the planet's magnetic field.

Predictions that the sunspot cycle would be exceptionally large were first issued in early 1987. But scientists say this cycle won't be quite as large as the 1958-59 solar maximum. The last sunspot cycle peak was in late 1979, and the cycle minimum was in September 1986. The upcoming maximum is expected as early as late 1989; earlier scientists were forecasting a peak in 1991. Magnetic storms are not dangerous to people on earth. But they pose a potentially lethal proton radiation hazard for spacewalking astronauts and spacecraft electronics. Excess ultra-violet light from solar flares heats the earth's atmosphere, expanding it to produce drag that can make satellites in low orbits fall to earth prematurely.

The U.S. Spacelab fell to earth after an intense solar flare at the peak of the last cycle in 1979.

— *Amateur Radio* and the WIA

TCA COPIES

Copies of articles from *The Canadian Amateur* from Vol. 1 No. 1 Jan. 1973 are available. One article per issue \$2 post paid.

Thus, 'flipping' all the bits in reverse order will result in binary 1000010 or hex 42 which (checking our ASCII table) is indeed the letter B.

ALL ABOUT PARITY

The purpose of the parity bit is to provide a sanity check for the character. To make things interesting, there are five possible parity settings. These settings are even parity, odd parity, mark parity, space parity, and no parity. Even parity means that the total number of ASCII bits (not including the start and stop bits) including the parity bit is an even number. Odd parity indicates that the total number of bits including the parity bit is odd. Mark parity means that the parity bit is always at the marking level (logic level 1). Space parity is used to force the parity bit to be always 0. Last, no parity means that there is no parity bit present. No parity indicates that the total number of bits present on the RS-232 line does not include a parity bit. This parity business is sometimes a very confusing situation. Some people confuse no parity with space parity (logic 0). The confusion arises because it is possible to set up a terminal for 8 data bits and indicate to the TNC that there is no parity present. In this situation, the parity bit is treated as data in the 8th bit of the character. This 'trick'

is sometimes used to send binary data as 8 bit bytes on an RS-232 line. For packet radio use, the parity bit is usually not that important as the RS-232 signals only flow on a cable that is typically five or 10 feet long. Noise should not be present on a properly constructed RS-232 cable.

BITS PER SECOND AND BAUD

Note that bits per second (bps) and the term *baud* are not always the same. Baud is used to indicate the number of transitions on a line. For higher speed modems (eg. greater than 2400 bps) the actual baud rate on the modem line may be half or a quarter of the number of bits per second on the RS-232 interface on that particular modem. If an RS-232 interface is running at 300 bps and each character requires 10 bits, the character rate on the interface will be 300/10 = 30 characters per second. The overhead of the start bit, stop bit and the parity bit (if present) must be included when actual character throughput is being computed.

SAY FAREWELL TO 1989

I hope that the Christmas season will be a joyful one for you and that the year 1990 will be a year for you to fully enjoy our amazing hobby called *Amateur Radio*. See you next month (in 1990!).

Mobile Radio helps victims

Rev. Ken Rentz of Dryden, Ont. was able to use the mobile Amateur radio in his car to help accident victims he encountered on a trip to Winnipeg March 12.

Rev. Rentz, minister of the First United Church in Dryden, was driving into Winnipeg when he came upon a truck that had hit ice between Steinback and Winnipeg and rolled. The occupants, two ladies, were not seriously injured.

Their personal effects had spilled from the back of the truck. Several other vehicles also lost control and ended up in the ditches. Rev. Rentz used the mobile radio in his car to call for assistance.

Through the VE4MAN Starbuck Repeater, he contacted VE4AHG, Dave Elgert, who lives in Portage la Prairie. Mr. Elgert called his local RCMP Detachment who in turn called the Steinback RCMP detachment and they were on the scene in 15 minutes.

Bruce Massey VE4GR came on air with his radio from Winnipeg and relayed messages between the ladies in the truck and their families. Along with other Amateur radio operators, Rev. Rentz had assisted disaster officials at Dryden by providing communications for the F-28 crash.

The Winnipeg Amateur radio operators maintain several repeaters throughout southern Manitoba. These repeaters receive signals transmitted by hams from their vehicle radios or low-power handheld radios and re-transmit them at a higher power. This increases the range of communication. These repeaters are also linked together to provide coverage along the Trans-Canada Highway for emergencies.

Plans are underway in northwestern Ontario to link communities together with Amateur radio repeaters. The Kenora and Winnipeg clubs are working together to link all the repeaters between them, as well as one located at Sioux Narrows.

Kenora will become the hub of the northwestern Ontario system. Amateurs in Red Lake and Ear Falls are planning to link in. The Amateur Radio Society of Dryden is presently raising funds to relocate and upgrade its repeater so it can be linked in.

Similarly, Amateur radio clubs in Fort Frances, Atikokan and Thunder Bay are working to link their repeaters so that, eventually, there will be uninterrupted coverage from Thunder Bay to Winnipeg.

— *The Dryden Observer*

LOOKING AROUND



Art Blick VE3AHU, P.O. Box 356, Kingston, Ontario K7L 4W2

In answer to a couple of queries— (1) How do you measure RF power output from a transmitter?, and (2) Why do NiCd batteries require 'zapping' and how is this done?

(1) The two common methods of measuring RF power output are through the use of an in-line RF Ammeter or through measuring the output RV voltage. RF ammeters were readily available in the surplus market in the years following WWII but are infrequently found today, except possibly at Amateur fleamarkets, and are expensive. If you have one, mount it in a suitable box with In and Out coax connectors and put it in series with the coax lead from your transmitter to a dummy load. See Fig. 1.

Tune transmitter for maximum output and read meter. The RF power output can be calculated from $P = I \times I \times R$ watts (sorry, my printer does not have facilities for printing 'squares' or 'square roots'). If using a 50 ohm dummy load, a reading of 1.4A denotes a power output of 100 watts; if using a 75 ohm load, the reading will be 1.15A for 100 watts. The RF Ammeter in my station reads from 0 to 4 amps, is non-linear and spreads the readings from 1 to 3 amps, so a reading of 1/10 amp is readily made.

The second method is to read the RF voltage output and this can be accomplished using an RF probe with a VTVM, FET Vm or digital Vm. RF probes are usually designed to work with a particular voltmeter and follow the general design of Fig. 3. Power output can be calculated from $P = E^2/R$. One big problem— the diode used in the probe, normally a germanium signal type, will only handle around 60V RF and, as 100 watts of RF will produce 70.7V RF into a 50 ohm load (86.6V RF to a 75 ohm load), the production of this RF power will undoubtedly burn out the diode. To prevent this, we have, for many years, used what we call a 'Centatap' that can be placed in series with the coax feeder and gives a voltage output that is 1/100 of input voltage. See Fig. 2. This circuit draws only 1 mA of current from a 100 watt RF input. An RF power output of 100 watts would therefore produce a reading of 0.7V RF into a 50 ohm load, etc. The RF voltage can be changed to DC voltage by adding the converter circuit shown in Fig. 3. This circuit is designed for use with a 10 megohm input voltmeter.

(2) There is an excellent article on care of NiCd batteries in *Ham Radio*, July

Continued on next page

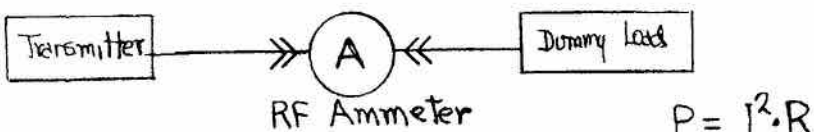


Fig. 1— RF Ammeter connection.

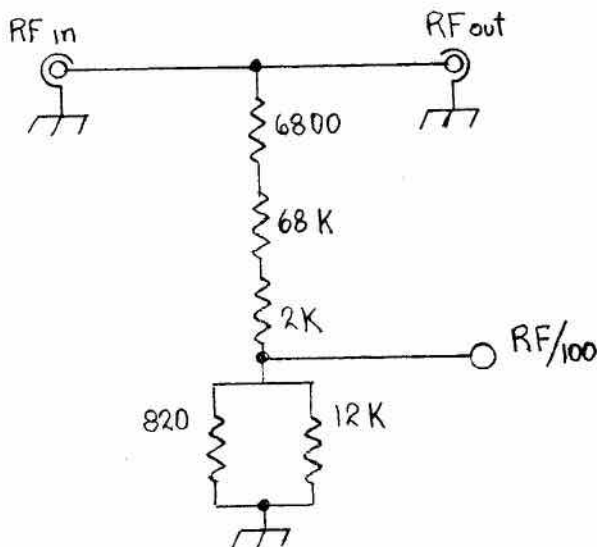


Fig. 2— The Centatap.

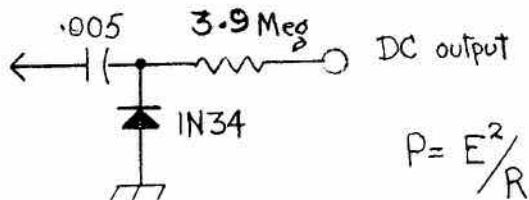


Fig. 3— RF/DC Converter.

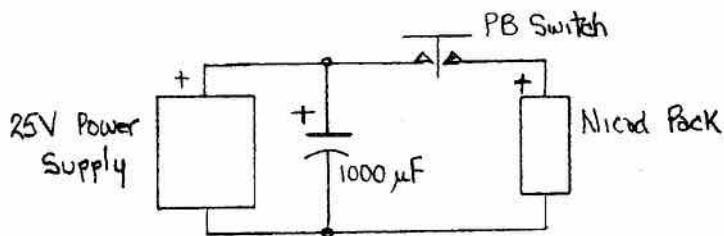


Fig. 4— Nicad Pack Zapper.

1987 issue, page 62ff. It notes that batteries, left in a discharged condition for a lengthy period of time, may develop inter-element shorts— little 'whiskers' (dendrites) grow from plate to plate, causing a short circuit so the cell potential will drop to zero and the cell cannot be charged. This effect is accelerated by high temperature, as I found out last summer when my hand-held was left in the car for a couple of weeks.

The process used to destroy these 'whiskers' is called 'zapping' and the circuit shown in Fig. 4 is the best one that I have tried over the years. Just tie a 1000 uF, or higher, electrolytic capacitor across the power supply output, attach the negative lead to the battery negative, apply the positive output to the battery positive for about one second, and do this three to five times.

This application can be done by using a push-button switch, as shown, or simply by touching the positive battery terminal with the lead attached to the positive power supply output. You will produce sparks using the latter method! Note that the voltage rating of the capacitor must be higher than the power supply voltage output and we use a 40V rated capacitor for this when we are zapping a 10.8V NiCd battery. This high-voltage, high current pulsing will not harm the battery. The need for 'zapping' is readily determined when a charged battery reads lower than its rated voltage output, e.g. a 10.8V battery reads 9.6V.

It is advisable to wear safety goggles when zapping as NiCds have been known to explode under high current, as may occur if the zap pulses are too long or carried out for too long a period. The use of safety goggles is always advised when working in the home workshop. ■

LONDON REPEATER

The London Amateur Radio Club ATV Group is preparing to install an ATV split-band repeater as a part of the London Seniors ARC club station at the Western Counties Wing of Parkwood Hospital. Over 20 Amateurs have ordered down converters and antennas for the new repeater so it looks like a very active winter on ATV for the group.

— LARC Bulletin

GOOD NEWS!

The Radio Communications Act, Bill C-6, was passed by the House of Commons on Oct. 5, 1989. This was originally Bill C151 introduced by the Hon. Marcel Masse in April '89, and deals with EMI problems caused by radio transmitters to substandard electronic appliances.

Goodwill Games event

The 1990 Goodwill Games, telecast around the world, is expected to be seen by one billion viewers! The games take place in Seattle, July 20-Aug. 5, 1990. Twenty-five hundred athletes from 50 countries will compete in 21 events over 17 days.

Three U.S. Amateurs, John Kiesel KE7V, Jack Bock K7ZR and Homer Spence K7RA, were recently invited to the Soviet Union by the Zilan DX Club in Kazan. They also formed a W5YI-VEC testing team and administered the first U.S. Amateur radio operator examinations ever held in the U.S.S.R.

The Seattle area Amateurs advise that competitive Amateur Radio DX contest operation with U.S.S.R., U.S. and other foreign operators will also take place during the 1990 Goodwill Games. The event will have official status and is being termed a 'cultural' rather than a sports event. The operation takes place

from eight locations in the Seattle area using eight Soviet, eight American and eight foreign operators using comparable stations during the IARU HF RadioSport Championship.

The U.S. and U.S.S.R. will be the main competitors, but the best foreign operators in the world will also be invited. The objective is to have an Amateur radio competition similar to the format to other sports events being staged at the 1990 Goodwill Games. The ham radio competition is being coordinated with DOSAAF, the Soviet Amateur/military organization, and the RSF (U.S.S.R. RadioSports Federation).

The Goodwill Games will be in the U.S.S.R. in 1994 when Moscow and Leningrad co-host the event. The games return again to the U.S. in 1998.

— W5YI Report

Ham Radio operators say equipment needed

The following article appeared in a March 1989 issue of *The Dryden Observer*. Thanks to Bob VE3IO.

The Amateur Radio Society of Dryden is looking for new equipment and the recent Air Ontario plane crash stresses the need.

The radio society, whose members operate ham radios in the area, is looking for a new repeater and a better location for the repeater. The society has also identified the need for installation of new outdoor vertical antenna at various locations in the Dryden area.

The society set up a communications station at the Dryden fire hall during the aftermath of the Air Ontario plane crash March 10. Although an indoor antenna used by Ham operators served the purpose of radio communication, the absence of an outdoor vertical antenna did hamper transmissions.

Roy Orvis of the society says members have been contributing money towards the purchase of new equipment but outside funding is needed to upgrade facilities.

"We've been looking at this new equipment for about two years. The air crash certainly brought it home for us," said Mr. Orvis.

Mr. Orvis said outdoor vertical antennas at locations such as the fire hall, hospital and the airport would serve as operating stations and enable Ham operators to patch into the repeater and send out messages about

30 miles, depending on the quality of the repeater.

"An upgrade of our equipment would certainly be beneficial for responding to emergencies and covering the area more efficiently," he said.

The society's repeater is now located on Airport Road, but the group is looking for a better site to enhance communications. Mr. Orvis says a location on Highway 601 north of the Dryden townsite has been identified as a potential spot for a new repeater. He said the radio society has approached Dryden officials and negotiations for the new site are ongoing.

The present repeater is made with older surplus equipment. A new repeater would increase reliability for radio operators, said Mr. Orvis. He said the society also needs a portable generator for the repeater site as a back-up system in the event of a power failure.

He notes that Thunder Bay has an extensive system of vertical antenna operating stations at senior citizen homes, hospitals, fire halls, the police station and airport. The stations are maintained and regularly tested by Ham operators.

He also noted that Ham radio operators are often the only means of communication in emergency or disaster situations, citing the Mexico earthquake and the Jamaican hurricane as two examples. ■

ANTENNAS

THE GAIN GAME by GERRY KING VE3GK



QUARTER-WAVE COAXIAL TRANSFORMER NOTES:

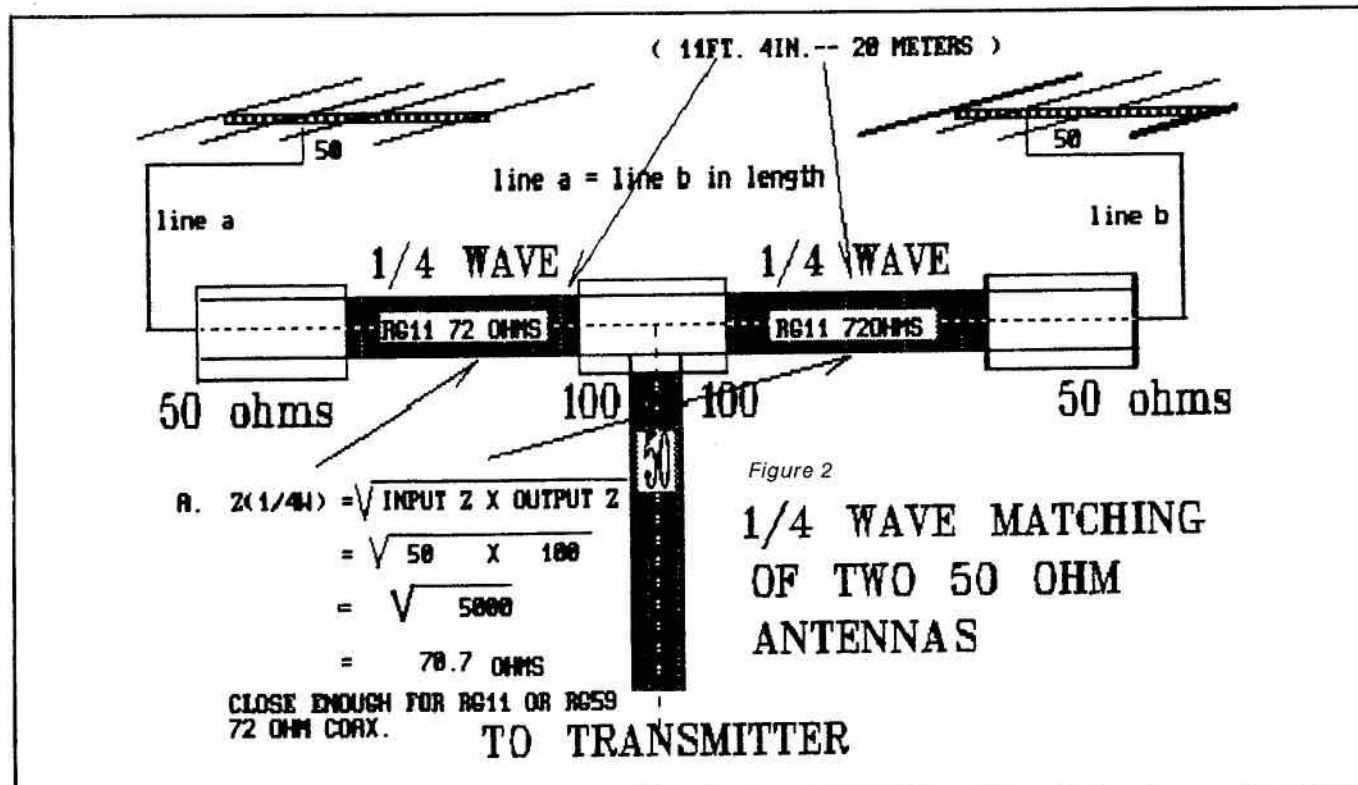
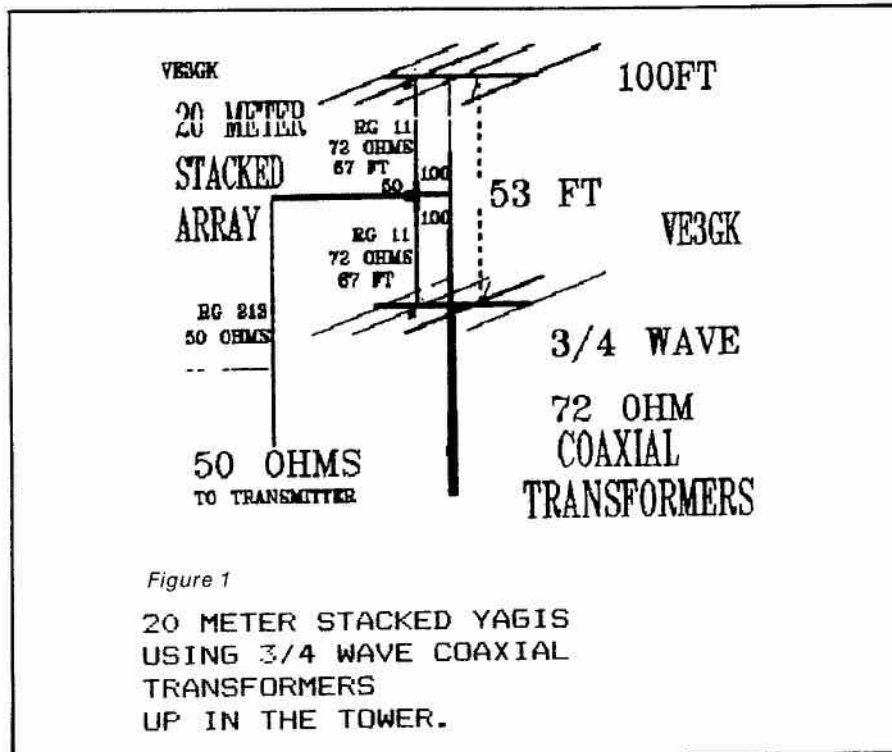
Transmission lines reviewed:

Characteristic impedance of a transmission line depends on the dielectric (the insulator material between the inner and outer conductor) and the ratio of the diameter of the two conductors. Length, resistivity and the frequency of operation have little effect. Losses occur at higher frequencies and better quality transmission lines are required. Always try to keep the transmission lines as short as possible.

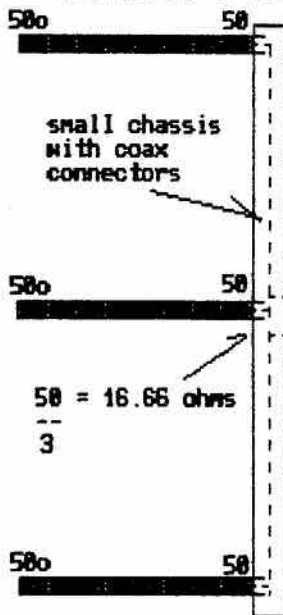
One should be able to lengthen or shorten the feed line, in multiples of 1/2 wave, and not affect the reflected power. If a change is noted, the line is no longer acting as a transmission line; it's now become part of the radiating system. More work has to be done on the antenna and matching system.

If the load impedance, the transmitter output impedance and the transmission line impedance are the same value, maximum energy is transferred.

Start with known values such as the transmitter output impedance (usually 50 ohms) and with good quality 50 ohm coax such as RG213. Work on the



MATCHING 3 ANTENNAS



$$50 = \frac{16.66 \text{ ohms}}{3}$$

TWO 1/4 W LINES IN PARALLEL

Figure 3

Figure 4

1/4 WAVE MATCHING TRANSFORMER

$$Z(1/4\lambda) = \sqrt{(\text{INPUT "Z"} \times \text{OUTPUT "Z"})}$$

$$= \sqrt{16.66 \times 50}$$

$$= \sqrt{833}$$

$$= 28.8 \text{ OHMS}$$

(29.5 ohms close enough for practical work)

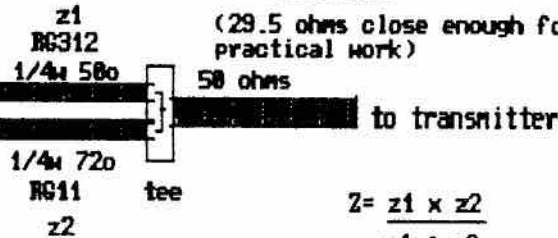
$$\text{OR } Z \text{ INPUT} = \frac{1/4 \text{ WAVE}}{Z \text{ OUTPUT}}$$

$$= \frac{29.5^2}{50}$$

$$= \frac{870.5}{50}$$

$$= 17.4$$

CLOSE ENOUGH



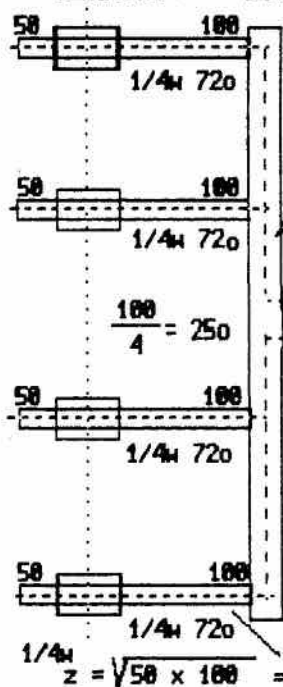
$$Z = \frac{z1 \times z2}{z1 + z2}$$

$$= \frac{50 \times 72}{50 + 72}$$

$$= \frac{3600}{122}$$

$$= 29.5 \text{ ohms}$$

MATCHING ANTENNAS



$$\frac{100}{4} = 250$$

$$z = \sqrt{50 \times 100} = 70.7 \text{ ohms}$$

1/4 WAVE MATCHING TRANSFORMER

$$Z(1/4\lambda) = \sqrt{(\text{INPUT "Z"} \times \text{OUTPUT "Z"})}$$

$$= \sqrt{25 \times 50}$$

$$= \sqrt{1250}$$

$$= 35.3 \text{ ohms}$$

(36 ohms close enough for practical work)

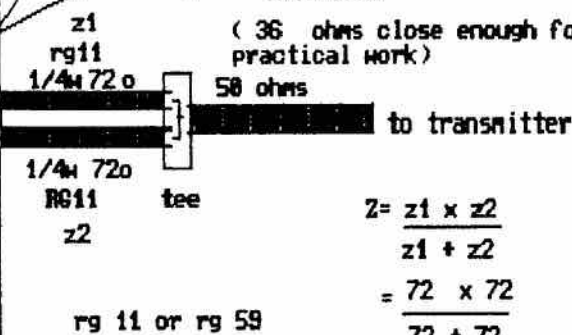
$$\text{OR } Z \text{ INPUT} = \frac{1/4 \text{ WAVE}}{Z \text{ OUTPUT}}$$

$$= \frac{36^2}{50}$$

$$= \frac{1296}{50}$$

$$= 25.92$$

CLOSE ENOUGH



$$Z = \frac{z1 \times z2}{z1 + z2}$$

$$= \frac{72 \times 72}{72 + 72}$$

$$= \frac{5184}{144}$$

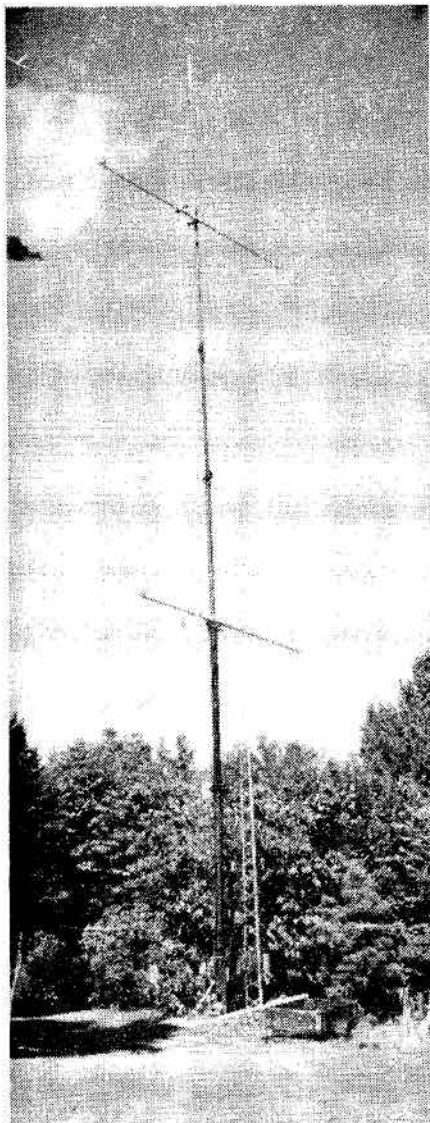
$$= 36 \text{ ohms}$$

VE3GK

antenna, trim it so the minimum reflected power is on frequency. If the reflected power will not come down to a reasonable value at the bottom of the curve it does not mean the antenna is not resonant. Resonance can occur at a higher or lower value and impedance transformation is required. One must either measure the impedance or look up the value in an antenna book from a similar situation.

Once you have determined the value, transform it by using matching techniques. Try to use matching devices at the antenna such as the balun or gamma match to transform odd impedances to 50 ohms.

Quarter wave or odd multiples of quarter wave (eg. $\frac{3}{4}w = \frac{1}{2}w + \frac{1}{4}w$) coaxial transformers are used by many Amateurs, especially those who use multiple antenna arrays.



4 over 4 stacked array, one at 100 ft., the other at 45 ft. 30 ft. booms, 20M.

QUARTER WAVE COAXIAL TRANSFORMERS:

A quarter wave length of transmission line will transform impedance up or down according to the formula shown in the examples in the drawings.

Fig. 1 is how I feed my stacked 20 metre array. Fig. 3 is how Ian VK3MO and Mike EA3OT feed their three 4-element stacked 210 metre yagis. Fig. 4 is how one could feed a 4-antenna stacked system.

In my particular installation I use two quarter-wave 72 ohm transmission lines to raise the 50 ohm feed impedance of each of the four element monobanders in the 4 over 4 stacked array. As you can see, the input impedance from each yagi is raised to about 100 ohms. When the transformers are connected in parallel, at the tee connector, the resulting impedance is about 50 ohms. In my set-up I have less than $\frac{1}{2}$ watt of reflected power as measured on the BIRD 43 wattmeter with 100 watts into the tee connector at resonance.

System used to feed three antennas (used by VK3MO and EA3OT) is shown in Fig. 3. System used to feed four antennas is shown in Fig. 4.

CONCLUSION

I have found, over the years through practical experiments, that if you concentrate on the antenna and its feed—your signal will improve to the extent that you stand out from the crowd.

I also understand the theory that states if one decreases the VSWR from 2 to 1 to 1.1 to 1 that the difference should not be perceivable. However, in practice, when one strives for that extra effort, other improvements take place and the overall signal gain is very apparent.

Someone asked why I would go to the trouble of installing a 2-ton rotating tower to support 2 mono band yagis to achieve a theoretical gain of 3 dB ($1/8''$ on the S meter). In actual practice the gain seems to be much more. Take a listen to Ian VK3MO on 20 metres with his 4x4x4 stacked system.

One does not have to have a stacked array to have an outstanding signal. I have received answers to my CQ from Australia long path from the mobile on 20 metres. Do the best with what you have. ■

Radio's first voice was Canadian

Mervyn C. Fry

Yes, it WAS a Canadian—Reginald Aubrey Fessenden—who was recognized as the 'father' of radio and as the first to actually transmit the sound of the human voice without wires.

Several years prior to his first broadcast by radio, Reginald Fessenden had perfected a new method of sending Morse code more effectively than Guglielmo Marconi. To him goes the credit for successfully transmitting the sound of the human voice, between two 50-foot towers on Cobb Island located in the Potomac River, Washington D.C., December 23, 1900.

The first radio broadcast ever in the world's history was made by Reginald Fessenden on Christmas Eve 1906 when he beamed a 'Christmas Concert' to the astonished crews of the ships of the United Fruit company out in the Atlantic Ocean and the Caribbean Sea.

Beamed out from the 400-foot towers of the transmitting shack at Brant Rock, Massachusetts on the Atlantic coast, this program commenced exactly at 9 o'clock, with 'CQ CQ CQ', meaning 'general call to all stations within

range', sent out in dots and dashes. Then over the microphone, Reginald himself gave a brief speech as to the program to follow. This was immediately followed by one of the operators switching on the Edison phonograph and a solo voice singing Handel's 'Largo'.


The first case of 'mike fright' was registered when Mr. Stein, an assistant, backed away unable to utter a word! However, Fessenden grabbed his violin and 'fiddled' through 'O Holy Night', singing as well as playing. Helen, his wife and his secretary, Miss Bent, endeavoured to read parts of the Bible text, 'Glory to God in the highest and on earth peace to men of good will', but, like Mr. Stein, they suffered stage fright.

Concluding the program, Fessenden wished his listeners "A Merry Christmas".

The success of this first broadcast was verified by operators, not only from those on the ships of the United Fruit Company but also from vessels all over the south and north Atlantic, amazed at the magic and miracle of this first wireless radio broadcast.

— The Cat's Whisker,
Cdn. Vintage Wireless Assoc.

Get Results!



THE CANADIAN AMATEUR
Canada's Amateur Radio Magazine

SWAP SHOP

SEAWAY COMMUNICATIONS CO.

3481 ROSEDALE AVE., CORNWALL, ONT. K6K 1V5
(613) 938-3896

RG-213/U	Mil spec 50 Ohm, 97% shield, NCV.....	\$ 68.00 /100ft.
4XL-IIA	9913 equiv, double shield, NCV jacket	\$ 98.00 /100ft.
RG-8X-IIA	52 Ohm 95% shield, NCV jacket.....	\$ 42.00 /100ft.
PL-259	AMPHENOL, phenolic.....	\$ 2.00
D-52	SPI-RO 80/40 trap dipole -105ft- kW	\$ 95.00
PB-1	SPI-RO 1:1 balun, no soldering, kW+	\$ 26.00
LM-150	LARSEN 5/8 wave antenna for 2m.....	\$ 65.00
NM0-2/70	LARSEN dual band antenna 2m/70cm	\$ 83.00
KG-142-PL	LARSEN 1/2 wave on-glass for 2m	\$ 70.00

PARTIAL LISTING ONLY - WE CARRY LARSEN, SPI-RO, AMPHENOL, COAX, ANTENNA WIRE, LADDERLINE, CONNECTORS, PARTS, ETC.
PLEASE CALL OR WRITE FOR FREE CATALOG AND PRICELIST.

Receiver P.C.B. DT-66 VHF Marconi ...	\$150. ea
Receiver P.C.B. DT-62 UHF Marconi ...	\$150. ea
P.A. 30 Watts VHF and UHF	\$150. ea
1:1 Balun 2-30 MHz 1000 W	\$20. ea
1:4 Balun 2-30 MHz 1000 W	\$20. ea
Stranded Copperweld wire #1415 ft
Stranded Copperweld wire #1025 ft
6 in. End Insulator	\$3.00 ea

For Parts and service on all Marconi Products
HF-VHF-UHF... Please contact us, VE2GFC.

COM-O-PAC INC.

2264 Montee Gagnon, Blainville, P.Q. J7E 4H5
Tel (514) 435-2739, Fax. (514) 437-0586

Ham Radio Magazine

CARF is the exclusive Canadian Subscription agent for HAM RADIO Magazine.
SAVE MONEY. Subscribe or renew through CARF to this excellent American magazine. Only \$35⁰⁰ Canadian for 12 issues.

Use the handy order form below:

CARF Membership Number: _____ Expiry Date: _____

If a renewal, my Ham Radio Number is: _____ Expiry Date: _____

Send Renewal Notice with \$35⁰⁰ to CARF Head Office.

Name: _____ Call: _____

Address _____

City: _____ Code: _____

I am a CARF Member and wish to take advantage of the discount. Enclosed is:

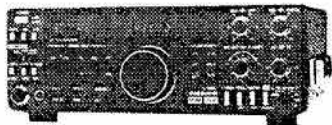
My cheque for \$35⁰⁰

Visa/Mastercard Number: _____ Expiry Date: _____

I am not a CARF Member and wish to order Ham Radio at the non-member rate. I am enclosing \$38.

Allow 6-8 weeks for processing.

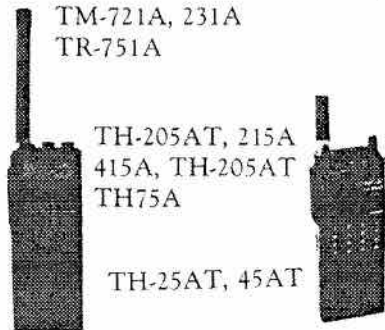
KENWOOD



TS 940, 680S, 440, 140



TM-721A, 231A
TR-751A



TH-205AT, 215A
415A, TH-205AT
TH75A

TH-25AT, 45AT

LEASE TO OWN

1. 48' TOWER, MAST BEARING, MAST; HAM IV ROTOR, ROTOR WIRE 100'; TH3JR. & BALUN, RG 213u 100'; 4 CONNECTORS; TS-140S, PS-430, DELIVERY TOTAL— \$3900.00

36 MONTH LEASE— \$142.58 per month
42 MONTH LEASE— \$127.76 per month

2. 48' FREE-STANDING TRYLON TOWER, MAST BEARING, MAST 12'2"; HYGAIN HAM IV ROTOR; EXPLORER 14 BEAM; 2 METRE ANTENNA; 300 RG 213u; 150' 8448 8 WIRE CONDUCTOR; 4 CONNECTORS; ICOM IC-761, ICOM IC-275H; DELIVERY TOTAL— \$8778.00

36 MONTH LEASE— \$311.71 per month
42 MONTH LEASE— \$278.00 per month

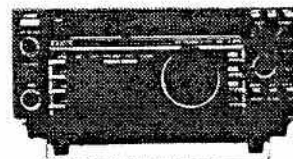
3. 48' TOWER, ROTOR, BEAM; ICOM IC-751A, ICOM PS-30, DELIVERY TOTAL— \$4900.00

36 MONTH LEASE— \$179.14 per month
42 MONTH LEASE— \$160.52 per month

4. 48' TOWER, MAST BEARING, MAST; HAM IV ROTOR & WIRE, TH3JR. & BALUN & WIRE; CONNECTORS; ICOM IC-735, ICOM PS-55, DELIVERY TOTAL— \$4200.00

36 MONTH LEASE— \$153.55 per month
42 MONTH LEASE— \$137.54 per month

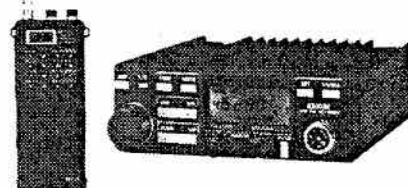
ICOM



IC-725, 735, 765, 751A, 781



IC-2GAT, 32AT, 4GAT, 2SAT



IC-228H, 448A, 900

WE WILL MEET OR BEAT ANY PRICE!

- Quick, reliable service
- We trade



American Express

CENTURY 21 COMMUNICATIONS INC.

23 McCleary Ct., Unit 23, Concord, Ont. L4K 3R6

Telephone: (416) 738-0000

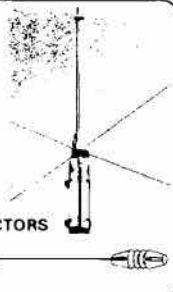
FAX: (416) 738-1169

Commercial - Cellular - Marine - Amateur
Sales - Service - Installations

ANTENNAS

- Larsen Antennas
- Van Gorden
- ANTENNA WIRE

ANDREW HELIAX & CONNECTORS



ACCESSORIES

- Power Supplies
- Accessories
- Bencher Paddles
- Meters



PUBLICATIONS

- ARRL
- Radio Amateur Callbook
- World Radio TV Handbook
- Gordon West Radio School

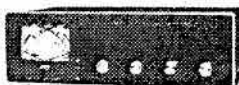


ANTENNAS

- Cushcraft AP8, A3, ARX-2B, 215 WB + more
- **hy-gain**
- Hustler Mobile HF, Mobile VHF, etc.



ACCESSORIES



MFJ

Antenna Tuner
Plus Full Line
Of Accessories

AMERITRON

MIRAGE

VHF & UHF Amps



PACKET Kantronics

AEA

PK-232, PK-87



1278

MFJ

1270B, 1274, 1278



ICOM

IC-735 HF Transceiver
With One
Year Warranty!

ROCK SOLID

"The seven IC-735's used at P4QV performed well. Their excellent dynamic range contributed to our victory at P4QV. The IC-735 is a true champion!"

Dale Green, VE7SV

ICOM's IC-735 is the world's most popular HF transceiver for three simple reasons: **Performance, Size and Reliability.** With the highest performance, smallest size, and best customer satisfaction of any HF transceiver, the IC-735 is the undisputed champion for fixed, portable or mobile operations.

- **Field Proven 100W Transmitter** with 100% duty cycle. Proudly backed with ICOM's full one-year warranty.
- **105dB Dynamic Range Receiver** includes passband tuning, IF notch, adjustable noise blanker, and semi or full CW QSK.



- **Conveniently Designed.** Measures only 3.7"H by 9.5"W by 9"D. Great for mobilizing or portable operation!
- **Optional AH-2 Automatic Tuning Mobile Antenna System** covers 3.5MHz-30MHz.
- **All HF Amateur Bands and Modes** transmits all U.S. HF amateur bands. General coverage receiver.
- **12 Tunable Memories** operate and reprogram like 12 separate VFO's. Supreme flexibility!

Additional Options: SM-8 or SM-6 desk mic, PS-55 AC power supply, AT-150 automatic antenna tuner for base operation.

ICOM's IC-735. . . . the radio with the rock solid reputation! See it today at your local ICOM dealer.

ICOM America, Inc.,
2380 116th Avenue N.E., Bellevue, WA 98004
Customer Service Hotline (206) 454-7619
3150 Premier Drive, Suite 126, Irving, TX 75063
1777 Phoenix Parkway, Suite 201, Atlanta, GA 30349
ICOM CANADA, A Division of ICOM America, Inc.,
3071 - #5 Road, Unit 9, Richmond, B.C. V6X 2T4
All stated specifications subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. 735989.

ICOM
First in Communications